

**The Royal Air Force, Combined Operations Doctrine and the Raid on Dieppe, 19  
August 1942**

By

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## Abstract

This thesis seeks to examine the use of air power during Operation JUBILEE. In recent revisionist accounts, the role of the Royal Air Force has come in for criticism. Therefore, this thesis seeks to examine why the RAF fought the battle in the manner that it did. It examines both the doctrinal and operational context of the forces involved in JUBILEE and in doing so examines their effectiveness. This thesis contends that Combined Operations doctrine argued that the key role for air power was to maintain air superiority in order to protect assaulting force. It then examines this alongside the development of the offensive use of RAF Fighter Command in the battle for air superiority in the period 1940-1942. In understanding, these twin pillars of doctrine and operations this thesis challenges the perceived failure of the RAF during the raid by arguing that in seeking to battle the *Luftwaffe* in the manner that it did during JUBILEE it provided the most appropriate protection that it could for the assault forces. The thesis then examines the impact that JUBILEE had upon Fighter Command strategy and various aspects of Combined Operations development in 1943 thesis in order to assess its effectiveness. This thesis argues that while there may not be a direct link to Operation OVERLORD in 1944 operations at Dieppe had an impact during 1943 and needs to be considered as one line of development in parallel with those from other theatres of war.

## **Dedication**

This thesis is dedicated to my parents, Robert and Patricia Mahoney, who have provided unflinching support through each step of my education.

## Acknowledgements

A work such as this would not be possible without the support and help of many different people and institutions and this is my opportunity to say thank you to them.

First, thanks must go to the staffs of the various institutions where I conducted research. These were the Department of the Research and Information Services at the RAF Museum, Hendon, London; the National Archives, Kew, London; and the Department of Heritage and History, Canadian National Defence Headquarters, Ottawa. The staffs of the University of Birmingham's Information Services were also helpful in providing books and articles to a long-distance student. In particular I am indebted to Sarah Lower and her team of the Library at my place of work, Penwith College, latterly Truro and Penwith College.

Personal thanks must go to my colleagues and students at Truro and Penwith College in Penzance who for the past two years have heard me go on about this project. I am sure that at some point, I have bored them half to death about it but their good humour has helped me through this project. In particular, I must thank Colin Fell, George Yates, Chrissie Denis and Amanda Miller who with me reside in the 'Dungeon' of the college and have kept my spirits high. Thanks must also go to my friends of the Cornish Scale Modellers who have helped in keeping my spirits up through this process.

A paper on the historiography of the Dieppe Raid was delivered to the 2008 postgraduate symposium at the Centre for First World War Studies, University of Birmingham, and thanks must go to the members who gave useful comments on some of the points raised. Thank you to Dr John Bourne who gave me the opportunity to deliver the paper.

My biggest thanks must go to my supervisor, Professor Gary Sheffield, who has guided me through the process of writing this thesis. Without his guidance and support this thesis would not have been half as good as it may be. Gary has been supportive of my ideas and has opened up opportunities that I may not have the chance to experience. Of particular note was the opportunity to participate in the RAF's Exercise TALLY-HO in 2007. This gave me the chance to visit Dieppe and experience a RAF Staff Ride. I am grateful to Sebastian Cox, Head of the Air Historical Branch (RAF), Air Commodore Neville Parton, then Director of Defence Studies (RAF), and Dr David Jordan who allowed me to discuss the air action during JUBILEE when we visited Dieppe. A sympathetic and knowledgeable supervisor is all that a young postgraduate would want and I am glad to say that is what I have had.

Finally, thanks must go to my family who have supported me through each step of my education and have never tried to steer me away from whatever course I chose. Both my parents and my sister provided accommodation and a good cup of tea when conducting research in London. Without this support, this thesis would have been much more of a financial burden and would have been more difficult to complete. Thank you for your support.

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## List of Abbreviations

8AAF	United States Eighth Army Air Force
AA	Anti-Aircraft
AACO	Air Advisor on Combined Operations
AACO (Air)	Assistant Advisor on Combined Operations (Air)
ACO	Advisor on Combined Operations
ACAS (G)	Assistant Chief of the Air Staff – General Branch
ACAS (Ops)	Assistant Chief of the Air Staff – Operations
ACAS (P)	Assistant Chief of the Air Staff – Plans
ACAS (T)	Assistant Chief of the Air Staff – Technical Requirements
AEAF	Allied Expeditionary Air Force
AHB	Air Historical Branch, RAF
AOC-in-C	Air Officer Commander in Chief
ASR	Air Sea Rescue
BAFF	British Air Forces in France
BEF	British Expeditionary Force
BWC	Black Watch of Canada
CAS	Chief of the Air Staff
CCO	Chief of Combined Operations
CCSDCO	Combined Committee on Staff Duties in Combined Operation
CIGS	Chief of the Imperial General Staff
CMHQ	Canadian Military Headquarters
COHQ	Combined Operations Headquarters
COSSAC	Chief of Staff to the Supreme Allied Commander
CTC	Combined Training Centre
DAT	Director of Aerial Tactics
DBO	Director of Bomber Operations
DCAS	Deputy Chief of the Air Staff
DCCO	Deputy Chief of Combined Operations
DCO	Director of Combined Operations
DDFO	Deputy Director of Fighter Operations
DFO	Director of Fighter Operations
DHH	Department of Heritage and History, Ottawa
D of P	Director of Plans
D of T	Director of Training
FAA	Fleet Air Arm
FDO	Fighter Direction Officer
FDS	Fighter Direction Ship
FDT	Fighter Direction Tender
FMR	Fusiliers Mont-Royal
FOO	Forward Observation Officer
GCI	Ground Control Interception Radar
GOC	General Officer Commanding
HQS	Headquarters Ship
IJN	Imperial Japanese Navy
JSCSC	Joint Services Command and Staff College, Shrivenham
LST	Landing Ship Tank
MCO	Manual of Combined Operations (1938 Edition)
OKW	<i>Oberkommando der Wehrmacht</i> (German High Command)

OR	Operational Research
ORS	Operational Research Section
QOCHC	Queen's Own Cameron Highlanders of Canada
RAF	Royal Air Force
RAFM	Royal Air Force Museum, Hendon
RHLI	Royal Hamilton Light Infantry
RN	Royal Navy
RNAS	Royal Naval Air Service
RRC	Royal Regiment of Canada
SASO	Senior Air Staff Officer
SEAC	South East Asia Command
SSR	South Saskatchewan Regiment
Tac R	Tactical Reconnaissance
TNA	The National Archives, Kew
USAAF	United States Army Air Force
VCAS	Vice-Chief of the Air Staff
WDAF	Western Desert Air Force

## List of Operational Codewords

AFLAME	Planned Combined Operation against Berck in October 1942
ARCHERY	Combined Operation against the Vaagso Islands, 27 December 1941
ASTORIA	The assault on Le Havre in September 1944
AVALANCHE	One element of the invasion of Italy at Salerno, 3 September 1943
BLAZING	Planned Combined Operation against the Contentin Peninsula in May 1942
CAULDRON	Assault by No. 4 Commando against the Hess Battery during Operation JUBILEE
CHARIOT	Raid on St Nazaire, 28 March 1942
CHARNWOOD	Assault on Caen, 8-9 July 1944
COCKADE	Deception operation in 1943 that was formed of Operations STARKEY, WADHAM and TINDALL
COLEMAN	Planned Combined Operation in late 1942
CORKSCREW	Invasion of the island of Pantelleria, 10 June 1943
CROSSBOW	Deception cover for Operation TORCH
DYNAMO	Evacuation of the BEF from France, May-June 1940
FORTITUDE SOUTH	Deception element of Operation OVERLORD that was designed to suggest that the invasion was to occur in the Pas de Calais area
HUSKY	Invasion of Sicily, 9 July – 17 August 1943
JUBILEE	The raid on Dieppe, 19 August 1942
MILLENIUM	First thousand bomber raid by RAF Bomber Command against Cologne, 30/3 May 1942
OVERLORD	Invasion of Normandy, 6 June 1944
OVERTHROW	The deception plan for Operation TORCH
RANKIN	Planned re-entry into Europe if Germany collapsed in 1943
RATTLE	Planning conference held by COSSAC in June 1943 to examine problem related to the invasion of Europe
RUTTER	The planned raid on Dieppe. Superseded by JUBILEE
<i>Seelowe</i>	Planned German invasion of Great Britain in 1940
STARKEY	Feigned assault in the Boulogne area in September 1943
TINDALL	Feigned attack on Norway in September 1943
TORCH	Invasion of North Africa, 8 November 1942
WADHAM	Feigned assault in the Brest area as support for STARKEY in September 1943
<i>Weserübung</i>	German invasion of Norway, 9 April 1940
YUKON I and II	Exercises in preparation for Operation RUTTER/JUBILEE

## Introduction

### I.1 Outline of Operation JUBILEE

At 04:45 on 19 August 1942, Allied forces landed on the French coast eight miles from Dieppe.<sup>1</sup> This was the first wave in a raid against the town Dieppe with the aim of:

*limited military and air objectives, embracing the destruction of local defences, power stations, harbour installations, rolling stock, etc., in Jubilee, the capture of prisoners, the destruction of an aerodrome near the town and the capture and removal of German invasion barges and other craft in the harbour.*<sup>2</sup>

JUBILEE was the largest raid launched by Combined Operations Headquarters (COHQ) and the culmination of a strategy that began in 1940. The force comprised of troops from 2<sup>nd</sup> Canadian Infantry Division, the British Army's No. 3 and 4 Commando and the Royal Marine's 'A' Commando. Included was a small detachment of French and American troops, notably fifty Rangers who were the first American soldiers to see combat in Europe.<sup>3</sup> The ground commander was Major General J H Roberts, General Officer Commanding (GOC) 2<sup>nd</sup> Canadian Infantry Division, a curious choice for such a difficult mission as he lacked operational experience.<sup>4</sup> These were supported by substantial forces from the Royal Air Force (RAF) under the command of Air Marshal Trafford Leigh-Mallory and from the Royal Navy (RN) under the command of Captain

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<sup>1</sup> All times given are in British summer time (one hour behind Continental time).

<sup>2</sup> Department of Heritage and History (DHH), Canadian Military Headquarters (CMHQ) Historical Report No. 83 – Preliminary Report on Operation “JUBILEE” (The Raid on Dieppe), 19 August 1942, 19 September 1942, p. A-1. It was noted in this report that while attempts were made to mask the name of JUBILEE's target on the last page of the operational order the map reference for Dieppe was given.

<sup>3</sup> On the participation of the Rangers see Jim DeFelice, *Rangers at Dieppe: The First Combat Action of U.S. Army Rangers in World War II* (New York: Berkley Caliber, 2008).

<sup>4</sup> The process of choosing both the Canadians as the main force for the assault and Roberts as commander is examined in, Brian Loring Villa *Unauthorized Action: Mountbatten and the Dieppe Raid, 1942* (Oxford: Oxford University Press, 1989) pp. 212-231; Peter Henshaw, ‘The Dieppe Raid: A Product of Misplaced Canadian Nationalism’ *The Canadian Historical Review*, Vol. 77, No. 2 (June 1996) pp. 250-266.

James Hughes-Hallett; the RN provided paltry forces for the support of the operations. The heaviest ships involved in the operation were eight Hunt Class destroyers of which two of were command ships. In total, there were two hundred thirty-seven vessels in various roles for the operation.<sup>5</sup> By the end of the operation, some four thousand two and fifty-two service members were casualties.<sup>6</sup>

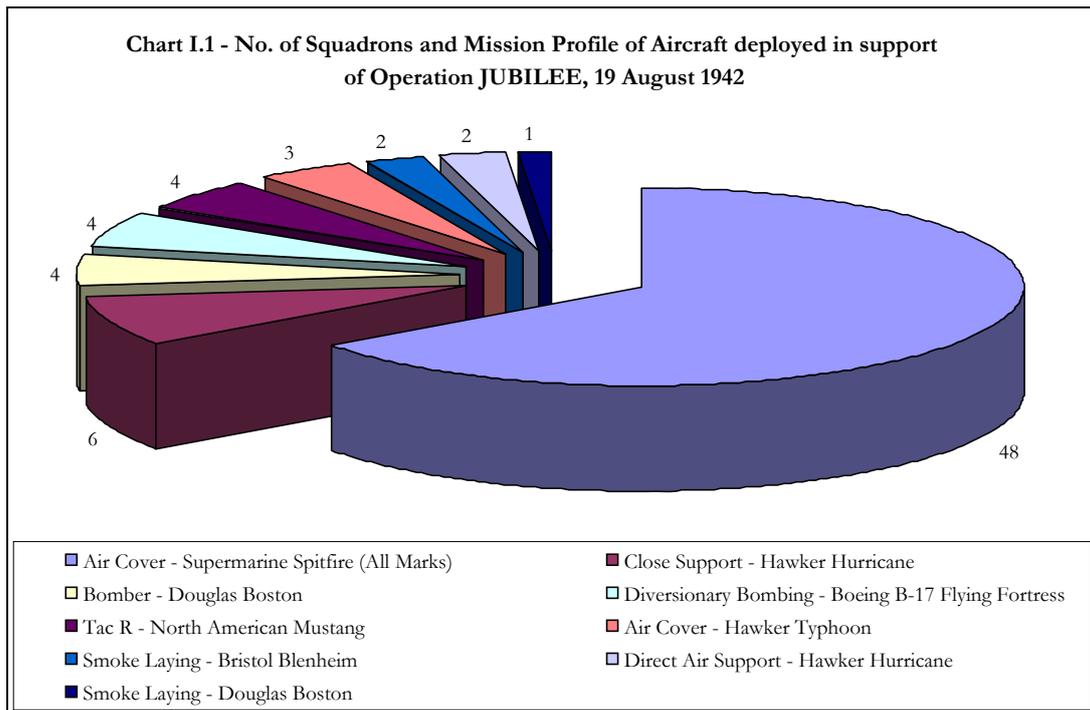
The RAF supplied substantial forces for JUBILEE. In total, some seventy RAF squadrons and four United States Eighth Army Air Force (8AAF) squadrons were tasked to support JUBILEE; the type of squadrons deployed in support of JUBILEE is illustrated in Chart I.1.<sup>7</sup>

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<sup>5</sup> Stephen Roskill, *The War at Sea, Volume II: The Period of Balance* (London: HMSO, 1954) p. 243.

<sup>6</sup> Charles Stacey, *Official History of the Canadian Army in the Second World War: Volume I – Six Years of War: The Army in Canada, Britain and the Pacific* (Ottawa: Queen's Printer, 1955) pp. 387-388.

<sup>7</sup> The National Archives (TNA), AIR 20/5186, Report by the Air Force Commander on the Combined Operation against Dieppe, 5 September 1942, p. 2. The number of squadrons tasked to JUBILEE has caused some confusion amongst historians with John Terraine citing sixty-one and the RAF's quasi-official history citing fifty-six: John Terraine, *The Right of the Line: The Royal Air Force in the European War, 1939-1945* (London: Wordsworth Edition, 1997; Hodder and Stoughton, 1985) p. 560; Denis Richards and Hillary St George Saunders, *Royal Air Force, 1939-1945 – Volume 2: The Fight Avails* (London: HMSO, 1953) p. 143. For a breakdown of the squadrons, see Appendix 1.



(Source: TNA, AIR 20/5186, Appendix A to Report by the Air Force Commander; Franks, *The Greatest Air Battle*, pp. 222-225; Franks, *Fighter Command Losses*, pp. 56-62)

Command was exercised through the mechanism of Fighter Command's No. 11 Group.<sup>8</sup> RAF operations during JUBILEE were split into five distinct phases with air operation starting at 04:45 and finishing at 22:45.<sup>9</sup> The first phase, 04:45 to 05:50, saw attacks on the beaches and defences with Douglas Bostons laying smoke while escorted bombers attacked the beachfront.<sup>10</sup> At the same time Hawker Hurricane fighter-bombers and Supermarine Spitfires attacked gun batteries on the headlands, which were to be assaulted by No. 3 and 4 Commando.<sup>11</sup> In the second phase, 05:50 to 07:30, air cover

<sup>8</sup> In later years, a great deal of controversy would surround his role in the 'Big Wing' controversy of 1940 and his choice as commander of the tactical air forces for OVERLORD that has clouded any reasonable analysis of his effectiveness as a leader. The only biography of Leigh-Mallory is one produced by his great nephew, Bill Newton Dunn, Liberal Democrat MEP for the East Midlands. Unfortunately, the book has many factual inaccuracies and is often defensive about criticisms made of Leigh-Mallory: Bill Newton Dunn, *Big Wing: A Biography of ACM Trafford Leigh-Mallory* (Shrewsbury: Airlife, 1992).

<sup>9</sup> TNA, AIR 20/5186, Report by the Air Force Commander, pp. 6-10.

<sup>10</sup> TNA, AIR 20/5186, Report by the Air Force Commander, p. 6.

<sup>11</sup> TNA, AIR 20/5186, Report by the Air Force Commander, p. 6. On the attacks by No. 3 and 4 Commando see, Will Fowler, *The Commandos at Dieppe: Rehearsal for D-Day* (London: Collins, 2003);

and *ad hoc* direct support were provided. For example, at 0645, the Rommel battery at Puy behind Blue Beach was causing problems for the Royal Regiment of Canada (RRC), therefore, orders were sent to No. 88 Squadron to attack the battery.<sup>12</sup> Within an hour, the squadron was en route when a recall order was received.<sup>13</sup> As the unit had gone too far to turn back, the attack went in suffering heavy casualties from German fighters.<sup>14</sup> The third phase of operations, 07:30 to 10:30, saw the RAF tasked primarily with providing air cover for operations on the ground. This was the greatest period of activity for the RAF with '20 to 30 fighters being constantly in the area'<sup>15</sup> The penultimate phase, 10:30 to 14:10, saw the RAF continue to provide air cover while the withdrawal from the beaches was undertaken. In addition limited direct air support was provided for the withdrawing forces.<sup>16</sup> During this phase *Luftwaffe* tactics against the attacking forces changed with larger mixed formations of fighters, fighter-bombers and bombers being utilised.<sup>17</sup> The final phase, 14:10 to 22:45, saw air cover provided for the fleet returning to Britain.<sup>18</sup> Active operations were curtailed by deteriorating weather.

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Brereton Greenhous, 'Operation Flodden: The Sea Fight off Berneval and the Suppression of the Goebbels Battery, 19 August 1942' *Canadian Military Journal*, Vol. 4, No. 3 (Autumn 2003) pp. 47 – 57.

<sup>12</sup> TNA, AIR 20/5186, Report by the Air Force Commander, p. 7; Norman Franks, *The Greatest Air Battle: Dieppe, 9<sup>th</sup> August 1942* (London: Grub Street, 1992), p. 70.

<sup>13</sup> TNA, AIR 20/5186, Report by the Air Force Commander, p. 8.

<sup>14</sup> Franks, *The Greatest Air Battle* pp. 70-71.

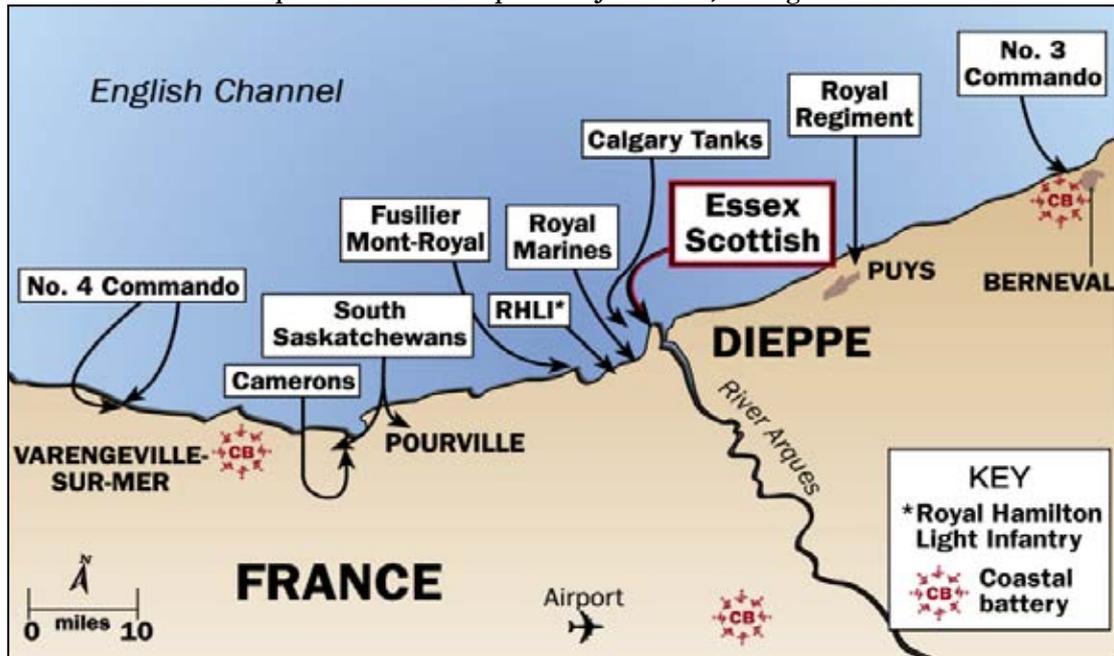
<sup>15</sup> TNA, AIR 20/5186, Report by the Air Force Commander, p. 8.

<sup>16</sup> TNA, AIR 20/5186, Report by the Air Force Commander, p. 9.

<sup>17</sup> TNA, AIR 20/5186, Report by the Air Force Commander, p. 9.

<sup>18</sup> TNA, AIR 20/5186, Report by the Air Force Commander, p. 9.

Map I.1 – Outline of Operation JUBILEE, 19 August 1942



Map 1.1 outlines the locations assaulted during JUBILEE. The first unit to land was No. 3 Commando at Berneval and out of twenty-three landing craft, only six made it to shore. However, despite losses the attack went in and managed to suppress fire from the Goebbels battery.<sup>19</sup> At 04:54, No. 4 Commando landed at Varangeville-sur-Mer to attack the Hess battery. This attack, Operation CAULDRON, has been considered the only successful aspect of JUBILEE as the battery was destroyed. However, there was an element of luck with shells left in open pits around the battery, which were blown-up by a single mortar round.<sup>20</sup> However, the operation became the basis for a British Army doctrinal pamphlet on attacking gun positions and was described as a ‘model of bold action and successful synchronisation.’<sup>21</sup>

<sup>19</sup> Greenhous, ‘Operation FLODDEN’, pp. 47-57.

<sup>20</sup> Fowler, *Commandos at Dieppe, passim*.

<sup>21</sup> DHH, CMHQ Report No. 101 – Operation “JUBILEE”: The Raid on Dieppe, 19 August 1942, Part II: The Execution of the Operation. Section 1: General Outline and Flank Attacks, 11 August 1943, p. 21; TNA, WO 208/3108, Notes from Theatres of War No. 11: Destruction of a German Battery by No. 4 Commando during the Dieppe Raid (1943).

On the inner flanks, the RRC and the Black Watch of Canada (BWC) landed on Blue Beach at Puys. Unfortunately, they landed fifteen minutes behind schedule and of five hundred troops landed, just six returned unscathed.<sup>22</sup> At Pourville, Green Beach, the South Saskatchewan Regiment (SSR) and the Queen's Own Cameron Highlanders of Canada (QOCHC) were to take the high ground above Dieppe. The SSR was to outflank Dieppe while the QOCHC were to link up with the 14<sup>th</sup> Canadian Army Tank Regiment (The Calgary Tanks) and attack the airfield at St Aubin, this proved fruitless because of the problems encountered in Dieppe itself.<sup>23</sup> A secondary mission attached to the landing at Pourville was the attempt by the RAF to capture or examine the *Freya* radar that was stationed in the area.<sup>24</sup> The SSR quickly entered Pourville and had reinforcement been available they may have pushed onto their objectives, however, they become bogged down despite support from destroyers offshore.

In the main assault at Dieppe, the Royal Hamilton Light Infantry (RHLI) and the Essex Scottish landed on Red and White Beaches. Their attack had been preceded by attacks by fighter-bombers and bombers, which had dazed the defenders, however, the strength of the positions in Dieppe made progress difficult. Lieutenant Fred Woodcock of the RHLI recalled that all he could remember was 'the sound, because I was blinded. The boat filled with water and I was soon up to my neck.'<sup>25</sup> The assault was to be

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<sup>22</sup> Villa, *Unauthorized Action*, p. 14; Ronald Atkin, *Dieppe, 1942: The Jubilee Disaster* (London: Macmillan, 1980), pp. 113-133.

<sup>23</sup> Atkin, *Dieppe, 1942*, pp. 134-149.

<sup>24</sup> The role of Flight Sergeant Jack Nissenthall is dealt with in John Campbell, *Dieppe Revisited: A Documentary Investigation* (London: Frank Cass, 1993) *passim*. Originally published in 1975, James Leasor offers a dramatic version of Nissenthall's mission in *Green Beach* (London: House of Stratus, 2001). Nissenthall published his own memoirs in 1987 as *Winning the Radar War: A Memoir by Jack Nissen and A W Cockerell* (Toronto: Macmillan, 1987).

<sup>25</sup> Atkin *Dieppe 1942*, p. 153.

supported by twenty-nine Churchill MkIII tanks from the Calgary Tanks.<sup>26</sup> However, from the start of the operation conditions deteriorated as tanks were bogged down in the chert beach and became prominent targets for antitank guns. The tanks were fifteen minutes late arriving at the beaches and this had ‘unfortunate results for the general fortunes of the operation on the main beaches.’<sup>27</sup> Eventually all of the tanks were destroyed and only three remained on the esplanade.<sup>28</sup> Due to the deteriorating situation at Dieppe, Roberts decided at 06:30 to commit his reserve, the Fusiliers Mont-Royal (FMR). Roberts claimed that after:

*About one hour after touch down, information received indicated that “Red” Beach was sufficiently cleared to permit the landing of the floating reserve.*<sup>29</sup>

Roberts was wrong. At 08:00, Roberts, having been deceived by intelligence again, decided to commit RM ‘A’ Commando to White Beach to force a breakthrough. This necessitated a quick rethink on the way into the beach and as it moved parallel to the beach it became what has been described as the ‘sea parallel of the Charge of the Light Brigade’, ‘A’ Commando came under a hail of artillery fire and its intended effect became negligible.<sup>30</sup>

By 09:30, it became clear that the operation was a failure and landing craft started taking wounded off the beach. At the same time both Roberts and Hughes-Hallet contended that, withdrawal was necessary and that it should begin at 11:00.<sup>31</sup> By 12:50, all troops that could be evacuated had been removed from the beaches. The casualty rate

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<sup>26</sup> DHH, CMHQ Report No. 108 - ‘Operation “Jubilee”: The Raid on Dieppe, 19 Aug 42. Part II: The Execution of the Operation. Section 2: The Attack on the Main Beaches, 17 December 43, Amended on 12 July 1950, Para. 137

<sup>27</sup> DHH, CMHQ Report No. 108, Para. 80.

<sup>28</sup> DHH, CMHQ Report No. 108, Paras. 84-88. Hugh G. Henry has dealt with the failure of the Calgary Tanks in *Dieppe: Through the Lens of the German War Photographer* (London: Battle of Britain Prints, 1993).

<sup>29</sup> DHH, CMHQ Report No. 108, Para. 142.

<sup>30</sup> DHH, CMHQ Report No. 108, Para. 174.

<sup>31</sup> DHH, CMHQ Report No. 108, Paras. 225-230.

for the ground force reached almost sixty percent. As one historian has commented, it was a cruel fate for a country, Canada, who had waited:

*over two and a half years for combat and be killed, maimed, or captured within a single morning one of the undeniable tragedies of the Second World War.*<sup>32</sup>

## **I.2 Thesis Rationale, Aims and Limitations**

Considering the amount of ink that has been spilt over JUBILEE, it could be queried whether there is a need for another examination of a raid that in the context of the Second World War was a small operation.<sup>33</sup> However, much of the historiography has been driven by Canadian nationalism in trying to explain the problems that faced their troops at Dieppe. Research on Dieppe has been varied from early journalistic accounts to thorough scholarly explanations and subjects have been just as diverse with recent research being conducted into how JUBILEE was reported.<sup>34</sup>

However, there has been a distinct lack of analysis of how Dieppe fitted into prevailing Combined Operations doctrine and how effective were the various elements of JUBILEE. There has been some attempt to shift the focus of the historiography away from the contentious issues of blame to a discussion of effectiveness with Hugh G. Henry's work on the Calgary Tanks and Will Fowler's work on CAULDRON, however, this needs to be taken further.<sup>35</sup> Therefore, there is a need to shift the historiography to an analysis of effectiveness in order to assess whether or not any lessons were truly learnt

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<sup>32</sup> Villa *Unauthorized Action*, p. 2.

<sup>33</sup> See Villa, *Unauthorized Action*; Campbell, *Dieppe Revisited*; Atkin, *Dieppe, 1942*; Hugh Henry, 'The Planning, Intelligence, Execution and Aftermath of the Dieppe raid, 19 August 1942' PhD Thesis (University of Cambridge, 1996).

<sup>34</sup> Timothy Balzer, 'In Case the Raid is Unsuccessful...?: Selling Dieppe to Canadians' *The Canadian Historical Review*, Vol. 87, No. 3 (September 2006) pp. 409-430.

<sup>35</sup> Henry, *Dieppe*; Hugh G. Henry, 'The Calgary Tanks at Dieppe' *Canadian Military History*, Vol. 4, No. 1 (1995) pp. 61-74; Fowler, *Commandos at Dieppe*

from JUBILEE. The role of air power during JUBILEE has received little serious attention about the role it actually played on the day; much has centred on higher strategic discussions, for example, in his despatch on the operation, Hughes-Hallett spent only ten lines describing the role of the RAF.<sup>36</sup> Norman Franks' narrative of the operation did little to attempt to analyse the effectiveness of the forces deployed.<sup>37</sup> Thus, it is the rationale of this thesis to seek to re-contextualise the debate about Dieppe and concentrate on its relevance as a military operation by examining the place of air power in its doctrinal and operational context. In doing this it will analyse the effectiveness of the forces deployed and the links between JUBILEE and subsequent operations.

In analysing the role of air power during JUBILEE there are several research questions that will be explored. First is an exploration of the RAF's role in the development of Combined Operations doctrine during the inter-war years and how the RAF saw the use of air power in this type of operations. Second is an examination of the operational context of the RAF in the period 1940-1942 and an assessment of the role the RAF played in the planning for JUBILEE. A key aspect of this is an examination of how the RAF viewed the operation and how support for a Combined Operations fitted in with the RAF's offensive fighter strategy of the period. Third, the thesis will seek to examine the impact of JUBILEE by examining the effectiveness of the support provided through both qualitative and quantitative sources. It will examine the usefulness of air power on the day of JUBILEE and the costly nature of providing offensive air cover over enemy territory. In examining its impact, the thesis will examine the role JUBILEE had in shaping discussion on the command and control of air power in Combined Operations and the on the issue of fire support. Overall, by placing Dieppe into its

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<sup>36</sup> Captain J. Hughes-Hallett, 'Dieppe Raid: Despatch on the Raid, 18-19 August 1942' *The London Gazette*, 12 August 1942, p. 3823. The despatch was originally submitted on 30 August 1942 and published after the war. Villa, *Unauthorized Action*, *passim*.

<sup>37</sup> Franks, *The Greatest Air Battle*, *passim*.

doctrinal and operational context the impact of air power operations can be examined and compared to the lessons learnt in other theatres of war, therefore, contextualising its effectiveness in the short-term rather than long-term, as was suggested by Earl Mountbatten of Burma.<sup>38</sup> Thus, at its centre this thesis seeks to examine why the RAF fights the air battle in the manner it did over Dieppe and how effective it was.

In order to examine these research questions this thesis will utilise a chronological conceptual model in order to frame the discussion. This will roughly split the thesis into three key periods, first, 1918-1939, second, 1940-1942 and finally, 1942-1944. Framing the discussion in this manner has aided in the assessment of JUBILEE's effectiveness by producing an understanding of what came before and after JUBILEE.

Primarily the research has drawn upon archival sources at the National Archives, Kew, the RAF Museum, Hendon and the Canadian Military Headquarters Reports (CHMQ) from the Department of History and Heritage, Ottawa Canada.<sup>39</sup> Thanks to poor historical records that remain on the Dieppe operation it has been necessary to widen the scope of records examined by seeking out records from a variety of departments; a full list of documents consulted can be found in the bibliography. This plurality of archival material has aided in strengthening the conclusions reached. They have been backed up by a variety of non-contemporary sources on issues such as the development of Combined Operations doctrine and air power theory.

For example, archival sources have included an examination of the papers of the RAF Staff College in order to assess the RAF's thinking on the subject backed up by Air Ministry files on the writing of the *Manual of Combined Operations* (MCO). These are backed up with key work on Combined Operations doctrine such as David Massam's

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<sup>38</sup> Earl Mountbatten of Burma, 'Operation Jubilee: The Place of the Dieppe Raid in History' *Journal of the Royal United Service Institution for Defence Studies* Vol. 119 No. 1 (1974)

<sup>39</sup> The CMHQ Reports, and its successor the Army Headquarters Reports (AHQ) are available online at <http://www.cmp-cpm.forces.gc.ca/dhh-dhp/his/rep-rap/index-eng.asp>

1996 doctoral thesis.<sup>40</sup> In addition to Massam's thesis, key non-contemporary sources on Combined Operations have included Kenneth Clifford's *Amphibious Warfare Development in Britain and America from 1920* and Bernard Fergusson's *The Watery Maze*, though these must be treated with caution as Clifford was a former US Marine Corps officer and Fergusson was the former Director of Combined Operations (DCO).<sup>41</sup>

In addition to key works on Combined Operations there are also several important works on air power that have helped inform the interpretations present in this thesis. Most important has been Ian Gooderson's work on tactical air power, *Air Power at the Battlefield*.<sup>42</sup> Gooderson's work has been important in re-focussing the debate about the effectiveness of bombers as a tactical support weapon; one of the key arguments present in revisionist accounts of JUBILEE. David Ian Hall's work on British tactical air doctrine, *Strategy for Victory*, is important for shifting interpretations away from the perception of the RAF being a force that concentrated solely of aerial bombardment; it is within this revisionist interpretation that this thesis falls.<sup>43</sup>

Despite the scope of research undertaken there are several areas that, because of limitations of time and the span of the work, have been avoided due to the focus on operational and tactical issues. First, strategic level discussions surrounding the RAF's role, in particular the argument that the RAF was not interested in providing its full

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<sup>40</sup> David Massam, 'British Maritime Strategy and Amphibious Capability, 1900 – 40' DPhil Thesis (Oxford University, 1996).

<sup>41</sup> Kenneth Clifford, *Amphibious Warfare Development in Britain and America from 1920* (New York: Edgewood, 1983); Bernard Fergusson, *The Watery Maze: The Story of Combined Operations* (London: Collins, 1961).

<sup>42</sup> Ian Gooderson, *Air Power at the Battlefield: Allied Close Air Support, 1943-1945* (London: Frank Cass, 1998); Ian Gooderson, 'Heavy and Medium Bombers: How Successful Were They in the Tactical Close Air Support Role During World War II?' *Journal of Strategic Studies*, Vol. 15, No.3, (September 1992) pp. 367-399

<sup>43</sup> David Ian Hall, *Strategy for Victory: The Development of British Tactical Air Power, 1919-1943* (Greenwood, CT: Praeger, 2007); David Ian Hall, 'The Long Gestation and Difficult Birth of the 2<sup>nd</sup> Tactical Air Force (RAF)' *Royal Air Force Air Power Review*, Vol. 5, No. 3 (Autumn 2002) pp. 20-33; David Ian Hall, 'Creating the 2<sup>nd</sup> Tactical Air Force RAF: Inter-Service and Anglo-Canadian Co-Operation in the Second World War' *Canadian Military Journal*, Vol. 3, No. 4 (Winter 2003) pp. 39-45.

weight of support due to its desire to prosecute the strategic bomber offensive, though by default this thesis does show that this is not as clear as some historians have argued.<sup>44</sup> Second, it does not explore the importance of radar to JUBILEE as John Campbell in *Dieppe Revisited* has dealt with this effectively.<sup>45</sup> It also does not explore the diversionary raid on Boulogne by the 8AAF, which has little bearing on the general thesis of this work. Research also opened several areas that could not be explored because of the word limit; this included the use of balloons in Combined Operations and the RAF's participations in providing meteorological advice for Combined Operations.<sup>46</sup> If this work were expanded, it would be envisaged that the scope of archival sources would be increased to include various personal papers at assorted institutions and to expand the German perspective using the *Bundesarchiv* at Freiburg.

### **I.3 The Historiography of Operation JUBILEE**

Writing about JUBILEE began almost as soon as the dust had settled with journalistic accounts appearing in 1943.<sup>47</sup> Timothy Balzer has gone as far as to suggest that reporting of JUBILEE was shaped by a communiqué given out by COHQ in advance of JUBILEE, which suggested that all reporting be positive.<sup>48</sup> Early accounts by journalists certainly follow this line of reasoning with both Austin and Reynolds's books being optimistic and espousing the COHQ line that important lessons were learnt during

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<sup>44</sup> See Villa, *Unauthorised Action*, pp. 127-162

<sup>45</sup> Campbell, *Dieppe Revisited*, *passim*.

<sup>46</sup> TNA, AIR 2/7999, Balloons for Combined Operations; AIR 2/4833, Combined Operations: Co-Ordination of Meteorological Advice; AIR 2/4845, Combined Operations Organisation: Meteorological Services.

<sup>47</sup> Alexander Austin, *We Landed at Dawn* (London: Hodder and Stoughton, 1942); Quentin Reynolds, *Dress Rehearsal: The Story of Dieppe* (London: Angus & Robertson, 1943).

<sup>48</sup> Balzer, 'In Case the Raid in Unsuccessful', *passim*.

JUBILEE.<sup>49</sup> This interpretation was supported by the production of a pamphlet by the Ministry of Information entitled *Combined Operations*.<sup>50</sup> This booklet detailed the exploits of the COHQ between 1940 and 1942 and a large portion of the book is given over to JUBILEE. Many of the arguments given in these works are based around the findings prevalent in the *Combined Report* on Dieppe and the *Lessons Learnt* document compiled by Hughes-Hallett.<sup>51</sup>

However, critical accounts emerged soon after the end of the war when Colonel C P Stacey began writing the official history of the Canadian Army. During the war, Stacey had been the head of the CMHQ Historical Section and had been responsible for compiling numerous reports on Dieppe. Stacey's role was to collate reports that served a didactic purpose for the Canadian military. Stacey was a vital link in framing Canadian national and military history.<sup>52</sup> He produced a 'White Paper' on JUBILEE that angered Mountbatten as it challenged the veracity of the claims then being made by COHQ; Mountbatten's official biographer has described Dieppe as his one of two key regrets, the other being the partition of India in 1947.<sup>53</sup> The arguments made by Stacey would filter into the official history. While critical, Stacey provided a balanced account of JUBILEE, though he did examine some of the key issues that contributed to JUBILEE's failure such as command issues, the Canadian desire to fight, and bombardment.<sup>54</sup>

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<sup>49</sup> Reynolds was associate editor for *Collier's Weekly* while Austin worked for *The Daily Herald*. Both were present during the raid. Michael Roth, *Historical Dictionary of War Journalism* (Greenwood, CT: Greenwood Press, 1997) p. 17 and pp. 257-258

<sup>50</sup> Anon, *Combined Operations, 1940-1942* (London: HMSO, 1943).

<sup>51</sup> TNA, ADM 239/350, Raid on Dieppe: Lessons Learnt.

<sup>52</sup> Tim Cook, 'Clio's Soldiers: Charles Stacey and the Army Historical Section in the Second World War' *The Canadian Historical Review*, Vol. 83, No. 1 (March 2002) pp. 29-57.

<sup>53</sup> Cook, 'Clio's Soldiers' pp. 41-42; Philip Ziegler, *Mountbatten: The Official Biography* (London: Collins, 1985) p. 186.

<sup>54</sup> Stacey, *Six Years of War*, pp. 308-412.

Writing on Dieppe lay dormant until in the early 1960s when the question of German foreknowledge led to a re-examination of sources.<sup>55</sup> This question emerged when David Irving, in a series of articles in the *Evening Standard* in 1963, argued that Hitler had foreknowledge of JUBILEE, thus opening up an explanation for JUBILEE's failure.<sup>56</sup> This led to renewed interest in JUBILEE with the publication of Eric Maguire's work and Stephen Roskill's article in the *Journal of the Royal United Services Institute* that effectively refuted Irving's claims.<sup>57</sup> However, with the exception of Stacey, and to a degree Roskill in his writings, most historians until the late 1960s accepted the view espoused by Mountbatten. Mountbatten's views on JUBILEE's role and importance can be summed up in his 1974 paper in the *Journal of the Royal United Services Institution*, which argued that despite JUBILEE's failure it was a necessary pre-requisite for Operation OVERLORD.<sup>58</sup> However, the gradual release of information that occurred in the 1970s, in particular the release of ULTRA decrypts began to open up contrary views on the operation; this was aided by the sudden death of Mountbatten in 1979.

The opening up of sources led historians to question previously accepted views about JUBILEE. Notable amongst these revisionists is Brian Loring Villa whose work, *Unauthorized Action*, has laid the blame for JUBILEE's failure at Mountbatten's door. However, the author's nationalistic defence of Canadian involvement biases it. However, it has opened up many interesting question about JUBILEE.<sup>59</sup> Villa's work has aroused much criticism from some historians for relying far too heavily on political science

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<sup>55</sup> Stephen Roskill, 'The Dieppe Raid and the Question of German Foreknowledge' *Journal of the Royal United Service Institute*, Vol. 109 (Feb: 1964) p. 27.

<sup>56</sup> David Irving, 'Dieppe: Hitler *knew* it was coming' *Evening Standard*, 1 October 1963; Roskill, 'German Foreknowledge' p. 27; Campbell, *Dieppe Revisited*, pp. 13-20

<sup>57</sup> Maguire, Eric *Dieppe, August 19<sup>th</sup> 1942* (London: Jonathon Cape, 1963: Corgi Books, 1974); Roskill, 'The Dieppe Raid' pp. 27-31.

<sup>58</sup> Earl Mountbatten of Burma, 'Operation JUBILEE'; Roskill, Stephen *The War at Sea, Volume II: The Period of Balance* (London: HMSO, 1954).

<sup>59</sup> Villa, *Unauthorized Action*, *passim*.

techniques and his conclusion is considered too conspiratorial to be accepted.<sup>60</sup> Peter Henshaw has refuted Villa's claims by linking the issue of authorisation to Mountbatten's desire for power as Chief of Combined Operations (CCO).<sup>61</sup> This led to a debate between Villa and Henshaw in a 1998 article in the *The Canadian Historical Review*.<sup>62</sup> Villa is also heavily critical of the role of the Chiefs of Staffs, notably Portal and Pound, both of whom he views as not supporting the operation enough, and thus contributing to its failure.<sup>63</sup> James Campbell and Denis Whitaker have produced more balanced and considered accounts with Campbell's work being thoroughly researched and effectively examining some of the intelligence questions about Dieppe.<sup>64</sup> Recent research has tended to concentrate on lower unit action such as that of the commandos, in particular Fowler's work, or has started to examine some of the doctrinal background to Combined Operations.<sup>65</sup>

Analysis of air power during JUBILEE can be described as poor at best with little serious scholarship on the subject. On the one hand, there are Franks' narrative accounts, and sycophantic early accounts that describe the use of air power an unqualified success such as the Ministry of Information's *Combined Operations* pamphlet, which uses the term the 'Triumph of the Air'. This portrayal is prevalent in the early histories of JUBILEE.<sup>66</sup>

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<sup>60</sup> Hall, *Strategy for Victory*, p. 211, fn. 36.

<sup>61</sup> Peter J Henshaw, 'The British Chiefs of Staff Committee and the Preparation of the Dieppe Raid, March- August 1942: Did Mountbatten Really Evade the Committee's Authority?' *War in History*, Vol. 1, No. 2 (1994) 197-214.

<sup>62</sup> Brian Villa and Peter Henshaw, 'The Dieppe Raid Debate,' *Canadian Historical Review* Vol. 79, no. 2 (1998) pp. 304–15.

<sup>63</sup> For example see the chapters in *Unauthorized Action*; 'The Royal Navy on the Eve of Dieppe', pp. 95 – 126, and 'The RAF on the Eve of Dieppe', pp. 127 – 162.

<sup>64</sup> Campbell, *Dieppe Revisited*, *passim*; Denis Whitaker and Sheila Whitaker, *Dieppe: Tragedy to Triumph* (Ontario: McGraw-Hill, 1992) *passim*.

<sup>65</sup> Robin Neillands, *The Dieppe Raid: The Story of the Disastrous 1942 Expedition* (London: Aurum Press, 2006); Fowler, *Commandos at Dieppe*.

<sup>66</sup> Franks, *The Greatest Air Battle*, *passim*; Anon, *Combined Operations*, pp. 132-136.

At the opposite end of the spectrum is Villa's work, which is especially critical of the RAF. Villa claims that 'There was a degree of callousness in Portal's allowing a largely Canadian force to go in without the bomber support they needed.'<sup>67</sup> A key revisionist argument is that for JUBILEE to have succeeded it needed bomber support. Villa is especially critical of the decision to withdraw this support.<sup>68</sup> However, this interpretation misunderstands the nature of air support for Combined Operations, something that this thesis seeks to examine. It also ignores the difficulty of utilising heavy bombers in support of land operations. For example, Ian Gooderson has noted that the 'Operational results of employing the strategic air weapon in a tactical role were mixed.'<sup>69</sup> Arguably, if used over Dieppe the results would have been near disastrous as the rubble and destroyed buildings would have made an already difficult position worse; results that would be illustrated two years later during the bombing of Caen during Operation CHARNWOOD.<sup>70</sup> This thesis, thus, seeks to push our understanding of JUBILEE further by critically examine a hitherto little explored aspect of JUBILEE.

#### **I.4 Definitions**

This thesis deals with several distinct but interrelated terms in order to explain the performance and impact of the RAF during JUBILEE. However, before moving on to examine the key areas of debate it is worth defining these terms. First, is doctrine, in the case of this thesis the MCO. Doctrine can be defined as that which is taught and

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<sup>67</sup> Villa *Unauthorized Action* p. 162.

<sup>68</sup> Villa is also critical of the bombardment problems that emerged from poor naval support. The question of naval gun fire support has been examined in Brian Begbie, 'Naval Gunfire Support for the Dieppe Raid' MA Thesis (University of Ottawa, 1999).

<sup>69</sup> Gooderson, *Air Power at the Battlefield*, p. 157.

<sup>70</sup> Gooderson, *Air Power*, pp. 133-136; Peter Gray 'Caen - The Martyred City' in John Buckley, (ed.) *The Normandy Campaign: Sixty Years On* (Abingdon: Routledge, 2006) pp. 164 -166.

disseminated.<sup>71</sup> Doctrine derives its information from the formative experience of a service in a didactic attempt to distil the lessons of history into guidance for future operations. It is hoped that doctrine will guide the course of military operations at all levels, though it has been noted that for the British, doctrine is often viewed as guidance and not a strict set of rules.<sup>72</sup> Within the doctrinal framework the MCO can be considered operational level doctrine as it deal with distinct objectives within a common framework, this is unlike modern 'joint' doctrine, which is at the strategic level.<sup>73</sup> This is because the MCO does not deal with all forms of Combined Operations; in particular, it only deals with operations involving all three services. The RAF's strategic doctrine of the time was AP1300, the *War Manual*.<sup>74</sup> Thus, this thesis deals with the RAF's involvement with an operational doctrine intended to inform on how to perform a specific type of operation. The key RAF idea in the MCO was the attainment of air superiority and this is discussed in Chapter One.

The second area for definitions is Combined Operations. This is a confusing area as modern doctrine views Combined Operations as operations between nations.<sup>75</sup> However, during the Second World War Combined Operations described what modern observers would describe as joint warfare. AP 1300 defined Combined Operations as:

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<sup>71</sup> Anon, *AP3000: British Air Power Doctrine*, 3<sup>rd</sup> Edition (London: The Stationary Office, 1999) p. 3.11.1; Neville Parton, 'The Development of Early RAF Doctrine' *The Journal of Military History*, Vol. 72, No. 4 (October 2008) p. 1155.

<sup>72</sup> This is especially true of the British Army and this theme has been explored in several works in the past few years such as John Buckley, *British Armour in the Normandy Campaign* (Abingdon: Frank Cass, 2004); David French, *Raising Churchill's Army: The British Army and the War against Germany, 1919-1945* (Oxford: Oxford University Press) This still remains to be explored for the RAF though some work is now being undertaken on RAF doctrine such as Parton, 'Early RAF Doctrine'.

<sup>73</sup> Anon, *AP3000*, p. 3.11.5.

<sup>74</sup> Anon, *AP3000*, pp. 3.12.3-3.12.7; Parton, 'Early RAF Doctrine' pp. 1155-1177.

<sup>75</sup> Anon, *AP3000*, p. 3.13.3.

*the term to de-scribe those forms of operations where naval, military or air forces in any combination are co-operating with each other, working separately under their respective commanders, but with a common aim.*<sup>76</sup>

Thus, if Combined Operation were to be discussed in the modern military the vernacular to be used would be one of Joint Operations<sup>77</sup> Therefore, Combined Operations in this context involves more than one service operating together to achieve a common aim. However, this definition can be taken further, as does the doctrine of the time, as there are several forms of combined operations that can be taken into consideration, for example, raids, invasion, demonstrations and withdrawals.<sup>78</sup> The revised MCO of 1938 defined Combined Operations as:

*forms of operations where, naval, military, or air forces in combination are co-operating with each other, working independently under their respective commanders, but with a common strategical object.*<sup>79</sup>

While this definition does not offer a satisfactory definition for the topic of this thesis, it is what the British military understood by the term as they went into the Second World War. However, within the context of this thesis Combined Operations can be refined as discussing a raid against a hostile shore utilising forces from each of the three services operating independently under the command of their respective service chiefs but with common tactical, operational and strategic aim as laid down by the supreme commander. This contains the key tenets of the 1938 definition under which Mountbatten and his force commanders, including Leigh-Mallory, were operating.

The final area is military effectiveness. At its most basic level, effectiveness relates to the conversion of energy through a process of change and this can be applied to a military system by examining how doctrine was applied and what changes come out at

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<sup>76</sup> TNA, AIR 10/1910, Royal Air Force War Manual Part I – Chapter 13: Combined Operations, para. 1.

<sup>77</sup> Anon, *AP 1300*, P. 3.13.6.

<sup>78</sup> TNA, DEFE 2/709, Manual of Combined Operations, 1938; Ian Speller and Christopher Tuck *Amphibious Warfare: The Theory and Practice of Amphibious Operations in the 20<sup>th</sup> Century* (Staplehurst: Spellmount, 2001) pp. 7-21.

<sup>79</sup> Clifford, *Amphibious Warfare Development*, p. 1.

the end of an operation. Allan Millett, Williamson Murray and Kenneth Watmann stimulated work on effectiveness in their 1986 essay in *International Security*.<sup>80</sup> They described four levels of effectiveness in the military system, political, strategic, operational and tactical.<sup>81</sup> Numerous factors affect effectiveness, for example, a lack of resources, the effect of doctrine to various socio-economic factors, thus, effectiveness can also be split into organisational and sociological effectiveness of military forces.<sup>82</sup> For the purpose of this thesis it is organisational effectiveness is considered at the operational level of war. This refers to the analysis, selection, and development of doctrine to achieve objectives where decisions for specific operations are taken and where the development of doctrine is transferred into practice and post-operation analysis takes place in order to assess and learn lessons from the operation.<sup>83</sup>

In order to assess this several key issues will be examined and linked to the research question in order to evaluate effectiveness. First, how well did the RAF's integrate with the other services before, during and after the operation? Second, how flexible was the RAF in dealing with changes during the operation? Third, how did the RAF's operational objectives fit into strategic objectives laid out for Fighter Command? Finally, how did the RAF evaluate its own performance during and after the operation

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<sup>80</sup> Allan R Millett, Williamson Murray and Kenneth Watmann, 'The Effectiveness of Military Organizations', *International Security*, Vol. 11, No. 1 (Summer 1986) pp. 37-71. This article then formed the basis of a three-volume work on effectiveness that has framed the debate ever since; Allan R Millett and Williamson Murray (Eds.) *Military Effectiveness – Volume 1: The First World War* (London: Unwin Hyman, 1988), *idem*, *Military Effectiveness – Volume 2: The Inter War Years* (London: Unwin Hyman, 1988); *idem*, *Military Effectiveness – Volume 3: The Second World War* (London: Unwin Hyman, 1988).

<sup>81</sup> Millett *et al*, 'Military Organizations' pp. 37-60.

<sup>82</sup> Jeffrey J Bernasconi (Cdr.), 'Military Effectiveness: A Reappraisal' *Advanced Military Studies Program Monograph*, School of Advanced Military Studies, United States Command and General Staff College, 1997, pp. 6-9.

<sup>83</sup> Millett *et al*, 'Military Organisations' p. 50.

and were appropriate lessons drawn from the experience? These issues will be revisited in the conclusion.

## Chapter 1

### Air Power and Combined Operations Doctrine from 1914 to the Second World

#### War

This chapter examines the inter-war context and development of Combined Operations doctrine from the perspective of the RAF in order to contextualise RAF operations during JUBILEE. It illustrates that while Combined Operations may not have been at the top of the service's list of priorities it did involve itself in the theoretical development of Combined Operations doctrine and in the administrative arrangement surrounding the writing and improvement of doctrine.<sup>84</sup> The chapter starts with an examination of the lessons learnt from the First World War, namely during the Gallipoli campaign. It then summarises the problems that the RAF faced during the inter-war years such as the financial issues that plagued the service and the problem of misperception of the new service. The chapter then examines the role that the various staff colleges, and in particular the RAF Staff College at Andover, played in the discussion and development of Combined Operations doctrine. It then examines the RAF's role in Combined Operations exercises of the period and the lessons taken from these. It then discusses the RAF's participation in the writing of doctrine, of which there were several revisions in the period, and how the lessons from the First World War, staff college exercises and Combined Operation exercises shaped the writing of it. Thus this chapter attempts to show how the RAF viewed Combined Operations and how this affected the nature of the RAF's involvement with JUBILEE. It will in particular draw out two important differences between the RAF and the other services. First, the importance of air

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<sup>84</sup> For a fuller and more comprehensive analysis of the development of Combined Operations from the perspective of all the services during the inter-war years see: Massam, 'British Maritime Strategy' and Clifford, *Amphibious Warfare*.

superiority to the RAF as the key priority for air power in Combined Operations and in general; second, how the RAF's view of Combined Operations was at variance with the RN and the Army.

### **1.1 Lessons of the First World War**

The First World War had a significant impact on the development of doctrine in the British military.<sup>85</sup> For Combined Operations, it brought to the fore the impact of air power. Major General Anderson, Commandant of the Army Staff College, Camberley, observed at the first Combined Operations staff exercise in 1919 that all future operations would have to take account of all three of the services.<sup>86</sup> This view was supported by the Mitchell Report on the Dardanelles campaign and by Major General Sir George Aston, a leading amphibious expert of the time, who considered air power's impact decisive in this area.<sup>87</sup> The experience of the Dardanelles campaign in 1915 and the raids along the Flanders coast in 1918 form the context to inter-war developments.<sup>88</sup>

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<sup>85</sup> For example, for the experience of the Army see: David French, 'Doctrine and Organisation in the British Army, 1919-1932' *The Historical Journal*, Vol. 44, No. 2 (2001) pp. 497-515.

<sup>86</sup> TNA, ADM 116/2086, Anderson, to Director of Staff Duties, 7/01/1920' p. 1.

<sup>87</sup> Ian Speller, 'In the Shadow of Gallipoli? Amphibious Warfare in the Inter-War Period' in Jenny Macleod (ed.), *Gallipoli Reconsidered* (London: Frank Cass, 2004) p. 140; George Aston, *War Lessons, New and Old* (London: John Murray, 1919) p. 39. Aston considered air power's impact on 'joint' operations as early as 1914 in his work *Sea, Land and Air Strategy* (London: John Murray, 1914). Jim Beach, 'The British Army, the Royal Navy, and the 'Big Work' of Sir George Aston, 1904-1914', *Journal of Strategic Studies* Vol. 29, No. 1 (February 2006) p. 64.

<sup>88</sup> On the Dardanelles Campaign see, Macleod, *Gallipoli Reconsidered* and Timothy Travers, *Gallipoli, 1915* (Stroud: Tempus, 2001). On Zeebrugge and Ostend see Mark Karau, 'Twisting the Dragon's Tail: The Zeebrugge and Ostend Raids of 1918', *Journal of Military History*, Vol. 67, No. 2 (April 2003) pp. 455-481. On the plans for amphibious operations in Flanders during 1917 see Andrew Wiest, *Passchendaele and the Royal Navy* (Greenwood, CT: Greenwood Press, 1995).

Clifford has argued that Gallipoli was more than just an experience but that it formed the core of thinking during the inter-war years in guiding developments.<sup>89</sup>

The Dardanelles Commission set up to examine the failure of the campaign overlooked the contribution of air power to the campaign as a factor to its failure.<sup>90</sup> However, Eric Ash has noted that the senior airman during the campaign, Colonel Frederick Sykes, failed to recognise the technological limits of air power.<sup>91</sup> During the campaign, air power performed many of the roles familiar to First World War air power such as tactical reconnaissance (Tac R) and air cover.<sup>92</sup> However, a degree of experimentation occurred, for example, in late 1915 interdiction raids were conducted against logistical centres and railheads such as Ferejik in order to dislocate the battlefield from its supplies.<sup>93</sup> Most notably during the withdrawal phase, the Royal Naval Air Service (RNAS) was responsible for providing air cover in order to stop Turkish aircraft from interfering in the process. This was a significant lesson for Combined Operations doctrine that was important for inter-war developments.<sup>94</sup>

By the end of the campaign, the importance of air cover in Combined Operations had been identified. However, during the operation many problems had occurred. The problem began with a fractious command relationship between Sykes and

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<sup>89</sup> Clifford, *Amphibious Warfare*, p. 31.

<sup>90</sup> Jenny Macleod, 'General Sir Ian Hamilton and the Dardanelles Commission', *War in History*, Vol. 8, No. 4 (2001) p. 418.

<sup>91</sup> Eric Ash 'Sir Frederick Sykes and the Air Revolution, 1912-1918' PhD Thesis (University of Calgary, 1995) p. 248. Ash's work has also been published as *Sir Frederick Sykes and the Air Revolution, 1912-1918* (London: Frank Cass, 1999).

<sup>92</sup> Peter Mead, *The Eye in the Air: History of Air Observation and Reconnaissance for the Army, 1785-1945* (London: HMSO, 1983) p. 112.

<sup>93</sup> H A Jones, *The War in the Air: Being the Story of the part played in the Great War by the Royal Air Force, Volume 2* (London: HMSO, 1928) pp. 64-72.

<sup>94</sup> Jones, *The War in the Air Vol. 2*, pp. 72-77.

Wing Commander C R Samson, a man described as uncooperative and tactless.<sup>95</sup> Vice Admiral de Robeck described the relationship as having got off to a bad start due to ‘an unfortunate publication’ that had criticised Sykes.<sup>96</sup> Despite early problems, relations did improve although Sykes’ dealings with other naval officers remained difficult despite being given the naval rank of Wing Captain. The main problem during the campaign was logistical. The first unit deployed, No. 3 Squadron RNAS, was a conglomeration of types tasked with different missions that caused logistical problems for spares.<sup>97</sup> Added to this was the unsuitability of the squadrons’ base at Tenedos. The base moved to Imbros where a more effective logistical system emerged. At the same time the types used by the squadron was rationalised.<sup>98</sup> Sykes recognised that air power had two primary functions during the campaign. First, was to provide intelligence and communication over the battlefield, second, to prevent reinforcements reaching the front. In order to achieve this it was accepted that air superiority was required in order to support operations in the region. This meant that concentration of air power was needed to fight for control of the air at the operational level in order to meet regional tactical objectives, however, the campaign ended before this realisation could have a decisive impact. This would be a key lesson for the future.<sup>99</sup>

Gallipoli provided many lessons for future Combined Operations. For example, in planning operations along the Flanders coast in 1917 it was recognised that the

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<sup>95</sup> Ash, ‘Sir Frederick Sykes’ p. 243. The RNAS used its own rank system at this time with a Wing Commander being equivalent to a Lieutenant Commander in the RN.

<sup>96</sup> Ash, ‘Sir Frederick Sykes’ p. 251 and Brad King, ‘Gallipoli: The Royal Naval Air Service and the Dardanelles’ *The Joint Imperial War Museum/ Australian War Memorial Battlefield Study Tour to Gallipoli, September 2000* (2001) p. 8.

<sup>97</sup> King, ‘Gallipoli’ p. 3.

<sup>98</sup> Jones, *The War in the Air*, p. 57.

<sup>99</sup> Ash, ‘Sir Frederick Sykes’ pp. 253-256.

maintenance of air cover would be vital to success.<sup>100</sup> This would become a key attribute of Combined Operation doctrine with the MCO noting that ‘The main aim of air strategy...is therefore to assert the superiority of our air forces over...the enemy...as to prohibit any sustained attack on the expedition.’<sup>101</sup> In addition to the recognition of the importance of air cover to the success of Combined Operations, it was identified that a secure base was vital. In order to provide direct air support it was recognised that effective command and control, in conjunction with air cover, was required. Gallipoli provided the context for the development of doctrine in the inter-war years and its importance was noted in the RAF’s official history, which stated that ‘For the first time a campaign was conducted on, under and over the sea, and on and over the land.’<sup>102</sup>

## **1.2 The Royal Air Force and the Problems of the Inter-War Years**

The RAF finished the First World War as the world’s first independent air force with strength of 293,532 officers and men and a self-confidence of its own capabilities as shown by its actions during the final campaigns of the war.<sup>103</sup> Despite this early confidence, the RAF faced numerable problems in the early post-war years where it had to cope with both inter-service and financial constraints.<sup>104</sup> In January 1919 Air Marshal Sir Hugh Trenchard, now Chief of the Air Staff (CAS), had the Air Ministry produce a

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<sup>100</sup> Speller, ‘In the Shadow of Gallipoli?’ p. 139.

<sup>101</sup> TNA, AIR 10/1437, Manual of Combined Operations (1938), p. 121.

<sup>102</sup> Jones, *The War in the Air*, p. 75.

<sup>103</sup> John Buckley, *Air Power in the Age of Total War* (London: UCL Press, 1999) p. 101.

<sup>104</sup> For a detailed analysis of the early years of the RAF see Malcolm Cooper’s work on the subject ‘Blueprint for Confusion: The Administrative Background to the Formation of the Royal Air Force, 1912 – 1919’ *Journal of Contemporary History*, Vol. 22 (1987) pp. 437-453; *The Birth of Independent Air Power* (London: Allen and Unwin, 1986) and ‘British Air Policy on the Western Front, 1914-1918’, DPhil Thesis (University of Oxford, 1982).

synopsis of the role that the air force had played in the First World War.<sup>105</sup> This piece laid out four principles that were to form the core of RAF thinking for much of the inter-war period. The most important of these was the argument that central to the effective application of air power in the battlespace was the attainment of ‘Command of the Air’ or air superiority.<sup>106</sup>

However, before Trenchard could forge a future for the newly formed RAF he first had to defend it from budgetary constraints that were placed upon each of the services in the early post-war years. The RAF’s budget fell from £52.5 million in 1920 to £9.4 million in 1923, a drop of some eighty-three percent, and in the same period it saw its strength drop to some 27,000 officers and men and just twenty-five squadrons.<sup>107</sup> Each of the services had to contend with a smaller pot of money and deal with the Treasury’s imposition of the ten-year rule as a basis for military spending that caused serious issues for the planners of each the services.<sup>108</sup> The rule also did not help the already prevalent hostility that existed between the newborn RAF and the older branches of the military. Both the Army and RN argued that they should have control of their own

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<sup>105</sup> TNA, AIR 8/13, Cmd. Paper 100: Synopsis of British Air Effort during the War, (1919); Hall, *Strategy for Victory*, pp. 14-16. The key lessons drawn from the war can also be seen in; Squadron Leader B E Suttton, ‘Some Aspects of the Work of the Royal Air Force with the BEF in 1918’ *Journal of the Royal United Services Institute*, Vol. 67 (1922)

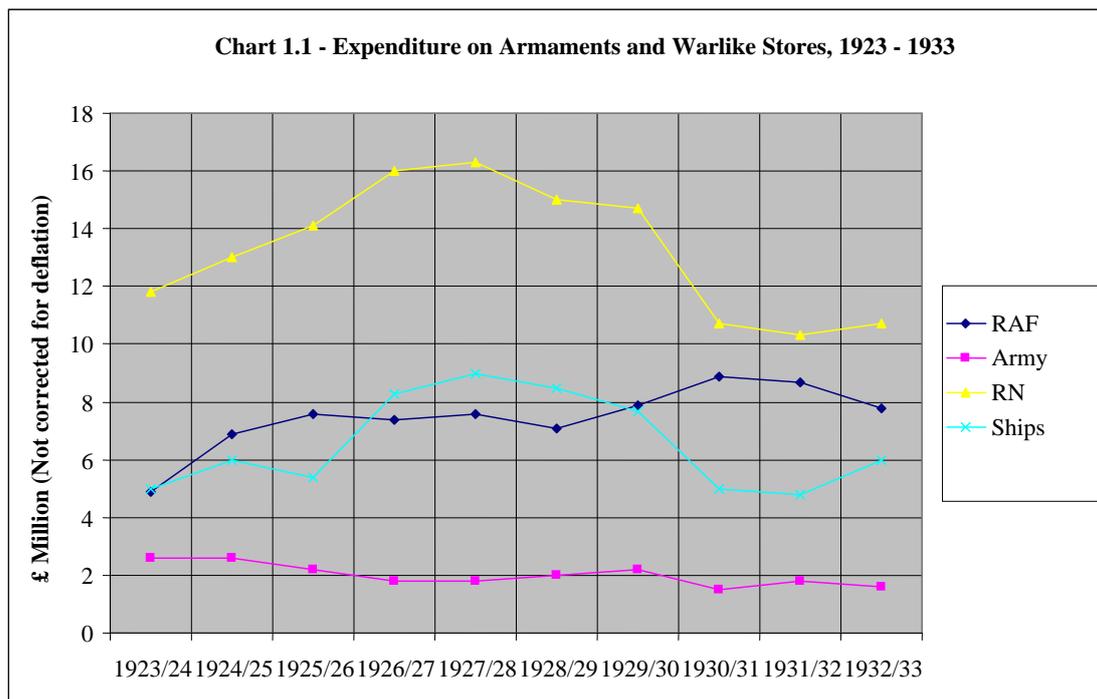
<sup>106</sup> Hall, *Strategy for Victory*, pp. 14-16

<sup>107</sup> Hall, *Strategy for Victory*, p. 17; B R Mitchell, *Abstract of British Historical Statistics* (Cambridge: Cambridge University Press, 1962) pp. 398-400. In the same period, it should be noted that spending on the army went down seventy-five percent from £181.5 million to £45.4 million. Considering the imperial policing role that the army was facing this was a large drop for the service to cope with.

<sup>108</sup> The basis of this rule was that ‘the British Empire will not be involved in any large war over the next ten year’: W. D. Gruner, ‘The British Political, Social and Economic System and the Decision for Peace or War’, *British Journal of International Studies*, 6 (1980), p. 212. Also see Stephen Roskill, ‘The Ten Year Rule – The Historical Facts’ *Royal United Service Institute Journal*, 117:1 (1972: Mar). On the lower-level impact of the budgetary constraint see the accounts by a future Marshal of the Royal Air Force during his service at No. 3 Flying Train School: Henry Probert, *Bomber Harris: His Life and Times* (London: Greenhill, 2001) p. 47. Leigh-Mallory also faced similar problems when posted to the School of Army Co-Operation in 1921: Dunn, *Big Wing*, p. 50

air assets and for much of the inter-war period both branches made concerted efforts to bring their assets back into their respective folds.<sup>109</sup>

Alongside budgetary figures, it is useful to examine the expenditure of the various services in this period, table 1.1 shows that RAF expenditure on armaments and various war stores compared favourably with the army but not so well in comparison to the RN and its capital ship building programme.



(Source: David Edgerton, *Warfare State: Britain, 1920 – 1970* (Cambridge: Cambridge University Press, 2006) table 1.1, p. 22 and M Postan, *British War Production* (London: HMSO, 1952) table 1, p. 2).

David Edgerton has suggested that the fall in overall naval expenditure and in the naval-industrial complex was because of the rise of a new military-industrial complex, the aero industry and its major recipient, the RAF, a service that Edgerton describes as a ‘procurement intensive force.’<sup>110</sup> For example, in 1923 the RAF’s expenditure on

<sup>109</sup> On the inter-service disputes between the RAF and the Army see; Derek Waldie, ‘Relations Between the Army and the Royal Air Force, 1918-1939’, PhD Thesis (University of London, 1980).

<sup>110</sup> David Edgerton, *Warfare State: Britain, 1920 – 1970* (Cambridge: Cambridge University Press, 2006) p. 21.

airframes equalled fifty-two percent of its annual budget.<sup>111</sup> This expenditure helped finance a growing aircraft industry in Britain. However, despite the growing expenditure of the RAF it did not overtake the overall budget of the Army until 1937 and the Navy in 1938, a period when the British government became more reliant on the promise of air power.<sup>112</sup> Edgerton notes that in the inter-war period, the RAF re-equipped itself several times with new airframes and that by the early 1930s RAF expenditure on airframes exceeded the RN's spending on capital ships.<sup>113</sup> Despite providing an apparent picture of a service able to spend freely on new aircraft, the figures do not take into account the pace of technological change in aircraft design during the inter-war years and the constantly changing operational requirements of the RAF, which forced it to spend such a high proportion of the its budget on airframes.<sup>114</sup> For example, in terms of engine horsepower, output increased from around 225 hp in 1918 to 500 hp in the early 1930's and then finally to a figure in excess of 1,000 hp in the RAF latest monoplane fighters, the Hawker Hurricane and the Supermarine Spitfire.<sup>115</sup> Thus, there was a service dealing with financial constraints and, as described below, ever-changing operational requirements parallel to technological change.

The issue of perception was to trouble the RAF throughout the inter-war years as well as in much of the post war historiography. In reality, Trenchard's and the RAF's perceived infatuation with strategic bombing provided the backdrop for many of the discussions that took place on tactical matters during the period. Williamson Murray has gone so far as to suggest that 'senior [RAF] air leaders held fast to Trenchard's

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<sup>111</sup> Hall, *Strategy for Victory*, p. 17; Mitchell, *British Historical Statistics* pp. 398-400 and Edgerton, *Warfare State* p. 22.

<sup>112</sup> Edgerton, *Warfare State* p. 43.

<sup>113</sup> Edgerton, *Warfare State* p. 43.

<sup>114</sup> Colin Sinnott, *The RAF and Aircraft Design, 1923-1939: Air Staff Operational Requirements* (London: Frank Cass, 2001) *passim*.

<sup>115</sup> Buckley, *Air Power*, pp. 109-110.

ideological belief in the bomber. This approach rejected co-operation with the other services.<sup>116</sup> John Terraine has supported this view by echoing similar sentiments noting that:

*It may be said, without straining verity, that bombing was what the RAF was all about...It is chiefly for that reason...that cooperating with the army and navy went right out of fashion between the wars.*<sup>117</sup>

These interpretations are not helped by the elucidation of serving RAF officers. Marshal of the Royal Air Force Sir John Slessor wrote in his memoirs, *The Central Blue*, that ‘Our belief in the bomber, in fact, was intuitive – a matter of faith.’<sup>118</sup> Many historians down the years have echoed this comment and it has produced what Tami Davis Biddle has described as the ‘Seeds of later troubles.’<sup>119</sup> Air Commodore Philip Joubert de la Ferte, Commandant at Andover, in a debate on war aims at a staff exercise at the Wessex Bombing Area Headquarters of the Air Defence Great Britain in 1933, noted that there were five main misconceptions about the RAF and he argued that these needed to be rectified. Key was:

*4. that the RAF will not direct its effort to what the other services argue should be the common aim: the attack on the enemy armed forces*  
*5. that the RAF is advocating a form of military action that no,...government will...put into effect...*<sup>120</sup>

He was willing to confess that the RAF may have been to blame for this but it does highlight the lack of understanding between the services that characterised this period.<sup>121</sup>

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<sup>116</sup> Williamson Murray, *War in the Air 1914 – 45* (London: Cassell, 1999) p. 88.

<sup>117</sup> John Terraine ‘Theory and Practice of Air War: The Royal Air Force’ in Horst Boog (Ed.) *The Conduct of the Air War in the Second World War: An International Comparison* (Berg: Oxford, 1992) p. 470.

<sup>118</sup> John Slessor, *The Central Blue: Recollections and Reflections* (London: Cassell, 1956) p. 204.

<sup>119</sup> Tami Davis-Biddle, *Rhetoric and Reality: The Evolution of British and American Ideas about Strategic Bombing, 1914-1945* (Princeton, NJ: Princeton University Press, 2002) pp. 88-94.

<sup>120</sup> TNA, AIR 2/675, P.B. Joubert de la Ferte *The Aim of the Royal Air Force*, May 1933; Davis-Biddle, *Rhetoric and Reality*, p. 100.

<sup>121</sup> Davis-Biddle *Rhetoric and Reality*, p. 100.

However, this interpretation does not give the RAF and its leaders their due as there is evidence that they attempted to think about the nature of war and how air power could be applied to warfare. A considerable amount of time was placed upon thinking about how the RAF could apply air power to other facets of warfare. Slessor, while serving on the staff of the Army Staff College, Camberley, spent time writing on the inter-relationship between air and land power and this eventual found its way into written form in his treatise *Air Power and Armies*.<sup>122</sup> Slessor earned a well-deserved reputation as a tactical expert at Camberley as the RAF instructor, primarily because the previous holder of his position had not been able to discuss the broader aspects of air power and Trenchard had promised the Chief of the Imperial General Staff (CIGS), Field Marshal Sir George Milne a more capable officer.<sup>123</sup> Previously Slessor had been tasked to re-write the RAF's manual on co-operation with land forces. His work was forward-thinking for the time, for example, in thinking about how to isolate enemy forces on the battlefield he concluded that a 'carefully organized attack on the enemy system of supply' would produced positive results as this is where they are 'vulnerable' especially if the enemy is a highly organised force.<sup>124</sup> Slessor was not the only officer to make arguments for the use of air power in support of the other services. Much important work appeared in the pages of the *Journal of the Royal United Services Institute* in the inter-war period; for example, Leigh-Mallory spent considerable time writing about the relationship between the services and in particular, the importance of air superiority over the battlefield, his work advocated that this was key in any operation.<sup>125</sup>

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<sup>122</sup> John C. Slessor, *Air Power, and Armies* (Oxford: Oxford University Press, 1936).

<sup>123</sup> 'John C. Slessor and the Genesis of Air Interdiction' in Philip S. Meilinger, *Airwar: Theory and Practice* (London: Frank Cass, 2003) pp. 66-67.

<sup>124</sup> RAF Museum (RAFM), Hendon, File 8951, Employment of Army Co-Operation Squadrons, RAF Manual AP 1176, 1932, Ch. V.

<sup>125</sup> Trafford Leigh-Mallory, 'Air Co-Operation with Mechanized Forces' *Journal of the Royal United Services Institution*, Vol. 75 (1930: Feb/Nov) pp. 565-577; Trafford Leigh-Mallory, 'The Maintenance of Air

Apart from the issues of financial constraints and perception, the RAF faced another problem in the inter-war years, operational priorities. The RAF, in line with all the services, had less money to spend and it had to decide how to spend that money in the face of ongoing operations. Slessor in a 1931 essay on the development of the RAF outlined the key roles that the RAF had been called on to perform since its formation in 1918.<sup>126</sup> He outlined several key developments that he saw as vitally important to the RAF. Notable amongst these were the relations with the navy and army, home defence, imperial air reserves, the Fleet Air Arm (FAA), army co-operation squadrons and regional control.<sup>127</sup> The latter development, otherwise referred to as air policing, was an important role for the RAF's role in the period.<sup>128</sup> It emerged in the wake of the budgetary constraints of the early post-war years as an attempt to provide an alternative and cheaper option to the issue of imperial policing. The best example of this policy were the actions of the RAF in Iraq between 1922 and 1925 when Trenchard formulated a plan for controlling a rebellion that had broken out in the aftermath of the First World War. The plan was a success in both operational and financial terms as the policy eventually restored control to Iraq and did it with considerably less expense than previous attempts. By 1923, expenditure had reduced to £7.81 million from a figure of £23.36 million in 1921 and by 1927; this figure had shrunk even further to £3.9 million.<sup>129</sup> The success of operations in Iraq led to the use of aerial policing in other areas

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Superiority in a Land Campaign' *Royal Air Force Air Power Review*, Vol. 6, No. 1 (Spring 2003) pp. 152-159 (Reprinted from the *Royal Air Force Quarterly*, Vol. 2, No. 2 (April 1931) pp. 245-52).

<sup>126</sup> John C Slessor, 'The Development of the Royal Air Force' *Journal of the Royal United Service Institution*, Vol. 76 (Feb/Nov: 1931) pp. 324-334

<sup>127</sup> Slessor, 'The Development of the Royal Air Force' *passim*

<sup>128</sup> For the best treatment of the policy of aerial policing see; David Omissi, *Air Power and Colonial Control: The RAF, 1919-1939* (Manchester: Manchester University Press, 1990) .

<sup>129</sup> Buckley, *Air Power*, p. 103.

of the Empire and many future high-ranking RAF officers of the Second World War would spend their early careers serving in the imperial policing role within the empire.<sup>130</sup>

The RAF also had to deal with the gradually changing geo-strategic situation in Europe. For example, in the mid-twenties, in a period of deteriorating relations with France, the RAF had to deal with the potential threat of what has been described as the French air menace.<sup>131</sup> This, coupled with the emergence of the threat of Germany in the 1930s, led to the materialisation of a distinct home fighter force based around the concept of strategic air defence. This force had its origins in the Home Defence Air Force of 1923 with a projected strength of fifty-two squadrons, which would eventually emerge as Fighter Command.<sup>132</sup> Fighter Command would eventually take on the role of the defence of the United Kingdom and deploy a sophisticated command and control network that would come to fruition by 1940. Changing relations in Europe also led to a considerable degree of reorganisation for the RAF in the late 1930s. The need to expand and re-arm in this period led to the formation of four functional commands in 1936: Fighter, Bomber, Coastal and Training Command, and the introduction of modern aircraft.<sup>133</sup>

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<sup>130</sup> Leigh-Mallory served in Iraq between 1935 and 1937 ending up as AOC Iraq Command; Dunn, *Big Wing*, pp. 59-61. Arthur Harris served in the Middle East and India no less than four times starting off as OC 31 Squadron in India in 1921, then moving to Group Headquarters in Basra, Iraq in 1922 and then later in that year taking over as OC 45 Squadron in country. After a return to the UK Harris returned to Iraq as Senior Air Staff Officer in 1930 and, finally, in 1938 he took over as AOC Palestine and Transjordan; Henry Probert *Bomber Harris*, pp. 419-420. Slessor also served in India in 1921/1922 with 20 Squadron on the North-West Frontier. His experiences were to help frame some of his ideas on the role of air power. See Vincent Orange, *Slessor: Bomber Champion – The Life of Marshal of the Royal Air Force Sir John Slessor, GCB, DSO, MC* (London: Grub Street, 2006) pp. 25-36.

<sup>131</sup> John Ferris, 'The Theory of a "French Air Menace"', *Anglo-French Relations and the British Home Defence Air Force Programmes of 1921-1925* *Journal of Strategic Studies*, Vol. 10, No. 1 (1987) pp. 62-83.

<sup>132</sup> John Ferris, 'Achieving Air Ascendancy: Challenge and Response in British Strategic Air Defence, 1915-1940' in Sebastian Cox and Peter Gray (Eds.) *Air Power History: Turning Points from Kitty Hawk to Kosovo* (London: Frank Cass, 2002) p. 26.

<sup>133</sup> Anon, *A Short History of the Royal Air Force* (London: RAF) p. 87.

As well as major operational issues such as rearmament and preparation for war, the service also had other issues to deal with. For example, the formation of the RAF in 1918 had left the service in command of naval aviation and this led to the need for effective relations with the navy who had command of the aircraft carriers. However, this co-operation was not always friendly and became a contentious issue in 1923 when the RN began to fight for the return of the FAA.<sup>134</sup> Had the RN been successful in this respect it could well have led to the return of army co-operation squadrons to the army.<sup>135</sup> Despite these inter-service rivalries, the RAF did attempt to think about the issue of co-operation as exemplified by Slessor's *Air Power and Armies*.<sup>136</sup> Eventually the issue of control of the FAA was solved in 1937 when its operational control was handed over to the Admiralty when Coastal Command was formed. Despite operational and strategic considerations, discussion did occur on various issues such as maritime aviation and direct air support, though at times their development was patchy because of issues already discussed.<sup>137</sup>

Thus, in the inter-war years the RAF faced major issues surrounding the problem of perceptions (contemporary and historical), and financial and operational dilemmas. While the financial problems were not insurmountable, despite constantly changing technological and operational factors, the major problem facing the RAF was its operational conditions. For a service that in its early years struggled for survival it eventually developed into a service with many varied roles, which while not all receiving

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<sup>134</sup> On the development of naval air power in the inter-war period see Philip Weir, 'The Development of Naval Air Warfare by the Royal Navy and Fleet Air Arm between the Two World Wars' PhD Thesis (University of Exeter, 2006).

<sup>135</sup> Anon, *A Short History of the Royal Air Force*, p. 59.

<sup>136</sup> Slessor, *Air Power and Armies*, *passim*.

<sup>137</sup> On the problems and discussion surrounding the role of maritime aviation see; John Buckley, *The RAF and Trade Defence, 1919-45: Constant Endeavour* (Keele: Keele University Press, 1995) *passim*; Christina Goulter, *A Forgotten Offensive: Royal Air Force Coastal Command's Anti-Shipping Campaign, 1939-1945* (London: Frank Cass, 1995) esp. Chap. 1-3; Hall, *Strategy for Victory*, *passim*.

the same priorities, did push it in many varied directions. It is within this context the RAF's involvement with the Combined Operations doctrine should be understood. A major development for the RAF in developing its operational thinking was the emergence of the Staff College and the role its officers played in both the RAF's institution and the other services establishments especially within the realms of Combined Operations.

### **1.3 The Role of the Staff Colleges and Combined Operations Exercises**

Trenchard was aware of the lack of tradition that the RAF faced when compare to the Army and RN. In order to rectify this position Trenchard made strident efforts to make the RAF as professional as possible with an effective theoretical and technical underpinning. To this end, plans emerged in the autumn of 1919 for the formation of a Staff College at Andover as a 'School of Thought' for the service, although it did not come to fruition until 1922.<sup>138</sup> Once Andover opened, however, it was to become important in helping the RAF develop and evaluate its doctrine. Slessor, who attended its third course in 1924, noted that under the tutelage of Air Commodore Sir Robert Brooke-Popham 'we had to feel our way towards a doctrine of air warfare...based on the supremacy of the air offensive.'<sup>139</sup> The RAF's strategic doctrine, AP1300, was developed and discussed at the College, thus, it played a vitally important role in the development of

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<sup>138</sup> See the papers of the Staff College's first Commandant, Air Commodore Brooke-Popham, at the Liddell Hart Centre for Military Archives, King's College London. Also see R A Mason, *The Royal Air Force Staff College, 1922-1972* (Bracknell: RAF Staff College, 1972); Hall, *Strategy for Victory*, p. 18 and Allan English, 'The RAF Staff College and the Evolution of RAF Strategic Bombing Policy, 1922-1929' ,MA Thesis (The Royal Military College of Canada, 1987); also see the same author's article of the same name in the *Journal of Strategic Studies* Vol. 16, No. 3 (1993), pp. 408-431.

<sup>139</sup> Orange *Slessor*, p. 27.

the service.<sup>140</sup> Until the creation of Andover, officers still attended Camberley and the RN Staff College, Greenwich. Some would continue to serve on their staffs up until the Second World War, notably both Slessor and Leigh-Mallory served on the Staff at Camberley. Within the scope of Combined Operations, this is an important factor to note, as the RAF was keen for its officers to learn what they could from each service. Thus, all of the Staff Colleges became important think tanks for Combined Operations. The Staff Colleges were also vitally important in providing the theoretical and practical basis for the writing of the MCO as each spent a month of their courses dealing with issues surrounding the problems of inter-service cooperation. This then culminated in a week's staff exercise at Camberley.<sup>141</sup>

As already seen the Commandant of Camberley noted the importance of air power after the combined staff exercise between the Army and RN at Camberley in November 1919. The purpose of this exercise and subsequent similar ventures was to analyse the need to revise the current doctrine that had come into existence in 1912. Anderson claimed that after studying the Combined Operations of the First World War the impact of air power could not be ignored.<sup>142</sup> He argued that in its present form the doctrine was out of date and in dire need of revision to take account of the RAF. He argued that any new manual, which was due for revision, needed to take note of the 'views and requirements' of the RAF who 'must of course be included in it.'<sup>143</sup> Anderson went on to note that Chapter III of the Manual, which dealt with plans for Combined Operations, required considerable revision.<sup>144</sup> Anderson's two primary concerns with the

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<sup>140</sup> Philip Meilinger, 'The Development of Air Power Theory' in Peter Gray and Sebastian Cox, (Eds.) *Air Power Leadership: Theory and Practice* (London: The Stationary Office, 2002) p. 93; Parton, 'Early RAF Doctrine', *passim*.

<sup>141</sup> TNA, AIR 20/9503, History of the Combined Operations Organisation, 1940-1945, 1956, p. 9.

<sup>142</sup> TNA, ADM 116/2086, Anderson to Secretary of the DSD, War Office, p. 1.

<sup>143</sup> TNA, ADM 116/2086, Anderson to the Secretary of the DSD, p. 4.

<sup>144</sup> TNA, ADM 116/2086, Anderson to the Secretary of the DSD, p. 6.

current system then in place were, first, that there was no effective system in place with which to train personnel from the services with the skills to oversee effective planning for Combined Operations. Second, that as it stood staff for Combined Operations were only drawn from the two senior services. For Anderson this situation was unacceptable as putting together disparate officers from then disparate services he noted did not create 'a combined staff' that could ensure 'sufficiently close co-operation.'<sup>145</sup> He also argued that this situation was further exacerbated by the lack of inclusion of RAF officers. He suggested that in order to solve these pertinent problems and bridge the gap between the services a dedicated group of officers from each service should come together in order to study and solve the problems that faced the military within the context of Combined Operations. This would eventually come about with the formation of the Inter-Service Training and Development Centre in 1936.<sup>146</sup>

These views were echoed by Anderson's successor at Camberley, Major General Edmund Ironside, who conducted a staff exercise in 1922 to examine the problem of defending Singapore from an assault by the Japanese Empire.<sup>147</sup> It should be noted that for much of the inter-war period discussions surrounding Combined Operations and their conduct often reflected the imposition of the 'Singapore Strategy' in the Far East and how limited Empire forces would deal with this threat.<sup>148</sup> Singapore was to become a contentious and long-running issue between the RAF and RN. For example, in 1928 the Air Staff drafted a paper that claimed that Japanese forces would not be able to reach Singapore in order to undertake any sustained bombardment of the base area, thus,

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<sup>145</sup> TNA, ADM 116/2086, Anderson to the Secretary of the DSD, p. 6.

<sup>146</sup> TNA, ADM 116/2086, Anderson to the Secretary of the DSD, p. 6.

<sup>147</sup> TNA, ADM 116/2223, Combined Operations: Report on the Exercise conducted at the Army Staff College, 1922.

<sup>148</sup> For an introduction to the problem of the 'Singapore Strategy' see Brian Farrell, *The Defence and Fall of Singapore, 1940-1942* (Tempus: Stroud, 2005) pp. 10-55.

precluding the need for major naval forces in the area.<sup>149</sup> Thus, while this thesis deals with the use of air power in support of offensive Combined Operations its use in preventing them was much discussed with similar principles of the efficacy of air superiority being noted. In the staff exercises that were conducted, the defending forces of the RAF amounted to one squadron of aeroplanes and one of flying boats. It was assumed for the purpose of the exercise that two squadrons from India would reinforce these forces within twenty-two days of war breaking out.<sup>150</sup> It was assumed that forces defending Singapore would be facing the power projection of the Imperial Japanese Navy (IJN) and its two aircraft carriers the ANAGI, AKAGI, and their complement of approximately 100 aircraft.<sup>151</sup> It was argued that with the use of these forces, the IJN would achieve air superiority and the report goes on to note the problems this would cause for the reinforcement and defence of Singapore.<sup>152</sup> The report suggested that because of Japanese air superiority it would not be possible to reinforce Singapore with the troops available in India.<sup>153</sup> As a solution to the problem of contesting Japanese air superiority, the report suggested that sufficient aircraft be based on Singapore Island in order to achieve this objective. However, the main consideration for the army was that these air bases be free from ‘a “coup de main” operation by the civil population or to sea bombardment.’<sup>154</sup> For the army this meant dispersion, something that was an anathema to the RAF who considered concentration of force at the decisive point as key for gaining air superiority. Despite this, the report did concede the importance of air superiority in the defence of the island in order to defeat the Japanese intention to assault

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<sup>149</sup> TNA, AIR 8/102, The Defence of Singapore, 1928-1930, paper prepared by the Air Staff, 16 January 1928.

<sup>150</sup> TNA, ADM 116/2223, Report on Combined Operations Exercise, pp. 4-5

<sup>151</sup> TNA, ADM 116/2223, Report on Combined Operations Exercise, p. 8.

<sup>152</sup> TNA, ADM 116/2223, Report on Combined Operations Exercise, p. 12.

<sup>153</sup> TNA, ADM 116/2223, Report on Combined Operations Exercise, p. 12.

<sup>154</sup> TNA, ADM 116/2223, Report on Combined Operations Exercise, p. 13.

Singapore. To this end, the report suggested that four squadrons, fifty-five aircraft, operate out of Singapore. There is, however, no discussion of the application of air power and the force suggested was of mixed types with not enough recognition of the importance of fighters to achieve air superiority with only one of the squadrons being of 'Fighter Reconnaissance' types.<sup>155</sup>

The importance of staff exercises was to continue during the 1920s, and in 1929 at Camberley, a Combined Operations Exercise was convened to explore the problems facing an expedition sent to the Baltic in order to intervene if needed. As with all such exercises of the period it was a joint effort by the three Colleges with Directing Staff producing appreciations of the exercise. In the case of the RAF, the Directing Staff in charge of the air appreciation was Air Commodore Ludlow-Hewitt, Group Captain Barrett and Major Lock, an army officer.<sup>156</sup> In the appreciation, they pointed out that the key roles that the RAF may provide in attaining the combined aim was:

- (a) *By delaying the Russian concentration of troops and aircraft*
- (b) *By gaining and maintaining air superiority at the point of landing*<sup>157</sup>

Thus, the RAF saw as its role at this time as one of battlefield aerial interdiction and providing local air superiority. This view was in line with contemporary thinking on the use of air power on the battlefield and based upon ideas in the 1925 edition of the *Manual of Combined Naval, Military and Air Force Operations*.<sup>158</sup> The Directing Staff concluded that of the two overriding considerations the second, the attainment of air superiority, was of paramount importance as without the latter the former could not be successful.<sup>159</sup> Having decided the primary aim of the RAF in support of the

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<sup>155</sup> TNA, ADM 116/2223, Report on Combined Operations Exercise, p. 18.

<sup>156</sup> TNA, AIR 20/157, Combined Operations Exercise, Army Staff College, Camberley, 11 November 1929 to 16 November 1929.

<sup>157</sup> TNA, AIR 20/157, Combined Operations Exercise: Air Appreciation, p. 2.

<sup>158</sup> TNA, AIR 10/5533, Manual of Combined Naval, Military and Air Operations, 1925, p. 90.

<sup>159</sup> TNA, AIR 20/157, Air Appreciation, p. 3.

expeditionary forces the appreciation then went into detail some of the problems that would face the RAF in the operation. The key problem foreseen was the calculation of Russian (sic) air strength in the region and the problems this could cause to the British fleet.<sup>160</sup> It assumed that the Russians could reinforce defending forces with up to one hundred and thirty-one aircraft in order to challenge the aim of achieving air superiority.<sup>161</sup> Thus, three methods were discussed as a means of reducing enemy air strength: first, preliminary air operations; second, by diversion; finally, by an attack on the Polish front. The first possibility was not considered practical because of the lack of Russian air units in the region and the fact that it would require the establishment of an advanced air base and a week of air operations before the main attack, therefore, denuding the attacking forces of their main advantage; surprise, an issue noted in the planning for JUBILEE. It also argued that it would also give them the opportunity to reinforce the region, and therefore contest air superiority.<sup>162</sup> As to the other two possibilities, both were considered too unwieldy to be effective and it was concluded that the RAF 'should be prepared to meet Russian air forces' in order to defend the expedition.<sup>163</sup> Another issue for the Directing Staff to deal with was the problem of deploying the necessary forces in support of the operation. This was exacerbated by the lack of airfields and, thus, the use of floatplanes was discussed.<sup>164</sup> This would continue to

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<sup>160</sup> TNA, AIR 20/157, Air Appreciation, p. 4.

<sup>161</sup> TNA, AIR 20/157, Air Appreciation, p. 4.

<sup>162</sup> TNA, AIR 20/157, Air Appreciation, p. 5.

<sup>163</sup> TNA, AIR 20/157, Air Appreciation, p. 6.

<sup>164</sup> Richard Harding 'Amphibious Warfare, 1930-1939' in Richard Harding (ed.) *The Royal Navy, 1930-2000: Innovation and Defence* (London: Frank Cass, 2005) pp. 52-53.

be a technological and theoretical dead end that both the RAF and RN pursued in the inter-war years and up to the Norwegian campaign.<sup>165</sup>

Into the 1930s Combined Operations remained an important form of exercise at Andover and as Air Vice-Marshal Peirse noted to a meeting of the Deputy Chief of Staff Committee in 1938 the 'Staff Colleges now spend over a month every year – in our case one-eighth of the whole course' examining Combined Operations.<sup>166</sup> Clifford has argued that Peirse felt that too much time was being spent on the subject and that he was unwilling to extend the scope of study on amphibious warfare at Andover. While this might appear to paint the RAF in an unfavourable light, it fails to comprehend the scope of study already undertaken by the Staff College into the nature and application of air power in war.<sup>167</sup> Alongside the various staff exercises time was spent lecturing on the nature of Combined Operations during the month given over to this form of operation on the RAF Staff Course. For example, during the 15<sup>th</sup> Staff Course at Andover discussion took place on the importance of providing air support for Combined Operations. During a lecture on *The Army in Combined Operations* on 3 November 1937, one of the students, Squadron Leader Sharp, raised the issue of air attack and asked why this had not be mentioned.<sup>168</sup> Lieutenant Colonel Collingwood responded by noting that the army would want to defend itself from this threat by the use of AA guns and that protection of the force until the army had established itself in the bridgehead was the responsibility of the RN.<sup>169</sup> Collingwood, thus, did not comprehend the role that the

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<sup>165</sup> TNA, AIR 9/1, File 10 – Extracts from the Reports of the Commandant, RAF Staff College dealing with the Employment of Seaplanes and Seaplane Carriers and Remarks by Branches of the Air Ministry, *passim*; TNA, CAB 54/13, DCOS (IT) 13 Enclosure A: Memorandum on Landing Operations, p. 37.

<sup>166</sup> Clifford, *Amphibious Warfare*, p. 70.

<sup>167</sup> Clifford, *Amphibious Warfare*, p. 70

<sup>168</sup> RAFM, AIR 69/155, RAF Staff College, 15<sup>th</sup> Course: 'The Army in Combined Operations' lecture by Lieutenant Colonel S Collingwood MC, RA – Minutes of Discussion' 3 November 1937, p. 7

<sup>169</sup> RAFM, AIR 69/155, The Army in Combined Operations, p.7

RAF could play in defending the attacking forces from air attack. During the same course, Commander J W Cuthbert delivered a lecture on *The Naval Aspect of Combined Operations* and in this lecture; Cuthbert discussed some of the issues of providing air support from aircraft carriers.<sup>170</sup> Aircraft Carriers and their use in Combined Operations had been one of the key issues during the inter-war years. The key reason for this was that many of the exercises and planning for Combined Operations had surrounded operations that were outside of the range of land-based air power as the Navy were planning against the possibility of an amphibious campaign against Japan, though air superiority was viewed as important in carrier-based operations.<sup>171</sup> Wing Commander Musgrove-Whitham again brought up the issue of aircraft and their potential effect. Much of Cuthbert's lecture had been a comparison between the landings at Cape Helles at the start of Gallipoli and the situation as it stood in 1937. Cuthbert's reply to Musgrove-Whitham noted that now the Army and RN now had to accept the help of the RAF. He noted that at Cape Helles in 1915 the problem of submarines during the landings had led to the need for heightened protection and that had better aircraft defence been available this would have helped the situation.<sup>172</sup> During the discussion period, Wing Commander Lohitham noted the importance of both 'mastery of the sea and air' and that without these prerequisites, the army's aspect would not be possible and Cuthbert agreed that there was the importance of 'priority of tasks.'<sup>173</sup> As well as the importance of air superiority, the issue of command and control was raised and Cuthbert noted that this had been a major source of contention for the services. Cuthbert noted that experience had been garnered during the 1934 Combined Operations exercise in

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<sup>170</sup> RAFM, AIR 69/156, RAF Staff College, 15<sup>th</sup> Course: 'The Naval Aspect of Combined Operations' lecture by Commander J W Cuthbert RN, 3 November 1937, p. 1

<sup>171</sup> Massam, 'British Maritime Strategy' p. 134

<sup>172</sup> RAFM, AIR 69/156, 'The Naval Aspect of Combined Operations' Minutes of Discussion, 3 November 1937, pp. 1-2.

<sup>173</sup> RAFM, AIR 69/156, Minutes of Discussion, p. 2.

Yorkshire that had been designed primarily to test out the system of command and control in Combined Operations and that its findings were to be integrated into future doctrine.<sup>174</sup> He also noted that the findings had led to the formation of a Combined Signals Board in order to examine the problem of effective communication. Again the issue of communication from ships to aircraft was noted as one the concerns that needed to be dealt with; indeed problem here would still be a concern in 1942.<sup>175</sup>

During the 16<sup>th</sup> Staff Course at the RAF Staff College Group-Captain Ronald Graham delivered a lecture on the *Introduction to Combined Operations*. This lecture, delivered after the draft copy of the 1938 MCO had been approved for publication, sought to outline some of the key developments that had taken place in Combined Operations.<sup>176</sup> Graham drew out the importance of the Staff Colleges and their role in improving and refining the manual and that the improvements made to the 1938 manual was due to their input.<sup>177</sup> He also noted that the new manual would be more comprehensive in scope than previous manuals as had been advocated by Air Vice-Marshal Higgins as early as 1922.<sup>178</sup> For the RAF the reasoning for this had been that the application of air power in all Combined Operations was the same as they sought to use the strategic application of air power to affect operational and tactical outcomes. However, Graham admitted that the addition of air power had complicated the problems of Combined Operations.<sup>179</sup> The Air Ministry and the RAF have been criticised for arguing that opposed landings, the main scope of this study, were not possible in the face

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<sup>174</sup> RAFM, AIR 69/156, Minutes of Discussion, p. 4.

<sup>175</sup> RAFM, AIR 69/156, Minutes of Discussion, p. 4.

<sup>176</sup> RAFM, AIR 69/204, RAF Staff College, 16<sup>th</sup> Course: 'Introduction to Combined Operations' lecture by Group Captain R Graham DSO, DSC, DFC, 10 October 1938.

<sup>177</sup> RAFM, AIR 69/204, Introduction to Combined Operations, p. 2.

<sup>178</sup> RAFM, AIR 69/204, Introduction to Combined Operations, p. 2; TNA, AIR 5/204, File 38A – Some Aspects of Combined Operations in so far as they affect the Royal Air Force, p. 1.

<sup>179</sup> RAFM, AIR 69/204, Introduction to Combined Operations, p. 7.

of strong aerial opposition.<sup>180</sup> While in some quarters this may be true, overall this point is debatable and Graham argued that, it is was worth studying the problems of opposed amphibious landings and ‘we should not allow the question of air opposition to obscure the value of the exercise.’<sup>181</sup> Much of the lecture concentrated on the issue of command in such operations and Graham took great pains to explain the advantages and disadvantages of the various methods for a joint operation.<sup>182</sup>

Graham, as one the RAF’s leading authorities on Combined Operations, was required to deliver lectures at Camberley on the subject of *Aircraft in Seaborne Expeditions and Landings on Hostile Shores* during the preparation for the 1938 Combined Operations exercise.<sup>183</sup> Graham would go on to chair an inter-service committee that in 1943 would examine the issue of bombardment in support of Combined Operations. It is useful to examine this lecture for two important reasons. First, Graham was, as already stated, one the service’s leading lights in Combined Operations doctrine; and second, it encapsulated the service’s view of Combined Operations on the eve of war in Europe. The main theme of the lecture stressed the importance of air superiority over the battlespace in order to achieve the combined strategic aim of the operation in question. Graham did, however, despite his previous contentions on the subject; note that the advantage lay with the defender and that this was especially true in the realms of air power.<sup>184</sup> However, this apparent reversal of opinion is not as strange, as it may seem. Air power theorists of the inter-war years were keen to stress the importance of command of the

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<sup>180</sup> Massam, ‘British Maritime Strategy’ p. 106 and Clifford, *Amphibious Warfare*, p. 69.

<sup>181</sup> RAFM, AIR 69/204, Introduction to Combined Operations, p. 4.

<sup>182</sup> RAFM, AIR 69/204, Introduction to Combined Operations, *passim*.

<sup>183</sup> RAFM, AIR 69/169, Lecture to the Army Staff College, Camberley: ‘Combined Operations: Aircraft in Seaborne Expeditions and Landings on Hostile Shores’ lecture by Group Captain R Graham DSO, DSC, DFC, RAF, 7 November 1938.

<sup>184</sup> RAFM, AIR 69/204, Introduction to Combined Operations, p. 4; AIR 69/169, Aircraft in Seaborne Expeditions and Landings on Hostile Shores, p. 5.

air, be it with either bombers or fighters, though most importantly using offensive air power. By the last years of the 1930s, the importance of command of the air was especially important for the RAF who had been spending significant sums of money developing an integrated command and control system in order to defend Britain.<sup>185</sup> To stress the weakness of air power in defence would have been at variance with the prevalent thinking of the time. However, Graham did not claim, as Massam has, that achieving command of the air through offensive action over the landing area is impossible.<sup>186</sup> In his conclusion, he noted that the key role of air power is to see to the ‘destruction or neutralisation of the defender’s air forces’, thus achieving air superiority.<sup>187</sup> Graham noted the conditions under which aerial action in order to gain air superiority should be undertaken for fear of losing surprise in the operation. He noted three key factors that would, in his view limit the success of air action, first, the extent to which enemy forces could be neutralised, second, the value of strategic surprise and finally, the extent to which that surprise could be sacrificed in order to achieve air superiority.<sup>188</sup> Thus, it appears that Graham was willing to accept that during such operations air superiority, while from the RAF’s point of view desirable, would not always be possible and that air action would have to take place under the strain of enemy air action. This actually occurred during JUBILEE.

Alongside the debates and staff exercises conducted at the three staff colleges the students and directing staff were involved in the conduct of practical exercises to test doctrine. Among the most notable of these were the 1928 exercise in the Moray Firth,

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<sup>185</sup> See Malcolm Smith, ‘The RAF’ in Paul Addison and Jeremy Crang (Ed.), *The Burning Blue: A New History of the Battle of Britain* (London: Pimlico, 2000) pp. 22-38.

<sup>186</sup> Massam, ‘British Maritime Strategy’ *passim*.

<sup>187</sup> RAFM, AIR 69/169, Aircraft in Seaborne Expeditions and Landings on Hostile Shores, p. 5.

<sup>188</sup> RAFM, AIR 69/169, Aircraft in Seaborne Expeditions and Landings on Hostile Shores, p. 3.

the 1935 exercise in the Malta Command and, finally, the 1937 exercise in Singapore.<sup>189</sup> The Moray Firth exercise dealt with the very real problem for the RAF of naval-air co-operation and the problems that posed for the RAF. It categorised the main support operations into reconnaissance and bombing operations with no mention of counter air operations in order to achieve air superiority.<sup>190</sup> The reason for this was the question of how to provide fighter support when no effective force existed; the carrier used in this operation was HMS *Furious*, a ship of limited tactical value. This problem was to persist until the Norway campaign in 1940. For many the solution was the utilisation of floatplane fighters.<sup>191</sup> For example, the use of floatplanes was recommended although extracts dealing with the 1927 Baltic exercise did note that practical problems were significant and refuelling and effective re-armament handicapped them.<sup>192</sup> Primarily, the use of seaplanes had arisen because of the RN's concern over its aircraft carriers when the RAF could not supply land-based air cover. As early as 1923 the RAF had argued that air cover be provided from carriers until bases could be established ashore.<sup>193</sup> However, the Admiralty held its views on the application of air power in Combined Operation with a degree of intransigence and did not wish to see its carriers brought into the range of an enemy's fleet and possibly lost.<sup>194</sup> Due to this position, the RAF Staff College suggested the design of aircraft able to operate with or without floats and based improvements on experience gained in the period 1928 to 1931.<sup>195</sup> However, as noted earlier this was a technological dead end. In both 1935 and 1937, exercises took place in

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<sup>189</sup> TNA, ADM 203/89, Combined Naval and Military landing operation, Moray Firth, 11-12 June 1928; AIR 2/1679, Malta Command Combined Operations, 1935; AIR 2/1886, Singapore Combined Exercise, January 1937.

<sup>190</sup> TNA, ADM 203/89, Moray Firth, 11-12 June 1928, *passim*.

<sup>191</sup> Massam, 'British Maritime Strategy' p. 286.

<sup>192</sup> TNA, AIR 9/1, File 10, p. 1.

<sup>193</sup> TNA, AIR 2/1061, Minute 31, Steele to Air Commodore T C R Higgins, DTSD, 6 December 1923.

<sup>194</sup> TNA, AIR 2/1061, Draft Minutes of the 4<sup>th</sup> Meeting of CCSDCO, 11 October 1923.

<sup>195</sup> TNA, AIR 9/1, File 10, *passim*.

Malta and Singapore in order to test their defences from possible assaults.<sup>196</sup> In order to denude Malta of the ability to interfere with the assaulting force air raids were planned to destroy any aircraft on the ground.<sup>197</sup> It was noted that the efficacy of surprise knocked out defences on Malta with only a few aircraft picked up by the island's AA defences and that this allowed the attacking forces to gain air superiority.<sup>198</sup> The Singapore exercise sought to test the applicability of reinforcing the island when facing an attack by Japanese forces.<sup>199</sup> During the course of both of these exercises, the problem of gaining and maintaining air superiority through various means was explored and it was recognised that these conditions were of importance to the success of either the attacking or defending forces during a Combined Operation. Thus, using the Staff Colleges and the various Combined Operations exercises the theory and practice of the use of air power on the outcome of Combined Operations was explored.

#### **1.4 The Royal Air Force and the Manual of Combined Operations**

While the Staff Colleges and the various Combined Operation exercises of the inter-war years built up a body of experience and thinking on the subject of Combined Operations their central importance was in shaping doctrine. The MCO went through four updates, first, in 1922 as a provisional manual, then again in 1925, 1931 and 1938. The various staff and practical exercises were designed to test the principles laid out in the manuals and to feedback on improvements for the manual and aid in the body of knowledge being provided by the Staff Colleges. These revisions were especially important in the

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<sup>196</sup> TNA, AIR 2/1679, Malta Command Combined Operations Exercise 1935; AIR 2/1886, Singapore Combined Operations Exercise 1937.

<sup>197</sup> TNA, AIR 2/1679, Malta Command Combined Operations Exercise – Appendix B: The Air Operations.

<sup>198</sup> TNA, AIR 2/1679, Appendix B, pp. 1-3.

<sup>199</sup> TNA, AIR 2/1886, Singapore Exercise, pp. 1-2.

early post-war years as the 1913 *Manual of Combined Naval and Military Operations* was shown to be clearly out of date because of the experiences of the First World War. In the staff exercise held at Camberley in October 1919 it became clear to the students and Directing Staff of the limitations of the 1913 manual. The most pertinent of these was that the manual had been written before the effect of the air power could be properly ascertained.<sup>200</sup> In fact, the staff exercise at Camberley had been convened for that very purpose. The recommendations of the commandants of both Camberley, Anderson, and the RN Staff College, Captain E E Drax, went on to form the basis of the provisional manual of 1922 through the mechanism of the Altham Committee.<sup>201</sup> The Altham Committee, and its successor the Co-ordination Committee for Staff Duties for Combined Operations (CCSDCO), became responsible for the production of Combined Operations doctrine. These committees' formalised much of the work then going on in the Staff Colleges. Thus, they became important in the formal production of the manual and its various updates and the Staff Colleges were there to test and recommend revisions to the manual.<sup>202</sup> As Massam has noted there existed a symbiotic relationship between the Staff Colleges and the committee as the 'staff colleges were the chief resource available' as cost precluded regular major exercises. Therefore, the annual theoretical exercise hosted at Camberley was the only real alternative.<sup>203</sup> Thus, the annual staff exercises provided the necessary revision to the provisional manual up until 1925. The Air Staff produced a series of memoranda and notes that helped to inform the role their staffs were to play in exercises.<sup>204</sup> This illustrates that despite the appearance given

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<sup>200</sup> Clifford, *Amphibious Warfare*, p. 31.

<sup>201</sup> Both of these reports can be found in TNA, ADM 116/2086, Combined Operations: Revision of Manual.

<sup>202</sup> TNA, AIR 2/1061, Co-Ordination Committee for Staff Duties for Combined Operations.

<sup>203</sup> Massam, 'British Maritime Strategy' p. 124.

<sup>204</sup> TNA, AIR 9/7, Air Staff Notes No. 3 – Combined Operations; AIR 8/71, Air Staff Memoranda No. 10 – Methods of Supporting the Landing of a Military Force on Enemy Territory, 1923; AIR 2/1061, File 28A

by the Air Staff, the RAF was able to consider its role outside of the confines of what it saw as its primary role, strategic bombing.

In producing the provisional 1922 manual Air Vice-Marshal J F Higgins, the RAF representative on the Altham Committee, was tasked with producing the chapters dealing with air power. Higgins began with a criticism of the 1921 Combined Operations staff exercise at Camberley where he noted that the ‘scheme’ had shown a ‘complete misapprehension...as to the status of the Royal Air Force and its relations with the other services.’<sup>205</sup> Higgins then went on to work on what he described as ‘Some Aspects of Combined Operations in so far as they affect the Royal Air Force.’<sup>206</sup> The first, and possibly most important, aspect that Higgins discussed was the RAF’s view of Combined Operations; he took issue with the view that Combined Operations could include RAF units subordinate to either service. In addition, Higgins pointed out that to the RAF Combined Operations could, and did, include operations involving more than one of the services, thus, for the RAF this meant something that was outside of the scope of the terms of reference for the Manual as it stood.<sup>207</sup> Therefore, what Higgins was suggesting was a holistic approach to the subject of Combined Operations, something akin to modern joint warfare. This was something that was unlikely to find favour with the RN who was paying for the publication of the manual. Thus, the terms of reference would stay firmly in the realms of assaults on an enemy shore. Higgins then sought to explain the relationship between the commanders involved and external commanders who may have an influence on the operation. Higgins was adamant on the need for co-operation between the commanders and the need to subordinate command to those who were the

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– Agenda for the 5<sup>th</sup> Meeting of the Co-Ordination Committee for Staff Duties for Combined Operations; Massam, ‘British Maritime Strategy’ p. 125.

<sup>205</sup> TNA, AIR 5/204, Report of Exercise at the Army Staff College – Summary of Principal Proposals.

<sup>206</sup> TNA, AIR 5/204, File 38A – Some Aspects of Combined Operations in so far as they affect the Royal Air Force.

<sup>207</sup> TNA, AIR 5/204, File 38A, p. 1.

predominant partner in the operation. However, it was noted that this might not be the case for the whole operation and that the system set up must be one that is flexible enough to react to the demands of the operation.<sup>208</sup> Thus, while at sea the predominant partner would be the navy but in the land phase, that role would pass to the army. Higgins, however, stresses the point that the Air Officer Commander in Chief (AOC-in-C) should always be an RAF officer and that while he may answer to the predominant partner they must be willing to co-ordinate their actions; an issue not always understood by the other services.<sup>209</sup> Higgins also expounded what he saw as the primary aim of the air power in support of Combined Operation, namely the attainment of air superiority. The secondary role of the RAF was interdiction of the battlefield.<sup>210</sup> These recommendations went on to form the basis of the chapters dealing with air power in the *Manual of Combined Naval, Military and Air Operations* in 1925.<sup>211</sup> The CCSDCO, which superseded the Altham Committee, reaffirmed the views espoused by Higgins. The RAF's member in 1923, Air Commodore Higgins, confirmed that the RAF's primary aim was to achieve air superiority.<sup>212</sup> Both the committees were inter-departmental and inter-service and represented a plurality of ideas and acceptance of them. However, financial constraints limited their scope and reliance on the staff colleges.<sup>213</sup> Distribution of the manual within the RAF was widespread with over four hundred copies distributed amongst staff division and the various commands, another two hundred and thirty were

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<sup>208</sup> TNA, AIR 5/204, File 38A, p. 1.

<sup>209</sup> TNA, AIR 5/204, File 38A, p. 1. The issue of subordination of command was to be one of the perennial problems of any combined operation whether on land or at sea and was not to be solved properly until the battle in North Africa in 1941-1942. For a discussion of some of the land based problems see; Hall, *Strategy for Victory*, passim.

<sup>210</sup> TNA, AIR 5/204 'File 38A, p. 3.

<sup>211</sup> TNA, AIR 10/5533, Manual, 1925, especially Chapter X and XX.

<sup>212</sup> TNA, AIR 2/1061, File 41B – Minutes of the 5<sup>th</sup> Meeting of the Co-Ordination Committee for Staff Duties in Combined Operation, 13/12/1923.

<sup>213</sup> Massam, 'British Maritime Strategy', p. 124.

kept as a war reserve, and thus, it can be assumed that these principles were widely read.<sup>214</sup> The setting up of the Chiefs of Staff Committee in 1923 led to a re-evaluation of many of the principles of the 1925 manual and saw the publication of a new edition in 1931.<sup>215</sup> However, concerning the application of air power the views established by Higgins remained valid and constant.

By the time that the 1938 edition of the MCO had been published, the general principles on the utilisation of air power initially laid out by Higgins in 1922 had become accepted by the other services. It became accepted by all three services the threat that air power could cause to any potential offensive Combined Operation and that defence against this threat was paramount to the success of operations and, therefore, in order to combat this threat any landing force must be prepared to defend itself.<sup>216</sup> However, the MCO also took account of the greater role of fighter aircraft in the attainment and maintenance of air superiority in assaults.<sup>217</sup> The new manual also represented a new change in direction for the manual, one that the RAF had long proposed, in that it now took account of more than one type of operation as being combined in nature. The new manual now considered eight types of operations as combined.<sup>218</sup> One of the key reasons for this change in definition was the effect of the reports coming out of the Staff Colleges and in particular, the RAF Staff College, which had deliberated over the issue of command and control and the nature it, should take.<sup>219</sup> This was duly considered by the Drafting Committee that had been formed in 1936 on the suggestion of Air Vice-Marshal Courtney, the Deputy Chief of the Air Staff (DCAS).<sup>220</sup> By the time the manual

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<sup>214</sup> TNA, AIR 2/1059, File 75A – Distribution List of the Manual of Combined Operations (1925).

<sup>215</sup> Massam, 'British Maritime Strategy' pp. 131-132; Clifford, *Amphibious Warfare*, pp 41-46.

<sup>216</sup> TNA, AIR 10/1437, Manual of Combined Operations, 1938, Chap. 3, Para. 5, p. 18.

<sup>217</sup> TNA, AIR 10/1437, Manual of Combined Operations (1938) p. 121.

<sup>218</sup> TNA, AIR 10/1437, Manual of Combined Operations, Chap. 3, Para 12, p.19.

<sup>219</sup> Clifford, *Amphibious Warfare*, p. 52.

<sup>220</sup> Clifford, *Amphibious Warfare*, pp. 49 – 54.

was produced, it became accepted that the term combined meant ‘all-service representative’ that is encompassing each service.<sup>221</sup> The RAF member on the Drafting Committee was Squadron Leader Fairweather and it was noted that the problem with the current manual was its narrow scope and that it either required expanding to encompass all forms of war or narrowing further to minor opposed landings.<sup>222</sup> During the preparation of the manual consideration was given to the issue of a Headquarters Ship (HQS) for operations.<sup>223</sup> However, it was noted that these vessels would be specific to the form of operation they were undertaking, prefiguring a debate that occurred in 1943 over the use of HQS in long or short-range operations.<sup>224</sup>

Due to the expansion in the scope of the MCO, the issue of command became contentious with both the Army and RAF viewing any war as a Combined Operation.<sup>225</sup> This led to the belief that other systems of command other than the previous proscribed joint system be considered. Eventually the manual three key systems of command as appropriate to Combined Operations. First, joint command with force commanders of equal standing, second, unified command with a combined commander and finally, command by one service that had the most stake in the operation.<sup>226</sup> This would become a contentious area of JUBILEE and is discussed in Chapter Two.

Thus, by the time of the publication of the MCO the key principle of air superiority was accepted as the main role of the RAF in Combined Operations. While debate did exist over the ability of Combined Operations to succeed in the face in air power, it was also recognised that if air superiority were achieved then it would aid in the

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<sup>221</sup> Clifford, *Amphibious Warfare*, p. 56.

<sup>222</sup> TNA, AIR 2/1830, Wing Commander Pirie, Deputy Director of Operations, to Squadron Leader Fairweather, 6 July 1936.

<sup>223</sup> TNA, AIR 2/1830, Wing Commander Pirie to Air Marshal Barrett, 23 September 1936.

<sup>224</sup> TNA, AIR 2/1830, Air Marshal Barrett to Wing Commander Pirie, 10 October 1936.

<sup>225</sup> Clifford, *Amphibious Warfare*, p. 53.

<sup>226</sup> TNA, AIR 10/1437, Manual of Combined Operations (1938), pp. 20-22

success of that operation. For example, in 1938 Peirse argued that ‘One of the greatest difficulties in this form of operation will be the need for establishing a favourable air situation.’<sup>227</sup> Indeed Clifford admits that by 1938 air superiority was an essential consideration for all Combined Operations.<sup>228</sup> This theoretical construct in line with developments at Fighter Command in 1940 provide the context for JUBILEE. The RAF also aided in pushing Combined Operations doctrine closer to joint vision that it had of warfare as it viewed the use of air power as a strategic weapon that aided the success of operations. As noted below the need for air superiority was not restricted to Combined Operations but was also applied to other areas of air power operations.

### **1.5 The Royal Air Force and Air Superiority Missions**

This chapter has discussed the primary aim on the RAF during Combined Operations as being the attainment of air superiority. It is worth considering the methods used to gain this aim. AP3000 describes air superiority as a degree of dominance that allows the conduct of operations on air, land and sea free from enemy interference.<sup>229</sup> The term air cover is used in an interchangeable manner with air superiority and is used when describing attempts to wrest air superiority, as was seen over Dieppe. The RAF’s *War Manual* also described air superiority as having a ‘moral, physical and material superiority’ over the enemy in order to deprive flexible actions against an operations aim.<sup>230</sup> Thus, it is linked to the offensive nature of RAF doctrine and the weakening of an enemy’s opposition through air action.

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<sup>227</sup> TNA, CAB 54/2, DCOS Paper 64, 8 February 1938.

<sup>228</sup> Clifford, *Amphibious Warfare*, p. 69.

<sup>229</sup> Anon, *AP3000*, p. 3.12.2.

<sup>230</sup> TNA, AIR 10/1910 ‘Royal Air Force War Manual’ Chap. 7, Para. 10. A useful online version of the manual is available at <http://ww2airfronts.org/doctrine/raf/warmanual1/warmanual1-0.html>.

Air superiority is inexorably linked to the Douhetian concept of 'Command of the Air' and Trenchard's views of offensive air power. Early in the RAF's history, this was linked to the efficacy of the bomber; however, in the face of the rise of the *Luftwaffe* and effective fighter aircraft in the late 1930s this view became more nuanced.<sup>231</sup> Indeed Slessor in *Air Power and Armies* espoused the importance of air superiority and Air Marshal Sir Arthur Coningham argued its importance in the land campaign.<sup>232</sup> Undeniably by late 1940 Fighter Command role included offensive fighter operations as will be discussed in Chapter Two.<sup>233</sup>

The nuanced view of air superiority can be viewed in the Combined Operations doctrine of the inter-war years. As already noted as early as 1922 air superiority was considered the RAF's primary role in Combined Operations.<sup>234</sup> However, in the various editions of Combined Operations doctrine various methods were noted. The 1925 manual accepted the need for air superiority but in a period of belief in the superiority of the bomber, it noted various methods of achieving that aim.<sup>235</sup> It discusses the use of aircraft in the destruction of enemy air forces, lines of communication, demoralisation of personnel and the civilian population and destruction of material.<sup>236</sup> These missions were to be undertaken by bomber aircraft. The use of fighters was relegated to air cover in the defence of the landing area and it summarised the various duties they may be called upon such as defeating aircraft involved in supporting bombardment.<sup>237</sup> In line with the changes mentioned above the 1938 MCO went further on the use of fighters by

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<sup>231</sup> Anon, *AP3000*, p. 3.12.5.

<sup>232</sup> Slessor, *Air Power and Armies*, *passim*; Air Marshal Sir Arthur Coningham, 'The Development of Tactical Air Force (lecture) May, 1946' *Royal United Service Institute Journal*, 91 (1946: Feb/Nov) *passim*.

<sup>233</sup> TNA, AIR 16/373, File 1A-No. 11 Group Offensive Operations, 21 October 1940, p. 1.

<sup>234</sup> TNA, AIR 5/204 'File 38A.

<sup>235</sup> TNA, AIR 10/5533, Manual, 1925, p. 14.

<sup>236</sup> TNA, AIR 10/5533, Manual, 1925, p. 92.

<sup>237</sup> TNA, AIR 10/5533, Manual, 1925, pp. 94-96.

maintaining their vital use due to the possibility of counter-air attacks by the enemy.<sup>238</sup> Indeed air cover became one of three methods of supporting an assault on a hostile shore alongside bombardment and smoke screens.<sup>239</sup> Thus, once the offensive use of fighters became policy in 1940 the provision of air cover for JUBILEE and the battle for air superiority became inevitable linked.

## **1.6 Conclusion**

While Massam has portrayed the inter-war years as one of struggle in the development of Combined Operations doctrine, this chapter has attempted to illustrate and contextualise some of the developments and discussions that occurred in the period with particular reference to the implications that the growth of air power brought to the subject.<sup>240</sup> A cursory glance at some of the primary sources and a wider understanding of some of the strategic and domestic issues facing the RAF shows that despite some of the significant problems facing the service, most notably those of a financial nature, the RAF did take time to consider its role in Combined Operations. It is wrong to be too critical of a service, which due to its various commitments and attempts to stay independent was being pulled in many directions and, therefore, had few resources to spare. That it did consider its role in Combined Operations is to be commended and the fact that it did add knowledge and expertise to the doctrine of Combined Operations should be noted. The RAF's key contribution to the emerging doctrine was to think about its role in both strategic and operational terms and show that its primary aim was to be the attainment of air superiority and that without that general condition Combined Operations could not

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<sup>238</sup> TNA, AIR 10/1437, Manual of Combined Operations (1938) p. 121.

<sup>239</sup> TNA, AIR 10/1437, Manual of Combined Operations (1938) p. 144.

<sup>240</sup> Massam, 'British Maritime Strategy' *passim*.

succeed in the modern era. That this thinking was in line with the general doctrine of the RAF should not be viewed critically, as the RAF and its leaders were well aware of the role they had to play in the country's war effort. They also understood that for the other two dimensions of warfare, land and sea, to be decisive control of the third dimension, air, had to be mastered. Thus, this shows a service thinking about the long-range implications of its purpose. It is within this context the development of Combined Operations doctrine, and the subsequent utilisation of air power during JUBILEE must be understood.

## Chapter 2

### The RAF, the Battle for Air Superiority and Planning Operation JUBILEE

Chapter one examined the development of Combined Operations doctrine from the viewpoint of air power. It showed that the RAF during the inter-war years took the issue of Combined Operations seriously. While aerial bombardment may have been a matter of faith for the Air Staff, at an operational level the RAF's view of air power was more nuanced than often assumed. The RAF, through the mechanism of the Staff College, worked with the other services in examining the role of air power in Combined Operations. It also made great pains, despite serious inter-service issues and budgetary constraints, to work with the other services in writing and implementing the MCO. Thus, by 1939 the RAF had a theoretical understanding about the use of air power in supporting Combined Operations backed up with limited practical experience. It had a doctrine that stressed the strategic use of air power in order to achieve tactical and operational objectives. For the RAF air superiority was its primary role in supporting Combined Operations. It argued that this condition was necessary for any Combined Operation to succeed and that in achieving air superiority over the battle area the RAF could then further utilise air power to support operations on the ground.

This chapter seeks to take this doctrinal context and apply it to JUBILEE. It does this by first examining the application of air power in three early examples of Combined Operations, both successful and unsuccessful, the Norway campaign, and the evacuation from Dunkirk and the Battle of Britain. Each of these examples highlights some of the difficulties of launching Combined Operations in the face of air superiority. It will then discuss the RAF's own strategic fighter offensive and how the need to gain air superiority over Europe fits in to the context of Combined Operations doctrine and JUBILEE. An understanding of these medium-term factors will help to explain why the RAF sought an

aerial battle over Dieppe. The chapter will then examine the training of RAF units in Combined Operations at the Combined Training Centre (CTC) at Acnacharry. The chapter will then delve into the contentious area of planning for operation RUTTER/JUBILEE and examine some of the key issues raised and how these problems were dealt with. Notable amongst these key issues is the decision to remove the use of pre-bombardment from the operation.

## **2.1 The Battle for Air Superiority, 1940-1942**

Nineteen forty to 1942 saw the RAF battle the *Luftwaffe* for air superiority in numerous campaigns over France, the Low Countries, Norway and Britain. Each illustrates the necessity for air superiority in Combined Operations. Air Vice-Marshal Robb, Deputy Chief of Combined Operations (DCCO), noted in a 1941 lecture that the primary concern of air power was the need to gain air superiority.<sup>241</sup> Robb admitted that until the outbreak of war the use of air power in support of Combined Operations had been primarily a theoretical problem, however, the experience of Dunkirk and the Norwegian campaign had changed this and proven that air superiority was vital.<sup>242</sup> He noted that 'If the enemy has a powerful air force, we must prevent him somehow or other from interfering with our landing and our lines of communications', thus highlighting the need for the strong application of air power in Combined Operations.<sup>243</sup>

The German invasion of Norway, Operation *Weserübung*, led to what James Corum describes as the first modern joint campaign where 'mastery of the air translated

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<sup>241</sup> TNA, DEFE 2/847, The Air Aspects of an Opposed Landing (1941).

<sup>242</sup> TNA, DEFE 2/847, The Air Aspects of an Opposed Landing, p. 1.

<sup>243</sup> TNA, DEFE 2/847, The Air Aspects of an Opposed Landing, p.1.

into mastery of the sea.’<sup>244</sup> Long lines of communications, a constant point of discussion during the inter-war period, hampered British forces. This point allowed the *Luftwaffe* to build up forces rapidly when compared to the RAF. This allowed them to gain air superiority in theatre. This effected initial operations at Andalsnes where the Luftwaffe delayed the landings, as there had been no provision for air support.<sup>245</sup> General Paget, the commander at Andalsnes, noted that ‘all the lessons of peacetime exercises’ had been forgotten as no forward air bases were established.<sup>246</sup> The RAF attempted to find solutions based upon pre-war theory such as basing No. 263 Squadron on the frozen lake at Andalsnes, however, the unit lasted one day in the face of *Luftwaffe* air superiority.<sup>247</sup> Discussion also returned to the use of fighters fitted with floats, though the campaign ended before it was tested.<sup>248</sup> Long lines of communication also hindered the problem of defending bases in order to provide air support. The RAF attempted an interdiction campaign against *Luftwaffe* air bases, however, problems of command and control made it ineffective, as there was no unified command set-up for the campaign, which led to a lack of co-ordination between the services.<sup>249</sup>

The battle for air superiority remained the key role with the RN carriers HMS *Glorious* and HMS *Ark Royal* delivering a reformed No. 263 Squadron and No. 46

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<sup>244</sup> James Corum, ‘Uncharted Waters: Information in the First Modern Joint Campaign – Norway 1940’ *Journal of Strategic Studies*, Vol. 27, No. 2 (June 2004) p. 345.

<sup>245</sup> James Corum, ‘The German Campaign in Norway, 1940, as a Joint Operation’ *Journal of Strategic Studies*, Vol. 21, No. 4 (December 1998) p. 74.

<sup>246</sup> TNA, WO 106/1904, General Paget’s Report of Operation SICKLEFORCE Part II.

<sup>247</sup> Denis Richards, *The Royal Air Force, 1939-1945 – Volume 1: The Fight at Odds* (London: HMSO, 1953) pp. 89-93.

<sup>248</sup> TNA, CAB 54/13, DCOS (IT) 13 Enclosure A: Memorandum on Landing Operations, p. 37. It is interesting to note that the idea of a fighter floatplane persisted until 1942 when a prototype Supermarine Spitfire floatplane was tested based upon the MkV airframe. Alfred Price, *The Spitfire Story* (London: Jane’s, 1982) p. 195.

<sup>249</sup> Corum, ‘Uncharted Waters’ p. 357.

Squadron to the Narvik area.<sup>250</sup> Here they battled the *Luftwaffe* and covered the allied withdrawal. However, losses and concentrated *Luftwaffe* air strength neutralised their effectiveness. After covering the withdrawal, RAF units withdrew to HMS *Glorious*.<sup>251</sup> Norway illustrated to the RAF the need for the concentrated use of air power in order to achieve air superiority over the battlespace. The campaign illustrated many of the key tenets discussed in pre-war doctrine and while at Narvik the RAF had managed to achieve a degree of air cover it failed to achieve superiority due to failures in intelligence and the *Luftwaffe's* ability to concentrate more quickly. The RAF's failure to concentrate effectively hampered the army's ability to operate. This was a lesson soon to be reinforced over Dunkirk where, conversely, the RAF's ability to concentrate forces would hinder German operations.

The invasion of Western Europe in May 1940 led to a significant defeat for British force that was forced to evacuate. Air action is often split into three phases and the final phase illustrated important lessons for the use of air power.<sup>252</sup> The period 21 May to 17 June saw the RAF cover the army's evacuation from Europe, in particular Operation DYNAMO, the withdrawal at Dunkirk. The DCCO described DYNAMO as a Combined Operation in reverse and the applicability and importance of air superiority to its success.<sup>253</sup> Primarily Dunkirk was a fighter battle due to the *Luftwaffe's* attempt to reduce forces in the bridgehead.<sup>254</sup> However, due the counter air operations that the RAF undertook out of view of the bridgehead it earned itself the epithet the 'Royal Absent

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<sup>250</sup> Richards, *The Fight at Odds*, p. 99.

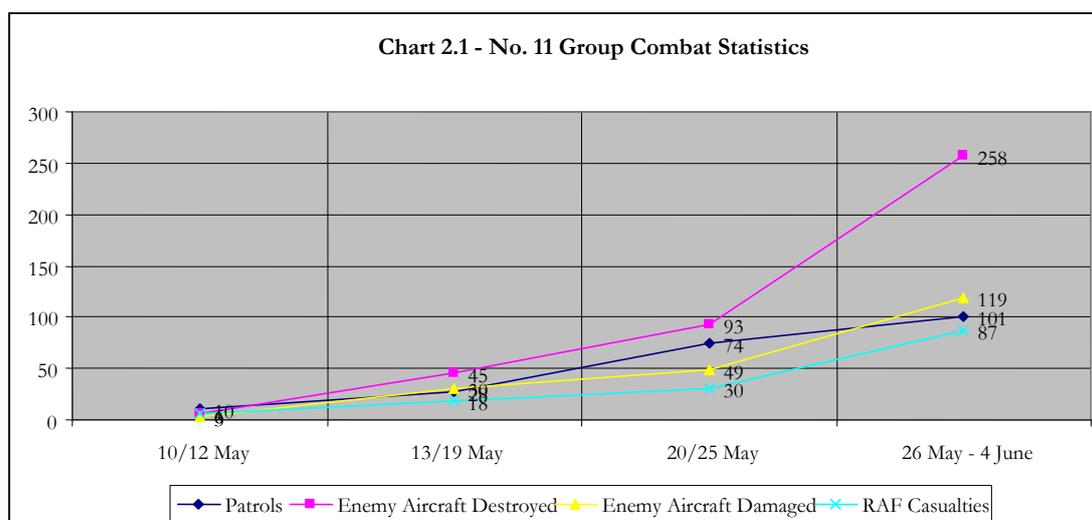
<sup>251</sup> Richards, *The Fight at Odds*, pp. 99-104. *Glorious* would suffer the cruel fate of being sunk by the German Cruisers *Gneisenau* and *Scharnhorst* who had received effective intelligence of her whereabouts from *Luftwaffe* reconnaissance. See Tim Slessor, 'The Tragedy of HMS *Glorious*' *The Royal United Services Institute Journal*, Vol. 144, No. 1 (1999) pp. 68-74.

<sup>252</sup> Hall, *Strategy for Victory*, p. 52.

<sup>253</sup> TNA, DEFE 2/847, The Air Aspect of an Opposed Landing, p.1.

<sup>254</sup> Norman Franks, *Air Battle for Dunkirk, 26 May-3 June 1940* (London: Grub Street, 2006) p. 70; Richards, *The Fight at Odds*, p. 135.

Force'.<sup>255</sup> This misperception of air operations forced the new CIGS, General Sir John Dill, to inform the army the RAF was going all out to support them.<sup>256</sup> Air Vice-Marshal Keith Park at No. 11 Group provided command for the air operations with fighter sweeps of four squadrons being provided. This was later increased to eight.<sup>257</sup> Seventy-five percent of the air operations over Dunkirk were fighter operations aimed at providing air cover for the evacuation, thus, providing much needed support for both the RN and army.<sup>258</sup> However, despite the weight of support provided the *Luftwaffe* was still able to sink three RN destroyers. Charts 2.1 and 2.2 illustrate the nature and cost of air operations during DYNAMO. The crescendo of operations undertaken reached a peak during 26 May and 4 June during the most important period of the evacuation. Chart 2.2 illustrates the aircraft lost. It was the Supermarine Spitfires and Hawker Hurricanes of No. 11 Group that bore the brunt of the air battle.



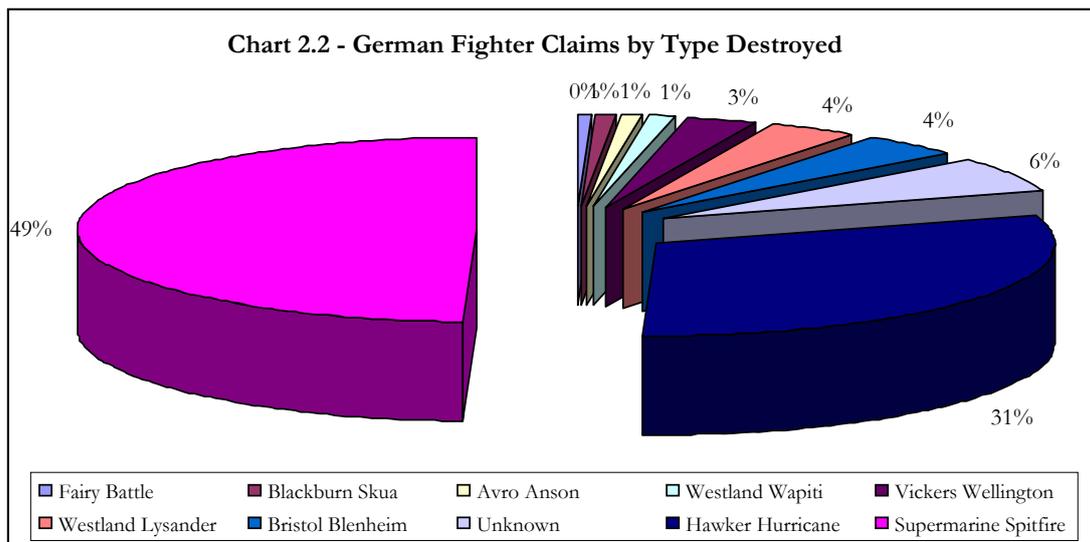
(Source: Norman Franks, *Air Battle for Dunkirk, 26 May-3 June 1940* (London: Grub Street, 2006) p. 186)

<sup>255</sup> Franks, *Air Battle for Dunkirk*, p. 16.

<sup>256</sup> Richards *The Fight at Odds*, p. 131

<sup>257</sup> TNA, DEFE 2/847, The Air Aspect of an Opposed Landing, p. 3

<sup>258</sup> Richards, *The Fight at Odds*, p. 142



(Source: Norman Franks, *Air Battle for Dunkirk, 26 May-3 June 1940* (London: Grub Street, 2006) pp. 187-188)

DYNAMO illustrated the importance of air cover in Combined Operations. The RAF's attempt to battle for air superiority ultimately led to the *Luftwaffe's* inability to reduce the bridgehead. However, German aircraft were still able to inflict damage when they got through the air cover provided. This provision of air cover aided the success of this Combined Operation in reverse and Admiral Sir Bertram Ramsey, who was in charge of DYNAMO, signaled Fighter Command on 29 May stating 'I am most grateful for your splendid cooperation. It alone has given us a chance of success'.<sup>259</sup>

The German decision to launch air operations against Britain after the Fall of France may not at first appear to be relevant to a study of Combined Operations. However, this is because the Battle of Britain has become clouded with the mythology of 'the few' and the defence of Britain in 1940.<sup>260</sup> However, it is this very defence that makes it relevant to this study. German plans for the future campaign against Britain had at its centre the decision by Hitler to plan an invasion of Britain in the aftermath of the campaign in France.<sup>261</sup> This invasion, Operation *Seelowe*, was a planned Combined

<sup>259</sup> Richards, *The Fight at Odds*, p. 138.

<sup>260</sup> See Gary Campion, *The Good Fight: Battle of Britain Propaganda and the Few* (Basingstoke: Palgrave, 2009).

<sup>261</sup> In recent years, the importance of the role of Fighter Command has become a major point of contention with the emergence of a more nuanced view of the Battle of Britain. In particular, see the

Operation and on 16 July, Hitler issued Directive No. 16 for preparations to begin.<sup>262</sup>

The directive ordered German forces to prepare for an invasion of Britain. However, the first priority in the planning process was the defeat of the RAF as a prerequisite for the invasion. The directive read that preparations included:

*the creation of those conditions which can make invasion possible;  
(a) The English Air Force must be beaten physically and morally to a point that they cannot put up any show of attacking force worth mentioning.*<sup>263</sup>

This highlights that the Germans considered air superiority necessary for any successful Combined Operation. The German High Command (OKW) had issued an earlier directive on 2 July with regard to planning for further operations against Britain and this stated that the:

*Invasion of England is quite possible under certain conditions of which the most important is the gaining of air superiority. For the present, therefore, the time at which it will take place remains an open question.*<sup>264</sup>

Thus, OKW were aware of the importance of air power in the success for any possible invasion. Vice Admiral Assman, who was involved in planning for *Seelowe*, reinforces this view in a report prepared by the RN's Naval Intelligence Division in 1947. The report

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public debate that emerged from the publication of an article by the journalist Brian James, 'Pie in the Sky?' *History Today*, Vol. 56, No. 9 (September 2006) pp. 38-40. James, misrepresented the nuanced views of three prominent historians from the Joint Services Command and Staff College. These three historians, Professor Gary Sheffield, Dr Christina Goulter and Dr Andrew Gordon, offered a rebuttal through the *Journal of the Royal United Services Institute*. The rebuttals can be found at 'The Battle of Britain Debate' on the Royal United Services Institute website:

<http://www.rusi.org/research/militarysciences/history/commentary/ref:C4538D604EF124>

Misunderstandings of this nuanced argument has reemerged in a recent history of the Battle, Campion, *The Good Fight*, pp. 3-4. On a new view of the Battle, see Anthony Cumming, 'The Navy as the Ultimate Guarantor of Freedom in 1940?' PhD Thesis (University of Plymouth, 2006).

<sup>262</sup> Klaus Maier, 'The *Luftwaffe*' in Paul Addison and Jeremy Crang (Eds.), *The Burning Blue: A New History of the Battle of Britain* (London: Pimlico, 2000) p. 19.

<sup>263</sup> Joint Services Command and Staff College Library (JSCSC), Shrivenham, OKW Directives for the Invasion of UK: Operation SEELOWE, Summer and Autumn 1940, p. 3.

<sup>264</sup> JSCSC Library, OKW Directives for the Invasion of UK, p. 1.

based on extensive captured documents noted that air superiority was the most important prerequisite for a successful landing.<sup>265</sup>

The Air Staff shared this view on the importance of maintaining air superiority. It issued a memorandum that states that Fighter Command's priority was deemed the struggle for air superiority and that the initial phase of the battle was:

*likely to be heavy bomber and fighter attacks directed against aerodromes and aircraft factories...designed to destroy the fighter squadrons on the ground and to draw them in the air into engagements against superior numbers.*<sup>266</sup>

Critics of the RAF and their participation in Combined Operations have argued that in the late 1930s the RAF stressed that opposed landings were not possible in the face of concentrated air power.<sup>267</sup> However, the *Luftwaffe's* attempt to gain air superiority during the August and September 1940 as a precondition to invasion and the fact that they failed in this effort clearly shows that the Air Staff's position on the importance of air superiority was the correct one. Throughout the period of the battle Air Chief-Marshal Sir Hugh Dowding, AOC-in-C Fighter Command, was aware of the importance of the role that his command was playing in the prevention of the invasion of Britain. As his most recent biographer has noted Dowding was aware that the task facing Fighter Command was simple; 'All he had to do was avoid defeat until bad weather made invasion impossible in 1940.'<sup>268</sup> This was a position that remained with Dowding throughout the battle. This contention was shared by the Air Staff and the then Air Vice-Marshal Sholto Douglas, DCAS, who stated in his autobiography that 'The Battle of Britain was fought against the immediate threat of a German invasion' and that 'Having

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<sup>265</sup> JSCSC Library 'German Plans for the Invasion of England, 1940' February 1947, p. 51.

<sup>266</sup> Appendix 16 'Invasion: Tasks of Fighter Command, Memorandum compiled by Air Staff, Fighter Command, 16 September 1940' in T C G James, *Air Defence of Great Britain, Volume 2: The Battle of Britain* (London: Frank Cass, 2000) pp. 365-366.

<sup>267</sup> Massam, 'British Maritime Strategy' p. 106 and Clifford, *Amphibious Warfare*, p. 69.

<sup>268</sup> Vincent Orange, *Dowding of Fighter Command: Victor of the Battle of Britain* (London: Grub Street, 2008) p. 174.

failed to smash the R.A.F. as a necessary prerequisite to invasion, they embarked upon a war from the air.<sup>269</sup>

One of the key factors in the defeat of the *Luftwaffe* was their inability concentrate on a specific set of targets in order to cause attrition on Fighter Command, thus, whittling down its strength and attaining air superiority. For example, in the second phase of the battle, 8-18 August, the *Luftwaffe* concentrated on a target set that included airfields and radar stations. The purpose of these attacks had been to neutralise airfields and defences in the area of a likely invasion.<sup>270</sup> However, poor planning and the inability to overcome the RAF's integrated command and control system eventually led to a change of tactics for the *Luftwaffe*. The decision to shift target sets during the fourth phase of the battle, 7-30 September 1940, marked an important turning point in the battle for air superiority in terms of the German attempt at invasion. The inability of the *Luftwaffe* to destroy the RAF's fighter force allowed it to contest air superiority and prevent invasion. The Battle of Britain highlights the need for effective command of the air for any major Combined Operation to be seriously considered and launched. Hitler's decision in early September 1940 to postpone *Seelowe* clearly illustrates that the RAF's victory not only defeated the *Luftwaffe* but that it also led to concerns about the ability of the German military to launch a successful Combined Operation when their first prerequisite not been achieved. It illustrates that they would not launch an invasion in the face of concentrated air power and the impact it would have upon the operations ability to succeed.

Having achieved victory Fighter Command now faced a two-fold mission, first, it was required to defend British cities during the Blitz of 1940 and 1941 and, second, it

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<sup>269</sup> Sholto Douglas with Robert Wright, *Years of Command: The Second Volume of the Autobiography of Marshal of the Royal Air Force Sholto Douglas, Lord Douglas of Kirtleside GCB, MC, DFC* (London: Collins, 1966) pp. 90-91.

<sup>270</sup> James, *The Battle of Britain*, p. 132.

was now required to take the offensive against the *Luftwaffe* over occupied territory. It is this second mission that is important to this thesis as it illustrates the importance of the battle for air superiority in the west. As early as 21 October 1940 Park received orders to take the offensive when weather and enemy activity warranted it.<sup>271</sup> This policy became more prominent once Douglas took over at Fighter Command and Leigh-Mallory replaced Park at No. 11 Group in late 1940 when they adopted a strategy of 'leaning forward into France.'<sup>272</sup> During the course of 1941 and 1942, Fighter Command would launch a variety of offensive operations over Northern Europe, initially consisting of RHUBARB and CIRCUS operations. These were offensive fighter sweeps either with or without bombers. However, by the end of 1941 a variety of missions emerged with the singular purpose of bringing the *Luftwaffe* to battle, notably RODEO and RAMROD missions.<sup>273</sup> At an operational level, these operations had as their aim the destruction of enemy targets on the ground, sea and air.<sup>274</sup> Also from June 1941, they had a political aim of drawing German forces away from the Eastern Front.<sup>275</sup> Until June 1941 many of the operations were taken at opportune moments, however, their political importance saw an increase in their use from June onwards. Despite this, factors outside of Douglas' control saw their utilisation vary during 1941, for example, by October, the number and scale of operations were cut back due to the short days, and varying weather conditions.<sup>276</sup> There has been controversy over the effectiveness of the operations in drawing down *Luftwaffe* fighter strength. For example, the Air Historical Branch (AHB) narrative is forced to

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<sup>271</sup> TNA, AIR 16/373, File 1A-No. 11 Group Offensive Operations, 21 October 1940, p. 1.

<sup>272</sup> Richards, *The Fight at Odds*, p. 383.

<sup>273</sup> Richards, *The Fight at Odds*, p. 383; Norman Franks *Royal Air Force Fighter Command Losses of the Second World War: Volume 2 – Operational Losses: Aircraft and Crews, 1942-1943* (Leicester: Midland Publishing Limited, 1998) p. 9.

<sup>274</sup> TNA, AIR 41/49, Air Defence of Great Britain, Volume V: The Struggle for Air Superiority, 1942-1943, p. 87.

<sup>275</sup> TNA, AIR 41/49, The Struggle for Air Superiority, 1942-1943, p. 87; Richards, *The Fight at Odds*, p. 383.

<sup>276</sup> TNA, AIR 41/49, The Struggle for Air Superiority, 1942-1943, p. 87.

admit that the planned impact was not realised.<sup>277</sup> However, while there is a degree of truth to this assertion it must be understood that by the time the daytime threat to Britain had been dealt with, there was a need to find a new role for Fighter Command. Another factor that caused problems for Fighter Command was the fact that it had been formed around the concept of aerial defence and by its very nature the primary equipment of the command were short-range aircraft, which caused operational difficulties.

During 1942, operations continued with the same aims as in 1941. However, because of the wastage in Fighter Command, Douglas' operational policy was amended twice in light of lessons being learnt. On 13 March, Douglas was ordered to resume CIRCUS operations and supplement these with fighter sweeps in order to draw down *Luftwaffe* strength, though he was to conserve strength where possible.<sup>278</sup> This was a seemingly contradictory order. Therefore, to deal with the issue of wastage, Leigh-Mallory received amended instructions on 13 April that ordered his operations:

- (a) To pick targets right on the coast, and not try to penetrate.*
- (b) To carry out a proportion of...operations without bombers at all, since the Hun [was] apparently ready to react even though no bombers [were] present.*
- (c) To employ large numbers of squadrons with a view to out-numbering the Hun.*<sup>279</sup>

These revised orders help to contextualise the nature of the force used at Dieppe. For example, the force disposition utilised fits these orders as, firstly, Dieppe is on the coast, second, few bombers were used except for smoke laying and close support operations, finally, the largest numbers of squadrons assembled since 1940 were used. With these revised orders, the Air Ministry hoped to draw down German strength by as much as two hundred airframes per month.<sup>280</sup> This was found wanting and by June Fighter

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<sup>277</sup> TNA, AIR 41/49, The Struggle for Air Superiority, 1942-1943, p. 88.

<sup>278</sup> TNA, AIR 41/49, The Struggle for Air Superiority, 1942-1943, pp. 102-103.

<sup>279</sup> TNA, AIR 41/49, The Struggle for Air Superiority, 1942-1943, p. 105.

<sup>280</sup> TNA, AIR 41/49, The Struggle for Air Superiority, 1942-1943, p. 105.

Command's operational policy was yet again amended in light of increasing casualties.<sup>281</sup> This change was caused primarily because of the introduction of the Focke-Wulf FW190 into *Luftwaffe* units, which was qualitatively superior to Fighter Command's primary aircraft, the Spitfire MkV. This situation would only be solved with the introduction of the Spitfire MkIX during the latter part of 1942. Thus, the fighter operations of 1941 and 1942 have drawn criticism, principally for not inflicting as many casualties as had been supposed. Even during the course of the operations, discussions took place as to the best method of conducting the missions. For example, in March 1941 there was an exchange of views between Douglas and his Senior Air Staff Officer (SASO), Air Commodore Sir Douglas Evill. Evill contended that the CIRCUS operations at the time were ineffective and needed to be curtailed or stopped until a new method was found for their employment.<sup>282</sup> However, Douglas argued that a curtailment of operations would not be advantageous, though he did agree that there was need for further training.<sup>283</sup> However, while the offensive provided Fighter Command with the opportunity to 'lean forward into France', by mid-1942, it had been virtual stalemated thanks to the tactical advantage enjoyed by the *Luftwaffe*. It does, however, illustrate the importance of air superiority to the RAF and that the orders issued to Leigh-Mallory on 13 April, when viewed in conjunction with an appreciation of Combined Operation doctrine, provide the operational context for No. 11 Group's operations over Dieppe.

The period, 1940 to 1942, saw Fighter Command involved in a series of operations that have been viewed in isolation and from a specific service perspective, for example, the Battle of Britain has often been viewed purely from the viewpoint of Fighter Command. However, an understanding of Combined Operations doctrine, in

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<sup>281</sup> TNA, AIR 41/49, The Struggle for Air Superiority, 1942-1943, p. 112.

<sup>282</sup> TNA, AIR 16/373, Minute from SASO to AOC-in-C Fighter Command, 7 March 1941.

<sup>283</sup> TNA, AIR 16/373, Minute from AOC-in-C Fighter Command to SASO, 7 March 1941.

particular air power's importance to their outcome, these operations can be viewed in different light. Overall, they illustrate the importance of air superiority to the success of Combined Operations. For example, recent shifts in the historiography of the Battle of Britain, as provided by the likes of Anthony Cummings, have increasingly provided the historian with a more nuanced view of the battle. An awareness of the possible roles of the both the RN and Army in any potential German Combined Operation shifts our understanding of the importance of Fighter Command's role by forcing historians to view the battle as a Combined Operation. By understanding Combined Operations doctrine it is no longer enough simply to regard it as a case of Fighter Command defeating the *Luftwaffe*. It shows that the wider implication denying air superiority to the Germans Fighter Command was to shape the nature of any possible Combined Operation by deny the Germans the ability to conduct it. Therefore, by viewing operations from the viewpoint of Combined Operations doctrine and the importance of air superiority the campaigns of the this period can be seen as testing the MCO, which, as seen in Chapter One, argued that this mission was the primary role for air power. This both sets the scene for JUBILEE and provides an explanation for the nature of air power used during JUBILEE.

## **2.2 Training for Combined Operations**

Bernard Fergusson, a retired general, in his history of Combined Operations, *The Watery Maze*, described the RAF as having a nonchalant attitude towards the subject of Combined Operations by stating that they were inclined to take the view that 'there was nothing particularly tricky in supporting an amphibious operation.'<sup>284</sup> As has already been illustrated there is little evidence of this being true, however, due to the pressures of the

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<sup>284</sup> Fergusson, *The Watery Maze*, p. 82.

war effort the RAF did have problems in preparing units for possible Combined Operations. It took until November 1941 for COHQ to be provided with a permanent advisor on air operations; though it should be noted that until this point Combined Operations had been small and required minimal air support. Mountbatten wrote to Air Chief Marshal Sir Charles Portal, CAS, requesting the posting of an officer of the rank of Group Captain to fill the post of Assistant Advisor on Combined Operations (Air) (AACO) in order to allow him to carry out his duties as Advisor on Combined Operations (ACO).<sup>285</sup> Portal replied on 5 November agreeing to release Group Captain Willetts to serve on Mountbatten's staff.<sup>286</sup> At the same time as this appointment, Mountbatten chaired the first meeting of an Inter-Service Committee that was charged with examining questions of training, equipment, inspection and administration for Combined Operation. From an air power perspective, the key conclusion of the first meeting of this committee was that there was a need for greater RAF participation in order for COHQ's training programme to be met. In response to this meeting Mountbatten again wrote to Portal to request suitable officers and equipment be seconded to COHQ. Mountbatten stated that 'At present we have no tested doctrine...for the employment of air forces in combined operations'. The key word here was tested, as there certainly already existed a doctrine on the use of air power Combined Operations as laid out in the 1938 MCO and in the RAF's War Manual AP1300.<sup>287</sup> He argued that in order to rectify the situation the only suitable solution was the posting of a 'competent and representative body of airmen' to work alongside officers from the RN and Army.<sup>288</sup> Mountbatten in this letter pointed out that there were some key issues that the RAF had not yet grappled with. These included practical matters such as the capture

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<sup>285</sup> TNA, AIR 20/5011, Mountbatten to Portal, 1 November 1941.

<sup>286</sup> TNA, AIR 20/5011, Portal to Mountbatten, 5 November 1941.

<sup>287</sup> TNA, AIR 20/5011, Mountbatten to Portal, 6 November 1941.

<sup>288</sup> TNA, AIR 20/5011, Mountbatten to Portal, 6 November 1941.

and defence of aerodromes, which had been discussed though not yet analysed and competently examined. However, it was noted that the primary aim of air power, as laid out in pre-war doctrine, was the maintenance of air superiority. In a reply to this letter, Portal vigorously picked up the issue and requested that the Director of Plans (D of P) examine the issue forthwith.<sup>289</sup> The decision was taken initially to appoint a senior staff officer, Air Commodore Walker, a signals officer and administrative officer.<sup>290</sup>

While a nucleus staff was being set up the more pressing question of equipment and the role of the unit based Inverary was being raised by December 1941. The question of the formation of a development flight was dealt with by a meeting of relevant personnel on 24 December 1941.<sup>291</sup> It was at this meeting that the decision was taken to form No. 1441 Combined Operations Development Flight. The unit's remit was to act as an experimental establishment that was to explore aerial problems inherent to Combined Operations and to take part in exercises with the Commando units at Inverary. Initially the unit was to be equipped with Westland Lysanders but it was envisaged that these would be replaced as soon as possible with more suitable fighter types, specifically the Hawker Hurricane.<sup>292</sup>

At the same time as the formation of No. 1441 Flight there was raised the question of control of air operations in any Combined Operation by Mountbatten. In a letter to Air Marshal Sir Richard Peck, Assistant Chief of the Air Staff (G) (ACAS (G)), of 7 February 1942, Mountbatten queried a directive issued to Air Commodore Fullard reference the appointment of force commanders for the air aspect of a Combined

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<sup>289</sup> TNA, AIR 20/5011, Memorandum from D. of Plans to VCAS, AMP, AMSO and DWO, 7 November 1941; AIR 20/5011, Portal to Mountbatten, 8 November 1941.

<sup>290</sup> TNA, AIR 20/5011, Portal to Mountbatten, 8 November 1941.

<sup>291</sup> TNA, AIR 20/5011, Memorandum from D. of Plans to DGO, DWO and DTO, 21 December 1941.

<sup>292</sup> TNA, AIR 20/5011, Minutes of a Meeting held in the Air Ministry, Whitehall, on 23<sup>rd</sup> December to discuss formation of an Air Section at Combined Training Centre, Inverary, and of a Combined Operations Development Flight.

Operation.<sup>293</sup> Mountbatten referred to a decision taken at a meeting on 28 December 1941 where it had been decided that until any foothold had been gained on the continent command of any air contingent would fall on the Air Advisor on Combined Operations (AACO) and then afterward it would devolve onto a force commander.<sup>294</sup> Mountbatten argued that the directive to Fullard was at variance with his role and the role initially given to the AACO in a directive of 6 February 1942 and required clarification of the procedure for the appointment of a force commander from the RAF.<sup>295</sup> The issue of force commanders and the role of Mountbatten's air advisor were clarified in a memo from DCAS to the D of P. It stated that in the opinion of CAS the force commander should be the AOC-in-C of the predominant command involved in the operation and not the AACO; thus in JUBILEE command would devolve onto Leigh-Mallory rather than the AACO.<sup>296</sup>

With the appointment of an air staff to the COHQ set-up, attention turned to the issue of training the appropriate RAF units in preparation for their participation in projected Combined Operations. A meeting planned for 9 February 1942 was arranged to discuss the training of RAF units in Combined Operations; however, the meeting was pushed back to 16 February. At the top of the agenda of this meeting was which type of training was to be the priority of No. 1441 Flight. These included, first, fighter support and control, second, smoke laying, third, close support and finally, recognition of ships.<sup>297</sup> The meeting agreed that in meeting the first method of training the methods utilised by No. 1441 Flight should match those of Fighter Command as closely as

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<sup>293</sup> TNA, AIR 20/5011, Mountbatten to ACAS (G), 7 February 1942.

<sup>294</sup> TNA, AIR 20/5011, Annex to Agenda for Meeting of Combined Operations Air Committee, 29 December 1941.

<sup>295</sup> TNA, AIR 20/5011, Directive to Vice Admiral, Combined Training, 6 February 1942, p. 2.

<sup>296</sup> TNA, AIR 20/5011, DCAS to D. of Plans, 23 February 1942.

<sup>297</sup> TNA, DEFE 2/812, Agenda – Meeting to Discuss the Training of RAF Units in Combined Operations, 5 February 1942, p. 1.

possible in order to ease interoperability for training considering that in any future operation they would provide the bulk of squadrons.<sup>298</sup> Portal stated that ‘The RAF will make available in turn six fighter squadrons for training with the Expeditionary Force.’, therefore, discussions took place exploring the efficacy of rotating squadrons from operational commands in order to take part in training.<sup>299</sup> Air Commodore Whitworth-Jones, the Director of Fighter Operations (DFO), noted that up to fifteen squadrons had been earmarked for exercises and experiments with the then forming expeditionary force and that initially it would be from these squadrons that the initial training units would come from. He noted that there was a need for Bomber Command squadrons; in particular those from No. 2 Group, to train and that, the matter was to be discussed with Air Chief Marshal Harris, AOC-in-C Bomber Command.<sup>300</sup>

By the end of March the D of P, Air Marshal Dickson, had issued operational orders to the C-in-C’s of the functional commands involved with Combined Operations; Fighter, Bomber and Army Co-Operation Commands, and took up the issue of supplying appropriate squadrons for training vigorously. The orders, sent out under the aegis of DCAS, Air Vice-Marshal Bottomley, noted that it was the intention of the Air Ministry to ‘press forward as rapidly as possible with training and preparation for combined operations.’<sup>301</sup> Douglas was instructed that the intention to train all fighter squadrons in army air support had now been extended to include the ‘special conditions of Combined Operations.’<sup>302</sup> It was made clear to Douglas that the Air Staff were aware

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<sup>298</sup> TNA, DEFE 2/812, Minutes of the Meeting to Discuss the Training of RAF Units in Combined Operations, 16 February 1942, p. 1.

<sup>299</sup> TNA, DEFE 2/812 ‘Agenda – Meeting to Discuss the Training of RAF Units in Combined Operations, p. 1.

<sup>300</sup> TNA, DEFE 2/812, Minutes of the Meeting to Discuss the Training of RAF Units in Combined Operations, 16 February 1942, p. 3.

<sup>301</sup> TNA, AIR 2/7697, File 4A – DCAS to AOC-in-C Fighter Command, 31 March 1942, p. 1.

<sup>302</sup> TNA, AIR 2/7697, File 4A, p. 1.

that his command was under severe operational pressures and that the system of rotation being implemented in order to affect the training of units was to be worked out in conjunction with Mountbatten. Douglas was also ordered to aid Army Co-Operation Command by providing battle experience for three fighter-reconnaissance squadrons.<sup>303</sup> It was also made clear that RAF participation in Combined Operation fell into two categories: first, air cover over the area of the operation and, second, support of ground troops in the land phase of the battle.<sup>304</sup> DCAS, in his minute to the Deputy DFO (DDFO) reference the extent of Douglas' knowledge, makes it clear that it is his opinion that it is in the second category that he believes that the greatest degree of training is required and that if it makes training more economical and effective then a wing of six squadrons should be made available at any one time depending on operational requirements.<sup>305</sup>

A similar operational order was issued to the AOC-in-C of Army Co-Operation Command.<sup>306</sup> In response to this directive Barrett responded by noting that he had already earmarked three squadrons, No. 225, No. 239 and No. 241, to take part in Combined Operations training exercises.<sup>307</sup> However, Barrett raised the issue of the equipment of his squadrons and argued that the current equipment of his units was not appropriate for the task it was being asked to perform.<sup>308</sup> A similar issue affected No. 1441 Flight. Barrett believed that if this issue were not dealt with it would seriously impair their training. No. 239 Squadron was to take part in JUBILEE and at the time of

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<sup>303</sup> TNA, AIR 2/7697, File 4A.

<sup>304</sup> TNA, AIR 20/829, DCAS to Deputy Director of Fighter Operations, 21 March 1943.

<sup>305</sup> TNA, AIR 20/829, DCAS to Deputy Director of Fighter Operations, 21 March 1943.

<sup>306</sup> TNA, AIR 2/7697, File 5A – Letter from DCAS to AOC-in-C Army Co-Operation Command, 31 March 1942.

<sup>307</sup> TNA, AIR 2/7697, File 12A – Letter from AOC-in-C Army Co-Operation Command to DCAS Ref. Training of AC Squadrons in Combined Operations, 4 April 1942, p. 1.

<sup>308</sup> TNA, AIR 2/7697, File 12A, p. 2.

this communication, it was equipped with Curtiss Tomahawks, which Barrett deemed unacceptable; however, by the time of the operation it had been re-equipped with North American Mustang MkIAs.<sup>309</sup>

A draft directive was prepared for Bomber Command but not issued. The draft letter directed Harris to provide squadrons from No. 2 Group for training particularly with reference to smoke laying operations.<sup>310</sup> However, D of P sent the letter to Vice-Chief of the Air Staff (VCAS), Air Chief Marshal Freeman, for verification due to the wide-ranging operations, which No. 2 Group was then undertaking, and it was felt that the addition of another operational requirement could cause problems.<sup>311</sup> At this point, the light bombers of No. 2 Group were involved in a wide range of activities, both operational and training. In terms of operations, the group was involved in CIRCUS, Intruder and Channel Stop operations with Fighter Command.<sup>312</sup> The key issue for DCAS was to avoid interference in Bomber Commands operations while meeting the requirements for training in Combined Operations and he directed that this be included in any directive to Harris.<sup>313</sup> At the same time, the draft letter was sent to the Director of Bomber Operations (DBO) who was concerned that certain assurances would have to be given to Harris in particular with reference to the re-equipment of No. 2 Group.<sup>314</sup> Subsequently VCAS wrote to Harris directing him to provide squadrons for training but noting that this activity should not influence operations unnecessarily.<sup>315</sup> Freeman's letter, and a letter sent on 15 April by Air Commodore Lewis-Roberts, the Director of

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<sup>309</sup> TNA, AIR 2/7697, File 12A, p. 2; Norman Franks, *The Greatest Air Battle: Dieppe, 19<sup>th</sup> August 1942* (London: Grub Street, 1997) p. 224.

<sup>310</sup> TNA, AIR 2/7697, File 6A – Draft Letter from Director of Plans to AOC-in-C Bomber Command.

<sup>311</sup> TNA, AIR 2/7697, Director of Plans to VCAS, 31 March 1942.

<sup>312</sup> TNA, AIR 2/7697, Director of Plans to VCAS, 31 March 1942.

<sup>313</sup> TNA, AIR 2/7697, DCAS to Director of Plans, 31 March 1942.

<sup>314</sup> TNA AIR 20/829, Director of Bomber Operations to DCAS, 20 March 1942.

<sup>315</sup> TNA, AIR 2/7697, File 11A – VCAS to AOC-in-C Bomber Command, 7 April 1942.

Operation Training (D of T), who outlined the RAF's training policy with regards to Combined Operations, received a swift reply from Harris who was characteristic in his forthright delivery of his opinion on the plans to provide squadrons for operations that he described as a 'hypothetical operation.'<sup>316</sup> The training policy outlined that Bomber Command must train four light bomber squadrons in Combined Operations and that in particular they must familiarise themselves with recognition techniques, close support bombing and smoke laying.<sup>317</sup> Harris noted that this policy was wasteful and that he thought that given the turnover in crews it would be ineffective. Harris suggested that the most effective means of providing training for his crews in these forms of operation would be in the Operational Training Units.<sup>318</sup> Harris received a reply from DCAS who re-iterated that the semi-official directive given to him by VCAS on 7 April stood firm and that it was the intention of the Air Staff to proceed promptly with this policy.<sup>319</sup> Thus, Harris was expected to implement the policy despite his objections.

However, despite the objection of Harris, the decision to train units in support of Combined Operations was in the main received positively by the operational heads of the commands responsible for possible operations. On 1 May 1942, Douglas at Fighter Command received a directive from DCAS on his priority of tasks for future operations. The letter referred to the recent discussions that had taken place on the subject of training for Combined Operations. DCAS prioritised the operations of Fighter Command as:

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<sup>316</sup> TNA, AIR 2/7697 'File 18A – AOC-in-C Bomber Command to the Under Secretary for State for Air, 26 April 1942 p. 2; AIR 2/7697 'File 20B – Director of Operation Training to Operational Commanders, 15 April 1942.

<sup>317</sup> TNA, AIR 2/7697, File 20B – Appendix 'A': RAF Training Policy and Training Requirements in Combined Operations.

<sup>318</sup> TNA, AIR 2/7697, File 18A, p. 2.

<sup>319</sup> TNA, AIR 2/7697, File 19A – Letter from DCAS to AOC-in-C Bomber Command, 30 April 1942.

- (a) *The intensification of the day fighter offensive which calls for reinforcement of 11 Group with Spitfire squadrons.*
- (b) *Maintenance of a proper state of readiness of squadrons ear-marked for operation "Region"*
- (c) *The training of fighter squadrons in rotation in Combined Operation*<sup>320</sup>

Thus, by May 1942, training for a 'hypothetical' operation had clearly become one of the primary tasks of Fighter Command in particular, and the other functional commands in general. It was noted that units earmarked for Operation BLAZING should be the first to rotate through the training programme.<sup>321</sup> No. 239 Squadron was the first squadron to go through the training at RAF Abbotsinch and would later serve during JUBILEE. Thus, by the time planning and training was moving forward the RAF had in place a policy and doctrine that not only took account of the need of Combined Operations but that also made it a leading priority in the training tasks of the appropriate functional commands.

### **2.3 Planning JUBILEE**

The genesis of JUBILEE lay in a decision on 14 June 1940 to appoint Lieutenant-General Alan Bourne as 'Commander of Raiding Operations on coasts in enemy occupation and Advisor to the Chiefs of Staff on Combined Operations.'<sup>322</sup> This appointment was made in the aftermath of a series of memorandum written by the Prime Minister, Winston Churchill, to his Chief of Staff, Major General Ismay on 4 and 6 June 1940. In these memorandums, Churchill called for the 'joint Chiefs of Staff to propose me measures for a vigorous, enterprising and ceaseless offensive' against German held territory.<sup>323</sup> Bourne had under his command six independent commando companies that

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<sup>320</sup> TNA, AIR 20/829, DCAS to AOC-in-C Fighter Command, 1 May 1942, p. 1.

<sup>321</sup> TNA, AIR 20/829, DCAS to AOC-in-C Fighter Command, 1 May 1942, p. 2.

<sup>322</sup> Fergusson, *The Watery Maze*, p. 47, Neillands, *The Dieppe Raid*, p. 25.

<sup>323</sup> Fergusson, *The Watery Maze*, p. 47.

had been formed for the Norway campaign. Unfortunately, for Bourne, Churchill described the first raids under his command as a 'silly fiasco'.<sup>324</sup> Churchill, displeased with these early failures, replaced Bourne with Admiral of the Fleet Sir Roger Keyes as DCO on 17 July 1940.<sup>325</sup> Keyes had been the architect of the raids on Zeebrugge and Ostend in 1918.<sup>326</sup>

Over the next year, raiding became an inherent part of British strategy in the war against Germany and a series of raids were launched against enemy held territory. However, Keyes faced problems in the planning and implementation of operations and on many occasions during 1941 these problem came to a head with the Chiefs of Staff Committee.<sup>327</sup> Eventually in the aftermath of a disastrous exercise in August 1941, he brought his concerns to the attention of the Chiefs of Staff; especially his concern over who was to issue orders to force commanders. In the ensuing debate, Keyes had a new directive drafted for his role and he was re-titled ACO.<sup>328</sup> However, Keyes could not accept this and on 27 October 1941, Commodore Lord Louis Mountbatten replaced him.<sup>329</sup> Mountbatten, with the backing of Churchill, began to conduct larger and larger raids against the enemy coasts, most notable at St Nazaire and Bruneval.<sup>330</sup> Thus, by early 1942, despite a tumultuous background, raiding and combined operations had become a distinct part of British military operations against the Axis powers.

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<sup>324</sup> Neillands, *The Dieppe Raid*, p. 26.

<sup>325</sup> Neillands, *The Dieppe Raid*, p. 27, Fergusson, *The Watery Maze*, p. 52. Fergusson suggests that the title Director went to Keyes head and that he believed he was responsible to the Minister of Defence, Churchill, and not the Chiefs of Staff. This issue was to follow him until his replacement by Mountbatten.

<sup>326</sup> Mark Karau, 'Twisting the Dragon's Tail: The Zeebrugge and Ostend Raids of 1918' *Journal of Military History*, Vol. 67, No. 2 (April 2003) pp. 455 – 481.

<sup>327</sup> Fergusson, *The Watery Maze*, pp. 70-85.

<sup>328</sup> Fergusson, *The Watery Maze*, p. 83.

<sup>329</sup> Fergusson, *The Watery Maze*, p. 89.

<sup>330</sup> Anon, 'Combined Operations' in I C B Dear (Ed.), *The Oxford Companion to World War II* (Oxford: Oxford University Press, 2001) p. 198.

The origins of JUBILEE lay in an Anglo-American strategic decision taken in April 1942 to increase the scale and frequency of raids.<sup>331</sup> The decision had a clear impact upon the RAF as it meant that as operations increased in scale they would require greater support, specifically in the form of air cover. The increase in scale also had the advantage of allowing the Fighter Command to continue its policy of offensive air operations against the *Luftwaffe*. While this may at first appear a selfish decision the motive can be viewed, through an understanding of Combined Operation doctrine, as altruistic, because if the RAF sought an aerial battle it would aid it in the aim of providing air cover for the assaulting forces. However, even before this decision was made raids had in general become larger in scale. For example, at the end of 1941 Operation ARCHERY, the raid on Vaagso Island, had seen the first truly combined operation undertaken by COHQ.<sup>332</sup> In terms of RAF participation, the operation had the support of bomber and fighter aircraft. In terms of forces structure, much like at Dieppe, fighters were predominant with five squadrons of long range Bristol Beaufighters and Blenheims being utilised. In terms of bombers there were twenty-nine Handley Page Hampdens supplied by Bomber Command.<sup>333</sup> The key role during the operation was to cover the operation and maintain air cover over the battlespace. ARCHERY illustrated the importance of air cover to the success of Combined Operations and that attrition in providing cover could be expensive for fighters, as eleven aircraft were lost.<sup>334</sup> Thus by March/April 1942 raids on the continent were becoming ever larger in size and scope of their objectives. It is in this context that JUBILEE emerged.

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<sup>331</sup> Stacey, *Six Years of War*, p. 324.

<sup>332</sup> Neillands, *The Dieppe Raid*, p. 44; Niall Cherry, *Striking Back: Britain's Airborne and Commando Raids, 1940-42* (Solihull: Helion, 2009) pp. 130-163.

<sup>333</sup> Appendix X 'Naval and Military Reports relating to Operation ARCHERY' in Cherry, *Striking Back*, p. 337.

<sup>334</sup> Appendix XII 'RAF Losses on Operation Archery' in Cherry, *Striking Back*, pp. 349-351.

Lieutenant General Sir Bernard Montgomery, in 1942 GOC Southern Command and involved in the planning for RUTTER, the precursor to JUBILEE, later noted about the planning of JUBILEE that:

*My own feeling about the Dieppe raid is that there were far too many authorities with a hand in it; there was no single operational commander who was solely responsible for the operation from start to finish, a Task Force Commander in fact.*<sup>335</sup>

Montgomery's view on the planning of the Dieppe Raid was seen through his experience of OVERLORD, which had an overall commander. Unfortunately, this teleological view of the planning of Dieppe has persisted in the historiography of JUBILEE and has distorted our understanding of some of the key issues raised during the planning process.<sup>336</sup> While the MCO discussed the merits of three systems of command in Combined Operations, it was early on in the planning process that the system of command would be either 'Joint Command' or 'Command by One Service'.<sup>337</sup> While Montgomery perhaps saw this decision as having been the root cause of the problems at Dieppe it does highlight the difficulty of planning for larger raids that faced COHQ in early 1942. Up until this point, the majority of raids had been small and there was little experience on which to make a decision on the system of command. Thus, by early May, Leigh-Mallory was appointed the RAF commander in a joint system of command alongside Major General Roberts as military commander and Vice Admiral Baille-Grohman was proposed as naval commander.<sup>338</sup> With the exception of the change of Captain Hughes-Hallett for Baille-Grohman, this would be the command structure in place when JUBILEE was remounted in late July. It is interesting to note the disparity in

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<sup>335</sup> Field Marshal The Viscount Montgomery of Alamein, *The Memoirs of Field Marshal The Viscount Montgomery of Alamein*, K.G. (London: Collins, 1958) p. 77; Neillands, *The Dieppe Raid*, p. 85.

<sup>336</sup> Neillands, *The Dieppe Raid*, p. 86.

<sup>337</sup> TNA, DEFE 2/542, RUTTER – Planning, p. 8; TNA, AIR 10/1437, Manual of Combined Operations (1938), pp. 20-22.

<sup>338</sup> TNA, DEFE 2/546, Extracts from Chiefs of Staff Meeting No. 42, 13 May 1942.

rank between the force commanders. It can be argued that Hughes-Hallett was brought in due to his willingness to work with Mountbatten.

The planning for RUTTER/JUBILEE has opened up several issues concerning air power, as there were two key changes to the plan between the cancellation of RUTTER and the mounting of JUBILEE; namely the use of a preliminary bombing raid and the use of airborne force to attack gun batteries on the flanks of the assault. The lack of Bomber Command involvement has become a major point of contention with Brian Loring Villa noting that, ‘Without heavy air bombardment, the disparity in fire-power proved fatal to the Canadian and British invaders.’<sup>339</sup> This theme has continued with Robin Neillands claiming that Leigh-Mallory’s decision to remove the support of bombardment was the result of loyalty that pressed him ‘...to accept a decision that fundamentally undermined the possibilities of success at Dieppe.’<sup>340</sup> However, both of these accounts view JUBILEE through the prism of the invasion of Normandy and they fail to appreciate the implication of utilising heavy strategic bombers for what amounted to a small-scale operation within the context of the Second World War. They also do not take account of the prevailing doctrinal view on the use of aerial bombardment in the support of Combined Operations. The MCO noted that only ‘Under certain conditions support of the landing by air bombardment will be of value.’<sup>341</sup> However, it also noted that:

*To what extent this support can be provided will depend on the number of aircraft available and other operations required of them. In most cases the general struggle for air superiority, local operations in defence of the landing against enemy aircraft, and spotting and reconnaissance duties will have prior claims.*<sup>342</sup>

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<sup>339</sup> Villa, *Unauthorized Action*, *passim*.

<sup>340</sup> Neillands, *The Dieppe Raid*, p. 273.

<sup>341</sup> TNA, AIR 10/1437, Manual of Combined Operations (1938), p. 146.

<sup>342</sup> TNA, AIR 10/1437, Manual of Combined Operations (1938), p. 146.

Thus, even before the war began it was laid down in Combined Operations doctrine that while it would be advantageous to have access to the use of aerial bombardment it should not be counted on due to other ongoing operations. Before RUTTER/JUBILEE, aircraft from Bomber Command had been utilised in both the raid on St Nazaire, Operation CHARIOT, and Vaagso, ARCHERY. For example, at St Nazaire aircraft had been used to try to divert attention away from the assault. However, their strange action over St Nazaire, where they circled and dropped single bombs, alerted the garrison to a possible attack on the town, and at midnight the garrison received orders to repel a possible parachute attack.<sup>343</sup> Thus, the use of Bomber Command in diversionary operations may have compromised the success of this operation. Also as already noted above bomber operations during ARCHERY were expensive in terms of effort given and results achieved. It is, therefore, more surprising that in the initial planning for RUTTER that bombing appeared. It should be considered that given the nature of operations that were to occur over Dieppe and the order Leigh-Mallory received from Douglas on 13 April the decision not to include bombers did not divert attention from the primary aim of air cover during JUBILEE; the provision of effective air cover. As early, as 14 April aerial bombardment was planned as a precursor to the landings with it being noted that the target would be the town generally.<sup>344</sup> However, it was noted in Mountbatten's appreciation given to the Chiefs of Staff that the approval for bombardment was required from the War Cabinet because of the standing directive that covered the use of bombers over occupied territory.<sup>345</sup> However, by the planning meeting of 5 June Leigh-Mallory argued that bombing would not add anything to the

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<sup>343</sup> C E Lucas-Phillips, *The Greatest Raid of All*, (London: Pan Books, 2000; Heinemann, 1958) p. 129; Fergusson, *The Watery Maze*, pp. 133-138.

<sup>344</sup> TNA, DEFE 2/546, Operation "RUTTER": Conclusions of Meeting Held at COHQ on Tuesday 21<sup>st</sup> April.

<sup>345</sup> TNA, DEFE 2/546, Extracts from Chiefs of Staff Meeting No. 42 dated 13.5.42.

operation and it would denude the element of tactical surprise.<sup>346</sup> Another factor leading to this decision was Harris' contention that bombers could not be used before twilight, thus, leaving only a window of five minutes for bombers before the start of the operation.<sup>347</sup> Leigh-Mallory's decision was also affected by the conclusion of the War Cabinet concerning the use of aerial bombardment, which stated that it should only be used when accurate attacks could be guaranteed.<sup>348</sup> Mountbatten would attempt to modify this directive but as seen by the meeting of 5 June Leigh-Mallory had concluded that it would not be effective anyway.<sup>349</sup> While Villa has contended that Leigh-Mallory's decision to cancel the bombing was based upon prescient analysis of its effect upon the landing force and Harris' intransigence, it is clear that Leigh-Mallory stated his objection to its effectiveness at the 5 June meeting.<sup>350</sup> Villa also points out on the issue of surprise that Dieppe had been bombed several times earlier; however, it is difficult to see how this relates to the issue of support for a Combined Operation.<sup>351</sup> Villa relies on the analysis of the official historians, C P Stacey and Stephen Roskill, who stated that the problems were difficult but not insurmountable. However, this raises the question of Stacey's and Roskill's understanding of the use of air power in support of Combined Operations.<sup>352</sup> Prevailing doctrine clearly stated that bombing should be used where possible but this was not the overriding concern of the RAF commander during operations.<sup>353</sup> In addition, research has explored the problems of using aerial

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<sup>346</sup> TNA, DEFE 2/546, Operation "RUTTER": Minutes of Meeting of Council and Advisers to CCO and Combined Force Commanders with Lieutenant-General Montgomery in the Chair, 5.6.42.

<sup>347</sup> TNA, DEFE 2/542, Planning Notes for Operation "RUTTER", 11 May 1942.

<sup>348</sup> TNA, DEFE 2/542, Planning Notes for Operation "RUTTER", 19 May 1942.

<sup>349</sup> TNA, DEFE 2/542, Planning Notes for Operation "RUTTER", 1 June 1942.

<sup>350</sup> Villa, *Unauthorized Action*, pp. 152-153.

<sup>351</sup> Villa, *Unauthorized Action*, p. 153.

<sup>352</sup> Villa, *Unauthorized Action*, p. 153; C P Stacey, *The Canadian Army, 1939-1945: An Official Historical Summary* (Ottawa: Queen's Printers 1948) p. 62; Roskill, *The Period of Balance*, p. 241.

<sup>353</sup> TNA, AIR 10/1437, Manual of Combined Operations (1938), p. 146.

bombardment in support of ground operations, which clearly recognises the problems inherent with their use; therefore, while Villa has made a case for its use, it does not stand up well to scrutiny.<sup>354</sup> Thus, while there has been much written over the lack of bombing support it can be argued that this decision was taken four months before JUBILEE took place and three months before RUTTER was due to occur and that the decision was based upon sound advice from the relevant commanders with experience of air power. When combined with Leigh-Mallory's standing orders from Douglas, the issue of tactical surprise and Harris' orders on bombing occupied territories it is understandable that bombing of Dieppe was cancelled.

The other key area that requires some explanation is the decision to replace the airborne assault on the flanks with commandos. This was, in hindsight, the right decision as both No. 3 and 4 Commando achieved the most success on the ground during JUBILEE. Indeed, No. 4 Commando's success would form the basis of a British army doctrinal pamphlet on attacking gun positions.<sup>355</sup> However, the reasons for this change lay in the state of Britain's airborne forces in 1942 and their lack of effective means to deploy a sizable force accurately.<sup>356</sup> From the very start, it was envisaged that airborne troops were to be used to protect the flanks of the operation and cut enemy communications.<sup>357</sup> It was intended that the 1<sup>st</sup> Parachute Battalion, reinforced to the strength of one and a half battalions, be dropped near Beneval-le-Grand in order to

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<sup>354</sup> See Gooderson, 'Heavy and Medium Bombers' *passim*.

<sup>355</sup> TNA, WO 208/3108, Notes from Theatres of War No. 11.

<sup>356</sup> On the early years of Britain's airborne force and the various institutional and organisational problems that faced them see William Buckingham, *Paras: The Birth of British Airborne Forces from Churchill's Raiders to 1<sup>st</sup> Parachute Brigade* (Stroud: Tempus, 2005).

<sup>357</sup> TNA, DEFE 2/546, Minutes of Meeting held at COHQ at 1100 Hours 14.4.42 to Discuss Operation "RUTTER", 16 April 1942.

neutralise gun batteries either side of Dieppe.<sup>358</sup> However, even at this stage questions were raised by Mountbatten's AACO about the advisability of using parachute troops in this manner.<sup>359</sup> Army Co-Operation Command was responsible for the control of squadrons tasked with dropping airborne forces and during May and June, the problem of squadron allocation and usage became an operational issue for RUTTER. At a staff meeting on 11 May Harris informed Mountbatten that due to overriding operational requirements Nos. 12 and 142 Squadrons were required by Bomber Command.<sup>360</sup> Much of this is set against the background of Operation MILLENIUM, the planned thousand-bomber raid against Cologne, and Harris' large raids of mid-1942. The loss of these squadrons led to a reduction in the size of the airborne force for RUTTER, in particular the loss of glider troops. The loss of squadrons was a key issue of concern for Mountbatten who appealed to Portal on 26 May to release the squadrons. Mountbatten was particularly concerned that if the squadrons suffered heavy casualties during MILLENIUM then this would put at risk the use of these squadrons for the lack of experienced aircrew.<sup>361</sup> Portal urged Mountbatten to discuss the issue with Barrett at Army Co-Operation Command, as no commander was obliged by the Air Ministry to support Bomber Command's operations.<sup>362</sup> Barrett, who had been on leave, wrote to Portal to state that he was exercising his prerogative outlined in Portal's reply to Mountbatten on 27 May, and recalling the two Whitley squadrons from the planned Bomber Command operation. He states that he loaned two Blenheim squadrons and the Whitleys to Harris on the advice of DBO. However, the prospect of jeopardising

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<sup>358</sup> TNA, DEFE 2/549, Operation "RUTTER": Operational Orders for 1<sup>st</sup> Parachute Battalion, 2 July 1942.

<sup>359</sup> TNA, DEFE 2/542, Planning Notes for Operation "RUTTER", 14 April 1942.

<sup>360</sup> TNA, DEFE 2/546, Minutes of Meeting held at 1200 on 11<sup>th</sup> May 1942 at COHQ to Discuss Operation "RUTTER".

<sup>361</sup> TNA, DEFE 2/542, Mountbatten to Portal, 26 May 1942.

<sup>362</sup> TNA, DEFE 2/542, Portal to Mountbatten, 27 May 1942.

RUTTER meant they would be recalled from operations.<sup>363</sup> However, the lack of effective airframes continued to hamper the use of airborne troops in light of the operational needs of other commands. Thus, by 1 June the planned force was reduced to one battalion.<sup>364</sup> Considering the operational difficulties, facing Britain's nascent airborne force it is understandable that when RUTTER was re-launched as JUBILEE the decision was taken to replace them with commandos. In the light of their success, the switch seems inspired. The decision enabled a concentrated force, rather than a possibly dispersed force, to be landed and assault the position with success.<sup>365</sup> The problem of timings would also have made concentration difficult for airborne force to complete the task successfully. However, the saga of squadron allocation does highlight the difficulties inherent in Combined Operations and the need to prioritise operations.

In preparation for RUTTER two exercises, YUKON I and II, were planned to take place during June. Both of these exercises were deemed failures and must rank as one of the contributing factors in the cancellation of RUTTER.<sup>366</sup> Due to operational commitments there was little involvement from the RAF in YUKON I, however, for YUKON II seven fighter squadrons were tasked with participating in the exercise.<sup>367</sup> The squadrons were to replicate the proposed actions of the RAF during the operation; fighter cover and Tac R. Leigh-Mallory was anxious for the RAF to play its part and to

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<sup>363</sup> TNA, DEFE 2/542, Portal to Mountbatten, 27 May 1942; AIR 8/895, Barrett to Portal, 29 May 1942.

<sup>364</sup> TNA, DEFE 2/546, Minutes of 1<sup>st</sup> Meeting of Combined Force Commanders at COHQ on 1<sup>st</sup> June 1942, 4 June 1942.

<sup>365</sup> On the success of No. 4 Commando see Fowler, *The Commandos at Dieppe*; on 3 Commandos role see Greenhouse, 'Operation FLODDEN', pp. 47-57. It is useful to compare the performance of the commandos at Dieppe with similar airborne operation during D-Day. The 9<sup>th</sup> Parachute Battalion under Lieutenant-Colonel Terence Otway was to attack the Merville Battery with strength of six hundred. However, due to scattering this force was reduced to one hundred and fifty. They took the battery with heavy casualties. However, Otway failed to neutralise the guns.

<sup>366</sup> Villa, *Unauthorized Action*, pp. 12-13.

<sup>367</sup> TNA, ADM 179/223, Exercise YUKON II: Outline of RAF Participation, 20 June 1942, p. 2.

test the process of calling up air cover during the course of the operation.<sup>368</sup> The key concern for Leigh-Mallory in the aftermath of YUKON II was issues of communication between Uxbridge and the area headquarters at Portsmouth. For Leigh-Mallory, this gave concern over communication with the force headquarters during JUBILEE.<sup>369</sup> He was assured that this was being looked into; in fact, earlier in the year an inter-service committee had been formed to examine the issue of communications during Combined Operations.<sup>370</sup>

Despite this concern and the two prominent issues of bombing and airborne troops, planning for JUBILEE ran into few problems from an air power perspective. By the time of JUBILEE, the plan had been simplified to concentrate on air cover with close support a secondary consideration and in this respect, it closely followed the principle outlined in Combined Operations doctrine. The plan called for fighter cover and general protection to the landing force to be provided all through the daylight hours with the most intensive operations coming during the landing and withdrawal. While air cover was provided, low-level fighter and bomber attacks would support the landing troops and provide smoke laying where appropriate. Tac R was to be provided by aircraft from Army Co-Operation Command within both the battle area and the lines of approach to Dieppe. While no bombing was to be used on the town, diversionary raids were planned to attack the airfield at Abbeville by aircraft of the US 8<sup>th</sup> Air Force.<sup>371</sup> It was estimated that in the area of Northern France the Germans could deploy

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<sup>368</sup> TNA, DEFE 2/546, Minutes of Meeting held at COHQ at 1400 hrs on Monday, 15<sup>th</sup> June 1942, to discuss certain points concerning Operation "RUTTER".

<sup>369</sup> TNA, DEFE 2/546, Minutes of Meeting held on 25<sup>th</sup> June at COHQ for Operation "RUTTER".

<sup>370</sup> TNA, DEFE 2/546 'Minutes of Meeting held on 25<sup>th</sup> June; AIR 20/832, Inter-Service Committee on Communications in Combined Operations Interim Report No. 2: Support Communications in Combined Operations, 14 January 1942.

<sup>371</sup> TNA, AIR 41/49, The Struggle for Air Superiority, 1942-1943, pp. 118-119; AIR 16/746, Combined Plan for Operation JUBILEE.

approximately two-hundred and sixty fighters and one-hundred and twenty bombers. Against this Leigh-Mallory was able to deploy seventy squadrons, thus allowing him to deploy overwhelming superior numbers as laid out in his operational orders of 13 April.<sup>372</sup> Control of the air battle was to be exercised from No. 11 Group headquarters at Uxbridge and through the normal command and control system of sector control.<sup>373</sup> The HQ Ships HMS *Fernie* and *Calpe* provided control of close support aircraft with links to Leigh-Mallory at Uxbridge; Air Commodore Cole on the *Calpe* represented Leigh-Mallory.<sup>374</sup> Cole was instructed to liaise with the other force commanders and direct operation at low-level, for example, Tac R aircraft from RAF Gatwick that performed reconnaissance along the approaching roads. The system utilised for control of low-level aircraft was the system developed by Army Co-Operation command and based upon forward and rear air links with a tentacle controlling aircraft from the HQS. Reconnaissance was one area where air power aided in both the planning and conduct of JUBILEE. During preparations for RUTTER/JUBILEE RAF reconnaissance aircraft were involved in gathering intelligence of the positions in and around Dieppe. It was responsible for discovery of caves in the cliff faces of the two headlands either side of the town. This enabled target identification for the destroyers offshore.<sup>375</sup> Reconnaissance also informed planners of the suitability of the area designated as a sanctuary for landing craft and that in the opinion of both the pilots and Leigh-Mallory the size of the anchorage needed to be reduced in order to present it as a target for bombers.<sup>376</sup> In light of this information, Baille-Grohman examined the possibility of modifying the plan. During the course of JUBILEE, it was planned to make use of Tac R

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<sup>372</sup> TNA, AIR 41/49, The Struggle for Air Superiority, 1942-1943, p. 119; AIR 16/746, Combined Plan.

<sup>373</sup> TNA, AIR 41/49, The Struggle for Air Superiority, 1942-1943' p. 120; AIR 16/746 'Combined Plan.

<sup>374</sup> TNA, AIR 41/49, The Struggle for Air Superiority, 1942-1943, p. 120; AIR 16/746 'Combined Plan .

<sup>375</sup> Michael Shoeman, 'Air Umbrella – Dieppe' *Military History Journal of the South African Military History Society*, Vol. 1, No. 5. Accessed at [www.rapidtp.com](http://www.rapidtp.com).

<sup>376</sup> TNA, DEFE 2/546, Minutes of Meeting held on 25<sup>th</sup> June.

through the communication tentacle in HMS *Calpe* to co-ordinate air support. Some seventy-one sorties were flown. In a report written after JUBILEE this was considered lavish.<sup>377</sup> There is justification to this claim because when compared to the number of operations conducted by the Western Desert Air Force (WDAF) at the same time the number of sorties for one day equalled half of those being flown by WDAF in support of Eighth Army.<sup>378</sup> Thus, by the time of the issuing of operational orders to squadrons in mid-August the RAF had overcome issues relating the effective use of air power.

## **2.4 Conclusion**

This chapter has sought to examine the development of Fighter Command operations from the perspective of Combined Operations doctrine. It has explored the various campaigns that it was involved in from 1940 to 1942 and these illustrate the degree to which air superiority is vital to the success of any planned combined operation. This coupled with the offensive action conducted during 1942 and 1942 lay the context for the air operations over Dieppe. The force structure deployed and choice of RAF commanders illustrates the importance placed upon air cover during JUBILEE. It has also examined the degree to which the RAF, despite its prevailing operational responsibilities, was involved in the Combined Operation programme. The appointment of Willetts as AACO represented a key turning point for the RAF as it gave them a chance to represent their views on Combined Operations. The willingness of the various commands to rotate squadrons through a training programme on Combined Operations also illustrates their readiness to train for what Harris described as a hypothetical

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<sup>377</sup> TNA, DEFE 2/333, Army Air Support and Tactical Reconnaissance during Operation “JUBILEE”, p. 2.

<sup>378</sup> TNA, DEFE 2/333, Army Air Support and Tactical Reconnaissance, p. 2.

operation. While the planning for Dieppe has been contentious in the historiography this chapter has examined the degree to which the RAF worked with the framework laid out by the 1938 MCO. While Montgomery was critical of the framework, operations had been planned up until 1942 in this way. The decision to use a joint system of command meant that the joint commanders decided on issues such as aerial bombardment. Thus, attributing blame to Leigh-Mallory shows a lack of awareness of the nature of the command arrangements. In addition, the decision in the light of contemporary evidence suggests that the concern over French casualties and the lack of tactical surprise were the main issues that led to its cancellation. The concerns expressed by Leigh-Mallory over command and control of close support was to one of the key lessons to come out of JUBILEE and is explored more fully in Chapter three. Overall, the planning process was from an air power viewpoint based on the prevailing doctrinal views and fitted in with the overriding operational objective of Fighter Command.

### Chapter 3

#### Operational Analysis of Operation JUBILEE and ‘Lessons Learnt’

The previous chapters have sought to explain the planning and doctrinal context of JUBILEE. They highlighted the importance of the issue of air superiority as being a prerequisite for the success of any Combined Operation. They illustrated the importance of air superiority through the discussion of several key examples that illustrate the impact that air power had upon the course of various campaigns that could be described as Combined Operations. They also examined training policy for the RAF in Combined Operations and planning for RUTTER/JUBILEE and highlighted the point that JUBILEE must be viewed through the RAF’s battle for air superiority over Northern France in line with the key tenants of the MCO.

Much has been made of the RAF’s performance during JUBILEE in the historiography. A great deal of this has centred on the issue of the perceived failure of the RAF hierarchy to acquiesce to the use of strategic bombers in support of JUBILEE.<sup>379</sup> This assertion has become dogma and is flawed as it misinterprets the nature of strategic bombing forces and their use. Gooderson has highlighted the problems of the use of this weapons platform using operational research reports.<sup>380</sup> Thus, the claims by revisionist historians that the failure to use Bomber Command in a more central role during JUBILEE was the key to the RAF’s failures during is flawed. This interpretation misinterprets the role of air power in Combined Operations. The RAF, as illustrated in Chapter one, saw as its first priority as the attainment of air superiority over the battlespace and by 1942, this was linked to the use of fighter aircraft in an offensive role.

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<sup>379</sup> Villa, *Unauthorized Action*, pp. 127-62.

<sup>380</sup> Gooderson, *Air Power at the Battlefield*, pp. 125-164.

Thus, the operational effectiveness of the RAF needs to be analysed within the context of the offensive fighter sweeps that it was conducting from late 1940 onwards. This was how Fighter Command considered its role in Combined Operations. Leigh-Mallory was quite right to interpret his role in JUBILEE as to be that of seeking to attain air superiority over the area of the operation using the methods he was already utilising. He saw the job of the forces under his command as primarily offensive in nature and in particular, the majority of the squadrons seconded to the operation were tasked with a fighter patrol role. This gave them a two fold role; first, at a strategic level, to bring the *Luftwaffe* to battle in order to wear down its strength in the west in preparation for any future invasion of France. Second, at an operational and tactical level, the RAF was to provide air cover for the naval and land forces involved in JUBILEE. This second role would also aid the primary mission of Fighter Command in 1942 of battling the *Luftwaffe*. In understanding this nature of the RAF's role during JUBILEE, we can start to appreciate and understand its success during JUBILEE. This is not to argue that aerial bombardment had not been considered but for a raid of JUBILEE's nature, its use was considered surplus to requirements. Therefore, attempts at a retrospective and teleological view of JUBILEE, and to compare and contrast OVERLORD and JUBILEE, are not helpful in understanding of the RAF's effectiveness at Dieppe as they were very different operations with different aims and objectives.

In order to ascertain the effectiveness of air power during JUBILEE this chapter will endeavour to take a progressive and pluralistic view of Dieppe's impact upon the progress of Combined Operations thinking in 1942 and 1943. It will start with an analysis of the cost of JUBILEE to RAF and illustrate the cost and effort in providing cover during JUBILEE. This will highlight the costly nature of a battle for air superiority but illustrate why this rather than bomber support was more advantageous to the assaulting forces during JUBILEE. It then deals with the contentious issue of 'lessons learnt' during

JUBILEE. This will include an analysis and discussion of the decision to continue the policy of raids as a method of attempting to bring the *Luftwaffe* to battle. It will also examine issues such as problems in overcome the difficulties encountered in the development of Fighter Control Ships for future Combined Operations in order to facilitate command and control of air operations. The chapter will then deal with the controversial issue of bombardment for Combined Operations by examining the findings of the Graham Report of 1943.

### **3.1 Contemporary Qualitative Analysis of Air Power at Dieppe**

The ability to analyse events from a retrospective standpoint has led some historians to assume that there is a direct linear link between JUBILEE and OVERLORD without an attempt to contextualise development in the intervening years. Undoubtedly, this has been because of Mountbatten's concerted efforts in the post-war years to claim that there was 'Lessons Learnt' from Dieppe by claiming a direct link to OVERLORD.<sup>381</sup> He was assisted in this by Hughes-Hallett, who had written the 'Lessons Learnt' report that laid the basis for Mountbatten's claims.<sup>382</sup> This, along with the issue of the cancellation of the pre-bombardment, has clouded and mythologized the historiography of Dieppe and has not allowed an objective analysis of whether any lessons were truly learnt.

In 1942, Hughes-Hallett wrote the dispatch on Dieppe for the *London Gazette*. He claimed simply that 'The fighter cover afforded by No. 11 Group was magnificent and

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<sup>381</sup> See Earl Mountbatten of Burma, 'Operation Jubilee: The Place of the Dieppe Raid in History' *Journal of the Royal United Service Institution for Defence Studies* Vol. 119 No. 1 (1974).

<sup>382</sup> TNA, ADM 239/350, The Raid on Dieppe: Lessons Learnt, September 1942; James Hughes-Hallett, 'The Mounting of Raids' *Journal of the Royal United Services Institution*, Vol. XCV (Nov. 1950) pp. 580-588.

the...loss of one ship...should be regarded as...fortunate.<sup>383</sup> While it is possible to question Hughes-Hallett's objectivity, because of his close association with Mountbatten, other contemporary sources illustrate the degree to which JUBILLEE was conceived as a success from an air power perspective. At a meeting of the War Cabinet on 25 August, the Chiefs of Staff commented that 'From an air point of view, the Dieppe Raid had achieved complete surprise.'<sup>384</sup> This further reinforces the view of Anthony Eden, who at a War Cabinet meeting on 20 August, claimed that the operations of the RAF had been the 'most encouraging aspect of the operation.'<sup>385</sup> While Eden's claims of the *Luftwaffe* having been 'roughly handled' were over-optimistic, it does illustrate the view that the RAF operations had been successful.<sup>386</sup> Discussions by the War Cabinet were sent immediately to the Joint Staff Mission in Washington and they claimed that the 'Support afforded by air forces was faultless...'<sup>387</sup> Thus, in the immediate aftermath of JUBILEE it was perceived that the RAF had won a significant victory.

At an operational level, it became obvious that the air effort had some impact on the *Luftwaffe* in Northern France. An RAF Air Intelligence report from 27 August claimed that a significant number of *Luftwaffe* units had been engaged in the largest battle since 1940 and that heavy losses had been inflicted upon them.<sup>388</sup> However, the report concluded that the impact of the RAF upon the *Luftwaffe* could have been greater had

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<sup>383</sup> Captain J. Hughes-Hallett, 'Dieppe Raid: Despatch on the Raid, 18-19 August 1942' *The London Gazette*, 12 August 1942, p. 3823. The despatch was originally submitted on 30 August 1942 and published after the war in 1947.

<sup>384</sup> TNA, CAB 65/27/34, Minutes of War Cabinet 118 (42). p. 246.

<sup>385</sup> TNA, CAB 65/31/18, Minutes of War Cabinet 115 (42), p. 2.

<sup>386</sup> TNA, CAB 65/31/18, Minutes of War Cabinet 115 (42), p. 2.

<sup>387</sup> TNA, CAB 122/259, War Cabinet to Joint Staff Mission, 21 August 1942.

<sup>388</sup> TNA, AIR 37/199, File 15G – Extract from AI3b Paper on Results of Dieppe Raid on 19.8.42, 27 August 1942, p. 1.

JUBILEE lasted for a period of up to three days.<sup>389</sup> Encouraged by the RAF's effort, after Dieppe, Leigh-Mallory urged that similar operations be mounted. For example, on 22 August Leigh-Mallory wrote to Mountbatten claiming that 'In my mind the most important result of Dieppe is that we made the Germans fight in the air.'<sup>390</sup> Leigh-Mallory claimed that in conjunction with raids such as No.4 Commando's assault on the Hess Battery the *Luftwaffe* could be enticed into battle and that this would aid in the destruction of the *Luftwaffe*. (The use of raiding as the basis of an intruder strategy will be discussed below).<sup>391</sup> Leigh-Mallory's letter to Mountbatten would eventually form the basis for the stillborn Operation AFLAME. Thus, it can be assumed that the key result of air operations during JUBILEE was to convince Leigh-Mallory of the suitability of Dieppe type operations as a means of bringing the *Luftwaffe* to battle for air superiority, still the key mission of Fighter Command in 1942.

While at a political and command level it can be argued that RAF's operations over Dieppe were viewed as a success, it is useful to see how those on the beach and on the supporting ships viewed it. Given that the RAF's primary mission was air cover, their opinion helps to frame whether or not that support was successful from their perspective. The CMHQ reports compiled by C P Stacey form a useful basis for such an analysis.<sup>392</sup> In terms of air power, the views are mixed, varying from negative opinions on the issue of supporting bombardment to positive views on the overall impact of air power. For example, Captain G A Browne of the Royal Canadian Artillery, who served

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<sup>389</sup> TNA, AIR 37/199, File 15G, p. 1; DEFE 2/551 'The Dieppe Raid (Combined Report)' October 1942, p. 164.

<sup>390</sup> TNA, DEFE 2/67, Leigh-Mallory to Mountbatten, 22 August 1942.

<sup>391</sup> On 4 Commando's attacks on the Hess Battery see, Fowler, *The Commandos at Dieppe, passim*.

<sup>392</sup> DHH, CMHQ Report No. 89 – The Operation at DIEPPE, 19 Aug 42: Personal Stories of Participants, 31 December 1942; CMHQ Report No. 90 – The Operation at DIEPPE, 19 Aug 42: Further Personal Stories of Participants, 18 February 1943; CMHQ Report No. 142 - Operation "JUBILEE": The Raid on Dieppe, 19 Aug 42, Further New Information, 18 July 1945.

as a Forward Observation Officer (FOO) with the RRC, commented on the cancelling of the aerial bombardment to preserve the element of surprise that:

*Further, is surprise easier to obtain, than the preparatory heavy air bombardment which in our case would quite probably have succeeded where surprise, or rather the hope of surprise, failed?*<sup>393</sup>

This rather negative view can be contrasted with that of Lieutenant J E R Wood of the Royal Canadian Engineers, who was captured on RED/WHITE beach, commented after the war that:

*Some of our people later claimed they never saw the Air Force. Of course they didn't. They were too busy up top keeping the Luftwaffe off us. I can truthfully say we were not machine gunned on that beach except by our own people after we'd folded up. That means the R.A.F. did its stuff.*<sup>394</sup>

Two accounts highlight one of the key problems found during JUBILEE; the identification of friendly aircraft and friendly fire due to issues of command and control. Both Captain James Runcie of the QOCHC and Private Maier of the Essex Scottish both discuss the issue of friendly fire on Canadian positions on RED/WHITE beach.<sup>395</sup> However, neither account is critical of the RAF; for example, Maier noted that a late-arriving Landing Craft Tank caused the incident he witnessed, in his opinion.<sup>396</sup> All the force commanders in their reports highlighted the issue of recognition with Roberts noting that 'A much higher standard of air recognition is required.'<sup>397</sup> This was reiterated by Hughes-Hallett in the 'Lessons Learnt' report.<sup>398</sup> The problem of control was noted in an army report in December, which praised the directing of close support aircraft, but noted that the delay imposed by the system then in place needed work.<sup>399</sup>

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<sup>393</sup> DHH, CMHQ Report No. 89, p. A-9.

<sup>394</sup> DHH, CMHQ Report No. 142, para. 15.

<sup>395</sup> DHH, CMHQ Report No. 89, p. H-6; CMHQ Report No. 90, p. D-3.

<sup>396</sup> DHH, CMHQ Report No. 90, p. D-3.

<sup>397</sup> TNA, DEFE 2/551, The Dieppe Report (Combined Report, October 1942), p. 143.

<sup>398</sup> TNA, ADM 239/350, Lessons Learnt, p. 1.

<sup>399</sup> TNA, WO 106/4195A, File 24 – Lessons to be Learned from the Dieppe Raid.

German accounts of the air action are confused, with their view of the purpose of the operation distorting their opinions of the effectiveness of the air efforts over Dieppe. For example, early German accounts view JUBILEE as an attempt at launch a Second Front.<sup>400</sup> This view of the nature of JUBILEE means that the overall view given in captured documents is one of disbelief in the nature of support provided for the assaulting troops. For example, report from the HQ of the 302<sup>nd</sup> Infantry Division states:

*The English higher command considerably underestimated the strength in all weapons required for such an attack. The strength of air and naval forces was not nearly sufficient to keep the defenders down during the landings and to destroy their signal communications. It is incomprehensible that it should be believed that a single Canadian Division should be able to overrun a German Infantry Regiment reinforced with artillery.*<sup>401</sup>

A persistent source of surprise amongst German reports, despite their experience at Crete in 1941, was the lack of airborne troops to support the operation. A report by LXXXI Corps noted that had airborne troops been used in the assault against Puy then in all probability the town would have been taken.<sup>402</sup> The Germans also expected more accurate support from the RAF against the coastal defences in the area claiming, contrary to the British reports, that smoke laying may have been the cause of this.<sup>403</sup> These views present two contrasting interpretation of the effectiveness of air power at Dieppe. Each one is dependent on what view is taken of the nature of the operation. For the Germans the operation was an attempt at a lodgment on the continent, therefore, it appears illogical for allies not to utilise all methods at their disposal. However, for the British the operation was a raid, therefore, the use of air power followed the prevailing doctrinal view and that the nature of the operation, in their opinion, did not require these

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<sup>400</sup> TNA, ADM 199/2465, Dieppe: German High Command Official Account, 29 August 1942, p. 3.

<sup>401</sup> DHH, AHQ Report No. 10 – Operation “JUBILEE”: The Raid on Dieppe, 19 Aug 42 – Information from German War Diaries, p. 40.

<sup>402</sup> TNA, WO 219/1867, Intelligence Report on British Landing at Dieppe on 19 Aug 42 by Headquarters LXXXI Corps, 22 August 1942, p. 57; DHH, CMHQ Report No. 116 – Operation “JUBILEE” the Raid on Dieppe, 19 Aug 42 – Additional Information from German Sources, 10 May 1944, para. 26.

<sup>403</sup> TNA, WO 219/1867, Intelligence Report on British Landing at Dieppe, p. 57.

methods. German and Allied reports have one area of contention in common, that of losses; this will be discussed below.

In general, contemporary accounts of the RAF during the Dieppe Raid are positive. It was one of the few aspects of JUBILEE to be praised in the Combined Report and by the various participants. This is not to say that there were not problems and as noted, various participants highlighted some of these. These areas were highlighted by the 'Lessons Learnt' report that noted that the following areas needed further examination: first, the scale of air support in relation to the land operation, second, the use of airborne troops, third, aircraft recognition and command and control; and finally the use of smoke.<sup>404</sup> These will be examined in more detail below with the exception of the second point, which falls outside the scope of this thesis. It is interesting to note that the lack of aerial bombardment is not a lesson that Hughes-Hallett deemed noteworthy. While qualitative analysis illustrates that air power at Dieppe was a success it is useful to examine some of the pertinent quantitative sources in order to understand the effectiveness of the RAF during the operation with relation to the issue of losses.

### **3.2 Quantitative Analysis of Air Power at Dieppe**

To further analyse and understand RAF operations during JUBILEE we must turn to the quantitative data from JUBILEE. Modern analysis has led to the conclusion that the RAF suffered greater losses than the Luftwaffe, one hundred and seven to forty-eight, and this has often led to claims that the RAF was defeated.<sup>405</sup> However, much information can be gathered from a statistical analysis of the losses Fighter Command suffered during JUBILEE. They offer an insight into many hitherto misunderstood

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<sup>404</sup> TNA, ADM 239/350, Lessons Learnt, *passim*

<sup>405</sup> Campbell, *Dieppe Revisited*, pp. 187-188.

aspects of JUBILEE. For example, the data provides answers to the question of which was the most hazardous type of mission performed during JUBILEE and which aircraft suffered the highest loss rate. Thus, this section will look at the statistics gathered in the aftermath of JUBILEE. Much of the information used in this section comes from the excellent work done by Norman Franks on Fighter Command losses and the associated work on Bomber Command by W R Chorley.<sup>406</sup> There are also several other sources for this section such as Operational Research (OR) reports from the Fighter and Bomber Commands OR Sections (ORS).<sup>407</sup>

The subject of claims over losses and kills made by the RAF during JUBILEE is contentious. Franks, in his history of the air battle over Dieppe, has noted that it was initially assumed that the honours between the RAF and *Luftwaffe* were even and this assumption is supported by Eden's protestations at the War Cabinet meeting on 22 August about the *Luftwaffe* having been roughly handled.<sup>408</sup> However, further analysis of claims and post-war access to *Luftwaffe* records has changed the balance of the claims. For example, Leigh-Mallory claimed that 'Reports since received indicate that the German Air Force...lost between 150 and 200 aircraft.'<sup>409</sup> The report breaks down enemy losses as shown in chart 3.1.

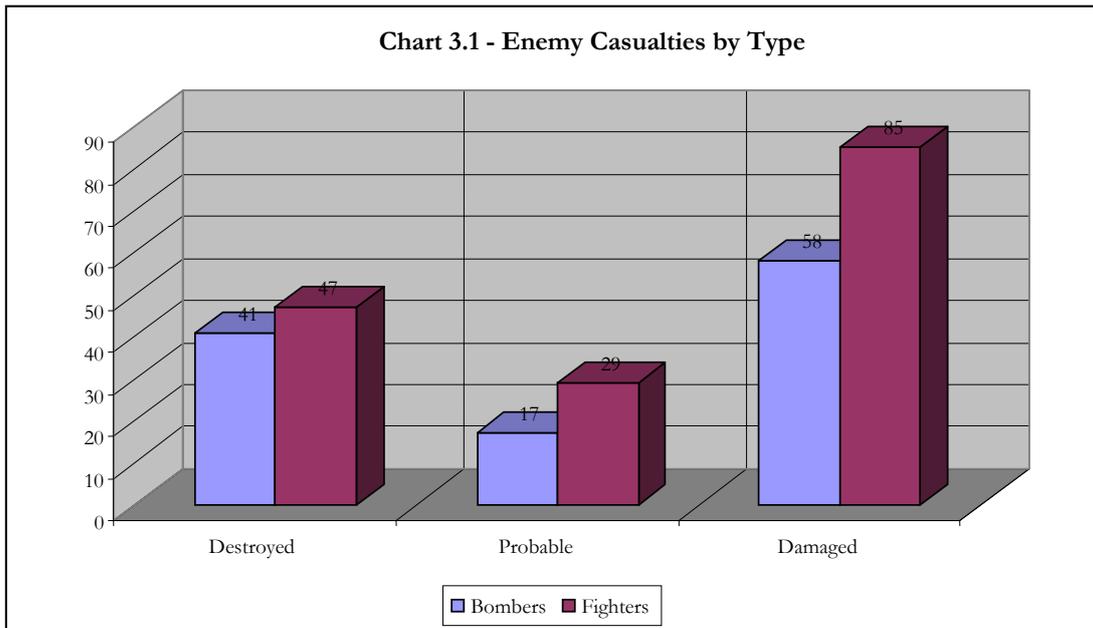
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<sup>406</sup> Norman Franks, *Royal Air Force Fighter Command Losses of the Second World War: Volume 2 – Operational Losses: Aircraft and Crews, 1942-1943* (Leicester: Midland Publishing Limited, 1998); W R Chorley, *Royal Air Force Bomber Command Losses of the Second World War: Volume 3, 1942* (Leicester: Midland Publishing Limited, 1998). Both of these works are based upon archival sources such as Form 540s and 541s from Operational Records Books of participating squadrons and various operational reports.

<sup>407</sup> For a history of OR in the RAF see Anon, *The Origins and Development of Operational Research in the Royal Air Force* (London: HMSO, 1953) *passim*.

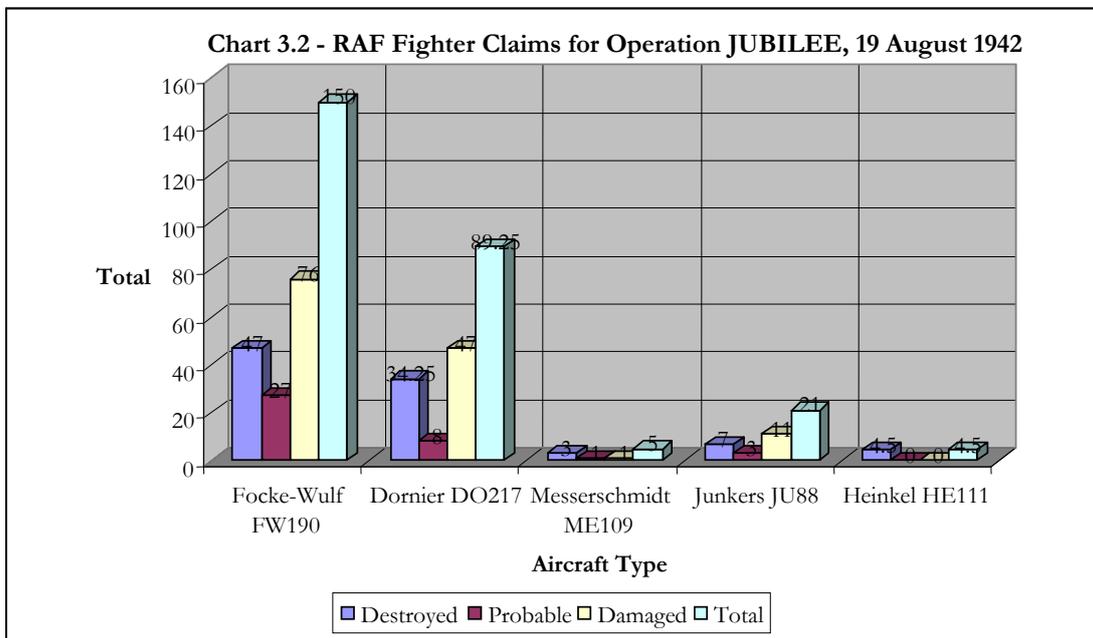
<sup>408</sup> Norman Franks, *The Greatest Air Battle: Dieppe* p. 189; TNA, CAB 65/31/18 'Minutes of War Cabinet 115 (42)' p. 2.

<sup>409</sup> TNA, AIR 20/5186 'Appendix C to Report by the Air Force Commander'.



(Source: TNA, AIR 20/5186 'Appendix C to Report by the Air Force Commander on the Combined Operation against Dieppe – August 19<sup>th</sup> 1942')

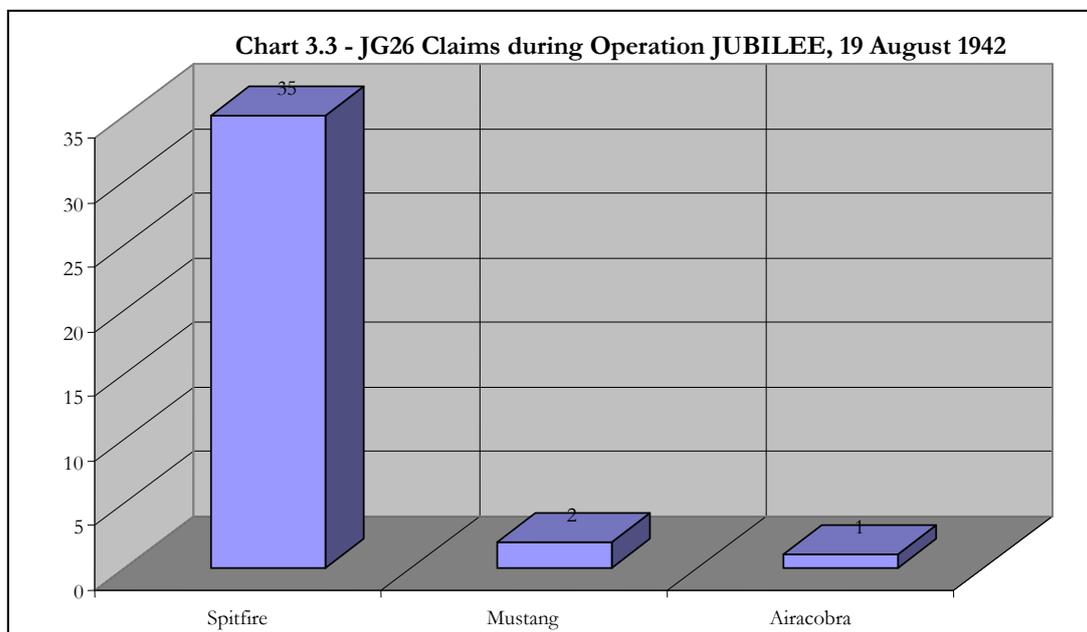
These figures compare favourably with the claim figures put together by Franks and illustrated in chart 3.2. This chart has broken down the claims into the type of aircraft claimed.



(Source: Norman Franks *The Greatest Air Battle: Dieppe, 19<sup>th</sup> August 1942* (London: Grub Street, 1997) pp.239-245)

However, recent research by Franks and Donald Caldwell claim that *Luftwaffe* records show that losses totaled no more than forty-eight airframes and that records for no more

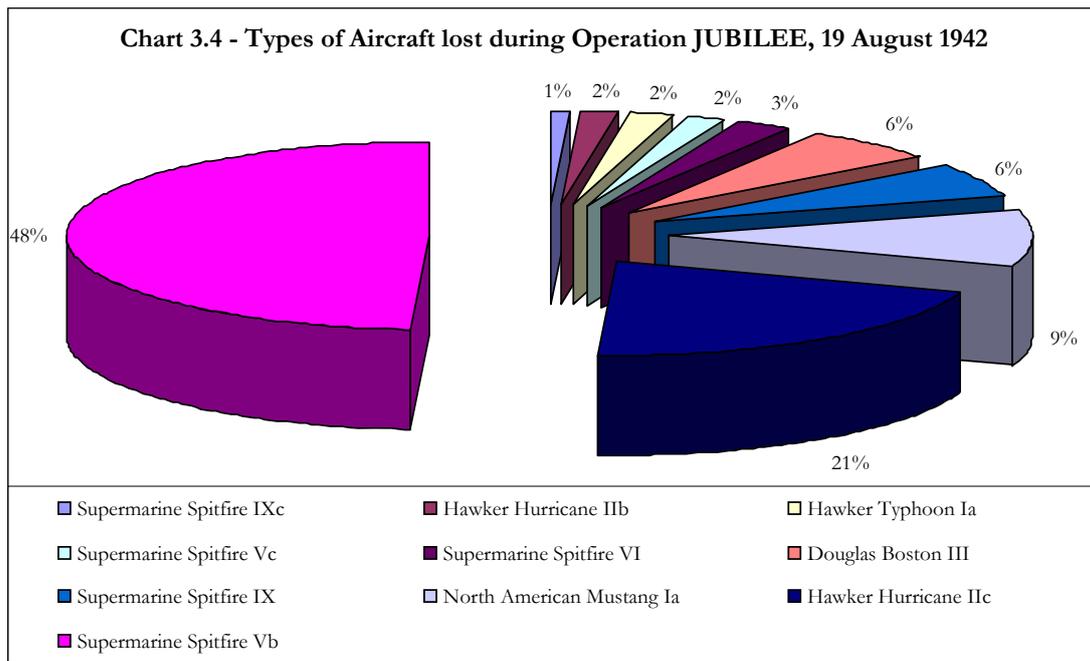
than twenty-one fighter pilot losses can be found.<sup>410</sup> However, the issue of over claiming kills was not just limited to the RAF, as an examination of the claims listed by Cauldwell for JG26 appears to be over zealous as illustrated in Chart 3.3.



(Source: Donald Cauldwell *The JG26 War Diary: Volume One, 1939-1942* (London: Grub Street, 1996) pp. 278-279)

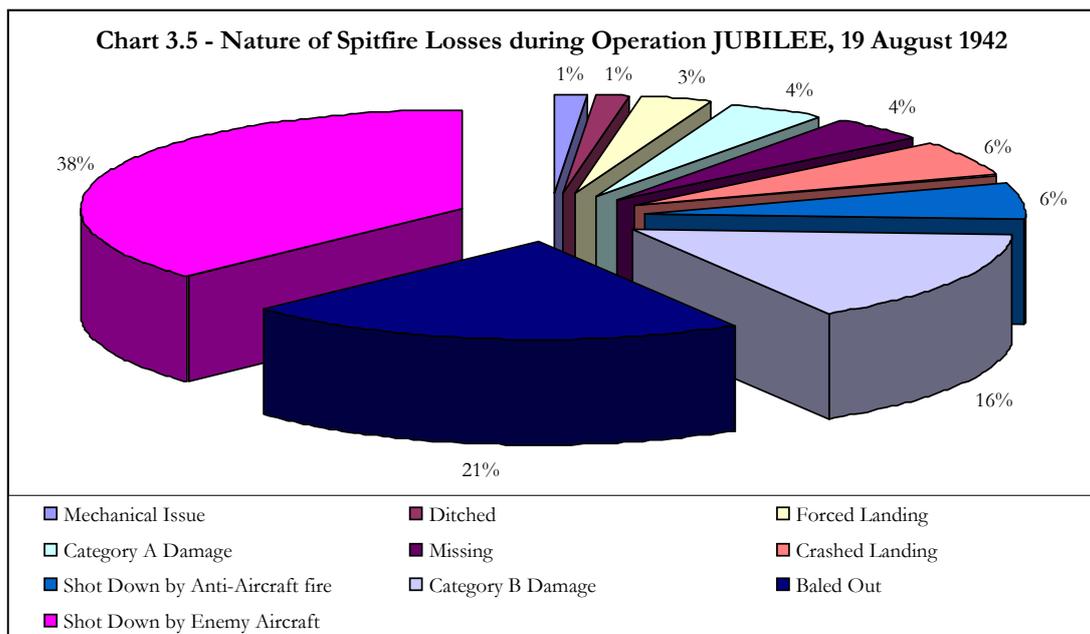
JG26's claims are interesting as they claim to have shot down thirty-five Spitfires during the course of the operation. This appears to be a high score and accounts for half of the Spitfires lost during the operation despite the fact that a significant number were also lost to AA fire. The claims also include an erroneous Bell Airacobra (this was a type that had left RAF service by March 1942). Chart 3.4 illustrates the aircraft lost by the RAF by type. It clearly illustrates that sixty per cent of losses sustained by the RAF were of the various marks of the Spitfire, which was at the time the mainstay of Fighter Command and constituted sixty-four per cent of the force committed to JUBILEE.

<sup>410</sup> Franks, *The Greatest Air Battle*, pp. 237-238; Donald Cauldwell, *The JG26 War Diary: Volume One, 1939-1942* (London: Grub Street, 1996) pp. 277-278.



(Source: Norman Franks *Royal Air Force Fighter Command Losses of the Second World War: Volume 2 – Operational Losses: Aircraft and Crews, 1942-1943* (Leicester: Midland Publishing Limited, 1998) pp. 56-62)

Chart 3.5 illustrates the nature of Spitfire losses during JUBILEE. It shows that thirty-eight per cent of the losses suffered by the Spitfire squadrons were caused by combat with enemy aircraft; this totals only twenty-six airframes. This on its own does not account for the claims of JG26; however, another twenty-one per cent are listed as pilots having baled out. Within reason it can be assumed that some of these losses were caused by combat with enemy aircraft, however, this only amounts for another fifteen airframes. Considering that the German fighter force deployed during JUBILEE came from the two *Kanalgeschwader*, JG2 and JG26, that operated in Northern France and that based on the available figures it can be assumed that a maximum of forty-one Spitfire airframes were lost due to the action of the *Jagdwaaffe*. Therefore, it can be assumed that the claims submitted by JG26 are an overestimation of its impact upon Fighter Command during JUBILEE.



(Source: Norman Franks *Royal Air Force Fighter Command Losses of the Second World War: Volume 2 – Operational Losses: Aircraft and Crews, 1942-1943* (Leicester: Midland Publishing Limited, 1998) pp. 56-62)

Chart 3.5 illustrates some interesting points, which is further highlighted by Chart 3.6 below. The most notable is that of seventy Spitfires lost in action, twenty per cent were classed as either Category A or Category B damage. Category A damage was defined as ‘repairable on site’ by the aircrafts’ operating unit.<sup>411</sup> Thus, for example, No. 19 Squadron repaired the Spitfire MkVb, BL573, of Sergeant J W Foster after being damaged by a Focke-Wulf FW190, at RAF Southend.<sup>412</sup> Category B damage was defined as repairable but not by the operating unit, thus, the airframe would be sent to a maintenance unit for repair.<sup>413</sup> Thus Spitfire MkVb, AB199, of Pilot Officer W B Morgan from 71 Squadron, which made a forced landing at RAF Friston, was repaired and served with the United States Army Air Force (USAAF) and then supplied to the French Air Force in 1945.<sup>414</sup> Thus, some fourteen airframes were returned to service. On top of this are aircraft that were classed as having either crashed or forced landed back in

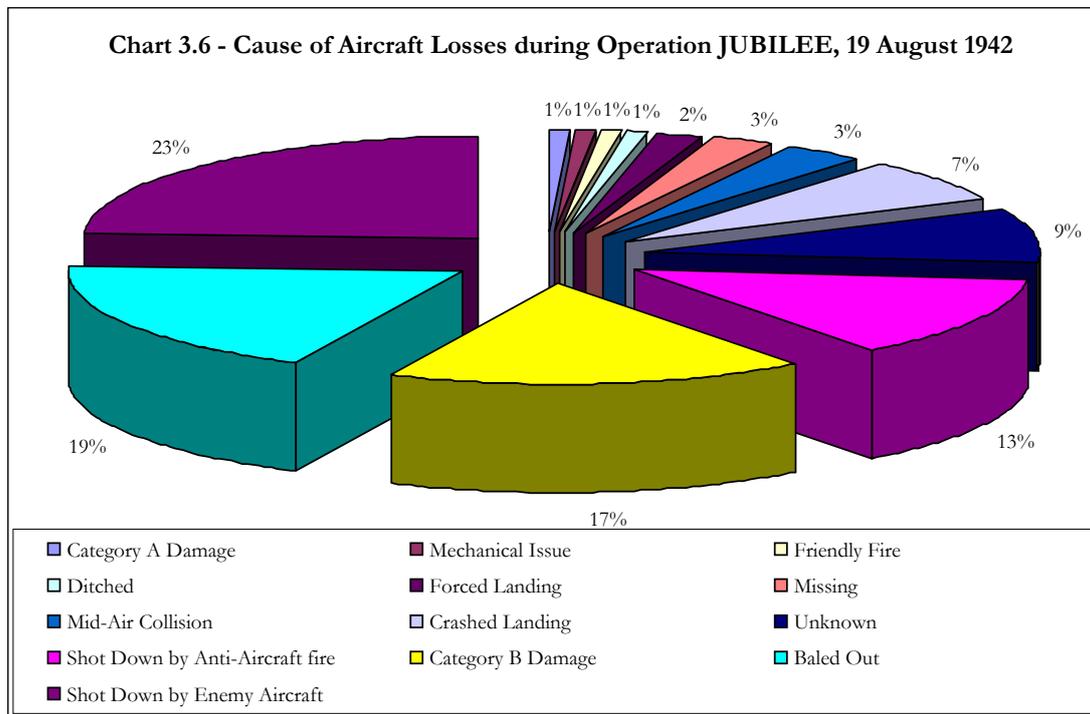
<sup>411</sup> Franks, *Fighter Command Losses*, p. 9.

<sup>412</sup> Franks, *Fighter Command Losses*, p. 56; TNA, AIR 20/5186, Appendix A to Report by the Air Force Commander.

<sup>413</sup> Franks, *Fighter Command Losses*, p. 9.

<sup>414</sup> Franks, *Fighter Command Losses*, p. 5.7

Britain, nine per cent or six airframes. Therefore, out of seventy Spitfires that are claimed as losses during the operation nearly a third could be returned to service.



(Source: Norman Franks *Royal Air Force Fighter Command Losses of the Second World War: Volume 2 – Operational Losses: Aircraft and Crews, 1942-1943* (Leicester: Midland Publishing Limited, 1998) pp. 56-62)

Chart 3.6 supports this picture with the overall figures for RAF losses. Overall, some twenty-seven per cent of aircraft losses were in a position to be returned to service. Thus while the overall pictures would appear to favour the *Luftwaffe*, in terms of claims it can be surmised that in just the case of airframes the RAF was able to cope with the losses and, by efficient maintenance system, return damaged airframes to service. It is important to note that aircraft classified as losses due to the pilot baling out were hit by either enemy aircraft or by AA fire, which was during the course of JUBILEE a key threat to direct support Hurricanes and smoke laying Bostons. AA fire accounted for at least thirteen percent of the losses suffered by the RAF during JUBILEE. AA fire also accounted for at least five of the twenty-two aircraft classified as bale outs.<sup>415</sup> Of twenty-six Hurricanes lost during JUBILEE, twenty-three were lost to AA fire illustrating the

<sup>415</sup> Franks, *Fighter Command Losses*, p. 56-62; TNA, AIR 20/5186, Appendix A to Report by the Air Force Commander.

cost of direct support operations in an area with high-density AA defences.<sup>416</sup> Hurricane pilot losses in direct support operations amounted to an average of 1.87 pilots per squadron. This was the second highest of the operation with only Army Co-Operation Command Mustangs on Tac R missions suffering higher with 2.25 casualties per squadron.<sup>417</sup> Thus, squadrons flying support missions for the army suffered highest due to their proximity to AA fire. This illustrates the advantage of the mission profile of the RAF during JUBILEE, in that while the largest proportion of the RAF's force structure was directed towards an air superiority battle this allowed squadrons tasked with support operations to operate relatively free from interference from enemy aircraft. It was expected that when operating in a hot environment these aircraft would suffer unduly, for example, in the aftermath of JUBILEE Air Commodore Whitworth-Jones, DFO, wrote 'that we must be prepared for a heavy damage rate in units used for Army support duties.'<sup>418</sup>

In late 1942, Fighter Command's ORS drew up a short report that examined the relative casualties suffered by the command during JUBILEE.<sup>419</sup> Unlike the more detailed classification of losses utilised above the report broke down the report broke down RAF losses into Category A/B losses and Category E damage, which was defined as written off, therefore, the breakdown of losses above that were not A or B would be Category E.<sup>420</sup> For the purposes of comparison the report also had to reclassify the *Luftwaffe* claims from the intelligence definitions of destroyed, probable and damaged. The results as given in the report are given in Table 3.1. The table expresses RAF losses

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<sup>416</sup> Franks, *Fighter Command Losses*, p. 56-62; TNA, AIR 20/5186, Appendix C to Report by the Air Force Commander,

<sup>417</sup> TNA, AIR 20/5186 Appendix C to Report by the Air Force Commander.

<sup>418</sup> TNA, AIR 20/5186, DFO to DAT, 24 September 1942.

<sup>419</sup> TNA, AIR 16/1044, Operational Research Section, Fighter Command, Report No. 395 – Operation "JUBILEE" (Dieppe), 19<sup>th</sup> August 1942: Relative Casualties by Type of Fighter Sortie, 3 December 1942.

<sup>420</sup> TNA, AIR 16/1044, ORS Report No. 395,p. 1; Franks, *Fighter Command Losses*, p. 9.

in terms of the duties undertaken by Fighter Command and by the number of sorties flown. Therefore, Spitfires flying on patrol over the sea and beaches during the operation suffered a Category E loss rate of 3.1 per cent out of one thousand and nine sorties.<sup>421</sup> This loss rate compares favourably with the loss rates incurred on aircraft flying in direct support of the ground forces, who on average suffered a loss rate of 8.3%. The Hurricane MkIIbs of Nos. 174 and 175 Squadron suffered most during the operation; they incurred a loss rate of 9.7% for just sixty-two sorties.<sup>422</sup> The most likely reason for this is the fact that when equipped with bombs the Hurricane lost its manoeuvrability and was more susceptible to ground fire. In conjunction both Chart 3.6 and Table 3.1, describe a picture of the most costly operations undertaken during the course of JUBILEE, direct support missions. However, analyses of the nature of the losses reveal that the main cause of these losses was AA fire. Therefore, it can be assumed that had Fighter Command not been providing air cover then the loss rate could have been higher.

**Table 3.1 – Summary of Relative Casualties by Type of Sortie**

Duty undertaken by Fighter Command	RAF Sorties	RAF Losses				Luftwaffe Losses in Battle				RAF Losses in Battle (% of RAF Sorties)		Luftwaffe Losses in Battle (% of RAF Sorties)		Ratio of Losses in Battle	
		By Enemy Action		Other Causes		Fighter & Fighter Bomber		Bombers		Cat. E	Cat. E & B	Cat. E	Cat. E & B	1 RAF Aircraft:-	
		Cat. E	Cat. B	Cat. E	Cat. B	Cat. E	Cat. B	Cat. E	Cat. B					Cat. E	Cat. E & B
Spitfire on patrol over sea and beaches	1709	53	17	3	7	64 +/- 7	65 +/- 13	49 +/- 3	47 +/- 12	3.1	4.1	3.7F +/- 0.3 & 2.9 B +/- 0.2	7.5F +/- 1.1 & 5.6B +/- 1.1	1.2F +/- 0.1 & 0.9B +/- 0.1	1.8F +/- 0.3 & 1.4B +/- 0.2
Spitfires escorting other aircraft against land targets	235	7	1	0	1	2 +/- 0.5	3 +/- 1	0	3 +/- 1	3.0	3.4	0.75 +/- 0.1	2.1F +/- 0.1 & 1.3B +/- 0.4		
Spitfires escorting	24	0	0	0	0	0	0	0	0	0	0				

<sup>421</sup> TNA, AIR 16/1044, ORS Report No. 395, p. 2.

<sup>422</sup> TNA, AIR 16/1044 'ORS Report No. 395, p. 2; Gooderson, *Air Power at the Battlefield*, p. 59.

other aircraft against sea targets																
Spitfires attacking ground targets with cannon	14	1	0	0	1	1 +/- 0.5	1	0	0	7.1	7.1					
Hurricanes attacking ground targets with cannon	194	17	3	1	0	0	0	0	0	8.2	10.3					
Hurricanes attacking sea targets	24	0	0	0	0	0	0	0	0							
Hurribombers attacking ground targets	62	6	0	0	0	1 +/- 0.5	1	1	0	9.7	9.7					
Typhoons on diversionary sweeps over the sea	110	1	0	1	0	1 +/- 0.5	0	2 +/- 0.5	0	0.9	0.9					
Total	2372	85	21	5	9	68 +/- 8	71 +/- 14	52 +/- 3	50 +/- 13	3.6	4.5	2.9F +/- 0.3 & 2.2B +/- 0.1	5.8F +/- 1.1 & 4.3B +/- 0.7	0.8F +/- 0.1 & 0.6B +/- 0.05	1.3F +/- 0.2 & 1.0B +/- 0.2	

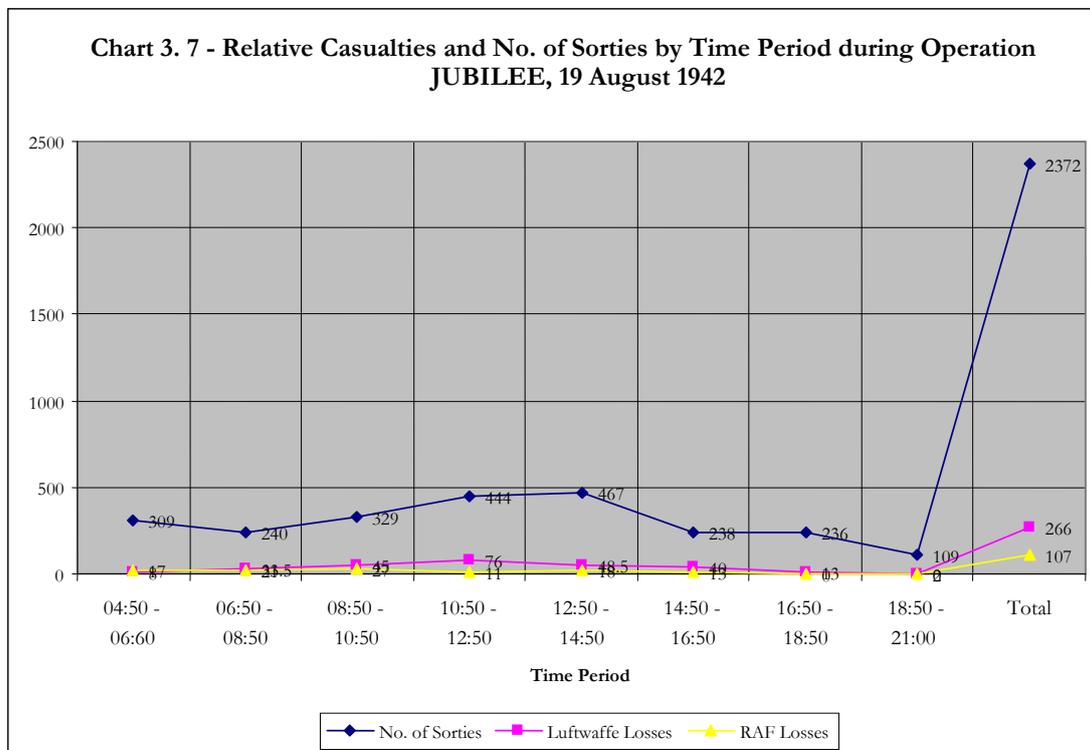
(Source: TNA, AIR 16/1044 'Operational Research Section, Fighter Command, Report No. 395 – Operation "JUBILEE" (Dieppe), 19<sup>th</sup> August 1942: Relative Casualties by Type of Fighter Sortie' 3 December 1942, p. 2)

The OR report also examined the details of the battle casualties suffered and inflicted upon the *Luftwaffe*. The report details when and where this occurred, if possible by the type of sortie being flown by the RAF. However, a more useful aspect of the table is that it gives an indication of the intense effort that was put in by the RAF during JUBILEE and this is illustrated in Chart 3.7. The periods were based upon the sortie times flown by Spitfires flying air cover over the beaches. This provides the table with structure as on average each sortie lasted thirty minutes with the first patrol at 04:50. However, the first fighter sortie flown was the attack by No. 43 Squadron on the beach defences at approximately 04:40.<sup>423</sup> Chart 3.7 illustrates that the number of sorties were stable throughout the period of the operation until the time came to cover the withdrawal of forces from the beach. Roberts issued the order to withdrawal at approximately 09:50 after the suggestion of Hughes-Hallett at 09:00.<sup>424</sup> The withdrawal

<sup>423</sup> Franks, *The Greatest Air Battle*, pp. 44-46.

<sup>424</sup> Neillands, *The Dieppe Raid*, p. 248.

was due to begin at 10:30 but put back until 11:00 to allow the RAF to lay smoke and cover the withdrawal. During this phase of operations there was a great deal of activity from the both the Bostons of No. 2 Group and the direct support Hurricanes.<sup>425</sup> In total, Hurricanes attacking ground targets flew one hundred ninety-four sorties with one hundred eleven occurring during the withdrawal.<sup>426</sup> A similar pattern can be seen in the number of sorties flown by Spitfires on cover duties. Of seventeen hundred and nine air cover sorties, nearly half were flown during the withdrawal; some eight hundred and forty-four sorties.<sup>427</sup>



(Source: TNA, AIR 16/1044 'Operational Research Section, Fighter Command, Report No. 395 – Operation "JUBILEE" (Dieppe), 19<sup>th</sup> August 1942: Relative Casualties by Type of Fighter Sortie' 3 December 1942, pp. 3-6)

Thus, it must be noted that the most difficult period for the RAF came in the final, and most difficult, phase of JUBILEE. The need to increase the number of sorties flown illustrates the importance of air cover in both providing cover for the withdrawing forces

<sup>425</sup> TNA, DEFE 2/551, Annex 7 – Report by the Air Force Commander in The Dieppe Report (Combined Report), October 1942, p. 147.

<sup>426</sup> TNA, AIR 16/1044 'ORS Report No. 395, p. 4.

<sup>427</sup> TNA, AIR 16/1044 'ORS Report No. 395, pp. 1-2.

but also to provide support for the squadron that were providing direct support to the ground forces and Roberts noted in his report that the Hurricane direct support squadrons were constantly called upon.<sup>428</sup> Presumably, this was because of the morale impact that this form of weapon had upon soldiers.<sup>429</sup>

Fighter Command's ORS was not the only one to take interest in the results of the operation. Bomber Command's ORS produced two reports on the role of the Boston Squadron of No. 2 Group, which was primarily tasked with smoke laying operations during JUBILEE.<sup>430</sup> Roberts stated that overall the support given by this form of operation was valuable but that there was a need to expand the availability of this resource.<sup>431</sup> This is echoed by Leigh-Mallory in his report.<sup>432</sup> However, despite the positive support for this form of operation, as well as the support made by the RAF as a whole, it was labour intensive and Bomber Command's ORS stated that if the operation were to continue for a prolonged period the effective force that was able to be deployed would diminish rapidly.<sup>433</sup> The report stated that of fifty-two Bostons available at the start only thirty-two were available by nightfall; an attrition rate of nearly forty per cent, though, it did admit that many of the aircraft had only suffered minor damage and could be returned to service within a few days.<sup>434</sup> However, this would not have been useful had the operation been planned for longer and eventually the forces available to No. 2 Group would have been drastically diminished and the force virtually immobilized. This high attrition rate, much like that of the direct support single-engined aircraft, was caused

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<sup>428</sup> TNA, DEFE 2/551, The Dieppe Report (Combined Report), p. 143.

<sup>429</sup> This is a theme picked up by Ian Gooderson in *Air Power at the Battlefront*.

<sup>430</sup> TNA, AIR 14/1809, File 1A – Day Raid Report No. 76: Bomber Command Report on Operations – Day 19<sup>th</sup> August, 1942, 6 September 1942; AIR 14/1809, File 3A – A Note on Losses Sustained at Dieppe, 12 October 1942.

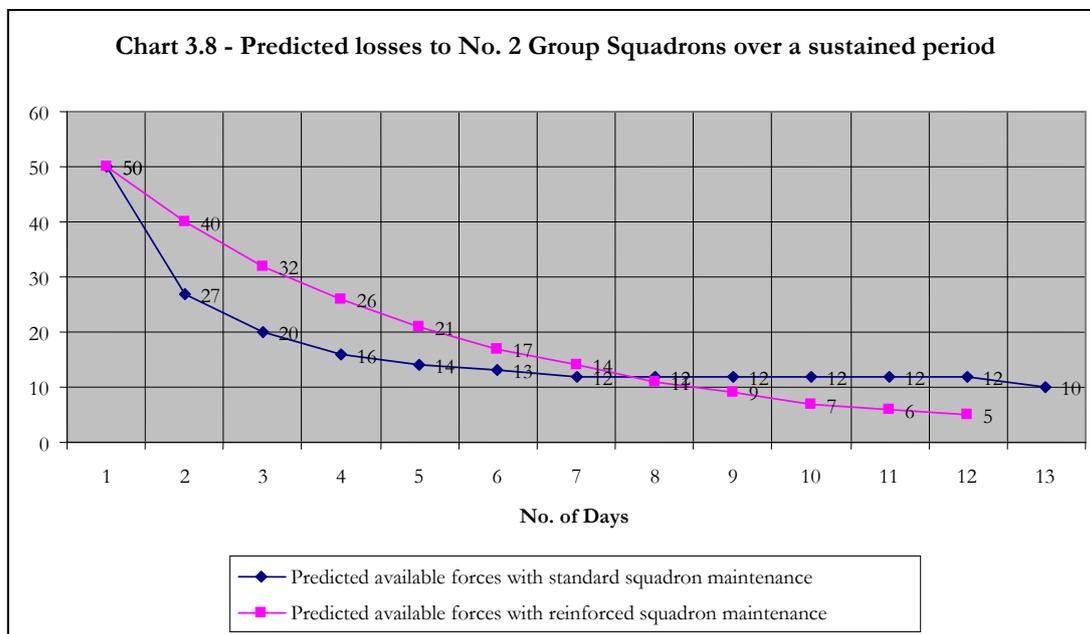
<sup>431</sup> TNA, DEFE 2/551, The Dieppe Report (Combined Report), p. 143.

<sup>432</sup> TNA, DEFE 2/551, The Dieppe Report (Combined Report), p. 148.

<sup>433</sup> TNA, AIR 14/1809, File 1A, p. 4.

<sup>434</sup> TNA, AIR 14/1809, File 1A, p. 4.

primarily by AA fire, again highlights the advantages of effective air cover and the report remarks on the effectiveness of the cover provided.<sup>435</sup> It was predicted that in a period of sustained operations a force of fifty airframes would drop to just ten after sustained operations of thirteen days. It claimed that this figure would not be aided by reinforced maintenance. In fact, the figures for a second week of operations noticeably dropped off due to the lack of returning aircraft from Category A or B damage.<sup>436</sup> However, the ORS states, much like the prevailing opinion at Fighter Command, that the losses incurred by No. 2 Group during JUBILEE and in any future similar operation would have to be expected no matter how inefficient maintenance was due to the effectiveness and desirability of providing smoke screens to landing forces.<sup>437</sup> The ORS, however, did suggest that in the future, some modification should be made to the way in which the smoke screen is delivered and to examine whether aircraft were the most efficient method in delivery that form of support.<sup>438</sup>



(Source: TNA, AIR 14/1809 'File 3A – A Note on Losses Sustained at Dieppe' 12 October 1942, p. 1)

<sup>435</sup> TNA, AIR 14/1809, File 1A, p. 2.

<sup>436</sup> TNA, AIR 14/1809, File 3A, p. 1.

<sup>437</sup> TNA, AIR 14/1809, File 3A, p. 2.

<sup>438</sup> TNA, AIR 14/1809, File 3A, p. 2.

The Bomber Command ORS reports make some interesting points about the effectiveness of the bombing of No. 2 Group. This is particularly interesting considering that the main claims over the lack of Bomber Command support. In reconnaissance undertaken in JUBILEE's aftermath it was observed that of the two hundred and sixteen bombs dropped by No. 2 Group one hundred and ninety-six were observed to have 'burst'. Of these, eighty were dropped across a housing estate and the rest fell in open country, the nearest target was reported as three hundred yards away.<sup>439</sup> The sorties flown were conducted at low level, about four thousand feet, therefore, they achieved very inefficient results for the expended force. Had heavier bombers been used the impact upon civilian targets may well have been greater, thereby, negating any possible tactical use they may well have had. Bomber Command had been criticised in the 1941 Butt Report for its accuracy when attacking German cities with the claim that only one in five crews put a bomb within five miles of the target.<sup>440</sup> Therefore, based on this and the ORS report it appears that any use of heavy bombers would have been highly inefficient and in the political realm, it may have actually been extremely damaging. Even in 1944, the issue of French casualties from bombing would still be a divisive issue in planning military operations, for example, it was an issue in the planning for Operation ASTORIA, the assault on Le Havre in September 1944.<sup>441</sup>

An area where the RAF had a relative advantage over the *Luftwaffe* was in the area of pilot losses. Chart 3.9 illustrates the fate of the RAF pilots lost in the course of JUBILEE. The pertinent point is that it illustrates is that thirty-three percent of RAF

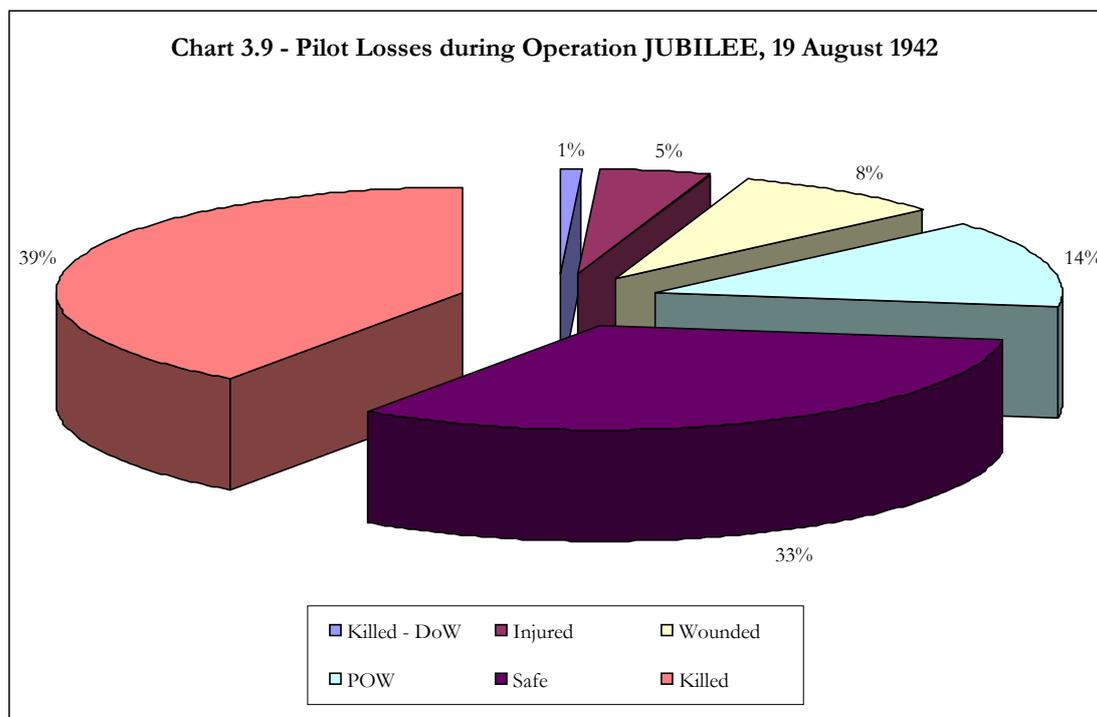
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<sup>439</sup> TNA, AIR 14/1809, File 1A, p. 2.

<sup>440</sup> Biddle, *Rhetoric and Reality in Air Warfare*, p. 1.

<sup>441</sup> On the use of heavy bombers in support of ground operations see, Gooderson, *Air Power at the Battlefield*, pp. 125-164. On the role of bombers during the assault on Le Havre see Andrew Knapp, 'The Destruction and Liberation of Le Havre in Modern Memory' *War in History*, Vol. 14, No. 4 (Winter 2007) pp. 476-498.

pilots were classified as safe. This means that they managed to bale out of their aircraft, were picked either by friendly craft or by the air/sea rescue (ASR) organisation. Leigh-Mallory in his report's covering letter to the Secretary of State for Air praised the work of the ASR organisation and lamented on the loss of several of the Dover station's craft that were operating outside of the range of the air cover umbrella.<sup>442</sup> It is a testimony to the crews of the ASR craft that they were the last vessels to leave the battle area and that some of the last operations performed by the RAF during JUBILEE was to provide air cover for these vessels that provided sterling work and rescued numerous pilots from the channel during the operation.<sup>443</sup>



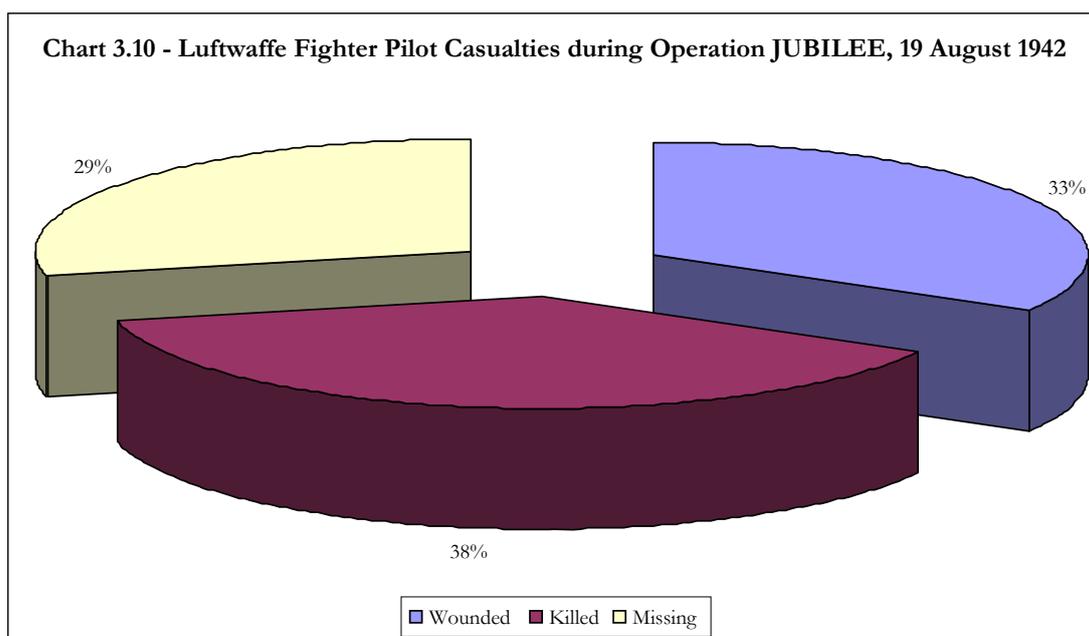
(Source: Norman Franks *Royal Air Force Fighter Command Losses of the Second World War: Volume 2 – Operational Losses: Aircraft and Crews, 1942-1943* (Leicester: Midland Publishing Limited, 1998) pp. 56-62)

As well as pilots classified as safe another thirteen per cent were classified injured or wounded, therefore, able to be return to service later. However, *Luftwaffe* fighter pilot losses illustrate a similar story with thirty-eight per cent killed during the operation, as shown in Chart 3.10. Another twenty-nine percent were classified as missing. Assuming

<sup>442</sup> TNA, AIR 20/5186, Covering Letter to Report by the Air Force Commander, p. 2

<sup>443</sup> Franks, *The Greatest Air Battle*, pp. 170-172

that these pilots were either captured or killed, which are the most likely explanations, then the *Jagdwaaffe* suffered attrition of sixty-seven per cent, a rate that would be deemed unacceptable for the return that occurred during JUBILEE. From 1942 onwards, there was a general decline in both the quality and quantity of German fighter pilots; therefore, a high attrition rate exacerbated the problem.<sup>444</sup>



(Source: Norman Franks *The Greatest Air Battle: Dieppe, 19<sup>th</sup> August 1942* (London: Grub Street, 1997) pp.237-238)

Overall, a more detailed analysis of the quantitative data available on JUBILEE reveal a more complex picture than the hitherto expressed. It highlights the high cost of providing assaulting forces with direct air support in the form of bombing, smoke laying and strafing. It should also be noted that there was little experience of this form of action in the aerial campaign over Northern France and in Combined Operations in general. That they were costly was a risk that it appears that both Fighter and Bomber Command were willing to take in future operations. It also reveals that in performing such costly operations the key threat came from AA fire, not enemy aircraft. Therefore, the decision

<sup>444</sup> On the issue of the general decline of German fighter pilots and the impact of the Battle for Air Superiority on the *Jagdwaaffe* see, Stephen Lee McFarland and Wesley Phillips Newton, *To Command the Sky: The Battle for Air Superiority over Germany, 1942-1944* (Washington DC: Smithsonian Institution Press, 1991).

to provide overwhelming air cover not only reduced losses to the direct air support squadrons down but also blunted the *Luftwaffe's* attempt to interfere with operations on the ground. The *Luftwaffe's* only major success of the day was the sinking of HMS *Berkeley*, which was sunk by bombs from attacking Dornier DO217s.<sup>445</sup> The key reason for this loss was that once German aircraft penetrated the fighter screen they became the responsibility of the RN's AA gunners in order to avoid friendly fire incidents, the air plan called for aircraft not to fly below three thousand feet.<sup>446</sup> Bomber Command's OR reports also highlighted the issue of providing heavier support from bombers and that will be picked up upon later in this chapter. When attacking a well-developed command and control system, as the *Luftwaffe* had deployed in Northern France by 1942, then it was expected that the attacking force would incur losses. The nature of the offensive helps explain the nature of the losses incurred by the RAF. However, the ability of the RAF to fix and replace losses and retrieve stranded pilots gave them a quantitative and qualitative edge over the *Luftwaffe* in battle, as they were able to recover experience pilots who were of much more use than the recruits the *Jagdwaffe* would begin to rely upon. From 1942 onwards, the *Luftwaffe* simply could not afford similar losses to those that were now being incurred by the RAF. It would be further weakened by the US 8<sup>th</sup> Fighter Command in 1944, thus, helping to gain air superiority over France in preparation for OVERLORD. Therefore, at a tactical and operational level it can be seen that the decision to structure the RAF with an overwhelming predilection for fighter squadrons was arguably the right decision from both a doctrinal and operational perspective. The beginnings of this drain on *Luftwaffe* resources can be seen in JUBILEE. However, the limitation of RAF aircraft and the *Luftwaffe's* decision to move aircraft back

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<sup>445</sup> TNA, ADM 267/108, Extracts from Weekly Intelligence Reports: HMS Berkeley – Sunk by Bombs – 19.8.1942, 18 December 1942; Neillands, *The Dieppe Raid*, pp. 257-258.

<sup>446</sup> TNA, DEFE 2/551, Annex 3 – Detailed Air Plan in The Dieppe Report (Combined Report), p. 127.

to Germany in order to defend its airspace meant that from late 1943 the battle for air superiority would be taken over by the 8AAF with its long-range fighters.

### **3.3 Raiding as an Intruder Strategy, 1942-1943**

The perceived success of JUBILEE would lead to the belief that raids would bring the *Luftwaffe* to fight, therefore, producing the means to battle them for air superiority over Northern France. In many respects, the emergence of this strategy, at the behest of Leigh-Mallory who in November 1942 replaced Douglas as AOC-in-C of Fighter Command, can be seen as a continuation of the offensive fighter sweep policy that was Fighter Command's main role in 1941-1942. This scheme of combining raids with an attempt at offensive air action would become an element of Operation COCKADE; the elaborate camouflage and deception plan aimed at keeping the German guessing as to when and where an invasion would take place.<sup>447</sup> In the year after JUBILEE, there were various attempts at launching such a scheme with varying degrees of success. Two operations made it as far as the planning stage, AFLAME and COLEMAN, and one would take place, albeit in a slightly different form, Operation STARKEY.

As early as 22 August 1942 Leigh-Mallory wrote to Mountbatten saying that 'I feel that we might profitably conduct a future operation on rather different lines.'<sup>448</sup> In terms of 'different lines' Leigh-Mallory suggested the use of commandos as the assaulting force, citing the tactical success of Lord Lovat's No. 4 Commando against the Hess Battery during JUBILEE as a possible blueprint.<sup>449</sup> Leigh-Mallory contended that one of the disappointing aspects of JUBILEE was the paucity of opportunity for his direct

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<sup>447</sup> TNA, AIR 41/49, The Struggle for Air Supremacy, January 1942 – May 1945, p. 274

<sup>448</sup> TNA, DEFE 2/67, Leigh-Mallory to Mountbatten, 22 August 1942, p. 1

<sup>449</sup> TNA, DEFE 2/67, Leigh-Mallory to Mountbatten, 22 August 1942, p. 1

support squadrons to attack German reserves, as they were not thrown into the battle. He argued that if a small force were landed on a quiet stretch of coast then this would force the Germans to utilise reserves, therefore, allowing his direct support squadrons the opportunity to inflict 'heavy casualties' upon the enemy.<sup>450</sup> He noted that this type of operation would also aid in the general degradation of the *Luftwaffe's* striking force and would contribute to its final defeat.<sup>451</sup> Since they were based upon information then available to Leigh-Mallory, these conclusions are hard to fault. However, in order to reproduce the effect that he was thinking about then a larger fighter force relative to the size of the operation would have to be provided to protect the direct air support that was to support the assaulting force. He also failed to appreciate the sheer size of the assaulting force necessary to draw in German reserves. Considering that this did not occur at Dieppe it is hard to see what effect a single commando would have upon German reserves in order to achieve the effect that Leigh-Mallory sought.

However, despite this failure to understand the military requirement of such an operation it received the support of Mountbatten who convened a meeting on 7 September at COHQ to examine the feasibility of such an operation.<sup>452</sup> At this meeting, it was outlined that the primary purpose of the operation was to bring the *Luftwaffe* to battle. It was proposed that a similar number of Hunt class destroyers as used at Dieppe be utilized as naval support; however, there was no discussion of ground forces to be used. It was decided that the plan appeared sound and that planning should proceed with the plan put to the Chiefs of Staff and another meeting to be held on 17 September.<sup>453</sup> Mountbatten submitted a minute to the Chiefs of Staff on 16 September outlining the

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<sup>450</sup> TNA, DEFE 2/67, Leigh-Mallory to Mountbatten, 22 August 1942, p. 1

<sup>451</sup> TNA, DEFE 2/67, Leigh-Mallory to Mountbatten, 22 August 1942, p. 1.

<sup>452</sup> TNA, AIR 16/762, File 1A – Minutes of Meeting to Consider Operation "AFLAME", 7 September 1942

<sup>453</sup> TNA, AIR 16/762, File 1A.

operation. In this minute, Mountbatten claimed that it might not even be necessary to land any troops in order to bring the *Luftwaffe* to battle.<sup>454</sup> Again, from the experience of JUBILEE, it is hard to see the reasoning behind this claim. Despite this, Mountbatten also claimed that AFLAME might have a larger strategic role to play as part of Operation OVERTHROW, the deception plan for Operation TORCH, assuming that approval was forthcoming in order to allow the operation to take place in October.<sup>455</sup>

From an air power perspective, it is hard to ignore the fact that it appeared that Dieppe had been an unqualified success as Leigh-Mallory received reports stating that the Germans were in the process of reinforcing certain positions along the French and Norwegian coastline.<sup>456</sup> However, by the time of the second planning meeting Mountbatten decided that no military force would be landed and that he was seeking the use of a light cruiser from the Admiralty in order to add to the deception. This raised concerns from Leigh-Mallory's representative, Air Commodore Harcourt-Smith, who stated that the deception had to be strong enough to bring the *Luftwaffe* to battle; this was the primary objective of the operation.<sup>457</sup> In order to aid the deception plan it was decided to make use of a small force of bombers on the night preceding the operation and to make use of dummy parachutists in order to convince the Germans of the operation's veracity.<sup>458</sup> In terms of the support to be provided by Bomber Command, Harris was sympathetic but asked that the targets be both more realistic considering the lack of success during JUBILEE, and also less politically sensitive. Harris pointed out to

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<sup>454</sup> TNA, DEFE 2/67, Minute to the Chiefs of Staff from the Chief of Combined Operation reference Operation AFLAME, 16 September 1942.

<sup>455</sup> TNA, DEFE 2/67, Minute to the Chiefs of Staff from the Chief of Combined Operation reference Operation AFLAME.

<sup>456</sup> TNA, AIR 16/762, File 3A – COHQ to Leigh-Mallory, 18 September 1942.

<sup>457</sup> TNA, AIR 16/762, File 4A – Minutes of a Meeting of the Force Commanders of Operation "AFLAME", 17 September 1942, p. 2.

<sup>458</sup> TNA, AIR 16/762, File 6A – Leigh-Mallory to Douglas, 23 September 1942.

Douglas that his operational directive from the War Cabinet dictated that only strictly military targets are attacked in occupied territory.<sup>459</sup> Douglas passed on these comments to Leigh-Mallory who responded that the suggestions made by Harris had already been considered and rejected. In particular, the bombing of docks was something to which the Germans were used to, and unlikely to achieve the results desired.<sup>460</sup> It is evident that despite Harris' rational objection the nature of the deception, bombardment did not change and the town of Berck remained its target.<sup>461</sup> On this issue, Harris received the support of Douglas blamed Mountbatten's over-zealous attitude for this situation and hoped that Harris would still 'play.'<sup>462</sup> AFLAME was scheduled to take place between 4 and 16 October depending on the weather and it was seen as a repeat of JUBILEE without the ground forces.<sup>463</sup> Eventually the weather played its part and ALFAME was postponed indefinitely. It is hard to see how the force involved could have induced the *Luftwaffe* to come to battle with the RAF given the lack of assault forces involved. However, this did not stop planning for a similar operation taking place.

By early October, Mountbatten was again seeking authorisation to launch an operation, COLEMAN, with the objective of inducing an air battle on terms favourable for Fighter Command.<sup>464</sup> In his covering letter to the Chiefs of Staff, Mountbatten admits to the operation being similar in conception to AFLAME, and therefore JUBILEE, and that it were complementary to the ongoing CROSSBOW deception for TORCH.<sup>465</sup> In effect, many elements that were prevalent in the planning for AFLAME

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<sup>459</sup> TNA, AIR 16/762, File 11B – Harris to Douglas, 25 September.

<sup>460</sup> TNA, AIR 16/762, File 11A – Douglas to Leigh-Mallory, 26 September 1942; AIR 16/762, File 12A – Leigh-Mallory to Douglas, 28 September 1942.

<sup>461</sup> TNA, AIR 16/763, Operation "AFLAME" – Royal Air Force Operation Order No. 1, p. 1.

<sup>462</sup> TNA, AIR 16/762, File 13A – Harris to Douglas, 30 September 1942.

<sup>463</sup> TNA, AIR 16/763, Operation "AFLAME" – Royal Air Force Operation Order No. 1, p. 1.

<sup>464</sup> TNA, AIR 20/4529, Operation "COLEMAN" – Outline of the Operation, 18 October 1942.

<sup>465</sup> TNA, AIR 20/4529, Covering Letter to Outline of Operation "COLEMAN", 18 October 1942.

re-appear in COLEMAN such as Mountbatten's insistence that night bombing was vital to the operation's success. In preparation for the Chiefs of Staff meeting on 22 October to consider the plan, ACAS (P) was asked to prepare a summary of the viability of the operation. To enable this to be pursued both the DFO and DBO were asked for their comments on the plan.<sup>466</sup> These memoranda illustrate the difficulties of inter-service co-operation as the DFO commented that the plan produced by Mountbatten illustrated the usual 'hurried sort of operation' that Mountbatten was known for.<sup>467</sup> DFO noted that in Mountbatten's covering letter to the Chiefs of Staff he claimed to have had discussions with the heads of Fighter and Bomber Command about the operation. However, DFO noted that this was certainly not the case with Harris who had first heard of the plan on 19 October when he was asked to examine the outline plan.<sup>468</sup> DFO does not refer to Douglas or Leigh-Mallory, who due to their involvement with AFLAME, were most likely aware of plans to re-launch it. The tone of the memorandum is one of frustration at Mountbatten's tactics in trying to force the operation through the planning process without due diligence, an issue that was prevalent during the decision to re-launch RUTTER.<sup>469</sup> DFO noted that if Mountbatten wanted the support of the RAF he should be careful to work within the appropriate channels.<sup>470</sup> DBO backs this up by confirming that until 19 October no one at Bomber Command had seen the plan. In veiled terms, DBO claimed that Mountbatten lied to the Chiefs of Staff.<sup>471</sup> This was of course a major

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<sup>466</sup> TNA, AIR 20/4529, DFO to ACAS (P) reference Operation "COLEMAN", 19 October 1942; AIR 20/4529 'DBO to ACAS (P) reference Operation "COLEMAN", 19 October 1942.

<sup>467</sup> TNA, AIR 20/4529, DFO to ACAS (P), 19 October 1942, p. 1.

<sup>468</sup> TNA, AIR 20/4529, DFO to ACAS (P), 19 October 1942, p. 1.

<sup>469</sup> On the issue of re-launching Dieppe and Mountbatten's role in changing the procedure for launching raids see, Peter Henshaw, 'The British Chief of Staff Committee and the Preparation of the Dieppe raid, March-August 1942: Did Mountbatten really evade the Committee's authority?' *War in History*, Vol. 1, No. 2 (1994), pp. 197-214.

<sup>470</sup> TNA, AIR 20/4529, DFO to ACAS (P), 19 October 1942, p. 1

<sup>471</sup> TNA, AIR 20/4529, DBO to ACAS (P), 19 October 1942.

issue for commands who were involved in constant operations. This was not the first time Mountbatten had attempted to circumvent the system. However, the opinions of the DFO and DBO would be brought forward to the Chiefs of Staff through the memorandum prepared by ACAS (P).<sup>472</sup>

At an operational level both DFO and DBO were concerned about the timings and appropriateness of the operation. Indeed, DFO noted that from Fighter Command's perspective the decision to seek a battle for aerial superiority was a good idea. However, prevailing weather conditions for November, when the operation was due to take place, would not aid the aim of the operation.<sup>473</sup> DFO was particularly concerned about the affect the weather would have on issues such as bombing accuracy and the fact that cloudy conditions would hinder offensive fighter operations because of the enemy's ability to use cloud cover to escape.<sup>474</sup> DFO was also concerned about the level of support that Mountbatten was expecting from No. 2 Group and it was pointed out that support from the Americans would be needed and that even if this was forthcoming high casualties were to be expected.<sup>475</sup> This was supported by DBO who pointed out that at Dieppe the limited actions of No. 2 Group had caused a high rate of wastage and that if the required numbers could be collected then the same would occur.<sup>476</sup> On the issue of night bombing, the DBO re-iterated the concerns that Harris had raised during AFLAME over the issue of accuracy and civilian casualties. DBO contended that given the probable weather conditions night bombing should be considered incidental to the operation.<sup>477</sup> These views were summarised by ACAS (P) and submitted to the Chiefs of

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<sup>472</sup> TNA, AIR 20/4529, Memorandum by ACAS (P) on Operation "COLEMAN" for the Chiefs of Staff Meeting on 22 October 1942, 20 October 1942, p. 1.

<sup>473</sup> TNA, AIR 20/4529, DFO to ACAS (P) reference Operation "COLEMAN", 19 October 1942, p. 2

<sup>474</sup> TNA, AIR 20/4529, DFO to ACAS (P) reference Operation "COLEMAN", 19 October 1942, pp. 1-2.

<sup>475</sup> TNA, AIR 20/4529, DFO to ACAS (P) reference Operation "COLEMAN", 19 October 1942, p. 1.

<sup>476</sup> TNA, AIR 20/4529, DBO to ACAS (P) reference Operation "COLEMAN", 19 October 1942, p. 2.

<sup>477</sup> TNA, AIR 20/4529, DBO to ACAS (P) reference Operation "COLEMAN", 19 October 1942, p. 2.

Staff for consideration with the caveat that the plan was a weak one given the prevailing operational issues that faced the RAF.<sup>478</sup> In the aftermath of this appreciation and the Chiefs of Staff meeting of 23 October Mountbatten was ordered to re-evaluate the plan in light of the navy's decision not to provide him with six Hunt class destroyers and Portal's decision to not allow fighter aircraft for direct support operations to participate.<sup>479</sup> Therefore, by late 1942 the attempt to draw the *Luftwaffe* to battle using raiding as bait for air action had ended. In many respects it highlighted a strategic dead-end, although one that was worth examining. Dieppe was in many respects the intruder strategy of 1941 writ large; therefore AFLAME and COLEMAN can be considered Dieppe writ large. However, they illustrate the degree to which Dieppe had been a one shot operation and that the likelihood of success a second time was unlikely especially so soon after Dieppe and given the prevailing operational conditions of the time.

Despite the apparent failure of using raiding as a means to bring the *Luftwaffe* to battle this strategy would receive renewed vigour under the auspicious of the planning for the invasion of Europe during 1943. At the Casablanca Conference in January 1943, discussions took place concerning the nature of operations during the forthcoming year. A report by the British Joint Planning Staff to the Combined Chiefs of Staff decided that there were three possibilities for cross-channel operations during 1943. These were categorised as raids; operations with the purpose of seizing a bridgehead; and an uncontested return to the continent.<sup>480</sup> The purpose of any future raids was described as provoking a major air battle and inflicting casualties on the enemy, therefore, a degree of continuity can be seen in the planning of raids in late 1942 and in 1943.<sup>481</sup> These

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<sup>478</sup> TNA, AIR 20/4529, Memorandum by ACAS (P), 20 October 1942, p. 2.

<sup>479</sup> TNA, AIR 20/4529, Extract from the Chiefs of Staff's 239<sup>th</sup> Meeting, 23<sup>rd</sup> October.

<sup>480</sup> TNA, AIR 20/5105, Report by the British Joint Planning Staff to the Combined Chiefs of Staff on Continental Operations in 1943, 22 January 1943, p. 1

<sup>481</sup> TNA, AIR 20/5105, Report by the British Joint Planning Staff, 22 January 1943, p. 1.

proposed operations would eventually evolve into Operations COCKADE, OVERLORD and RANKIN.<sup>482</sup> It was assumed that by August 1943 there would be sufficient air power resources for the purpose of either of these operations, however, it was noted that the home based operational commands of the RAF would require re-organisation in order to make offensive air operations more effective.<sup>483</sup> This re-organisation, based upon lessons from Europe and the Mediterranean, would lead to the formation of the RAF's 2<sup>nd</sup> Tactical Air Force (2TAF). In a report by the Combined Commanders to the Chiefs of Staff, it was made clear that from an air power perspective it was crucial that sufficient aircraft were available for maintaining air superiority.<sup>484</sup>

A key element in the preparations for the invasion of Europe was COCKADE, which was conceived as a deception plan with the purpose of pinning German forces in the west for fear of a possible large-scale operation against the continent.<sup>485</sup> COCKADE consisted of three subsidiary operations, STARKEY, WADHAM and TINDALL. Both STARKEY and WADHAM were inter-dependent, with STARKEY acting as the main assault and WADHAM as a follow-on force landing on the Brittany peninsula.<sup>486</sup> Of the operations STARKEY is most important for consideration in this thesis as inherent to its planning was the desire to draw the *Luftwaffe* to battle.<sup>487</sup> The outline plan for STARKEY noted that it was 'primarily designed to compel the German Air Force over a prolonged

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<sup>482</sup> John Campbell, 'Operation STARKEY, 1943: 'A Piece of Harmless Playacting?'' *Intelligence and National Security*, Vol. 2, No. 3 (1987) p. 92.

<sup>483</sup> TNA, AIR 20/5105, Report by the British Joint Planning Staff, 22 January 1943, p. 2

<sup>484</sup> TNA, AIR 20/5105, Report by the Combined Commanders – Some Basic Factors Concerning and Opposed Landing in France and the Low Countries, 22 March 1943, p. 1.

<sup>485</sup> TNA, AIR 41/49, The Struggle for Air Superiority, 1942-1943, p. 274.

<sup>486</sup> Campbell, 'Operation STARKEY' p. 93; TNA, AIR 41/49, The Struggle for Air Superiority, 1942-1943, p. 274.

<sup>487</sup> The most useful works on STARKEY are, Campbell, 'Operation STARKEY' and Michael Cumming, *The Starkey Sacrifice: The Allied Bombing of Le Portel, 1943* (Stroud: Sutton, 1996).

period to engage in air battles of attrition.<sup>488</sup> Thus, it is apparent that in terms of effectively deceiving the German of the Allies' intentions in 1943, raiding with the purpose of forcing an air battle had become an important element of preparations for the invasion. In its basic conception, STARKEY sought to feign the movement of a large number of troops and suggest to the Germans that a major operation was to take place in the area of Boulogne. As these movements took place, a crescendo of air operations would take place in the vicinity in an attempt to bring the *Luftwaffe* to battle. Then in the final phase of the operation, it was intended to demonstrate with amphibious forces off the French coast but not to actually land them. The operation was to last for a period of three weeks with air operations reaching their peak by early September 1943.<sup>489</sup> As with JUBILEE Leigh-Mallory was to take control of the RAF during the operation. Because of the scale of STARKEY, planning was spread over several months from March to August 1943. The air plan called for the use of a significant amount of Allied air power from both the RAF and the USAAF. In this respect General Ira Eaker, commander of the 8AAF, aided Leigh-Mallory in the planning process.<sup>490</sup> From an air power perspective, the planning for STARKEY was similar in many respects to the operations that had gone before it. This should come as no surprise given the involvement of Leigh-Mallory. However, one area where it did divert from previous operations was in the use of large numbers of bombers. Previously issues over accuracy and civilian casualties had led to the abandonment of their use. However, at the time of JUBILEE, this was not considered a major issue due to the factor of tactical surprise. Yet for STARKEY their use was considered vitally important to the deception plan. However, questions were

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<sup>488</sup> TNA, AIR 40/312, Report by the Air Force Commander on Operation "STARKEY", 16<sup>th</sup> August-9<sup>th</sup> September 1943, 16 September 1943, p. 1.

<sup>489</sup> TNA, AIR 41/49, The Struggle for Air Superiority, 1942-1943, p. 275; AIR 40/312, Report by the Air Force Commander, pp. 1-2; Cumming, *The Starkey Sacrifice*, pp. 25-31.

<sup>490</sup> TNA, AIR 41/49, The Struggle for Air Superiority, 1942-1943, p. 275.

raised over their use. Harris again questioned their viability noting that the initial level of bomber support to be provided was 'just the sort of thing an idol [sic] army dotes on.' Eaker, who was not willing to waver from the Pointblank Directive that had been issued to both himself and Harris, supported him in this view.<sup>491</sup> Thus, while bomber forces were to be used they were not used on the levels intended. The Pointblank Directive had called for the Allied bomber forces 'to impose heavy losses on German day fighter force and to conserve German fighter force away from the Russian and Mediterranean theatres of war' and was issued at the Casablanca Conference.<sup>492</sup>

The air plan called for three phases of operations. First, the preliminary phase was to call for the reinforcement of Fighter Command's No. 11 Group between 16 and 24 August. Second, the preparatory phase called for an increase in operations with reconnaissance over the target area and bombardment of key installations between 25 August and 7 September. Finally, the culminating phase called for attacks on vital installations, such as coastal batteries in preparation for the demonstration by the naval force off Boulogne. The naval force was to be protected by air cover in an attempt to lure the *Luftwaffe* up.<sup>493</sup> Significant forces were tasked to take part in STARKEY with No. 11 Group reinforced to seventy-two squadrons. For the culminating phase 8AAF and Bomber Command promised three hundred sorties each when available.<sup>494</sup> The issues of availability came around because Bomber Command had just begun its assault upon Berlin, thus Harris complained to the Chiefs of Staff that this interfered with his primary

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<sup>491</sup> Campbell, 'Operation STARKEY' pp. 95-96.

<sup>492</sup> Sir Arthur Harris, *Despatch on War Operations, 23rd February, 1942, to 8th May, 1945* (Frank Cass; London, 1995) p. 196.

<sup>493</sup> TNA, AIR 40/312, Report by the Air Force Commander, pp. 2-3.

<sup>494</sup> TNA, AIR 40/312, Appendix 'A' – STARKEY Order of Battle in Report by the Air Force Commander, pp. 1-4.

mission. However, he was ordered to make a portion of aircraft available for STARKEY, thus illustrating the importance placed on this operation.<sup>495</sup>

In general operation proceeded as planned over the period of the operation and during the period of D-Day, 7/8 September, Fighter Command flew some seventeen hundred sorties on air cover duties. Despite the air effort the Germans did not respond in the manner hoped for with only small forces engaging the attacking bombers and fighters. By this time, the *Luftwaffe* in northern France had standing orders to avoid combat where numbers were unadvantageous and the AHB narrative commented that this was probably a lesson learnt from Dieppe.<sup>496</sup> However, despite this apparent disappointment, lessons were learnt and they were able to be refined in preparation for the invasion in 1944. Much like at Dieppe concerns were still being uttered concerning the command and control of forces during the operation. It was noted that the HQS was not positioned advantageously for the control of fighters and that communications with airfields was far from good. This was an issue, as seen below, that was already being examined in light of Dieppe and operation elsewhere. It was also noted that in terms of strategic reconnaissance for the operation had been inadequate had this been an active operation.<sup>497</sup>

In other areas, STARKEY aided allied preparations for Normandy. For example, Campbell has argued that the deception lessons learnt during STARKEY affected FORTITUDE SOUTH. It had been intended that FORTITUDE SOUTH take a similar form to STARKEY but upon examining the results of STARKEY this plan was revised.<sup>498</sup> The issue of bombing during STARKEY has remained a point of contention

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<sup>495</sup> TNA, AIR 41/49, The Struggle for Air Superiority, 1942-1943, p. 276.

<sup>496</sup> TNA, AIR 41/49, The Struggle for Air Superiority, 1942-1943, p. 280.

<sup>497</sup> TNA, AIR 40/312, Report by the Air Force Commander, pp.28-30.

<sup>498</sup> Campbell, 'Operation STARKEY' p. 107.

with Cumming's work concentrating on this aspect of the operation.<sup>499</sup> Considering the similarities between JUBILEE and STARKEY and the issues raised by Villa over the lack of aerial bombardment for JUBILEE, it is interesting to compare this with a work that is at odds with the efficacy of bombing. A possible explanation for this divergence arrives from the issue that, unlike JUBILEE, STARKEY did not actually land any troops; therefore, it is difficult to understand their use. However, despite this, there is a link between doctrine and attempts to consider the use of bombing in raids such as STARKEY after Dieppe. STARKEY, however, did help shake the belief that air superiority could be won over the invasion area during the operation, a belief that had existed since Dieppe and exemplified in the operations planned for autumn 1942.<sup>500</sup> This led to the requirement that air superiority was a direct prerequisite for OVERLORD's success. Thus, it can be contended that by 1943 attempts at combining feint raids with the desire to engage the *Luftwaffe* had not had the effect of drawing down German strength but had instead aided in learning lessons in the area of deception and the necessity of air superiority. In many respects, the issue of air superiority had long been understood and that operational experience brought home the realities of inter-war doctrine of its importance in Combined Operations. For example, the MCO had noted that where possible advanced landing ground and air superiority should be gained in advance of any planned operation.<sup>501</sup>

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<sup>499</sup> Cumming, *The Starkey Sacrifice*, *passim*

<sup>500</sup> Campbell, 'Operation STARKEY' p. 107.

<sup>501</sup> TNA, AIR 10/1437, Manual of Combined Operations (1938), p. 121.

### **3.4 Command and Control of Air Power during Combined Operations**

Air operations over Dieppe illustrated the efficacy of providing overwhelming air cover as in pre-war doctrine. For example, Admiral Sir Dudley Pound in December 1942 noted that ‘One of the most important requirements for an opposed landing is the provision of adequate fighter support during the assault.’<sup>502</sup> While this memorandum on *Fighter Support for Assault in Combined Operations* was concerned primarily with future operations against Japan and the use of fighters in long-range operations, it does make clear the importance that was now to be placed upon fighter support.<sup>503</sup> Pound clearly noted that in support of continental operations the RAF would provide fighter support, much as at Dieppe and that this would be the most economical use of air power.<sup>504</sup> This is, however, where several developmental paths begin to converge with their experience building up throughout 1943 and feeding into OVERLORD in 1944. While Dieppe clearly illustrated certain lessons, many were also being learnt in the Mediterranean with the experience being built up by the WDAF and other forces in theatre in support of Operations TORCH, HUSKY, and AVALANCHE. For example, an undated paper from 1943 stated that lessons on the effect of tactical employment of air power were being learnt from various sources places such as Britain, France and Egypt.<sup>505</sup> Despite the plurality of lessons being drawn from various campaigns on the importance of air superiority there remained the issue of command and control of these forces in Combined Operations. In a paper written by Mountbatten on fighter direction, he commented that there was a need for Fighter Direction Ships (FDS) to co-ordinate the use of fighters in Combined

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<sup>502</sup> TNA, AIR 20/3920, Memorandum by the First Sea Lord to the Chief of Staff Committee on the issue of Fighter Support for Assault in Combined Operations, 5 December 1942, p. 1.

<sup>503</sup> While outside of the scope of this thesis the use of carrier air power is examined in Philip Weir, ‘The Development of Naval Air Warfare’ *passim*.

<sup>504</sup> TNA, AIR 20/3920, Fighter Support for Assault in Combined Operations, 5 December 1942, p. 1.

<sup>505</sup> TNA, AIR 20/4835, Future Strategy and its Effect on the Tactical Employment of Fighter, p. 1.

Operations.<sup>506</sup> This need was nothing new. In the planning for RUTTER/JUBILEE Leigh-Mallory had voiced concerns that communications between Uxbridge and the field headquarters during YUKON II had not been satisfactory. He was concerned that these problems would re-appear during RUTTER though it was noted that this was already being examined at the time.<sup>507</sup> However, despite this Leigh-Mallory noted that the use of the two HQS proved satisfactory and that the control system in place proved acceptable.<sup>508</sup> Leigh-Mallory also noted the similarity of the system to one being used in support of ground forces in North Africa.<sup>509</sup> It would be these two sources of experience that would see the evolution of more effective HQS and the development of Fighter Direction Tenders (FDT). They would aid in the command and control of air support during Combined Operations in 1943.<sup>510</sup>

During JUBILEE, it was not possible to utilise the HQS that were then under development so two of the *Hunt* class destroyers, *Calpe* and *Fernie*, had been equipped as HQS with VHF and HF radio equipment. They were noted to have served effectively but the conditions in these ships were cramped and that further development was required.<sup>511</sup> The problems of communication had already been highlighted earlier in 1942 and upon taking up the post of ACO in late 1941 Mountbatten had set up an inter-service committee to examine this issue. During the course of late 1941 to May 1942 the

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<sup>506</sup> TNA, AIR 20/4835, Fighter Direction in Combined Operation outside range of Shore-Based Fighter Cover, 25 December 1942, pp. 1-4.

<sup>507</sup> TNA, DEFE 2/546, Minutes of Meeting held on 25<sup>th</sup> June at COHQ for Operation "RUTTER"; AIR 20/832, Support Communications in Combined Operations, 14 January 1942.

<sup>508</sup> TNA, AIR 20/5186, Report by the Air Force Commander, p. 5.

<sup>509</sup> TNA, AIR 20/5186, Report by the Air Force Commander, p. 4.

<sup>510</sup> Early in the development of FDTs they were often referred to as FDS. Thus the term was interchangeable. However, from 1943 onwards a distinct FDS was to be developed for service in long-range operations.

<sup>511</sup> TNA, AIR 20/9503, History, p. 137

committee drafted six reports dealing with various issues relating to communication.<sup>512</sup> Of particular importance was the second report, which dealt with support communications in Combined Operations.<sup>513</sup> This report led to the ordering and development of HQS and the FDS in 1942 and it was noted that in particular the control of air units was difficult without the facilities that could be deployed in these vessels.<sup>514</sup> Concerning HQS, HMS *Bulolo* was built by June 1942 and HMS *Largs* was commissioned later in the year, but neither was ready for use at Dieppe.<sup>515</sup> These ships were to allow effective control and overview of forces involved in Combined Operations. From the RAF's perspective, they were to enable maximum flexibility to deal with changing requirements during the assault phase by reducing the time lag between requests for air support.<sup>516</sup>

For the development of HQS, JUBILEE represents a test of the system then being put in place. It would appear from the various reports on the raid that *Calpe* and *Fernie* served well in a role for which they were not intended. However, the loss of the *Berkeley* and the persistent attacks at low level by German bombers does raise the question of their effectiveness in calling upon low-level air support. This does not mean that air power failed at Dieppe but it does illustrate some of its limitations inherent during JUBILEE; for example, the coordination between low-level air cover and weaknesses in the provision of AA defence for the fleet.<sup>517</sup> However, after JUBILEE, there was to be continued development and refinement of the HQS concept as a command and control system for Combined Operations. Both *Bulolo* and *Largs* served at

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<sup>512</sup> TNA, AIR 20/9503, History, p. 132.

<sup>513</sup> TNA, AIR 20/832, Inter-Service Committee on Communications in Combined Operations: Interim Report No. 2 – Support Communications in Combined Operations.

<sup>514</sup> TNA, AIR 20/9503, History, p. 133; AIR 20/832, Interim Report No. 2, *passim*.

<sup>515</sup> TNA, AIR 20/9503, History, p. 133; Fergusson, *The Watery Maze*, p. 175.

<sup>516</sup> TNA, AIR 20/832, Interim Report No. 2, *passim*.

<sup>517</sup> Fergusson, *The Watery Maze*, p. 189.

Normandy supporting Anglo-Canadian forces. However, the development of these vessels did not fully deal with the operational problems of controlling air power during Combined Operations. This was because the HQS had too many functions with which to contend and the control of air power needed a specialised support vessel of its own; this had been recognised during JUBILEE and reinforced by the experience of TORCH where *Bulolo* served. It had been noted that Landing Ships Tank (LST) could be used to mount ground-control interception (GCI) radar for controlling aircraft.<sup>518</sup> Thus, HQS gained a co-ordinating function for the newly developed FDT by the time of Normandy.<sup>519</sup>

Discussions on the need for a new type of vessel to control air power during Combined Operations emerged in late 1942 with the recognition that the specialist equipment needed to control air power effectively did not fit easily into a HQS.<sup>520</sup> Initially discussions focussed on the types of operations to be supported and how best to support them. Questions were raised over the suitability of various RN ships for the role such as escort carriers, however, it was recognised that large fleet units would suffer the same problems as smaller vessels such as *Calpe*, in that they were already tasked for specialised work and to add another responsibility would require additional Fighter Direction Officers (FDO).<sup>521</sup> Discussions steered towards the development of three proposals: first, use of a suitable warship; second, conversion of further convoy vessels like *Bulolo*; third, conversion of a landing ship.<sup>522</sup> Discussions in January 1943 led to the

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<sup>518</sup> TNA, DEFE 2/421, A report on the Role and Operation of British Headquarters Ships and Fighter Direction Tenders in the Assault on the Continent of Europe, June 1944: Operation "NEPTUNE", September 1945, p. 1.

<sup>519</sup> TNA, DEFE2/421, British Headquarters Ships and Fighter Direction Tenders, p. 2.

<sup>520</sup> TNA, DEFE 2/954, Proposal to fit CGI, RDF in special vessels for Fighter Direction, 24 December 1942.

<sup>521</sup> TNA, DEFE 2/954, NCXF's Requirements for Night Fighter Control Ships, 30 December 1942.

<sup>522</sup> TNA, DEFE 2/954, Proposals by the Director of Plans, 8 January 1943.

decision that the most practical solution to the provision of a FDT was with an LST Mk.II. It was argued that it offered the advantage of being able to move with the fleet and had the necessary space to mount the equipment needed.<sup>523</sup> It was noted that the vessels would have to carry a GCI system and associated R/T, W/T and 'Y' facilities in order to control aircraft during Combined Operations.<sup>524</sup>

The inclusion of 'Y' signals intelligence in the requirements for FDTs highlights the use of this important source of information in the conduct of air power operations.<sup>525</sup> During JUBILEE, much use was made of the RAF's 'Y' network, especially the station at Cheadle, which had been informed of the raid before its launch.<sup>526</sup> It would appear that the effectiveness of 'Y' material during JUBILEE was mixed. This was for two key reasons: first, the time taken to analyse the material coming through the 'Y' system; second, the physical operational issues at No. 11 Group where it was difficult to pass information along the command chain.<sup>527</sup> The system also suffered from not being told by No. 11 Group as to what type of information was needed during the course of operation, thus, leading to an overloading of the system.<sup>528</sup> During JUBILEE, an improvised reporting system was used whereby information from the Observer Corps, RDF and fighter R/T traffic was decoded at Cheadle. Bomber W/T was also decoded at Cheadle but high priority material was transferred through to No. 11 Group when

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<sup>523</sup> TNA, DEFE 2/954, Fighter Direction Ships in Combined Operations, 28 January 1943.

<sup>524</sup> TNA, DEFE 2/954, Preliminary Examination of Detailed Requirements of Special Type of Ship for Fighter Direction, 16 January, 1943.

<sup>525</sup> A useful source on RAF intelligence in Sebastian Cox 'The Sources and Organisation of RAF Intelligence and its Influence of Operations' in Horst Boog (Ed.) *The Conduct of the Air War in the Second World War: An International Comparison* (Berg: Oxford, 1992) pp. 553-579.

<sup>526</sup> Appendix 13 – Intelligence Before and During the Dieppe Raid in F H Hinsley *et al*, *British Intelligence in the Second World War, Volume 2: Its Influence on Strategy and Operations* (London: HMSO, 1981) p. 703.

<sup>527</sup> TNA, AIR 40/2239, Handling of "Y" Material during Combined Operations, 30 August 1942.

<sup>528</sup> TNA, AIR 40/2239, "Y" Material, p. 1.

necessary.<sup>529</sup> It was found that there were faults in this system and that priority information could not be supplied to Leigh-Mallory. This reduced its impact upon operations. For example, security issues over the use of RDF traffic negated its use as no preparation was made for it.<sup>530</sup> It was suggested that in order to overcome this problem the type of information wanted from the RDF system should be requested in advance and that a new system of reporting be set up with controller at group headquarters.<sup>531</sup> In light of the experience gained during JUBILEE it was also recommended that a new organisation be superimposed upon the normal reporting system and that officers trained in Combined Operations be used to support the system in place.<sup>532</sup> The posting of specialist officers for decoding ‘Y’ intelligence would influence the development of FDTs where a proportion of the crew was dedicating to support this form of information and discussions in late 1943 established the strength required to operate the FDTs; for the ‘Y’ section, this would consist of one officer and eight other ranks.<sup>533</sup> By the time of OVERLORD the crew, staffing the ‘Y’ system on the FDTs that were working in conjunction with the GCI system provided excellent support for the air forces operating over the beachhead.<sup>534</sup>

Development and discussion of the FDT concept continued and by March 1943 LST 301 had been fitted with equipment for trials off Portland. In this series of tests it was recognised that there were several technical problems that would need to be dealt

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<sup>529</sup> TNA, AIR 40/2239, “Y” Material, pp. 2-3.

<sup>530</sup> TNA, AIR 40/2239, “Y” Material, p. 2.

<sup>531</sup> TNA, AIR 40/2239, “Y” Material, p. 4.

<sup>532</sup> TNA, AIR 40/2239, “Y” Material, p. 7.

<sup>533</sup> TNA, DEFE 2/1072, Combined Operations Ships – “Y” Intelligence Requirements, 21 December 1943.

<sup>534</sup> TNA, DEFE2/421, British Headquarters Ships and Fighter Direction Tenders, p. 15.

with before FDTs could be deployed.<sup>535</sup> These trials were to test the applicability of the concept, how GCI radar could be used and whether or not it could be mounted on a mobile platform with the purpose of offloading the equipment during an assault.<sup>536</sup> The possibility of using mobile GCI equipment faced severe practical problems. For example, the vehicles used to transport the equipment were too high to fit through the LST's bow doors and had to be craned on board. It was also found that the lorries that carried that equipment suffered from mechanical stress when tied to the decks. This meant that they could not be used effectively.<sup>537</sup> Problems with the mounting of equipment also impeded the detection of aircraft during the trials; aircraft from RAF Middle Wallop were detailed to support these. It was found that issues relating to the height of the GCI mount meant that detection was often a thousand feet out. The key issue for the trials was the problem of mounting the RAF GCI equipment to a ship, a role for which it was not envisaged.<sup>538</sup> It was decided that the GCI equipment needed some modification and that to supplement it with a naval set to provide full coverage.<sup>539</sup> In May, trials of the MkIV GCI equipment took place using LST 305 in the Clyde area. The trials of this equipment proved positive though similar technical issues as encountered in testing LST 301 were experienced.<sup>540</sup> Despite these issues, the operational testing of the system was useful and it was noted that the effectiveness of the layout was similar to that supplied by the Chain Home Low system.<sup>541</sup> However, identification, often a problem on land, was difficult at sea and it was suggested that while the theory of the system appeared sound the

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<sup>535</sup> TNA, DEFE 2/954, Trials of GCI Equipment fitted in LST 301, Portland, 27<sup>th</sup> Feb. to 14<sup>th</sup> Mar. 1943 – Report by Sub. Lt. D. Alford, 17 March 1943.

<sup>536</sup> TNA, DEFE 2/954, Trials of GCI Equipment, p. 1.

<sup>537</sup> TNA, DEFE 2/954, Trials of GCI Equipment, p. 1.

<sup>538</sup> TNA, DEFE 2/954, Trials of GCI Equipment, pp. 3-5.

<sup>539</sup> TNA, DEFE 2/954, Covering Letter to Trials of GCI Equipment, 17 March 1943.

<sup>540</sup> TNA, DEFE 2/954, Trials of GCI Equipment fitted in LST 305, 30 May 1943, pp. 2-5.

<sup>541</sup> TNA, DEFE 2/954, LST 305, p. 5.

equipment would need to be calibrated in the LST and the crews trained in interception methods while at sea.<sup>542</sup>

While there were teething problems in the installation of GCI equipment, LST 305 and two more LSTs, 407 and 430, were utilised in HUSKY and AVALANCHE where they proved invaluable in control air assets over the beachhead.<sup>543</sup> This success led to a request from Leigh-Mallory for the further development of FDTs for OVERLORD as he argued that these ships had proven their capabilities in the Mediterranean.<sup>544</sup> This opinion was reinforced by the views coming out of the Mediterranean with discussion occurring in the aftermath of AVALANCHE about the need for specialised FDS to free up the HQS in theatre.<sup>545</sup> This was also backed up by calls being made for these vessels from South-East Asia Command (SEAC).<sup>546</sup> Leigh-Mallory's request was noted, although Mountbatten pointed out that the vessels used in HUSKY, while suitable for the Channel, would not be for long-range operations in SEAC.<sup>547</sup> Here is where the divergence between requirements for FDTs in coastal areas and FDS for long-range operation emerges. However, despite this divergence the decision to convert LSTs into FDTs was taken on 13 November 1943. These ships were completed by February 1944.<sup>548</sup> The LSTs converted were Nos. 13, 216 and 217 and they were fitted out in the same manner as LST 305 with GCI, RDF and 'Y' equipment.<sup>549</sup>

One problem that emerged once the decision to create the FDTs was one of staffing. The ships were operated by the RN but the equipment came from the RAF.

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<sup>542</sup> TNA, DEFE, 2/594, LST 305, pp. 7-8.

<sup>543</sup> TNA, DEFE2/421, British Headquarters Ships and Fighter Direction Tenders, p. 9.

<sup>544</sup> TNA, DEFE 2/1070, Leigh-Mallory to Mountbatten, 10 September 1943.

<sup>545</sup> TNA, DEFE 2/1070, Cipher Message from Allied Forces Headquarters, Algiers to Combined Chiefs of Staff, 28 October 1943.

<sup>546</sup> TNA, DEFE 2/1070, Provision of Vessels for Fighter Direction Purposes, p. 1.

<sup>547</sup> TNA, DEFE 2/1070, Fighter Direction Ships for Combined Operations, 27 September 1943.

<sup>548</sup> TNA, DEFE 2/1072, Air Commodore Long to Air Ministry, 29 November 1943, p. 1.

<sup>549</sup> TNA, DEFE2/421, British Headquarters Ships and Fighter Direction Tenders, p. 10.

This created issues on inter-service co-operation and in the trials in early 1943, it had been noted that the conditions at sea meant that any crew would require specialist training to be able to cope with changeable conditions that would affect both crew and equipment.<sup>550</sup> The controlling formation for controllers attached to the FDTs was No. 105 Wing, which was based at the CTC and emerged out of the formations founded in early 1942. In December, No. 105 Wing raised the question as to the establishment needed for the ships and who was to supply the crews.<sup>551</sup> It was estimated that the crews would be supplied by the Allied Expeditionary Air Force (AEAF) and trained through the administration of No. 105 Wing. The requirements were set at sixty officers and three hundred and fifty-six other ranks for the four FDTs.<sup>552</sup> On 20 December, a meeting was held to discuss the personnel requirement for the FDTs. At this meeting, the requirement for four vessels was reduced to three and it was noted that it would be difficult for the RAF to supply the needed controllers for each FDT.<sup>553</sup> It was decided that it would be best if the set comprised of a 'mixed team' of naval FDO and RAF Controllers. It was necessary that the RAF controllers receive specialist training as noted earlier.<sup>554</sup> It was also decided that each ship have ten controllers for the GCI system and that each of these gain experience at sea. By early January 1944 plans were put in place for RAF Controllers to attend a short course at the Fighter Direction Centre at RNAS Yeovilton in order to familiarise themselves with naval procedures.<sup>555</sup> While training was dealt with, Leigh-Mallory raised questions of manning, arguing that his command should not bear the brunt of supplying airmen, as the need for the vessels was not peculiar to

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<sup>550</sup> TNA, DEFE 2/594, LST 305, pp. 7-8.

<sup>551</sup> TNA, DEFE 2/1072, No. 105 Wing to COHQ, 8 December 1943.

<sup>552</sup> TNA, DEFE 2/1072, Director General of Organisation to Leigh-Mallory, 14 December 1943.

<sup>553</sup> TNA, DEFE 2/1071, Minutes of Meeting to Discuss Personnel for Fighter Direction Ships, 20 December 1943.

<sup>554</sup> TNA, DEFE 2/1071, Personnel for Fighter Direction Ships, p. 1.

<sup>555</sup> TNA, DEFE 2/1071, Report of Meeting held at COHQ, 13 January 1944.

AEAF.<sup>556</sup> As can be seen the requirement was to be shared between the RN and RAF and manning levels were constantly being adjusted as airmen went through the training at Yeovilton and experienced was gained.<sup>557</sup> Manning was also aided by the fact that by May 1944 it was decided to remove unnecessary RAF personnel from HQS and hold them in reserve at No. 105 Wing as replacements.<sup>558</sup> Training remained ongoing, because of the proposed future use of the FDT/FDS concept in SEAC, and discussion as to setting up permanent crews emerged, as well as debate on whether or not RAF personnel should be transferred to the RN – a good illustration inter-service parochialism. It was felt that crews should be kept together in the preparation for OVERLORD. However, after their training most crews were dispersed to train and keep in touch with technical developments while the vessels remained in port.<sup>559</sup> By the time of OVERLORD the crews were proficient in the systems they were to use and capable of working at sea due to the training that they had received.<sup>560</sup>

The removal of the air control function for the HQS led to a rationalisation of the command and control systems for Combined Operation. The development of FDTs would eventually affect the control of air power during OVERLORD and the subsequent development of FDS would have been useful in the planned Combined Operations in SEAC. What emerged in the aftermath of JUBILEE and the experience of the Mediterranean was a synergetic command and control system that worked effectively in Combined Operations. It also saw the effective co-operation of two of the services to solve the problem of control that had persistently been a point of controversy in the inter-war years. A report on the use of HQS and FDTs produced by AEAF and

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<sup>556</sup> TNA, DEFE 2/ 1072, Leigh-Mallory to Under-Secretary of State for Air, 13 January 1944.

<sup>557</sup> TNA, DEFE 2/1072, COHQ to HQ No. 26 Group, 19 April 1944.

<sup>558</sup> TNA, DEFE 2/1072, COHQ to HQ AEAF, 9 May 1944.

<sup>559</sup> TNA, DEFE2/421, British Headquarters Ships and Fighter Direction Tenders, p. 10.

<sup>560</sup> TNA, DEFE2/421, British Headquarters Ships and Fighter Direction Tenders, p. 31.

published in September 1945 is glowing in its praise on the use of these vessels. On the use of FDTs it remarks that they were a great success especially given the ‘rush job’ of producing them in late 1943.<sup>561</sup> However, the report remarked on the problem of fitting the technical equipment in the FDTs, which had been noted throughout the trials in 1943. This was undoubtedly an outgrowth the unorthodox mating of two dissimilar sets of equipment.<sup>562</sup>

During OVERLORD, the HQS were responsible for the co-ordination of fighter-bomber support concentrating on controlling aircraft with pre-arranged target sets and squadrons on stand-by. In this role, they served well and information filtered through to the HQS was useful to the commanders on board in planning operations though the use of ‘Y’ intelligence. The report did note that the development of the FDT had reduced the usefulness of the HQS.<sup>563</sup> Given the problems of co-ordination experienced at Dieppe, this development had a positive impact. The primary reason for the loss of HMS *Berkeley* had been the problem of the calling down low-level cover through the HQS. In removing this function, the HQS was free to concentrate on other areas. The transfer of control of air cover to the FDTs was to show its worth during OVERLORD where effective air cover was maintained, something that was vital for an operation of the size of OVERLORD. Each low cover squadrons deployed during the assault was to call up its representative FDT and liaise with it while in the battlespace in order to receive control instructions when necessary.<sup>564</sup> In this, they were successful though it should be noted that operation were aided by the lack of *Luftwaffe* operations on the day.<sup>565</sup> Thus, the FDTs did not have to contest intense air operations as had been

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<sup>561</sup> TNA, DEFE2/421, British Headquarters Ships and Fighter Direction Tenders, p. 18.

<sup>562</sup> TNA, DEFE2/421, British Headquarters Ships and Fighter Direction Tenders, p. 27.

<sup>563</sup> TNA, DEFE2/421, British Headquarters Ships and Fighter Direction Tenders, p. 9.

<sup>564</sup> TNA, DEFE2/421, British Headquarters Ships and Fighter Direction Tenders, pp. 14-15.

<sup>565</sup> TNA, DEFE2/421, British Headquarters Ships and Fighter Direction Tenders, p. 18.

experienced at Dieppe. Thus, by examining the experience of Dieppe and subsequent operations in the Mediterranean an effective system evolved to control air forces in the assault phase of a Combined Operation using HQS and FDTs. While the FDT was a hasty expedient it would continue to be developed with plans to enlarge it to an ocean-going vessel for the support of long-range operation in SEAC.

### **3.5 The Graham Report and Aerial Bombardment**

Perhaps the most contentious issue in the historiography of JUBILEE has been the subject of the lack of pre-bombardment as a prelude to the operation. This thesis has so far shown that in doctrinal terms this was not an issue with it not being considered a necessary pre-requisite for Combined Operations in this period, the preference being for air superiority. It has also shown that while bombardment had been part of the original planning for RUTTER, its cancellation on the grounds of the loss of tactical surprise was not unreasonable on the part of Leigh-Mallory. Thus, the contentions of historians such as Villa and the Whitakers, that lack of this element effectively damaged any possible chance for success, needs to be re-examined.<sup>566</sup> Villa contends that the lack of 'fire-power proved fatal to the Canadian and British invaders.'<sup>567</sup> Given the nature of the positions that were being attacked and problems highlighted during 1943 and 1944 it is dubious that it would have been of much use. However, despite this the question of bombardment in general and aerial bombardment in particular was not ignored in the aftermath of JUBILEE. In Hughes-Hallett's *Lessons Learnt* summary, he noted that JUBILEE highlighted the need for fire support and that from the RAF it was needed

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<sup>566</sup> Denis Whitaker and Sheila Whitaker, *Dieppe: Tragedy to Triumph* (Ontario: McGraw-Hill, 1992) pp. 141-144; Villa, *Unauthorised Action*, pp. 127-128.

<sup>567</sup> Villa, *Unauthorised Action*, p. 127.

when and where the limits of time and space allowed.<sup>568</sup> While some research has been done on issues of naval bombardment little has been done on the issue of aerial bombardment.<sup>569</sup>

As early as 15 September 1942 COHQ prepared a paper that dealt with the issue of fire support during an assault. However, it failed to deal adequately with air support as this fell outside of its remit.<sup>570</sup> By October, an Assault Committee that was formed at COHQ to examine the problems associated with bombardment and to produce a report with proposals on new methods and requirements based upon recent experiences. However, air power was not fully explored as it was stated simply in the committee's conclusion, submitted on 6 December, that 'In all stages of the action all forms of air support would be an urgent requirement.'<sup>571</sup> This was hardly an informed assessment of the air requirements for support any Combined Operation. However, as a result of a memorandum submitted by CCO to the Chiefs of Staff on 16 November and discussed on 2 December it was decided to set up a Technical Sub-Committee to report on 'Whether the requirements of fire support in assaults could be met by bombing, gunfire from ships, or a combination of both.'<sup>572</sup> The RAF's representative on the committee was the DBO, Air Commodore J W Baker, thus highlighting the importance of the need for a discussion on aerial bombardment.<sup>573</sup> There was at this time two bodies that were seeking to examine the problems of bombardment in Combined Operations. While the initial results of the Assault Committee were disappointing this was not rectified by the

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<sup>568</sup> TNA, ADM 239/350, Lessons Learnt, p. 1.

<sup>569</sup> On naval gunfire support see, Brian Begbie, 'Naval Gunfire Support for the Dieppe Raid' MA Thesis (University of Ottawa, 1999).

<sup>570</sup> TNA, DEFE 2/1024, Short History of the Study of Requirements for Producing Fire Support for an assault Against a Defended Coast, 30 August 1943, p. 1.

<sup>571</sup> TNA, DEFE 2/1024, Short History, p. 2.

<sup>572</sup> TNA, AIR 20/9503, History of the Combined Operations Organisation, 1940 – 1945, (1956) p. 120.

<sup>573</sup> TNA, AIR 20/9503, History, p. 120; DEFE 2/1024, Short History, p. 3.

Technical Sub-Committee that only explored the provision naval support.<sup>574</sup> While it is clear that Dieppe had an impact on the planning for close support, these early efforts appear not to have explored aerial aspects in any meaningful manner.<sup>575</sup> Despite these difficulties it was recognised by the Assault Committee that any future exploration of the problems of close support was ‘fundamentally a joint naval and air problem’ and that for effective fire that was balanced there was a need for a ‘plan in which naval, military and air action must all play their parts.’<sup>576</sup>

While the Assault Committee and its investigations continued in early 1943, in general the question of support remained moot until planning for OVERLORD increased in the summer of 1943. During June 1943 a conference, RATTLE, was held to examine the problems facing OVERLORD’s planners. One of the early issues for discussion was air support. This meeting was to be chaired by Leigh-Mallory and was to examine in particular the issues of bombing and airborne forces.<sup>577</sup> Included for discussion was a paper on neutralising gun batteries. It summarised possible sources of contention that surround the use of aerial bombardment, for example, the physical impact that bombardment may have on ground force’s ability to move and the problem of providing adequate cover over all the proposed invasion beaches.<sup>578</sup> The memorandum also explored the question of why bombardment was desired and it questioned whether it was being used a tool for morale of troops or for military expediency.<sup>579</sup> The other question raised was what lessons were going to be learnt from

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<sup>574</sup> TNA, AIR 20/9503, History, p. 121; DEFE 2/1024, Short History, pp. 3-4.

<sup>575</sup> TNA, AIR 20/9503, History, p. 119.

<sup>576</sup> TNA, DEFE 2/1024, Appendix A – Summary of Findings of COHQ Assault Committee (November/December), 30 August 1943, p. 1.

<sup>577</sup> TNA, AIR 20/5229, RATTLE Programme, 23 June 1943, p. 1.

<sup>578</sup> TNA, AIR 20/5229, Air Bombardment – The Problem of Neutralising Coast Defences, 24 June 1943, pp. 1-2.

<sup>579</sup> TNA, AIR 20/5229, Air Bombardment, p.2.

air operations in the Mediterranean, in particular Operation CORKSCREW, the occupation of Pantelleria on 10 June 1943, which had been preceded by a ten day preliminary bombardment.<sup>580</sup> It is here that we start to see a divergence from the lessons from Dieppe in that it highlighted the need for some form of support but did not provide practical experience and that would be gained from other theatres of operation. It should also be noted that Fergusson credits Leigh-Mallory with playing a leading part and ensuring RATTLE occurred at all.<sup>581</sup>

With it becoming clear to the planners of OVERLORD and the various Mediterranean Combined Operations, that bombardment was a subject that needed a more rigorous investigation. Mountbatten submitted a paper to the Chiefs of Staff entitled *Considerations governing the support of a seaborne assault against a heavily defended coast*, which led to the proposal of the setting up of an inter-departmental committee to investigate the problem of bombardment.<sup>582</sup> The First Sea Lord at the Chiefs of Staff meeting on 17 August 1943 where it was agreed to set up the committee tabled this proposal.<sup>583</sup> It was agreed that the committee be set up and that a chairman be provided by COHQ. Sir Douglas Evill, VCAS, suggested that fire support should include all forms including aerial bombardment.<sup>584</sup> The decision to appoint the chairman was left to COHQ and it was decided to appoint an airman to the position, Air Vice-Marshal Ronald Graham.<sup>585</sup> Graham was a suitable choice for this position as he was currently serving as the Chief of Staff (Air) at COHQ and during the interwar years, he delivered

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<sup>580</sup> For details of CORKSCREW see, Fergusson, *The Watery Maze*, pp. 237-240; Ian Gooderson, *A Hard Way to Make War: The Allied Campaign in Italy in the Second World War* (London: Conway, 2008) pp. 76-78.

<sup>581</sup> Fergusson, *The Watery Maze*, pp. 273-274.

<sup>582</sup> TNA, AIR 20/9503, History, p. 122.

<sup>583</sup> TNA, AIR 20/9503, History, p. 122; DEFE 2/1024 'Extract from COS (43) 190<sup>th</sup> Meeting regarding Fire Support of Seaborne Landings against a heavily Defended Coast'.

<sup>584</sup> TNA, DEFE 2/1024, Extract from COS (43) 190<sup>th</sup> Meeting.

<sup>585</sup> TNA, DEFE 2/1024, Chief of Staff to CCO to Secretary, Chiefs of Staff Committee, 19 August 1943.

numerous lectures on the subject of Combined Operations at the RAF Staff College. The committee was made up of various representatives from each of the services and with relevant members from the forces preparing for OVERLORD attending most of the meetings.<sup>586</sup> At the first meeting, 4 September, of the committee it was agreed that the method for approach the problem should be split into:

- (i) Destruction or neutralisation of the coast defences.*
- (ii) Destruction or neutralisation of beach defences.*
- (iii) Tactical fire support of landings.*<sup>587</sup>

In discussing these key areas for examination, the first meeting spent much time considering the various forms of defences that would be encountered in each case. It was noted that the broad responsibilities of the three services in this form of action fell into two categories. First, on land, fire effect was an army requirement and that it should provide its own support; second, during the assault phase of any operation it was an air and naval problem to produce the required effect. Thus, there was an attempt to divide responsibility into spheres of operations.<sup>588</sup>

Whilst outside of the scope and remit of the committee, Graham made it clear to the committee of the possible limitation of aerial bombardment by pointing out that it would only be effective in an operation where air superiority had been achieved.<sup>589</sup> It was also pointed out by Professor Solly Zuckerman that there was a need to assess the cumulative effect of naval and air bombardment in order to consider appropriate methodologies.<sup>590</sup> The Air Ministry's representatives, Air Vice-Marshal Coryton and Breakey, ACAS (Ops) and ACAS (T) respectively, to prepare preliminary answers to

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<sup>586</sup> TNA, AIR 20/9503, History, p. 123.

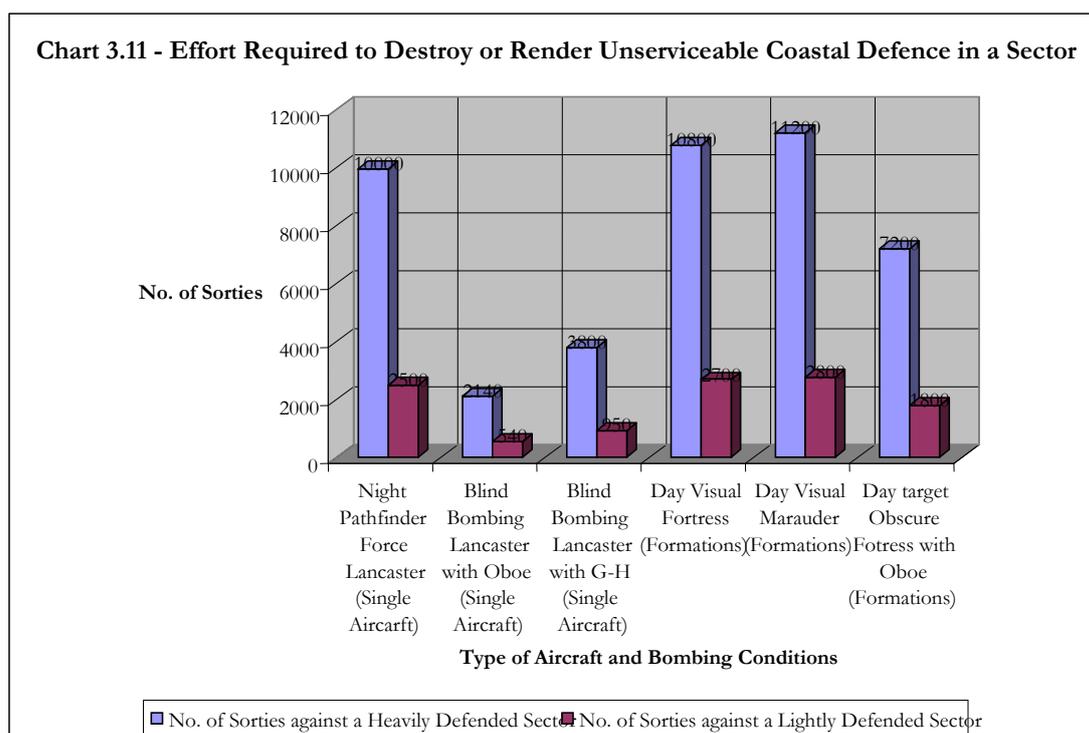
<sup>587</sup> TNA, DEFE 2/1024, Minutes of the 1<sup>st</sup> Meeting of the Interservice Committee to Consider Provision of Fire Support on a Heavily Defended Coast, 4 September 1943, p. 2.

<sup>588</sup> TNA, DEFE 2/1024, Minutes of the 1<sup>st</sup> Meeting, p. 2.

<sup>589</sup> TNA, DEFE 2/1024, Minutes of the 1<sup>st</sup> Meeting, p. 3.

<sup>590</sup> TNA, DEFE 2/1024, Minutes of the 1<sup>st</sup> Meeting, p. 3.

these issues, agreed concerning the three main problems facing the committee.<sup>591</sup> By the time of the second meeting of the committee, the Air Ministry had prepared two papers dealing with the issues of the destruction of coastal and beach defences by aerial bombardment.<sup>592</sup> On the issue of coastal defences, singled emplaced guns and batteries in open pits, it was generally concluded that attacks would be successful from high level but that attacks on concreted defences would have little, except moral, effect.<sup>593</sup> The investigation examined the practical implications attacking such positions and through comparison with CORKSCREW, it was agreed that in attacking this form of target bombs greater than 500lbs should be used and that the attack altitude was dependent on the intensity of AA defences in the area.<sup>594</sup>



<sup>591</sup> TNA, DEFE 2/1024, Minutes of the 1<sup>st</sup> Meeting, *passim*.

<sup>592</sup> TNA, DEFE 2/1024, Fire Support for an Opposed Landing statement by the Air Staff on the Destruction or Neutralisation of Coast Defences, 16 September 1943; DEFE 2/1024, Fire Support for an Opposed Landing statement by the Air Staff on the Destruction or Neutralisation of Beach Defences, 16 September 1943.

<sup>593</sup> TNA, DEFE 2/1024, Destruction or Neutralisation of Coast Defences, p. 6.

<sup>594</sup> TNA, DEFE 2/1024, Destruction or Neutralisation of Coast Defences, p. 2.

(Source: TNA, DEFE 2/1024 'Fire Support for an Opposed Landing statement by the Air Staff on the Destruction or Neutralisation of Coast Defences' 16 September 1943, p. 5)

Chart 3.11 illustrates the predictions made by the Air Ministry on the weight of effort needed to reduce coastal defences. As can be seen the most economical methods would appear to be with blind bombing Avro Lancasters equipped with Oboe. These figures were extrapolated from data acquired from CORKSCREW.<sup>595</sup> The paper not only considered the impact of bombardment but also examined the use of rocket-armed fighter-bombers in attacks against coastal defences. It was concluded that fighter-bombers were most effective against sandbagged emplacements and that 60lb high explosive rockets in a salvo of eight at an angle of twenty-five degrees was the most effective use of this weapon.<sup>596</sup> The paper was discussed at the second meeting of the committee on 18 September where Rear Admiral Patterson questioned the bombing accuracy figures supplied in the report. Coryton explained that the figure were the result of considering all factors and were based on the experience of highly trained crews, as were the Admiralty's. However, Graham highlighted that accuracy was a key issues and based upon the problems of getting bomber support in earlier operations this was an issue that had to be kept in mind by the committee.<sup>597</sup>

In addition to the paper on coastal defences, the Air Ministry also prepared a similar paper on how to deal with beach defences. The scope of this report examined attacks on numerous and scattered targets such as minefields and wire that would be present on any beach defence.<sup>598</sup> The paper concluded that because of the dispersed nature of the targets the most useful method of attack would be through the use of area

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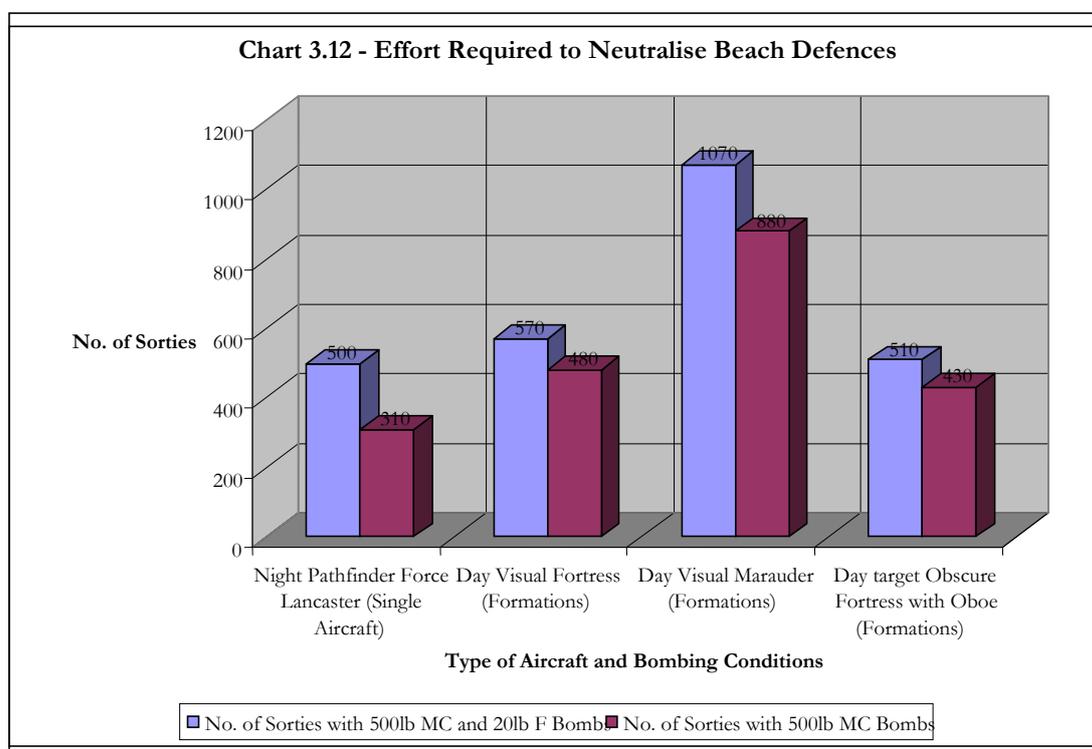
<sup>595</sup> TNA, DEFE 2/1024, Destruction or Neutralisation of Coast Defences, p. 5.

<sup>596</sup> TNA, DEFE 2/1024, Attacks on Gun Emplacements with R.P. - Appendix E to the Destruction or Neutralisation of Coast Defences', p. 1.

<sup>597</sup> TNA, DEFE 2/1024, Minutes of the 2<sup>nd</sup> Meeting of the Inter-Service Committee to Consider Provision of Fire Support for a Landing on a Heavily Defended Coast, 18 September 1943, p. 4.

<sup>598</sup> TNA, DEFE 2/1024, Destruction or Neutralisation of Beach Defences, p. 1.

bombing from medium or high altitude though it was noted that attacks on minefields were still be investigated and it was unsure what effect bombardment would have on this form of defence.<sup>599</sup> In terms of the effort, require to neutralise beach defences it was assumed that the most effective method was by Lancasters bombing with 500lb medium capacity and 20lb fragmentation bombs on targets marked by the Pathfinder Force as illustrated in Chart 3.12. It was also assumed that the proportion would be sixty per cent fragmentation bombs to forty per cent medium capacity bombs.<sup>600</sup>



(Source: TNA, DEFE 2/1024 'Fire Support for an Opposed Landing statement by the Air Staff on the Destruction or Neutralisation of Beach Defences' 16 September 1943, p. 2)

Both papers were discussed at the second meeting of the committee where it was agreed that due to the nature of conflicting figures on the weight and type of bombardment used by each of the services a technical sub-committee was to be set up to settle issues relating to the weight of bombardment.<sup>601</sup> However, Zuckerman pointed out to the committee that it was wrong to assume a commonality of power relating to similar

<sup>599</sup> TNA, DEFE 2/1024, Destruction or Neutralisation of Beach Defences, pp. 1-2.

<sup>600</sup> TNA, DEFE 2/1024, Destruction or Neutralisation of Beach Defences' p. 2.

<sup>601</sup> TNA, DEFE 2/1024, Minutes of the 2<sup>nd</sup> Meeting, p. 3.

weighted shells and bombs as they both had different ballistic and explosive properties, bombs having a higher explosive content than shells. He noted that during CORKSCREW a smaller weight of effort had been used and achieved good results in disrupting the ground around the beach defences.<sup>602</sup> Graham noted that because of the weight of work that had been completed by the time of the committee's second meeting an interim report would be produced by the time of the third meeting, which was scheduled for 9 October.<sup>603</sup>

In the time between the second and third meeting of the main committee the technical sub-committee met to discuss the issues raised over the weight of bombardment used by each services. Through the mechanism of this committee, the Air Staff refined their paper on attacks against coastal positions. However, in principle they reaffirmed a commitment to high and medium altitude bombing as the most appropriate method of attack.<sup>604</sup> In essence, it contained many of the recommendations that were in their previous papers on the subject and along with the previously prepared documents, would provide the basis of the appendices of the main report and are reproduced in Appendix 2 and 3. It reiterated that in order to have any effect on coastal positions any medium capacity bombs used must be greater than 500lbs and issues relating to altitude and prevailing weather conditions degraded that accuracy with such weapons. While stating the bombing was more efficient from altitudes above eight thousand feet the reason given for this was to counteract the impact of AA defences. The Air Staff argued that out of the impact zone of AA defences bombers were more accurate.<sup>605</sup> The report outlined four methods to be used in attacks, which were the standard methods then in

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<sup>602</sup> TNA, DEFE 2/1024, Minutes of the 2<sup>nd</sup> Meeting, p. 3.

<sup>603</sup> TNA, DEFE 2/1024, Minutes of the 2<sup>nd</sup> Meeting, pp. 5-6.

<sup>604</sup> TNA, DEFE 2/1025, Appendix II to the report of the Technical Sub-Committee: Attack on Coastal Defence Guns, p. 12.

<sup>605</sup> TNA, DEFE 2/1025, Appendix II, p. 12.

use by the RAF and offer little real insight into the effectiveness they might have. The methods were listed as:

- (i) *Visual day – level, glide or dive bombing.*
- (ii) *Visual night – by flare illumination.*
- (iii) *Bombing visually on target indicator bombs dropped by radio aids.*
- (iv) *Blind bombing using radio aids.*<sup>606</sup>

However, some indications of their effectiveness can be assembled from the figures given for the effort required to neutralise a target in report. It covers numerous scenarios where either individual aircraft or formations of aircraft may be used with the figures quoted being derived from experience in the Mediterranean and in bombing over Germany.<sup>607</sup> An overview of the figures provided can be seen in Table 3.2.

**Table 3.2 – Effort Required by Sorties**

	Bombing Conditions	Aircraft and Load	Sorties to be Dispatched against a:					
			12 Battery Sector			3 Battery Sector		
			12.5%	25%	50%	12.5%	25%	50%
<b>Individual Aircraft</b>	Day – Visual	Avro Lancaster (18 Bombs)	310	675	1625	80	170	400
	Day – Visual	Boeing B-17 Flying Fortress (12 Bombs)	470	1010	2440	120	250	600
	Night – Pathfinder Force (Target indicator bombs)	Avro Lancaster (18 Bombs)	710	1520	3670	180	380	920
<b>Individual Aircraft (Blind Bombing)</b>	Blind Bombing with Oboe	De Havilland Mosquito (4 Bombs)	625	1390	3350	160	350	840
	Blind Bombing with Oboe <sup>608</sup>	Avro Lancaster (18 Bombs)	140	310	740	35	80	190
	Blind Bombing with G-H <sup>609</sup>	Avro Lancaster (18 Bombs)	(310)	(675)	(1625)	(80)	(170)	(400)
<b>Formations</b>	Day – Visual	Boeing B-17 Flying Fortress (12 Bombs)	810	1750	4200	200	440	1080
	Day – Visual	Martin B-26 Marauder (6 Bombs)	1630	3500	8400	400	990	2100
	Day – Target obscured (Oboe leading)	Boeing B-17 Flying Fortress	(540)	91170)	(2800)	(140)	(290)	(700)

<sup>606</sup> TNA, DEFE 2/1025, Appendix II, p. 12.

<sup>607</sup> TNA, DEFE 2/1025, Appendix II, p. 15.

<sup>608</sup> At the point at which this report was prepared Lancasters were yet to be fitted with Oboe..

<sup>609</sup> Figures in brackets are tentative figure provided by the Air Ministry.

(Source: TNA, DEFE 2/1025 'Appendix II to the report of the Technical Sub-Committee: Attack on Coastal Defence Guns' p. 17)

The table illustrates that even under obscured conditions aerial bombardment had an effective chance of knocking out the target. Time was an issue raised by the sub-committee's report by pointing out that to achieve the higher rates of effort it would be necessary for aircraft using navigational aids to fly more than once and that the turnaround time would extend the period of operation. For this reason, it was considered that the effort required to achieve a twelve and a half per cent success rate against targets would be sufficient as it would destroy targets, maintain tactical surprise and decrease the time required over targets.<sup>610</sup> The acceptability of twelve and half per cent was discussed at the committee's third meeting where Major General Eldridge, the Director of the Royal Artillery, questioned the viability of this margin. However, Zuckerman noted that this margin was thoroughly discussed by the sub-committee and that it was considered that in order to offset this margin drenching fire from ships and support craft would mask the fire from surviving coastal guns; the committee accepted the margin as the basis for success.<sup>611</sup> The question of timing was an issue that had been raised in the planning for Dieppe and had accounted towards the cancellation of the bombing from the original plan. However, it is evident that even with the experience of Sicily the question of timing was still a moot point, with Coryton noting that going in early would not have much effect as troops could be replaced and that going in too late would denude the assaulting troops of effective support and this was noted in the final report

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<sup>610</sup> TNA, DEFE 2/1025, Appendix II to the report of the Technical Sub-Committee: Attack on Coastal Defence Guns, p. 18.

<sup>611</sup> TNA, DEFE 2/1025, Minutes of the 3<sup>rd</sup> Meeting of the Inter-Service Committee to Consider the Provision of Fire Support for a Landing on a Heavily Defended Coast held on Saturday, 9<sup>th</sup> October 1943, p. 5.

where it was concluding that air attack should not impact on the issue of tactical surprise.<sup>612</sup>

In finalising the report for submission to the Chiefs of Staff during November, it was circulated to the relevant heads of operational commands that would be involved in Combined Operations. For the RAF this primarily meant Fighter and Bomber Commands and the newly formed 2TAF under the command of Air Marshal Sir John D'Albiac. At this time, a report was submitted to Graham by the Director of Aerial Tactics (DAT) on the results of the bombing operation conducted during STARKEY. Thus, it can be seen that an operation with similar pretensions to JUBILEE fed into the process of considering the issues surrounding bombardment.<sup>613</sup> The report reaffirmed many of the recommendation made in the Graham Report with regard to the preferred use of heavy and medium bombers for this type of operation. Perhaps the most telling element of the report is the description of the results achieved by fighter-bombers against airfield targets and the recommendations made. It was noted that fighter-bombers and medium bombers caused repairable damage and that in order for these targets be rendered inoperable a force of one hundred thirty medium and heavy bombers would be required.<sup>614</sup> The general conclusion was reaffirmed in the analysis of attacks on coastal defence positions where fighter-bombers were described as not seriously damaging their targets with medium bombers being most successful in this operation.<sup>615</sup> D'Albiac's only concerns related to the final phase of operation and were linked to well known concerns of direct air support such as attacking too close to friendly troops and

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<sup>612</sup> TNA, DEFE 2/1025, Minutes of the 3<sup>rd</sup> Meeting, p. 3; DEFE 2/1025 'Report by the Inter-Service Committee formed to consider all existing means of providing Fire Support when Landing Forces on a Heavily Defended Coast' 25 October 1943, p. 6 (Graham Report).

<sup>613</sup> TNA, DEFE 2/1026, DAT to Graham, 9 November 1943.

<sup>614</sup> TNA, DEFE 2/1026, Preliminary Summary of Bombing Attacks – Operation Starkey, p. 5.

<sup>615</sup> TNA, DEFE 2/1026, Summary of Bombing Attacks, p. 4.

strict fire control from AA gunners offshore; an issue raised and considered during JUBILEE.<sup>616</sup>

Perhaps the most vociferous attack on the report came from Harris at Bomber Command who described the committee's findings as 'exceedingly questionable.'<sup>617</sup> Harris was critical of the many assumptions that had been used in the compilation of the report although many of these assumptions were based upon operational experience in Europe and the Mediterranean. Harris was overly concerned as to what would happen to the Combined Bomber Offensive if his bombers were expected to support such operations.<sup>618</sup> It should be noted that in mid-November 1943, Harris was about to launch his ill-fated attacks against Berlin. He attacked assumptions relating to air superiority and argued that this should be taken into consideration. Harris was wrong to point this out the problems of air superiority as it was outside of the committee's remit to consider this point. This is despite the fact that at the committee's first meeting Graham had clarified that air superiority was naturally a prerequisite for operations.<sup>619</sup> His opinions again illustrate the single-mindedness of Harris and his desire not to see his command used for any operation other than the bombing of Germany; this would be an issue that became a serious concern in the planning for OVERLORD.<sup>620</sup>

Graham took many of the relevant points under consideration and submitted the final report to the Chiefs of Staff on 23 December 1943. It was then issued as a Cabinet Paper on 7 January 1944 and distributed to the relevant departments planning Combined Operations such as COSSAC.<sup>621</sup> With the effort provided by all service ministries and the technical sub-committee, Graham produced an outline report that, with the exception of

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<sup>616</sup> TNA, DEFE 2/1026, D'Albiac to Leigh-Mallory, 9 November 1943.

<sup>617</sup> TNA, DEFE 2/1026, Harris to DCAS, 10 November 1943, p. 1.

<sup>618</sup> TNA, DEFE 2/1026, Harris to DCAS, p. 1.

<sup>619</sup> TNA, DEFE 2/1024, Minutes of the 1<sup>st</sup> Meeting, p. 3; DEFE 2/1026, Harris to DCAS, p. 1.

<sup>620</sup> TNA, DEFE 2/1026, Harris to DCAS, p. 2.

<sup>621</sup> TNA, AIR 20/9503, History, p. 123.

minor corrections, outlined the key factors determining effective fire support for Combined Operations. For the purpose of the report, Combined Operations were split into four phases, first, the preparatory phase, second, the approach, third, the assault and establishment of a beachhead, finally, the advance inland.<sup>622</sup> It was noted that all action would be joint, and that the effort fell into three tasks. First silencing coastal defences; second, drenching fire during the assault; finally, provision of support during the build up of the bridgehead.<sup>623</sup> The report concluded that in terms of the application of air power a success rate of twelve and half per cent would render coastal defence inoperable using the various methods discussed above. For drenching attacks on beach defences, it was agreed that a mixture of fragmentation and medium capacity bombs would produce the best result and that in an average bomb density of quarter of a pound per square mile would achieve advantageous results for the assault. For the final task, it was noted that the methods and density would be similar to the period of drenching fire, however, air support in this task would be based upon carefully prepared bomb lines in order to reduced friendly fire incidents.<sup>624</sup> The committee's responsibilities did not end with the report submittal but they were devolved onto one of the sub-committees of the Joint Technical Warfare Committee who widen the scope of information to include material coming out of operations in the Far East.<sup>625</sup> Thus, Dieppe began a process with the formation of the Assault Committee that was to continue through OVERLORD to the end of the war. Many sources were considered in the compilation of the report and it became one of the sources that added planning of the fire support plan for bombardment during OVERLORD.

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<sup>622</sup> TNA, DEFE 2/1025, Graham Report, p. 1.

<sup>623</sup> TNA, DEFE 2/1025, Graham Report, p. 1-2.

<sup>624</sup> TNA, DEFE 2/1025, Graham Report, pp. 1-11.

<sup>625</sup> TNA, AIR 20/9503, History, (1956) p. 123.

### 3.6 Conclusion

This chapter has sought to highlight some of the key issues raised by the use of air power during JUBILEE. It has shown that early accounts about the efficacy of the RAF during the raid are too simplistic in that they rely on unclear loss figures. Analysis of the RAF's losses reveals a much more complex picture of the aerial battle. It clearly shows that while losses were higher than the *Luftwaffe's* many of these were incurred by aircraft flying direct support missions and being shot down by AA fire. It also shows that many of the aircraft were damaged and able to make it back to Britain, so pilots and airframes were saved. By contrast, the *Luftwaffe* suffered losses that they could ill-afford. Thus, considering that offensive forces tend to suffer more than forces on the defensive, it can be said that in general the RAF's performance at Dieppe was more useful than previously assumed. The loss of HMS *Berkeley* would appear to suggest that not all was right for the RAF. There is some truth to this claim as the loss was caused by problems in calling down air cover during a German raid. However, this highlights a problem in the system and not the doctrine of air superiority. In addition, there were concerns over friendly-fire incidents for low flying aircraft. Contemporary accounts also highlight the perceived success of the RAF during the raid. Therefore, it led to discussion of further raids with the primary aim of bringing the *Luftwaffe* to battle. While this was a strategic dead end, it does illustrate the impact that the raid had upon the RAF. The majority of contemporary accounts, while not having access to fully accurate figures, talk of the successful role the RAF played during the raid. This was also back up by intelligence reports that Fighter Command was receiving. Based upon this it is, therefore, easy to understand why Leigh-Mallory sought similar operations over the French coast; whether similar success would have been achieved it open to conjecture.

The qualification of the 'Lessons Learnt' produces a more nuanced and varied picture of the RAF at Dieppe. However, this chapter has shown that JUBILEE certainly had an impact on RAF thinking but it should be assessed in line with developments in other theatres of war. JUBILEE facilitated the discussion of FDTs and command and control, but these ships had been on the cards since the start of 1942. The practical experience of *Calpe* as a HQS illustrated the need for a separate ship for the role of directing air power. However, it would be during 1943 that these ships gained practical experience. Much the same can be said for aerial bombardment. JUBILEE acted as an enabler for change but did not provide practical experience. This would come in the Mediterranean especially at Pantelleria. However, this experience was in line with JUBILEE, and would feed into the Graham Report, which alongside with practical experience provided a framework for the pre-bombardment utilised during OVERLORD.

## Conclusion

This thesis had as its central aim an examination of the effectiveness of the RAF during Operation JUBILEE. In order to do this the thesis has examined the doctrinal and operational context of the RAF's actions during the raid in order to understand why the RAF fought the air battle that it did. It has then examined the impact that JUBILEE had upon various aspects of the mechanics of Combined Operations. In particular, it examined the impact JUBILEE had upon the development of an effective command and control system for air power during Combined Operations and the discussions that occurred concerning the use of aerial bombardment in support of the assault against an opposed landing. This thesis has, through extensive analysis of contemporary and non-contemporary sources, sought to make a perceptive examination of the RAF's role during JUBILEE.

However, in order to assess the operational effectiveness of the RAF it is worth returning to the key issues discussed in the introduction. These issues can be summed up as service integration, flexibility, strategic context and operational evaluation. Each area highlights how effective was the RAF participation in JUBILEE. At the end, there will be some general remarks that will illustrate some of the key factors relating to the use of air power in Combined Operations, and how this thesis has contributed to our understanding of JUBILEE and, more widely, Combined Operations during the Second World War.

In the build up to and during JUBILEE, the RAF showed the degree to which as a service it was willing to integrate into Combined Operations. The fact that in the inter-war years the RAF called for a holistic Combined Operations doctrine illustrates that the RAF was aware of the need to consider inter-service cooperation on operations. That this did not happen was largely down to the other services, especially the RN, which

wished to keep the focus on amphibious operations. The RAF was aware of the key role it was to play in any Combined Operation and by the start of the war; the pre-requisite of air superiority was accepted by all the services. By 1942, the RAF had made a vigorous attempt to integrate itself into the Combined Operations organisation with the setting up of No. 1441 Flight at the CTC. This would eventually become No. 105 Wing, which would have an important role in controlling the crews required for the HQS and FDTs from 1943 onwards. This organisation from 1942 onwards would train squadrons from Fighter, Bomber and Army Co-Operation Commands in the principles relating to the support of Combined Operations. This occurred alongside their normal operations with which they were tasked. That this occurred despite the protestations of Harris, illustrates the importance that the Air Staff placed upon integration and co-operation.

During the course of JUBILEE Leigh-Mallory, as the senior RAF officer played a full part in the advising and operational decision-making process and during the course of the battle sought to control air operations with a representative onboard the HQS. That Leigh-Mallory was not on board himself highlights the difficulty of commanding air power and the need to be at a central command node to effectively control air assets. This would still be the overall situation in 1944, though eased by the development of the FDT. Leigh-Mallory also illustrated a willingness to work with Mountbatten on future operations when it showed the opportunity to attain his primary goal of air superiority, even though these would become strategic dead end.

The parallel development of Combined Operation doctrine and the operational objectives of Fighter Command merged to give that command its primary mission during JUBILEE. Normally viewed as a selfish act by the RAF, an understanding of Combined Operations doctrine shows that the opposite is actually the case. That the RAF's view of the role of air superiority had developed to include fighter operations by the time of JUBILEE helps to explain its role. The fact that it aided its Fighter Command's role in

1942 should not be seen negatively. It illustrates the flexibility of air power in the face of changing operational conditions. The need for air superiority from fighter aircraft had been illustrated in numerous campaigns before JUBILEE, prevented German attempts to gain air superiority in 1940.

That the RAF's *modus operandi* during JUBILEE fitted in with Fighter Commands role should as be noted viewed positively. The RAF was seeking to do its best to prevent the *Luftwaffe* from interfering with the operation. In this, it was generally successful. That the RAF suffered more than the *Luftwaffe* is not an indication that it was out fought on the day as the detailed analysis above illustrates that many of the airframes were returned to service and many pilots were rescued. This would be a telling factor for the *Luftwaffe* whose inability to replace losses would cost them in the air battles of the 1943 and 1944. However, the RAF was able to maintain an effective strength in 1943 with a well-trained cadre of pilots. The *Luftwaffe* was not able to do from 1942 onwards due to poor training and the high rate of losses it was suffering on all fronts.

Possibly the one area where problems occurred in the aftermath of JUBILEE was in the belief held by Leigh-Mallory and Mountbatten that a similar operation could be launched in order to wear down the *Luftwaffe* by forcing it to fight, even the RAF was forced to admit that the method was a one shot strategy and without the actual landing of significant forces there was unlikely to be a repeat performance. However, given the strategic situation of late 1942 and early 1943 it was perhaps not wrong for it to be tried. Both AFLAME and COLEMAN were strategic dead ends and this was realised by members of the Air Staff who vetoed the operations as far as they could. That they stayed on the agenda may well be explained by Mountbatten's attempts to garner more power for COHQ, as was seen in the preparation for JUBILEE. However, Leigh-Mallory must not be excused for not seeing the fallacy of this strategy. Despite the

failures of late 1942 the strategy was revived as part of deception plans in 1943, however, once again it did not succeed in the aim of bringing the *Luftwaffe* to battle.

In terms of the direct impact of air power on JUBILEE, it can be argued that with the exception of the loss of HMS *Berkeley* and some landing craft the cover provided by Fighter Command was useful in preventing the full weight of the *Luftwaffe* attacking the beaches. It was noted by eyewitness that some of the losses, while regrettable, were not the fault of the RAF as in the midst of battle craft were arriving late and caught in the maelstrom. The loss of HMS *Berkeley* was primarily the fault of the failure of command and control systems then in place to deal with RAF aircraft flying below three thousand feet. This meant that *Luftwaffe* aircraft under this height became the RN's responsibility, therefore, the loss must be put down to the RN's AA defences. In general, the direct support provided was very useful. For example, the attacks on the Hess Battery aided No.4 Commando's operation. Smoke laying was found to be very useful and was most welcome in the withdrawal phase of JUBILEE. The most disappointing aspect was the provision of Tac R, which were left with little to do, as the Germans did not send in reserves. However, the battle was costly for the RAF, with aircraft on the direct support mission suffering the most. Nevertheless, the RAF was willing to accept these losses.

Traditional arguments relating to the effectiveness of JUBILEE usually relate to its importance in providing lessons that contributed to the success of OVERLORD. This is certainly the argument made by Mountbatten in his later life and supported by Hughes-Hallett. From an air power perspective, it is hard to support this position. That JUBILEE served a purpose is certainly true. It fitted in with the prevailing view of air power in support of Combined Operations and aided Fighter Command's key operational objectives; however, these lessons did not last into 1944. By 1943, it became apparent to the Allies that the battle for air superiority in preparation for OVERLORD

would have to be fought closer to Germany and due to the technical limitation of Fighter Command's equipment; this battle would be primarily fought by the 8AAF.

Therefore, if the lessons of JUBILEE were not important in the preparation for OVERLORD, were they as useful elsewhere? The answer to this is that JUBILEE's importance lay in the impact it had upon events in 1943. JUBILEE acted as an enabler of change. It illustrated problems that had to be resolved if air power was to be fully effective in Combined Operations. The problems that occurred in the command and control of air power during JUBILEE, noticeably the loss of HMS *Berkeley*, led to the development and refinement of a command and control system that played a useful role in the Mediterranean and came to fruition at Normandy. Had the war gone on beyond 1945 it is also likely that the further development of the FDT concept into ocean going FDS would have been useful to SEAC. The ability to control air power within the area of fleet AA defence during OVERLORD overcame the primary problem encountered during JUBILEE.

JUBILEE also illustrated the need for some form of aerial bombardment in support of Combined Operations, though its exclusion was for valid reasons. In order to deal with this contentious issue, as illustrated by Harris' unwillingness to allow Bomber Command aircraft to bomb civilian targets in France, the formation of the inter-service committee on fire support was encouraged by discussions emanating from JUBILEE. This committee, led by the RAF examined the issue and made suggestions that would aid the planners of OVERLORD where aerial bombardment was used fully. Indeed the choice of Graham as chair was a perceptible one due to his pre-war experience in Combined Operations doctrine. However, as JUBILEE was an enabler it should be recognised that much practical experience in this issue and the development of the FDT concept came from the Mediterranean, which proved to be a training ground for ideas being developed. The Graham Report that appeared in December 1943 would form one

source of information for the planners of OVERLORD. In providing this source of information, the RAF illustrated its flexibility and willingness to work with other services on joint issues.

The thesis has sought to re-frame the debate surrounding the RAF at Dieppe by taking a progressive examination of both its operational and doctrinal context. Then it has sought to examine what impact JUBILEE had on air power in Combined Operations. Generally, it can be argued the RAF performed well on the day and that while losses were high these were either replaceable or repairable. Its impact upon on the *Luftwaffe* is more difficult but it can be said that their losses were more difficult to replace. While losses to the assault force occurred, it can be argued that had the RAF not been fighting for air superiority, thus, providing air cover, they would have been worse. The impact of JUBILEE on future operations is more difficult to assess. Certainly JUBILEE enabled discussions to occur but whether this had a direct link to OVERLORD is debatable given the vast amount of experience be gained in the Mediterranean. Thus, this thesis has hopefully refocused the debate on JUBILEE to an examination of the operational effectiveness of the RAF and the impact on developments in 1943 not 1944.

## Appendix 1

### Air Force Order of Battle for Operation JUBILEE, 19 August 1942<sup>626</sup>

#### Royal Air Force Units

Sector	No. of Squadrons	Primary Role	Squadron	Base	Aircraft
<b>Kenley</b>	4	Air Cover	111	Kenley	Supermarine Spitfire Mk. Vb
		Air Cover	611	Kenley	Supermarine Spitfire Mk. IX
		Air Cover	308 (Eagle)	Kenley	Supermarine Spitfire Mk. Vb
		Air Cover	402	Kenley	Supermarine Spitfire Mk. Vb
<b>Kenley</b>	3	Air Cover	350	Redhill	Supermarine Spitfire Mk. Vb
		Air Cover	310	Redhill	Supermarine Spitfire Mk. Vb
		Air Cover	312	Redhill	Supermarine Spitfire Mk. Vb
<b>Northolt</b>	4	Air Cover	306 (Polish)	Northolt	Supermarine Spitfire Mk. Vb
		Air Cover	317 (Polish)	Northolt	Supermarine Spitfire Mk. Vb
		Air Cover	308 (Polish)	Heston	Supermarine Spitfire Mk. Vb
		Air Cover	302 (Polish)	Heston	Supermarine Spitfire Mk. Vb
<b>Northolt</b>	1	Air Cover	303 (Polish)	Redhill	Supermarine Spitfire Mk. Vb
<b>Tangmere</b>	2	Air Cover	131	Merston	Supermarine Spitfire Mk. Vb

<sup>626</sup> TNA, AIR 20/5186, Appendix A to Report by the Air Force Commander; Franks, *The Greatest Air Battle*, pp. 222-225; Franks, *Fighter Command Losses*, pp. 56-62

		Air Cover	412	Merston	Supermarine Spitfire Mk. Vb
<b>Tangmere</b>	1	Air Cover	309 (Eagle)	West Hampnett	Supermarine Spitfire Mk. Vb
<b>Tangmere</b>	2	Air Cover	129	Thorney Island	Supermarine Spitfire Mk. Vb
		Air Cover	130	Thorney Island	Supermarine Spitfire Mk. Vb
<b>Tangmere</b>	4	Air Cover	66	Tangmere	Supermarine Spitfire Mk. Vc
		Air Cover	118	Tangmere	Supermarine Spitfire Mk. V
		Air Cover	501	Tangmere	Supermarine Spitfire Mk. Vb
		Air Cover	41	Tangmere	Supermarine Spitfire Mk. Vb
<b>Tangmere</b>	2	Close Support	43	Tangmere	Hawker Hurricane Mk. IIc
		Close Support	87	Tangmere	Hawker Hurricane Mk. IIc
<b>Tangmere</b>	2	Close Support	3	Shoreham	Hawker Hurricane Mk. IIc
		Close Support	245	Shoreham	Hawker Hurricane Mk. IIc
<b>Tangmere</b>	2	Close Support	32	Friston	Hawker Hurricane Mk. IIc
		Close Support	253	Friston	Hawker Hurricane Mk. IIc
<b>Tangmere</b>	2	Direct Air Support	174	Ford	Hawker Hurricane Mk. IIc
		Direct Air Support	175	Ford	Hawker Hurricane Mk. IIc
<b>Tangmere</b>	2	Bomber	88	Ford	Douglas Boston Mk. III

		Bomber	107	Ford	Douglas Boston Mk. III
<b>Tangmere</b>	3	Smoke Laying	13	Thrupton	Bristol Blenheim Mk. IV
		Smoke Laying	614	Thrupton	Bristol Blenheim Mk. IV
		Smoke Laying	226	Thrupton	Douglas Boston Mk. III
<b>Tangmere</b>	1	Bomber	418	Bradwell Bay	Douglas Boston Mk. III
<b>Tangmere</b>	1	Bomber	605	Ford	Douglas Boston Mk. III
<b>Debden</b>	3	Air Cover	232	Gravesend	Supermarine Spitfire Mk. Vb
		Air Cover	71	Gravesend	Supermarine Spitfire Mk. Vb
		Air Cover	124	Gravesend	Supermarine Spitfire Mk. VI
<b>Debden</b>	2	Air Cover	616	Hawkinge	Supermarine Spitfire Mk. VI
		Air Cover	416	Hawkinge	Supermarine Spitfire Mk. Vb
<b>North Weald</b>	2	Air Cover	121	Southend	Supermarine Spitfire Mk. Vb
		Air Cover	19	Southend	Supermarine Spitfire Mk. Vb
<b>North Weald</b>	4	Air Cover	242	Manston	Supermarine Spitfire Mk. Vb
		Air Cover	331	Manston	Supermarine Spitfire Mk. Vb
		Air Cover	332	Manston	Supermarine Spitfire Mk. Vb
		Air Cover	403	Manston	Supermarine Spitfire Mk. Vb

<b>Hornchurch</b>	3	Air Cover	64	Hornchurch	Supermarine Spitfire Mk. IXc
		Air Cover	122	Hornchurch	Supermarine Spitfire Mk. Vb
		Air Cover	340	Hornchurch	Supermarine Spitfire Mk. Vb
<b>Hornchurch</b>	2	Air Cover	81	Fairlop	Supermarine Spitfire Mk. Vb
		Air Cover	154	Fairlop	Supermarine Spitfire Mk. Vb
<b>Hornchurch</b>	3	Air Cover	485	West Malling	Supermarine Spitfire Mk. Vb
		Air Cover	610	West Malling	Supermarine Spitfire Mk. Vb
		Air Cover	411	West Malling	Supermarine Spitfire Mk. Vb
<b>Biggin Hill</b>	3	Air Cover	602	Biggin Hill	Supermarine Spitfire Mk. Vb
		Air Cover	307 (Eagle)	Biggin Hill	Supermarine Spitfire Mk. Vb
		Air Cover	222	Biggin Hill	Supermarine Spitfire Mk. Vb
<b>Biggin Hill</b>	2	Air Cover	165	Lympne	Supermarine Spitfire Mk. Vb
		Air Cover	401	Lympne	Supermarine Spitfire Mk. IX
<b>Biggin Hill</b>	2	Air Cover	65	Eastchurch	Supermarine Spitfire Mk. Vb
		Air Cover	133	Eastchurch	Supermarine Spitfire Mk. Vb
<b>Biggin Hill</b>	1	Air Cover	91	Hawkinge	Supermarine Spitfire Mk. Vb
<b>Gatwick</b>	4	Tac R	26	Gatwick	North American Mustang

					Mk. Ia
		Tac R	239	Gatwick	North American Mustang Mk. Ia
		Tac R	400	Gatwick	North American Mustang Mk. Ia
		Tac R	414	Gatwick	North American Mustang Mk. Ia
<b>Duxford</b>	3	Air Cover	56	Duxford	Hawker Typhoon Mk. I
		Air Cover	266	Duxford	Hawker Typhoon Mk. I
		Air Cover	609	Duxford	Hawker Typhoon Mk. I

**United States 8<sup>th</sup> Army Air Force Units**

<b>Higher Formation</b>	<b>Squadrons</b>	<b>Base</b>	<b>Aircraft</b>
<b>97<sup>th</sup> Bomber Group</b>	340 <sup>th</sup>	Polebrook	Boeing B-17 Flying Fortress
	341 <sup>st</sup>	Polebrook	Boeing B-17 Flying Fortress
	342 <sup>nd</sup>	Grafton Underwood	Boeing B-17 Flying Fortress
	414 <sup>th</sup>	Grafton Underwood	Boeing B-17 Flying Fortress

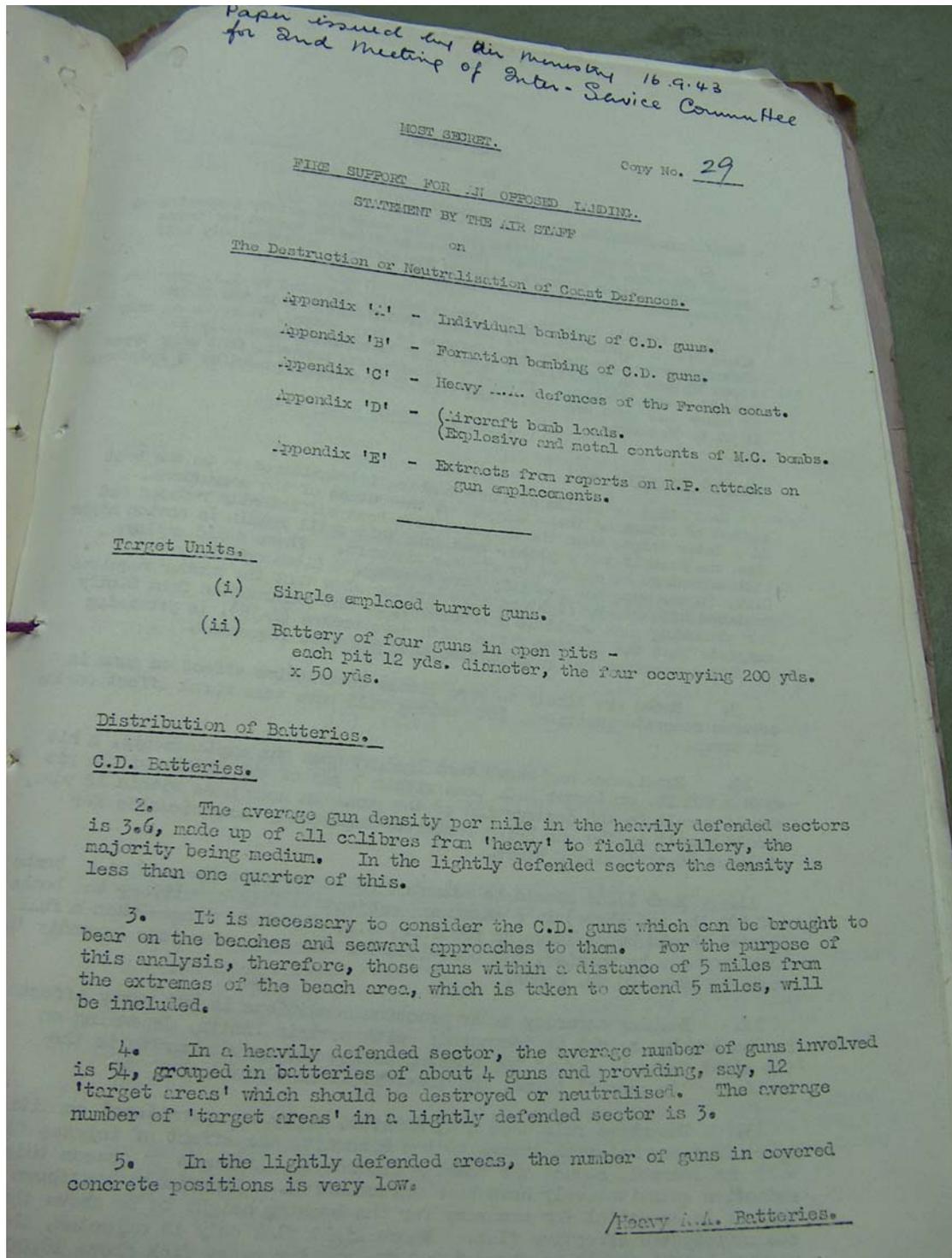
**Totals**

<b>Mission</b>	<b>Aircraft</b>	<b>Total</b>
<b>Air Cover</b>	Supermarine Spitfire (All Marks)	48
<b>Air Cover</b>	Hawker Typhoon	3
<b>Smoke Laying</b>	Douglas Boston	1
<b>Smoke Laying</b>	Bristol Blenheim	2

<b>Bomber</b>	Douglas Bomber	4
<b>Direct Air Support</b>	Hawker Hurricane	2
<b>Tac R</b>	North American Mustang	4
<b>Close Support</b>	Hawker Hurricane	6
<b>Diversionsary Bombing</b>	Boeing B-17 Flying Fortress	4
<b>Total</b>		<b>74</b>

## Appendix 2

### Fire Support for an Opposed Landing: Statement by the Air Staff on the Destruction or Neutralisation of Coast Defences, 16 September 1943<sup>627</sup>



<sup>627</sup> TNA, DEFE 2/1024, Fire Support for an Opposed Landing statement by the Air Staff on the Destruction or Neutralisation of Coast Defences, 16 September 1943

Heavy A.A. Batteries (see also Appendix '0')

6. The heavy A.A. batteries on the coast are mainly concentrated round the towns and therefore appear to be sited to defend the towns rather than hinder aircraft crossing the coast. Approximately half of these guns are combined A.A./C.D. guns.

7. Broadly speaking, the areas heavily defended by A.A. guns are those with a relatively heavy density of C.D. guns. In the lightly defended areas, the heavy A.A. defence is very meagre, there being only about 70 guns in 700 miles of coast, and is unlikely seriously to embarrass air attacks. It must be remembered, however, that many types of heavy A.A. guns are mobile and that an area could probably be reinforced in 24 to 36 hours.

General Principles:

8. High or medium altitude bombing is considered to be the best method of attacking these targets at the outset of the operations. At a later stage, when the defences have been sufficiently reduced and when the assault takes place, open guns that still remain in action might with advantage be engaged by fighter aircraft. These could employ R.P., 20 mm. guns and possibly dive bombing. (Although the results achieved hitherto by fighters dive bombing show that the number required for attacking guns would be prohibitive, recent information from Sicily suggests that the Mustang fitted with dive brakes (A-36), is promising in this connection and quantitative data has been requested.

9. Bombs are likely to have little destructive effect on guns in covered concrete positions, but bombing will have some moral effect on the gun crews.

10. Experience has shown that against open gun emplacements, a hit with a 500 lb. or larger M.C. bomb within 7 yds. of the middle of the pit should result in the destruction of the gun. A near miss within 12 yds., should result in the gun being rendered temporarily unserviceable for at least 60 skilled man hours.

11. Bomb loads should be selected to ensure that the number of bombs (of 500 lb. and above) is a maximum; subject to this condition, the bombs carried should be as large as possible, e.g. for short ranges when a full bomb load can be carried, the best load for the Lancaster (see Appendix 'D') would be 18 x 500 lb. bombs.

12. Bombing accuracy under practice conditions is adversely affected as the bombing height is increased; with certain limits, depending on the sight used, the lower the bombing height the more accurate is the bombing. In general terms, the lower limit is about 4,000 ft.

13. The above rule does not, however, apply to operational conditions. Apart from the material damage to the aircraft, the effect of intense flak will considerably reduce the bombing accuracy. Attempts to assess this reduction quantitatively have been unsuccessful. Experience has shown that it is essential for accuracy for the bombing height to be above that of the anticipated effective flak. Where light flak only is expected, the bombing height should be above 8,000 ft. and for heavy flak above 16,000 ft.

14. Weather conditions and the period of the day (night or day) have a direct bearing on the bombing method to be used.

/Bombing Methods.

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Bombing Methods.

15. The standard methods of bombing are:-
- (i) Visual day - level, glide or dive bombing.
  - (ii) Visual night - by flare illumination.
  - (iii) Bombing visually on target indicator bombs dropped by radio aids.
  - (iv) Blind bombing using radio aids.

16. For varying conditions of visibility, the following methods would be the most effective for obtaining the highest probability of not missing a small target with the minimum number of bombs:-

(i) Day - clear weather.

Bearing in mind all the practical limitations, formation bombing is the most effective method. Within practical limitations bombing accuracy decreases as the size of the formation increases.

(ii) Day - target obscured.

- (a) Formation bombing from above the clouds, the leader using blind bombing aids.
- (b) Individual aircraft using blind bombing aids.

(iii) Night - clear weather.

- (a) Bombing on target indicator bombs dropped by radio aids.
- (b) Individual aircraft using blind bombing aids.

(iv) Night - target obscured.

Bombing would have to be restricted to individual aircraft using blind bombing aids.

Effort required to destroy or render temporarily unserviceable the target units specified in para. 1 above.

17. Details of calculations that have been made of the order of the number of sorties required to ensure not missing the 'units' specified in para. 1 are given in Appendices 'A' and 'B'. The following table gives representative numbers of sorties required for an 80% chance of destroying a single open gun or a battery of four. To obtain the figures for temporary unserviceability as defined in para. 10 above, the numbers in the last two columns may be divided by 3.

It should be noted that the figures given for bombing methods in which a bombsight is used apply to present standards in those theatres where the experience has been gained. In considering operations in any specific theatre, some adjustment may be necessary in the light of prevailing conditions.

/TABLE I.

TABLE I.

Bombing Conditions	Aircraft	Sight	Height (ft.)	Average error (yds.)	No. of sorties 80% chance*	
					Single guns.	Four-gun battery.
<u>Single Aircraft.</u>						
Night P.F.F.	Lancaster	Mt. XIV	6/12000	400 with 200 off-set	700	840
Blind bombing day or night.	Lancaster <sup>x</sup>	Obce	-	200	140	180
Blind bombing day or night.	Lancaster	G-H	-	(300) <sup>∅</sup>	(320)	(320)
<u>Formations.</u>						
Day visual	Fortress	Norden	16,000	400	900	900
Day visual	Marauder	Norden	9,000	300	930	930
Day - target obscure.	Fortress	Obce	-	200	(600)	(600)

\* Figures for single aircraft include an allowance of 30% for gross errors, etc. The figures for formations are deduced from the Pantellaria figures and so already contain gross error allowances.

x Lancasters are not at present fitted with Obce, but the accuracy obtained by Mosquitoes applies.

∅ Numbers in brackets are tentative.

Efforts required to destroy or render temporarily unserviceable C.D defences of a sector.

18. As defined in para. 4 above, there are 12 'target areas' in a heavily defended sector and three in a lightly defended one. The numbers of sorties required for an 80% chance of destruction are given in Table II below; those for temporary unserviceability are obtained by dividing these numbers by three.

TABLE II.

TABLE II.

Bombing conditions.	Aircraft	No. of sorties	
		Heavily defended sector.	Lightly defended sector.
Night P.F.F. Blind bombing (day and night)	<u>Single Aircraft.</u>		
	Lancaster	10,000	2,500
	Lancaster (Obce) (G-H)	2,140	540
Day visual	<u>Formations.</u>	3,800	950
	Fortress	10,800	2,700
Day visual	Marauder	11,200	2,800
Day - target obscure	Fortress (Obce)	(7,200)	(1,800)

Comparison with Pantellaria Success.

19. The figures in Table II appear very large compared with the number of sorties required in Pantellaria to destroy 10 guns out of 80 attacked. This is because the requirement of 80% destruction has been assumed, while that actually achieved in Pantellaria was 12 1/2%.

20. As reduction progresses the number of bombs required for each succeeding 10% is greater, and with the same methods of calculation as used in Appendix 'B', it is estimated that 20,000 bombs would be required to destroy 10 out of 80 guns, arranged in isolated batteries of 4 guns. In Pantellaria, the number actually dropped to produce this result was 13,000 approximately. The discrepancy can be readily explained by the close grouping of some of the Pantellaria batteries, and the use of photographic cover to economise bombs.

21. The first factor alone appears sufficiently large to account for most of the discrepancy. For 9 out of the 15 batteries shown on the map in the Pantellaria report, the closeness of spacing is sufficient for them almost to be regarded as constituting 4-unit batteries, so that the 15 batteries can almost be covered by ten aiming points and thus by two thirds of the number of bombs required for isolated batteries.

22. To achieve the same order of destruction throughout the array, as was obtained at Pantellaria (12 1/2% instead of 80% destruction), the number of Fortress sorties required is of the order of 1020 for the heavily defended sector and 260 for the lightly defended one (i.e., of the order of 85 Fortress sorties per isolated battery).

23. The R.F. weapon is estimated to be most effective against guns in open pits (see Appendix 'E'), but the aircraft are very vulnerable to A.A. defence. It is therefore advisable to defer their use until the A.A. has been sufficiently reduced. This stage may have been reached after preliminary bombardment.

/2.

Conclusions.

24. Even with the high standard assumed, the destruction of C.D. guns in open emplacements of a highly defended sector by Air Forces is feasible, except under conditions which necessitate blind bombing, provided that:-

- (i) The necessary time is available to complete the operation.
- (ii) The weather conditions permit the operations for the time required.
- (iii) The degree of air superiority attained ensures that the bombers have requisite freedom from enemy air attack.

25. The attack of guns in covered concrete positions is liable to have little, except moral, effect.

26. It is suggested that in order to use the Naval and Air Forces to best advantage the attack on C.D. guns should be a joint one in which after preliminary bombing by the Air Forces, the attack is continued by Naval bombardment and surviving guns, where possible, are attacked by fighters using R.F. and 20 mm. guns. By this means a smaller force of bombers would be required, thus relieving more for employment on other targets where the Navy would be unable to assist.

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 HEADQUARTERS  
 16 SEP 1943

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- 400
- 600

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INDIVIDUAL BOMBING OF C. D. GUNS.

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APPENDIX A.

In order to estimate the chance of hitting gun units by individual aim, the following table I has been prepared showing the number of bombs required for different average errors, aiming at a target 14 yards in diameter.

Table I.  
Numbers of bombs required for different average errors, aiming at a gun.

Average error (yards)	Number of Bombs to ensure not missing.		
	65% chance	80% chance	90% chance.
50	65	105	150
100	260	440	625
200	1,050	1,800	2,600
400	4,160	7,000	10,000
600	8,500	15,000	20,000

Bombing of batteries with Single Bombs.

Table II gives the number of bombs required, with different average errors, for the chance of a hit on a gun when the aim is offset by 100 yards. This offset is taken because the four guns of a battery are considered to be dispersed within a rectangle 200 yards x 50 yards. It will be seen that the effect of the offset is negligible for average errors of 400 yards and greater.

Table II  
Number of bombs required aiming off 100 yards

Average error (yards)	Number of bombs to ensure not missing.		
	65% chance	80% chance	90% chance
50	1,400	2,500	3,500
100	520	900	1,250
200	1,300	2,250	3,200
400	4,160	7,000	10,000
600	8,500	15,000	20,000

Although the numbers of bombs required for the smaller errors are greater than in Table I, there will be a considerable chance of hitting more than one gun.

Stick Bombing.

3. In general, individual release will not be employed, but the use of stick bombing will not substantially alter the numbers of bombs in Tables I and II except when the stick-length considerably exceeds the aiming error. This condition is usually satisfied.

Expected Errors.

4. 50 - 100 yards error is representative of dive and very low level bombing. At 50 yards error, comparison of Tables I and II shows that it is more profitable to aim at guns singly, rather than at the battery.

200 yards error is representative of Oboe bombing in the area considered.

300 - 400 yards error is representative of C.H. bombing since the angle of error in this region is small. This figure is tentative, since data are meagre.

300 - 600 yards error is representative of the order of accuracy to be expected from the Main Bomber Force at 6,000 to 10,000 feet, with a marker in good weather daylight bombing or good weather night bombing with a marker.

Resultant Chance of Success for Individual Bombing Techniques using Bomber Command aircraft, with present standards.

5. The expected number of sorties to be despatched for the various chances of success of destroying one battery are given in Table III.

Table III  
Numbers of Sorties - Individual Bombing (B.C. aircraft)

Technique	Aircraft	Error Assumed (yards)	Failure %	Number of sorties for chances of destruction *		
				65%	80%	95%
Day visual (No fighter opposition) Main Bomber force.	Lancaster	300	30	190	320	440
Oboe Marking	Lancaster	400 offset 200	30	490	840	1,190
Oboe bombing	Mosquito	200	30	460	800	1,120
G - H bombing	Lancaster II	300	(30)	190	320	440

\* For temporary unavailability, the numbers of sorties can be divided by 3.

6. Notes on Table III

- (i) In the above table, it must be understood that the first two rows apply to present conditions of Bomber Command technique, and are not representative of what could be done with practice in daylight bombing.
- (ii) The column headed "failure" gives the increase in the number of sorties occasioned by aircraft, bomb and technical failures and gross errors. 10% of aircraft dispatched can be discounted in all cases for the first two causes. In Oboe marking and daylight bombing a further proportion will misidentify the aiming point. At Montbeliard and Friedrichshafen this was of the order of 40% - it is here taken as 20% on account of the short range, and the territory being well-known.
- (iii) The Oboe bombing technique is subject to a severe time limitation. In the region considered, at present only one channel is available, allowing only 6 aircraft per hour to be despatched. By moving one Oboe Station from its present site, a second channel could be made available, so that 12 aircraft could be dispatched per hour.
- (iv) The figures applying to G - H are tentative, pending accuracy trials.
- (v) The calculations on the day visual bombing and Oboe marking in Table III are based on operations against targets similarly lightly defended so that the effect of this is automatically allowed for.

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Bomber

In the calculations, the Lancaster has been taken to carry 18, the Mosquito 4 bombs.  
Table I shows that when the accuracy is high, it is better to attack individual guns if this can be done, and that this is the method most economical.  
The case has been worked out by M.A.E. for individual attack on a battery the IR.XIV sight, and an estimate of casualties has been made for various cases of flak opposition.  
The target was taken as four gun-pits each of 6 yards radius, 70 yards diameter. Comparing this with the case taken in the remainder of this report, the target-area is the same, but the 6 yard radius for the gun-pit (against a 100 yard vulnerable radius taken elsewhere) will make the figures in Table IV too low. On the other hand, no allowance has been made for gross errors etc., and errors assumed for the sight have been got by multiplying A. & A.E.E. figures by an operational factor, and may be less than those which would be got by operational crews.

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Table IV  
Estimated number of Aircraft required for Individual Bombing of all four guns of battery separately - High accuracy bombing at best heights considering opposition.

Opposition	Height (ft)	Number of aircraft for								
		65.5% chance				90% chance				
		9 stick	15 stick	27 stick	9 stick	15 stick	27 stick	9 stick	15 stick	27 stick
1,190 1/2 Tirpitz armament	5,700	126	80	63	107	122	98			
1,120 2 x 20 mm A.A.	3,100	96	66	52	151	103	82			
440 4 x 105 mm dual purpose & no A.A.	Height as low as possible without entering n/g. and rifle range-1,500'	74	57	46	118	88	72			

Notes on Table IV

(i) The heights in column 2 have been selected so that the casualties expected are not more than 5%, and yet the numbers of aircraft required are not unduly high. If greater heights are taken, casualties will be practically zero, but more aircraft will be required.

"1/2 Tirpitz" armament corresponds to  
4 x 105 m.m.  
4 x 37 m.m.  
10 x 20 m.m. guns.

(ii) The errors assessed at different heights were obtained as below :-

TABLE V.

Height of attack (feet)	A. & A.E.E. Probable Error (yards)	Operational factor.	Probable error in operations (yards)
1,500	30	1.5	45
5,000	46	1.5	69
8,000	66	1.33	88
15,000	140	1.25	175

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- (iii) The chance of success will be slightly greater if the attack is made within 20° of the line of the pits.
- (iv) The chance of success will be increased if it is possible to divert aircraft from an emplacement already destroyed to another one.

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FORMATION BOMBING OF C.D. GUNS APPENDIX B.

In this appendix, attacks on the batteries by Fortress and medium bomber aircraft are considered, using operational results obtained to arrive at an estimate. This then represents what can be done with the present state of training.

Table 1 gives the expectations in sorties required, for the results which can be achieved now.

TABLE I.  
Numbers of sorties required

Aircraft	2 guns per battery		3 guns per battery	
	Destruction	Temporary Unserviceability	Destruction	Temporary Unserviceability
Fortress (B.17)	440	150	900	300
Marauders (B.26)	470	160	930	310

Calculation - General.

The battery occupies an area of 10,000 sq. yards. With a vulnerable radius 7 yards, the vulnerable area of a gun is 154 sq. yards. If a bomb falls within the battery area, there is a chance  $154/10,000$  of destroying a gun, and  $(1 - 154/10,000)$  of missing it. Thus if  $n$  bombs fall within battery area, the chance of not missing the vulnerable target area is  $1 - (1 - 154/10,000)^n$ . This leads to the following chances of not missing for different numbers of bombs falling within the battery area.

Chance (%)	12 1/2	25	50	60	70	75	80	90
Number of bombs.	8 1/2	19	44	60	76	90	105	154

Calculation - Fortresses.

The numbers of bombs which must be dropped to achieve these densities can be estimated from the results of operation "Corkscrew". In this operation, Fortress aircraft achieved a density at the aiming point estimated as 3.3% of bombs dropped, in an area of 40,000 sq. yards. It can therefore be assumed that 0.85% of bombs dropped fell in an area of  $200 \times 50$  sq. yards, centred at the aiming point. So to destroy, on the average, two guns in the battery requires 5,300 bombs, and to destroy three guns requires 10,800 bombs. This needs 440 and 900 sorties of Fortresses, respectively, assuming that the load carried is 12 x 500 lb. bombs (some Fortresses can carry 16 bombs). For temporary unserviceability one third of the sorties will suffice.

4. Calculation - Medium Bombers.

In operation "Corkscrew" there were Mitchell (B.25), Marauder (B.26), Boston (A.26), Baltimore (A.30); about half the weight was carried by Marauders, about one quarter by Mitchells, somewhat less by Bostons, and the small remainder by Baltimores.

The density of bombs around the aiming point was estimated as 6.4% of bombs dropped for 40,000 sq. yards. Thus about 1.6% will fall in the battery area, and to destroy on the average, two guns, will require 2,800 bombs, and to destroy three guns will require 5,600 bombs. The number of sorties corresponding will depend upon the aircraft selected if B.26 were employed, 468 aircraft would be necessary, assuming they carry 6 x 500 lb. bombs, for destruction of 2 guns, and 932 for destruction of three.

For temporary unserviceability, one third of the sorties will suffice.

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Appendix 'C'.

HEAVY A.A. DEFENCES OF THE FRENCH COAST.

A list prepared by N.I.D. gives 581 heavy A.A. guns around the coast of France; of these 287 (49%) are combined A.A./C.D. guns and the rest pure A.A. Other authorities give results differing slightly from these; these discrepancies are being investigated but do not affect a general survey. As the coast is 1200 miles in length there is an average of about 0.5 guns per mile of coast. Since the guns are nearly all organised in 4 or 6 gun batteries there is an average of 10 miles between batteries.

2. The guns are almost entirely concentrated around towns, only 77 of the 580 guns (13%) being not in the immediate vicinity of one or other of the principal towns. The guns are therefore sited rather to defend the towns than to hinder aircraft crossing the coast. Gaps of 20 miles between guns are common, and even on the N. coast there is one gap of 70 miles.

3. The largest concentrations are Channel Islands 77 guns, St. Nazaire 69, Brest 64, Lorient 60, and Cherbourg 44. These may be compared with about 35 heavy A.A. guns on Pantellaria, 220 at Hamburg and 226 at Bremen.

4. Broadly speaking the areas heavily defended by A.A. guns are those with a relatively heavy density of C.D. guns. The following table gives the numbers of heavy A.A. and A.A./C.D. guns in the areas specified as having a high density of C.D. guns.

	<u>Length of coast, miles</u>	<u>No. of A.A. guns.</u>	<u>A.A. guns per mile.</u>
Dunkirk - Somme	105	79	0.8
Treport - Dieppe	35	14	0.4
Fecamp - Caen	70	31	0.4
N. end of Cherbourg Peninsular	50	57	1.2
St. Malo and Channel Islands	78	108	1.4
Brest, Lorient, St. Nazaire and La Rochelle	120	195	1.6
Bayonne - Spanish Frontier	25	24	1.0
	<u>483</u>	<u>508</u>	<u>1.05</u>

The last column, giving guns per mile, has not much significance as the guns are concentrated near the towns. The above list includes 88% of the total of 581 guns, leaving only 72 guns for the remaining 700 miles of coast.

From the above it seems that the number and disposition of heavy A.A. defences are not such as seriously to embarrass air attack on C.D. batteries outside the heavily defended areas. In particular there are several long stretches of lightly defended coast with no heavy A.A. guns; from what information is available, it appears that each C.D. battery is likely to be defended by 2 - 4 light flak guns, e.g. 20 mm.

AIRCRAFT BOMB LOADS

APPENDIX D

AIRCRAFT	MAXIMUM ALTERNATE BOMB LOADS OF M.C. BOMBS	NOTE
BOMB II	12 x 500 or 6 x 1000	NOTE: Some Fortresses can carry on the wings 8 x 250 or alternatively 2 x 1000 or 4 x 500 lb. bombs.
BOMB IIIA	8 x 500 or 4 x 1000	
BOMB III	15 x 500 or 8 x 1000 + 6 x 500	
MASTER	18 x 500 or 14 x 1000 or 6 x 1000 + 10 x 500 or 9 x 1000 + 6 x 500 or 10 x 1000 + 4 x 500	
OPERATOR	12 x 500 or 8 x 1000	
WINGLING	24 x 500 or 8 x 1000 + 9 x 500	
WINGTON	9 x 500 or 2 x 1000	
WINGSTON	4 x 500	
RAIDER	12 x 500 short tail or 8 x 500 or 6 x 1000	NOTE: Bomb load in operations at present restricted to 6 x 500.
MICHELL	8 x 500 or 4 x 1000 + 8 x 250	
MOSQUITO IV	4 x 500	
MOSQUITO XX	6 x 500 including two on wings	
VENTURA	3 x 500 + 4 x 250	

EXPLOSIVE AND METAL CONTENT OF M.C. BOMBS

TYPE OF BOMB	WEIGHT OF FILLING (lbs.)	WEIGHT OF CASE (lbs)	WT. OF COMPONENTS (lbs)	WT. OF TAIL (lbs)	TOTAL WEIGHT (lbs)	CHARGE/WT. RATIO %
250 lb M.C.	82	100	3	9	194	42
500 lb M.C.	180-224 dependent on type of filling and mk. of bomb.	205-233 depending on Mk. of bomb.	3	15	403-475	44-50
1000 lb. M.C.	475	516	4	26	1021	46
4000 lb. M.C.	2166	1485	4	109	3764	57

EQUIVALENT AMERICAN BOMBS

TYPE OF BOMB	WEIGHT OF FILLING (lbs)	WEIGHT OF CASE INCLUDING COMPONENTS & TAIL.	TOTAL WEIGHT	Charge/ratio
500 lb. GP (M43)	266	230	496	53
1000 lb. GP (M44)	538	428	966	56

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Appendix 'E'.

ATTACKS ON GUN EMPLACEMENTS WITH R.P.

I. Extracts from reports by D.Arm.D. on trials with R.P. against Gun Emplacements (S.B.33392/7 dated 25th May, 1943).

EMPLACEMENTS.

The gun pits were sunk 2' 6" to 3' and a sandbag wall 2' 6" wide was built up around the gun pit to a height of approximately 3' 6". The pits were circular of about 15' diameter and an open segment was left for the arc of fire of the field piece which was a 60 pdr. gun on a Mk. III carriage. A blast wall of sandbags was constructed outside the rear entrance to the pit. Approximately 6' 6" headroom existed from the top of the sandbag wall to the gun platform. In each gunpit 8 dummy figure targets had been attached to stakes at about man height.

CONCLUSIONS OF THE TRIAL.

- (a) The 3" Rocket with 60 lb. H.E. shell when fired as a salvo of 8 rounds in a 25° angle of attack is the most effective weapon.
- (b) By means of this attack the chance of putting a gun completely out of action is not less than 25%.

II. Assessment by D.Arm.D. of performance of R.P. against a representative battery of coastal guns.

TARGET.

The battery was assumed to consist of four guns, each gun emplacement being circular with a radius of 18 ft. and having a surrounding wall of height 6 feet. The emplacements were assumed to be in line and to be 70 yds. apart. The vulnerable portion of the gun was taken to be 4 ft. cube.

ANGLE OF ATTACK.

30° to allow the 60 lb. head to hit anywhere on the gun.

SLANT RANGES.

400, 700 and 1400 yards have been considered with an aircraft speed of 240 m.p.h.

/RESULTS EXPECTED.

RESULTS REPORTED.

60 lb. Head.

Number of aircraft required to give a 69% chance of obtaining at least one hit on all four emplacements.

Defensive Armament	Slant Range in yards	No. of a/c required	Total casualties
4 Turrets	1400	112	24%
	700	36	55.5%
	400	12	78%
4-105 mm.	1400	108	4.5%
	700	28	4.5%
	400	4	10%
2-20 mm.	1400	100	1.5%
	700	28	8.6%
	400	8	14%
No defence	1400	100	-
	700	24	-
	400	4	-

CONCLUSIONS.

The 60 lb. R.P. head is the recommended R.P. head for the attack of this type of target if R.P.s are to be used. With this head near misses within the emplacement will in all probability produce extensive damage. The casualty rates to aircraft are prohibitively high except against lightly defended or undefended positions, and it is considered that R.P.s should only be used in such circumstances, when the attack can be made at short ranges.

NOTE HERE

C.B. 707/43.

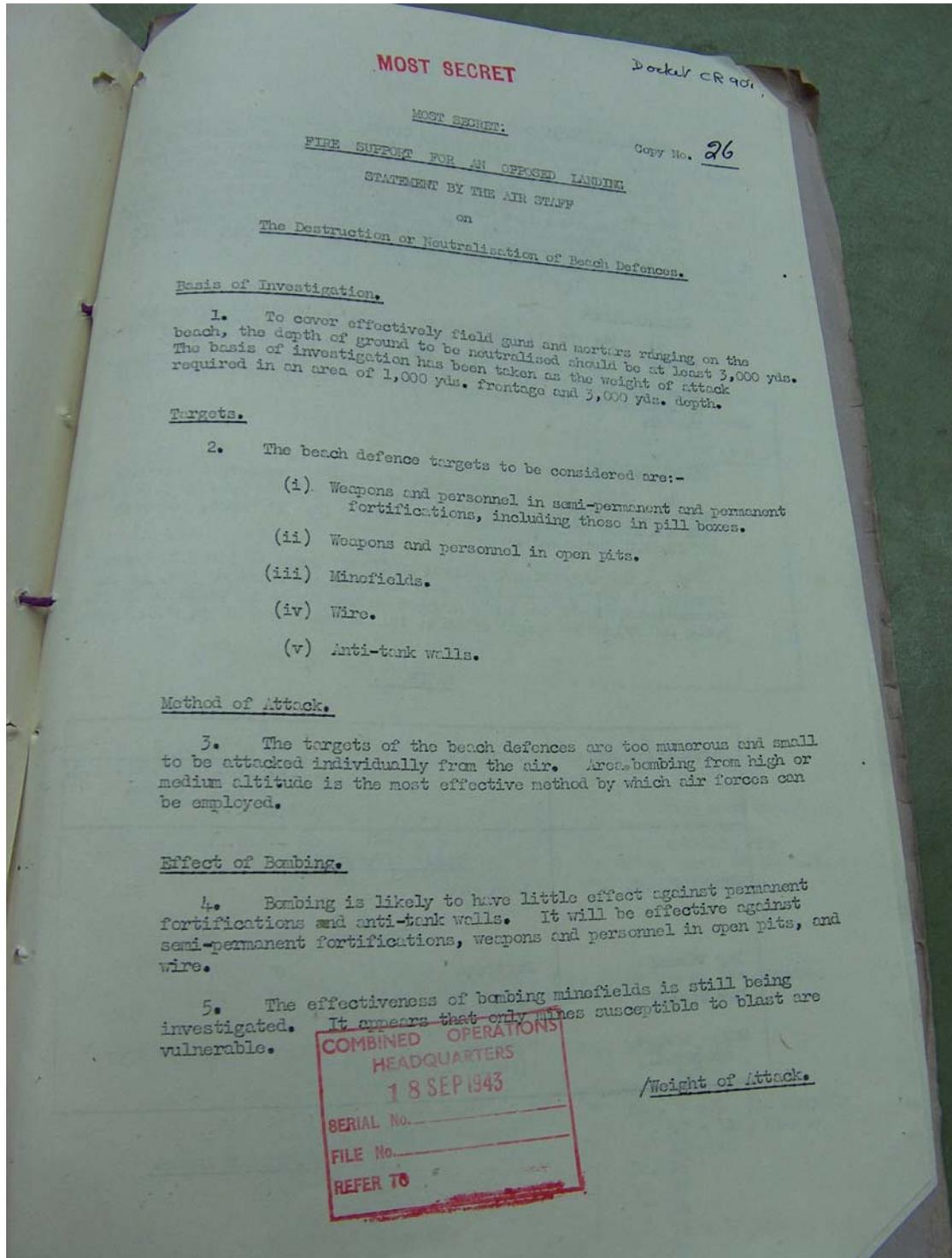
1. Service Control at 10.15 hours C.C.H. is
2. in the Control

DISTANCE

C.C.H.  
D.P.  
C.C.  
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### Appendix 3

#### Fire Support for an Opposed Landing: Statement by the Air Staff on the Destruction or Neutralisation of Beach Defences, 16 September 1943<sup>628</sup>



<sup>628</sup> DEFE 2/1024, Fire Support for an Opposed Landing statement by the Air Staff on the Destruction or Neutralisation of Beach Defences, 16 September 1943

Weight of Attack.

6. In the War Office paper RS/ACL, "Bombardment and Fire Support" it is shown that a density of projectiles, shells or bombs of about 150 tons per 1,000 yds. square is required for effective bombardment of an area occupied by German field formations protected by field defences. Beach defences are much stronger than field defences and as it is essential that the bombardment should be sufficiently heavy, it is reasonable to assume that it should be twice the weight required for the attack considered necessary for inland field defences, i.e. 300 tons per 1,000 yds. square or 900 tons per 1,000 yds. of coast.

Types of bomb.

7. The 500 lb. M.C. bomb is the most suitable to damage the heavier vulnerable targets. To damage wire and to inflict casualties, the 20 lb. 'F' bomb and the 500 lb. M.C. bomb fitted with the diaphragm operated fuse are effective. The former has the advantage of numbers, the latter economy of effort, both in preparation and in the air.

Effort required.

8. Table I shows the numbers of sorties necessary to produce the required weight of attack, of 900 tons per 1,000 yds. by 3,000 yds., with a mixture of 500 lb. M.C. bombs and 20 lb. 'F' bombs, and with 500 lb. M.C. bombs only.

9. The proportion by weight of 20 'F' bombs to 500 M.C. bombs required in the mixed load has been taken in the ratio of 5:4, on the assumption that all the bombs dropped on the foreshore would be 20 lb. 'F' bombs and 2/3rds by weight of those inland would be 500 lb. M.C. bombs.

TABLE I.

Bombing Conditions	Aircraft	No. of sorties	
		500 lb. M.C. and 20 lb. 'F' bombs.	500 lb. M.C. bombs.
<u>Single aircraft.</u>			
Night P.F.F.	Lancaster	500	310
<u>Formations</u>			
Day Visual	Fortress	570	480
Day Visual	Marauder	1,070	880
Day - target obscured.	Fortress (Obce)	510	430

Aircraft Loads.

Aircraft Loads.

10. Table the "Unit base load if inster that the weight of the Lancas

Bombin

M.A.

Aircraft Loads.

Lancaster - 18 x 500 lb. bombs or 216 x 20 lb. 'P' bombs.  
 Fortress - 12 " " " " 228 " " " "  
 Marauder - 6 " " " " 108 " " " "

10. Table II shows the weights of bombs which could be dropped on the "Unit beach" by the numbers of aircraft required to carry the mixed load if instead they carried 500 lb. H.G. bombs only. It will be seen that the weight advantage is considerably more pronounced in the case of the Lancaster.

TABLE II.

Bombing Conditions.	Aircraft	Weight of bombs per Unit-Beach (tons)
Night P.F.F.	<u>Single Aircraft.</u>	1450
	Lancaster	
Day Visual	<u>Formations.</u>	1070
	Fortress	
Day Visual	Marauder	1100
Day-Target obscured.	Fortress (Oboc)	1070

Safety Areas.

11. The safety area for bombing depends upon the direction of attack. By day, if the bombing run is parallel to the coast the assault force may close to one mile off-shore before bombing must cease. If the aircraft are bombing in any other direction the safety area should be one and a half miles. If it is desirable to simulate air bombardment while the assault force is within the safety area, 60 lb. H.E. bogus bombs can be used. By night the safety area is three miles.

R.P. and 20 mm. gun attacks.

12. Specific targets still active at the conclusion of the bombing may be engaged by fighters using the R.P. or 20 mm. guns.

Distribution: A.M.C.S.(W) Admiralty  
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## **Bibliography**

This bibliography is split into two sections, contemporary and non-contemporary sources.

### **1. Contemporary Sources**

#### **Archival Sources**

##### **The National Archives, Kew, London**

##### **Admiralty Files**

ADM 1/6/2086	
ADM 1/9552	Report on Combined Operations Exercises, 5-6 July 1938
ADM 1/11986	Operation "Jubilee" Combined Operations attack on Dieppe, various reports
ADM 1/12373	Operation "Jubilee" (raid on Dieppe): awards to naval personnel
ADM 1/20003	Publication of naval report on Dieppe raid
ADM 116/2086	Combined Operations: Revision of Manual
ADM 116/2223	'Combined Operations; Report on the Exercise conducted at the Army Staff College, 1922'
ADM 179/220	Operation "Rutter": outline plan, with orders and charts relating to the appointment of force commanders: reports on planning
ADM 179/223	Exercise "Yukon II"; Instructions for Raid on Bridport, embracing destruction of local defences and power stations (1942)
ADM 199/2465	Director of Naval Intelligence: France: Operational Reports including account of Dieppe Raid 1942 (1942-1944)
ADM 203/89	RN War College: Combined Naval and Military Landing Operation, Moray Firth (11/12 June 1928)
ADM 239/350	Raid on Dieppe: Lessons Learnt (1942)
ADM 267/108	HMS Berkeley – Sunk by Bombs – 19.8.1942 (1942)
ADM 234/354	No.33: raid on Dieppe: naval movements, 19 August 1942 (1946)
ADM 234/355	No.33: raid on Dieppe: naval operations, 19 August 1942 (1959)
ADM 239/350	Raid on Dieppe: Lessons Learnt

##### **Air Ministry Files**

AIR 1/2054/204/407/4	Paper on Combined Operations by Combined Operations Committee
AIR 2/675	War Aim of the RAF
AIR 2/1061	Co-ordinating Committee: Staff Duties in Combined Operations (1923-1940)
AIR 2/1679	Malta Command Combined Operations (1935)
AIR 2/1830	Revision of Combined Operations Manual 1936

AIR 2/1886	Singapore Combined Exercise, January 1937
AIR 2/1924	Southern Command Combined Operations exercise, Aug 1936
AIR 2/4833	Combined Operations: Co-Ordination of Meteorological Advice
AIR 2/4845	Combined Operations Organisation: Meteorological Services
AIR 2/7697	Training of Squadrons for Combined Operations (1942-1943)
AIR 2/7999	Balloons for Combined Operations
AIR 5/204	Collaboration with Admiralty in "Manual of Combined Operations" (1921-1923)
AIR 8/13	Synopsis of British Air Effort during the 1914-1918 War
AIR 8/71	Air Staff Memoranda, Nos. 1-41 (1923-1929)
AIR 8/102	Singapore: Miscellaneous Chief of the Air Staff papers on the Defence of Singapore, and as and Air Base
AIR 8/734	Fighter Support for Combined Operations
AIR 8/883	Operation "Jubilee"
AIR 8/895	Operation "Rutter"
AIR 9/1	Combined Operations
AIR 9/7	Air Staff Notes (1918-1928)
AIR 10/1437	Manual of Combined Operations (1938)
AIR 10/3863	Combined Operations Pamphlet No. 21: Conduct of A Long Range Assault in the Far East (1945)
AIR 10/4166	Combined Operations Pamphlet: No. 7(a) Support of the Assault (1943)
AIR 10/5523	Combined Operations Handbook: Communications for Control of air defence, air support and naval bombardment (1950)
AIR 10/5533	Combined Operations Handbook: Manual of Combined Naval, Military and Air Operations (1925)
AIR 10/5547	Air Support (1955)
AIR 14/1809	Operation "Jubilee" (1942-1943)
AIR 16/236	Fighter Command Intelligence Summary No 302-373
AIR 16/329	Day Fighter aircraft requirements: Spring 1943
AIR 16/373	Fighter Offensive Operations Policy (1940-1941)
AIR 16/538	Offensive Operations: conservation of forces and priority of targets
AIR 16/551	Fighter support for the Army
AIR 16/552	Operation of Fighters in support of the Army
AIR 16/666	Operation "Jubilee": composite combat reports
AIR 16/746	Operation "Jubilee": Combined Plan (1942)
AIR 16/747	Operation "Jubilee": combined plan
AIR 16/748	Operation "Jubilee": combined plan
AIR 16/760	Operation "Rutter"
AIR 16/762	Operation "Aflame" (1942)
AIR 16/763	Operation "Aflame" (1942)
AIR 16/764	Operation "Jubilee"
AIR 16/765	Operation "Jubilee"
AIR 16/1044	Operational Research Section Reports 1st series Nos. 353-529 incomplete (1942-1943)

AIR 20/157	Combined Operations Exercise, Camberley (1928)
AIR 20/183	Combined Operations Exercise, Singapore
AIR 20/829	Combined Operations: Training of Air Forces (1942-1945)
AIR 20/832	Combined Operations: Communications (1942)
AIR 20/949	Combined operations; organisation and staff studies
AIR 20/3920	Combined Operations: Fighter Support (1942-1944)
AIR 20/4310	Air power contribution to combined operations
AIR 20/4529	Operation "Coleman" Proposals for Combined Operation Air Battle on French coast (1942)
AIR 20/4835	Combined Operations: Fighter Directions (1942-1944)
AIR 20/5011	Combined Operations Policy and Organisation (1942)
AIR 20/5012	Combined Operations: policy and organisation
AIR 20/5105	Amphibious Operations from the U.K. (1943)
AIR 20/5186	Operation "Jubilee": Raid on Dieppe (1942)
AIR 20/5229	Conference to study Combined Operations involved in Operation "Overlord" (1943)
AIR 20/9503	History of the Combined Operations Organisation, 1940-1945 (1956)
AIR 23/7288	Control and disposition of Air Forces during combined operations
AIR 37/199	Reports on Operation "Jubilee" (1942-1943)
AIR 37/351	Combined Operation "Jubilee"
AIR 37/352	Combined Operation "Jubilee" reports from squadrons
AIR 37/353	Combined Operation "Jubilee"
AIR 39/19	Operation "Jubilee"
AIR 39/44	Operation "Rutter"
AIR 40/312	Report by Air Force Commander on Operation "Starkey" 16 Aug.-19 Sept. and Preliminary survey of bombing attacks (1943)
AIR 40/2239	'Y' intelligence for combined operations
AIR 41/18	The Air Defence of Great Britain, Vol IV: The Beginning of the Fighter Offensive, 1940-1941
AIR 41/49	The Air Defence of Great Britain: Volume V – The Struggle for Air Supremacy, January 1942-May 1945
AIR 41/66	The Liberation of NW Europe: Vol I The Planning and Preparation of the Allied Expeditionary Air Force for the Landings in Normandy 1942-1944

### **Cabinet Office Files**

CAB 54/13	Sub-Committee on Inter-Service Training - DCOS (IT) Papers 1-48 (1937-1939)
CAB 65/27/34	1. Naval, Military and Air Operations: - Air Operations: - The Dieppe Raid, Malta, Egypt. Naval Operations: - Shipping Losses. Military Operations: - Russia. 2. The Prime Minister: - Visit to the Middle East and Moscow. 3. Air Services: - Middle East. (1942)
CAB 65/31/18	Minute 1: Combined Operations: Raid on the Dieppe Area. (1942)
CAB 122/259	"Jubilee" (1942)

## Ministry of Defence Files

DEFE 2/67	Operation "AFLAME" (1942)
DEFE 2/333	"Jubilee" Part 2 (1942)
DEFE 2/542	"Rutter" (Planned Attack on Dieppe) Vol 1A (1942)
DEFE 2/546	"Rutter" (Planned Attack on Dieppe) Vol 3A (1942)
DEFE 2/549	"Rutter" (planned attack on Dieppe) Part 1A (1942)
DEFE 2/551	The Dieppe Raid (Combined Report) (1942)
DEFE 2/781	Lectures delivered by various Naval Officers, questionnaire on a Combined Operations Exercise, etc
DEFE 2/782A	Early history and summary of events leading to the formation of inter-service Training and Development Centre and Chief of Combined Operations
DEFE 2/812	Aircraft in Combined Operations (1940-1942)
DEFE 2/847	Combined Operations Lectures: Air Aspect of an Opposed Landing; Naval Aspects of Combined Operations; Military Aspect of Combined Operations and Authority to plan and execute raids (1941)
DEFE 2/1024	Fire Support for a Seaborne Landing on a Heavily Defended Coast, Part 1 (1943)
DEFE 2/1025	Fire Support for a Seaborne Landing on a Heavily Defended Coast, Part 2 (1943)

## War Office Files

WO 106/1904	"Sickle" Force: General Paget's Report on Operations (1940)
WO 106/4195A	"Jubilee" Raid on Dieppe (1942-1943)
WO 208/3108	Notes from Theatres of War Nos 1-17 and 21 (1942-1945)
WO 219/1867	German Intelligence Report on the Dieppe raid (1942-1944)

## Royal Air Force Museum, Hendon, London

File 8951	'Employment of Army Co-Operation Squadrons' RAF Manual AP 1176, 1932
AIR 69/155	Précis of a Lecture 'Combined Operations - Army' by Lt Colonel S Collingwood and Major General Sir Ronald Adam (1937)
AIR 69/156	Précis of a Lecture 'Combined Operations - Naval', by Commander JW Cuthbert RN and Captain TSV Phillips RN (1937)
AIR 69/169	Précis of a Lecture 'Combined Operations: Aircraft in Seaborne Expeditions and Landings on Hostile Shores' by Group Captain R Graham (1938)
AIR 69/204	'Introduction to Combined Operations' by Group Captain R Graham (1938)

## Joint Services Command and Staff College Library, Shrivenham

- Anon OKW Directives for the Invasion of UK: Operation SEELOWE, Summer and Autumn 1940
- Anon German Plans for the Invasion of England, 1940 (February 1947)

### **Department of History and Heritage, Ottawa, Canada**

- AHQ Report No. 10 Operation "JUBILEE": The Raid on Dieppe, 19 Aug 42 – Information from German War Diaries'
- CMHQ Report No. 89 The Operation at DIEPPE, 19 Aug 42: Personal Stories of Participants' 31 December 1942
- CMHQ Report No. 90 The Operation at DIEPPE, 19 Aug 42: Further Personal Stories of Participants' 18 February 1943
- CMHQ Report No. 101 Operation "JUBILEE": The Raid on Dieppe, 19 August 1942, Part II: The Execution of the Operation. Section 1: General Outline and Flank Attacks' 11 August 1943
- CMHQ Report No. 108 'Operation "Jubilee": The Raid on Dieppe, 19 Aug 42. Part II: The Execution of the Operation. Section 2: The Attack on the Main Beaches.' 17 December 43, Amended on 12 July 1950
- CMHQ Report No. 116 Operation "JUBILEE" the Raid on Dieppe, 19 Aug 42' – Additional Information from German Sources' 10 May 1944
- CMHQ Report No. 142 Operation "JUBILEE": The Raid on Dieppe, 19 Aug 42, Further New Information' 18 July 1945

### **Books**

- Anon *Combined Operations, 1940-1942* (London; HMSO, 1943)
- Aston, George *Sea, Land and Air Strategy* (London: John Murray, 1914)
- Aston, George *War Lessons, New and Old* (London: John Murray, 1919)
- Austin, Alexander *We Landed at Dawn* (London: Hodder and Stoughton, 1942)
- Harris, Arthur *Despatch on War Operations, 23rd February, 1942, to 8th May, 1945* (Frank Cass; London, 1995)
- Reynolds, Quentin *Dress Rehearsal: The Story of Dieppe* (London: Angus & Robertson, 1943)
- Slessor, John *Air Power, and Armies* (Oxford: Oxford University Press, 1936)

### **Diaries, Autobiographies and Memoirs**

- Douglas, Sholto *Years of Command: The Second Volume of the Autobiography of Marshal of the Royal Air Force Sholto Douglas, Lord Douglas of Kirtleside GCB, MC, DFC* (London: Collins, 1966)
- Montgomery, Bernard *The Memoirs of Field Marshal The Viscount Montgomery of Alamein, K.G.* (London: Collins, 1958)
- Nissen, Jack *Winning the Radar War: A Memoir by Jack Nissen and A W Cockerell* (Toronto: Macmillan, 1987)

Slessor, John *The Central Blue: Recollections and Reflections* (London: Cassell, 1956)

## Articles

- Grindle, J A 'The Development of Combined Operations Material and Technique' *Journal of the Royal United Service Institution*, Vol. 93 (1948) pp. 537-550
- Head, A H 'Amphibious Operations' *Journal of the Royal United Service Institution*, Vol. 91 (1946) pp. 485-494
- Hughes-Hallett, James 'Dieppe Raid: Despatch on the Raid, 18-19 August 1942' *The London Gazette*, 12 August 1942
- Hughes-Hallett, James 'The Mounting of Raids' *Journal of the Royal United Services Institution*, Vol. XCV (Nov. 1950) pp. 580-588.
- Leigh-Mallory, Trafford 'Air Co-Operation with Mechanized Forces' *Journal of the Royal United Services Institution*, Vol. 75 (1930: Feb/Nov) pp. 565-577
- Slessor, John 'The Development of the Royal Air Force' *Journal of the Royal United Service Institution*, Vol. 76 (Feb/Nov: 1931) pp. 324-334

## 2. Non-Contemporary Sources

### Official Publications

- Anon *The Origins and Development of Operational Research in the Royal Air Force* (London: HMSO, 1953)
- James, T C G *Air Defence of Great Britain, Volume 2: The Battle of Britain* (London: Frank Cass, 2000)
- Jones, H A *The War in the Air: Being the Story of the part played in the Great War by the Royal Air Force, Volume 2* (London: HMSO, 1928)
- Postan, M *British War Production* (London: HMSO, 1952)
- Richards, Denis *The Royal Air Force, 1939-1945 – Volume 1: The Fight at Odds* (London: HMSO, 1953)
- Roskill, Stephen *The War at Sea, Volume II: The Period of Balance* (London: HMSO, 1954)
- Stacey, Charles *The Canadian Army, 1939-1945: An Official Historical Summary* (Ottawa: Queen's Printers 1948)
- Stacey, Charles *Official History of the Canadian Army in the Second World War: Volume I – Six Years of War: The Army in Canada, Britain and the Pacific* (Ottawa: Queen's Printer, 1955)

### Books

- Addison, Paul and Crang, (eds.) *The Burning Blue: A New History of the Battle of Britain* Jeremy (London: Pimlico, 2000)
- Ash, Eric *Sir Frederick Sykes and the Air Revolution, 1912-1918* (London: Frank Cass, 1999)
- Atkin, Ronald *Dieppe 1942: The Jubilee Disaster* (London: Macmillan, 1980)

- Boog, Horst (ed.) *The Conduct of the Air War in the Second World War: An International Comparison* (Berg: Oxford, 1992)
- Buckingham, William *Paras: The Birth of British Airborne Forces from Churchill's Raiders to 1<sup>st</sup> Parachute Brigade* (Stroud: Tempus, 2005)
- Buckley, John *The RAF and Trade Defence, 1919-45: Constant Endeavour* (Keele: Keele University Press, 1995)
- Buckley, John *Air Power in the Age of Total War* (London: UCL Press, 1999)
- Buckley, John *The Normandy Campaign: Sixty Years On* (Abingdon: Routledge, 2006)
- Campbell, John *Dieppe Revisited: A Documentary Investigation* (London: Frank Cass, 1993)
- Campion, Gary *The Good Fight: Battle of Britain Propaganda and the Few* (Basingstoke: Palgrave, 2009)
- Cauldwell, Donald *The JG26 War Diary: Volume One, 1939-1942* (London: Grub Street, 1996)
- Cherry, Niall *Striking Back: Britain's Airborne and Commando Raids, 1940-42* (Solihull: Helion, 2009)
- Chorley, W R *Royal Air Force Bomber Command Losses of the Second World War: Volume 3, 1942* (Leicester: Midland Publishing Limited, 1998)
- Clifford, Kenneth *Amphibious Warfare Development in Britain and America from 1920* (New York: Edgewood, 1983)
- Cooper, Malcolm *The Birth of Independent Air Power* (London: Allen and Unwin, 1986)
- Cox, Sebastian and Gray, Peter (eds.) *Air Power History: Turning Points from Kitty Hawk to Kosovo* (London: Frank Cass, 2002)
- Cumming, Michael *The Starkey Sacrifice: The Allied Bombing of Le Portel, 1943* (Stroud: Sutton, 1996)
- Davis-Biddle, Tami *Rhetoric and Reality: The Evolution of British and American Ideas about Strategic Bombing, 1914-1945* (Princeton, NJ: Princeton University Press, 2002)
- Dear, I C B *The Oxford Companion to World War II* (Oxford: Oxford University Press, 2001)
- DeFelice, Jim *Rangers at Dieppe: The First Combat Action of U.S. Army Rangers in World War II* (New York: Berkley Caliber, 2008)
- Dunn, Bill Newton *Big Wing: A Biography of Air Chief Marshal Trafford Leigh-Mallory* (London: Airlife, 1992)
- Edgerton, David *Warfare State: Britain, 1920 – 1970* (Cambridge: Cambridge University Press, 2006)
- Farrell, Brian *The Defence and Fall of Singapore, 1940 – 1942* (Tempus: Stroud, 2005)
- Fowler, Will *The Commandos at Dieppe: Rehearsal for D-Day* (London: Collins, 2002)
- Franks, Norman *The Greatest Air Battle: Dieppe, 19<sup>th</sup> August 1942* (London: Grub Street, 1997)
- Franks, Norman *Royal Air Force Fighter Command Losses of the Second World War: Volume 2 – Operational Losses: Aircraft and Crews, 1942-1943* (Leicester: Midland Publishing Limited, 1998)
- Franks, Norman *Air Battle for Dunkirk, 26 May-3 June 1940* (London: Grub Street, 2006)

- Fergusson, Bernard *The Watery Maze: The Story of Combined Operations* (London: Collins, 1961)
- Gooderson, Ian *Air Power at the Battlefront: Allied Close Air Support, 1943-1945* (London: Frank Cass, 1998)
- Gooderson, Ian *A Hard Way to Make War: The Allied Campaign in Italy in the Second World War* (London: Conway, 2008)
- Goulter, Christina *A Forgotten Offensive: Royal Air Force Coastal Command's Anti-Shipping Campaign, 1939-1945* (London: Frank Cass, 1995)
- Gray, Peter and Cox, Sebastian (eds.) *Air Power Leadership: Theory and Practice* (London: The Stationary Office, 2002)
- Greenhouse, Breton *Dieppe, Dieppe* (Montreal: Art Global, 1992)
- Hall, David Ian *Strategy for Victory: The Development of British Tactical Air Power, 1919-1943* (Greenwood, CT: Praeger, 2007)
- Harding, Richard (ed.) *The Royal Navy, 1930-2000: Innovation and Defence* (London: Frank Cass, 2005)
- Henry, Hugh *Dieppe: Through the Lens of the German War Photographer* (London: Battle of Britain Prints, 1993)
- Leasor, James *Green Beach* (London: House of Stratus, 2001)
- Lucas-Phillips, C E *The Greatest Raid of All*, Pan Edition (London: Pan Books, 2000; Heinemann, 1958)
- Maguire, Eric *Dieppe, August 19<sup>th</sup> 1942* (London: Jonathon Cape, 1963; Corgi Books, 1974)
- Mason, R A *The Royal Air Force Staff College, 1922-1972* (Bracknell: RAF Staff College, 1972)
- Mead, Peter *The Eye in the Air: History of Air Observation and Reconnaissance for the Army, 1785 – 1945* (London: HMSO, 1983)
- Millett, Allan and Murray, Williamson (eds.) *Military Effectiveness, Volume 1: The First World War* (London: Unwin Hyman, 1988)
- Millett, Allan and Murray, Williamson (eds.) *Military Effectiveness, Volume 2: The Inter War Years* (London: Unwin Hyman, 1988)
- Millett, Allan and Murray, Williamson (eds.) *Military Effectiveness – Volume 3: The Second World War* (London: Unwin Hyman, 1988)
- Mitchell, B R *Abstract of British Historical Statistics* (Cambridge: Cambridge University Press, 1962)
- Meilinger, Philip *Airwar: Theory and Practice* (London: Frank Cass, 2003)
- McFarland, Stephen and Phillips, Wesley *To Command the Sky: The Battle for Air Superiority over Germany, 1942-1944* (Washington DC: Smithsonian Institution Press, 1991)
- Macleod, Jenny (ed.) *Gallipoli Reconsidered* (London: Frank Cass, 2004)
- Murray, Williamson *War in the Air 1914-45* (London: Cassell, 1999)
- Neillands, Robin *The Dieppe Raid: The Story of the Disastrous 1942 Expedition* (London: Aurum Press, 2006)
- Omissi, David *Air Power and Colonial Control: The RAF, 1919-1939* (Manchester: Manchester University Press, 1990)
- Orange, Vincent *Slessor: Bomber Champion – The Life of Marshal of the Royal Air Force Sir John Slessor, GCB, DSO, MC* (London: Grub Street, 2006)
- Orange, Vincent *Dowding of Fighter Command: Victor of the Battle of Britain* (London: Grub Street, 2008)
- Price, Alfred *The Spitfire Story* (London: Jane's, 1982)

- Probert, Henry *Bomber Harris: His Life and Times* (London: Greenhill, 2001)
- Robertson, Terence *Dieppe: The Shame and the Glory* (London: Hutchinson, 1963: Pan Books, 1965)
- Roth, Michael *Historical Dictionary of War Journalism* (Greenwood, CT: Greenwood Press, 1997)
- Saward, Dudley *Bomber Harris* (London: Buchanen and Enright, 1984)
- Sinnott, Colin *The RAF and Aircraft Design, 1923-1939: Air Staff Operational Requirements* (London: Frank Cass, 2001)
- Speller, Ian and Tuck, Chris *Amphibious Warfare: The Theory and Practice of Amphibious Operations in the 20<sup>th</sup> Century* (Staplehurst: Spellmount, 2001)
- Terraine, John *The Right of the Line: The Royal Air Force in the European War 1939-1945* (London: Wordsworth, 1997; Hodder and Stoughton, 1985)
- Travers, Timothy *Gallipoli, 1915* (Stroud: Tempus, 2001)
- Villa, Brian Loring *Unauthorized Action: Mountbatten and the Dieppe Raid, 1942* (Oxford: Oxford University Press, 1989)
- Whitaker, Denis and Whitaker, Sheila *Dieppe: Tragedy to Triumph* (Ontario: McGraw-Hill, 1992)
- Wiest, Andrew *Passchendaele and the Royal Navy* (Greenwood, CT: Greenwood Press, 1995).
- Winton, John *Carrier "Glorious": The Life and Death of an Aircraft Carrier* (London: Cassell, 1999)
- Ziegler, Philip *Mountbatten: The Official Biography* (London: Collins, 1985)

### Articles and Chapters

- Anon 'Combined Operations' in Dear, I C B (Ed.), *The Oxford Companion to World War II* (Oxford: Oxford University Press, 2001)
- Balzer, Timothy ' 'In Case the Raid is Unsuccessful...': Selling Dieppe to Canadians' *The Canadian Historical Review*, Vol. 87, No. 3 (September 2006)
- Beach, Jim 'The British Army, the Royal Navy, and the 'Big Work' of Sir George Aston, 1904-1914' *Journal of Strategic Studies* Vol. 29, No. 1 (February 2006)
- Campbell, John 'Operation STARKEY, 1943: 'A Piece of Harmless Playacting?'' *Intelligence and National Security*, Vol. 2, No. 3 (1987)
- Cook, Tim 'Clio's Soldiers: Charles Stacey and the Army Historical Section in the Second World War' *The Canadian Historical Review*, Vol. 83, No. 1 (March 2002)
- Cooper, Malcolm 'Blueprint for Confusion: The Administrative Background to the Formation of the Royal Air Force, 1912-1919' *Journal of Contemporary History*, Vol. 22 (1987)
- Copp, Terry 'Return to Dieppe: September 1944' *Canadian Military History*, Vol. 1, No. 1 (1992)
- Corum, James 'The German Campaign in Norway, 1940, as a Joint Operation' *Journal of Strategic Studies*, Vol. 21, No. 4 (December 1998)

- Corum, James 'Uncharted Waters: Information in the First Modern Joint Campaign – Norway 1940' *Journal of Strategic Studies*, Vol. 27, No. 2 (June 2004)
- English, Allan 'The RAF Staff College and the Evolution of RAF Strategic Bombing Policy, 1922-1929' *Journal of Strategic Studies* Vol. 16, No. 3 (1993)
- Ferris, John 'The Theory of a "French Air Menace", Anglo-French Relations and the British Home Defence Air Force Programmes of 1921-1925' *Journal of Strategic Studies*, Vol. 10, No. 1 (1987)
- Ferris, John 'Achieving Air Ascendancy: Challenge and Response in British Strategic Air Defence, 1915-1940' in Cox, Sebastian and Gray, Peter (eds.) *Air Power History: Turning Points from Kitty Hawk to Kosovo* (London: Frank Cass, 2002)
- French, David 'Doctrine and Organisation in the British Army, 1919-1932' *The Historical Journal*, Vol. 44, No. 2 (2001)
- Garrod, Martin 'Amphibious Warfare: Why?' *Journal of the Royal United Service Institute*, Vol. 133, No. 4 (Winter 1988)
- Gooderson, Ian 'Heavy and Medium Bombers: How Successful Were They in the Tactical Close Air Support Role During World War II?' *Journal of Strategic Studies*, Vol. 15, No.3, (September 1992)
- Gray, Colin 'Amphibious Operations' in Edmonds, Martin and Ewing, Humphry (Eds.) *Maritime Forces in Peace and War: Joint and Combined Operations*, Bailrigg Paper 30 (Lancaster: CDISS, 1999)
- Gray, Peter 'Air Power and Joint Doctrine: An RAF Perspective' *Royal Air Force Air Power Review*, Vol. 3, No.4 (Winter 2000)
- Gray, Peter 'Caen – The Martyred City' in Buckley, John (ed.) *The Normandy Campaign: Sixty Years On* (Abingdon: Routledge, 2006)
- Greenhous, Brereton 'Operation FLODDEN: The Sea Fight off Berneval and the Suppression of the Goebbels Battery, 19 August 1942' *Canadian Military Journal*, Vol. 4, No. 3 (Autumn 2003)
- Gruner, W D 'The British Political, Social and Economic System and the Decision for Peace or War', *British Journal of International Studies*, 6 (1980)
- Hall, David Ian 'The Long Gestation and Difficult Birth of the 2<sup>nd</sup> Tactical Air Force (RAF)' *Royal Air Force Air Power Review*, Vol. 5, No. 3 (Autumn 2002)
- Hall, David Ian 'Creating the 2<sup>nd</sup> Tactical Air Force RAF: Inter-Service and Anglo-Canadian Co-Operation in the Second World War' *Canadian Military Journal*, Vol. 3, No. 4 (Winter 2003)
- Hart, Basil Liddell 'The Value of Amphibious Flexibility and Force' *Journal of the Royal United Service Institution*, Vol. 105 (November 1960)
- Harding, Richard 'Amphibious Warfare, 1930-1939' in Harding, Richard (ed.), *The Royal Navy, 1930-2000: Innovation and Defence* (London: Frank Cass, 2005)

- Henry, Hugh 'The Calgary Tanks at Dieppe' *Canadian Military History*, Vol. 4, No. 1 (1995)
- Henshaw, Peter 'The British Chief of Staff Committee and the Preparation of the Dieppe raid, March-August 1942: Did Mountbatten really evade the Committee's authority?' *War in History*, Vol. 1, No. 2 (1994)
- Henshaw, Peter 'The Dieppe Raid: A Product of Misplaced Canadian Nationalism' *Canadian Historical Review*, Vol. 77, No. 2 (June 1996)
- Horan, H E 'Combined Operations, 1939-1945' *Journal of the Royal United Service Institution*, Vol. 98 (1953)
- Horn, Bernd 'Strength Born from Weakness: The Establishment of the Raiding Concept and the British Commandos' *Canadian Military Journal*, Vol. 6, No. 3 (Autumn 2006)
- Hyatt, A M J 'Official History in Canada' *Military Affairs*, Vol. 30, No. 2 (Summer 1966)
- Irving, David 'Dieppe: Hitler *knew* it was coming' *Evening Standard*, 1 October 1963
- Jacobs, W A 'Air Support for the British Army, 1939-1943' *Military Affairs*, Vol. 46, No. 4 (December 1982)
- James, Brian 'Pie in the Sky?' *History Today*, Vol. 56, No. 9 (September 2006)
- Karau, Mark 'Twisting the Dragon's Tail: The Zeebrugge and Ostend Raids of 1918' *Journal of Military History*, Vol. 67, No. 2 (April 2003)
- King, Brad 'Gallipoli: The Royal Naval Air Service and the Dardanelles' *The Joint Imperial War Museum/Australian War Memorial Battlefield Study Tour to Gallipoli, September 2000* (2001)
- Knapp, Andrew 'The Destruction and Liberation of Le Havre in Modern Memory' *War in History*, Vol. 14, No. 4 (Winter 2007)
- Maier, Klaus 'The *Luftwaffe*' in Addison, Paul and Crang, Jeremy (eds.), *The Burning Blue: A New History of the Battle of Britain* (London: Pimlico, 2000)
- Meilinger, Philip 'The Development of Air Power Theory' in Gray, Peter and Cox, Sebastian (eds.), *Air Power Leadership: Theory and Practice* (London: The Stationary Office, 2002)
- Meilinger, Philip 'John C. Slessor and the Genesis of Air Interdiction' in Meilinger, Philip, *Airwar: Theory and Practice* (London: Frank Cass, 2003)
- Millett, Allan, Murray, Williamson and Watmann, Kenneth 'The Effectiveness of Military Organizations' *International Security*, Vol. 11, No. 1 (Summer 1986)
- Macleod, Jenny 'General Sir Ian Hamilton and the Dardanelles Commission' *War in History*, Vol. 8, No. 4 (2001)
- Earl Mountbatten of Burma 'Operation Jubilee: The Place of the Dieppe Raid in History' *Journal of the Royal United Service Institution for Defence Studies* Vol. 119 No. 1 (1974)
- Roland, Charles 'On the Beach and in the Bag: The Fate of Dieppe Casualties Left Behind' *Canadian Military History*, Vol. 9, No. 4 (Autumn 2000)

- Roskill, Stephen 'The Dieppe Raid and the Question of German Foreknowledge' *Journal of the Royal United Service Institute*, Vol. 109 (Feb: 1964)
- Roskill, Stephen 'The Ten Year Rule – The Historical Facts' *Royal United Service Institute Journal*, Vol. 117, No. 1 (1972)
- Shoeman, Michael 'Air Umbrella – Dieppe' *Military History Journal of the South African Military History Society*, Vol. 1, No. 5. Accessed at [www.rapidhttp.com](http://www.rapidhttp.com)
- Slessor, Tim 'The Tragedy of HMS *Glorious*' *The Royal United Services Institute Journal*, Vol. 144, No. 1 (1999)
- Smith, Malcolm 'The RAF' in Addison, Paul and Crang, Jeremy (Ed.), *The Burning Blue: A New History of the Battle of Britain* (London: Pimlico, 2000)
- Speller, Ian 'In the Shadow of Gallipoli? Amphibious Warfare in the Inter-War Period' in Jenny Macleod (ed.) *Gallipoli Reconsidered* (London: Frank Cass, 2004)
- Terraine, John 'Theory and Practice of Air War: The Royal Air Force' in Boog, Horst (ed.) *The Conduct of the Air War in the Second World War: An International Comparison* (Berg: Oxford, 1992)
- Villa, Brian and Henshaw, Peter 'The Dieppe Raid Debate,' *Canadian Historical Review* Vol. 79, no. 2 (1998)
- Villa, Brian Loring 'Mountbatten, the British Chiefs of Staff and Approval of the Dieppe Raid' *Journal of Military History*, Vol. 54, No. 2 (April 1990)

### Monographs

- Bernasconi, Jeffrey 'Military Effectiveness: A Reappraisal' *Advanced Military Studies Program Monograph* (School of Advanced Military Studies, United States Command and General Staff College, 1997)

### Unpublished Thesis

- Ash, Eric 'Sir Frederick Sykes and the Air Revolution, 1912-1918' PhD Thesis (University of Calgary, 1995)
- Begbie, Brian 'Naval Gunfire Support for the Dieppe Raid' MA Thesis (University of Ottawa, 1999)
- Cooper, Malcolm 'British Air Policy on the Western Front, 1914-1918' DPhil Thesis (University of Oxford, 1982)
- Cummings, Anthony 'The Navy as the Ultimate Guarantor of Freedom in 1940?' PhD Thesis (University of Plymouth, 2006)
- English, Allan 'The RAF Staff College and the Evolution of RAF Strategic Bombing Policy, 1922-1929' MA Thesis (The Royal Military College of Canada, 1987)
- Henry, Hugh 'The Planning, Intelligence, Execution and Aftermath of the Dieppe raid, 19 August 1942' PhD Thesis (University of Cambridge, 1996)
- Massam, David 'British Maritime Strategy and Amphibious Capability, 1900 – 40' DPhil Thesis (Oxford University, 1996)

Waldie, Derek

'Relations Between the Army and the Royal Air Force, 1918 – 1939' PhD Thesis (University of London, 1980)

Weir, Philip

'The Development of Naval Air Warfare by the Royal Navy and Fleet Air Arm between the Two World Wars' PhD Thesis (University of Exeter, 2006)

### **Websites**

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[www.combinedops.com](http://www.combinedops.com)