



**Servicing Commandos refuelling a  
Spitfire during Operation Overlord**  
*Air Historical Branch (RAF)*

# Are the experiences of Servicing Commandos relevant today?

By Wg Cdr S D Ellard

In 1942, RAF aircraft maintenance units called Servicing Commandos were formed to provide a refuelling and rearming capability at recently captured enemy airfields. Selected aircraft technicians were given commando skills in order to operate under these demanding conditions. Drawing on archived documentation, unit histories and personal recollections, this paper explains the reasons for their formation, the role they were required to perform and their effectiveness during operations. The experiences of the Servicing Commandos are shown to be relevant today, as analysing their performance reveals enduring key success factors, which can be applied to enhance current RAF expeditionary operations.

The application of air power has always been dependent upon effective support on the ground. Whilst the dependence of military operations on logistic support is not unique to the air environment, ground support to air power nevertheless has some unique characteristics; it can be highly technical in nature and remote from the air battle and must therefore comprise personnel with the necessary skills and be responsive to the nature of air operations being undertaken. However, the true value of logistical support to air operations is often only appreciated when it fails to deliver, an example of which was the poor level of ground support provided to Royal Air Force (RAF) operations during the Battle of

France in 1940. During this phase of the War, the RAF was so short of fighter aircraft that an operational strategy was devised that would allow aircraft to be either operated in France or on the UK mainland.<sup>1</sup> The UK element of this strategy was provided by regular squadron ground crew, whilst the element in France was provided by Wing Servicing Echelons (sometimes termed Wing Servicing Flights), who were tasked with providing a forward refuelling and rearming capability.<sup>2</sup> However, the Wing Servicing Echelons were criticized for failing to deliver effective support under these operating conditions and could therefore not be relied upon in the future, where similar operational environments were envisaged. The result of post-operational analysis was the recommendation that formed units should be established to provide this support capability, which would need to possess strong esprit de corps, self sufficiency, be multi-skilled and be capable of operating under challenging operational conditions. Under the sponsorship of influential figures such as Mountbatten, Commodore Combined Operations, these units were subsequently formed and named the Servicing Commandos.

Drawing on archived documentation, unit histories and personal recollections, this paper explains the background to the formation of the Servicing Commandos and the role they were required to perform. The original Concept of Operations (CONOPS) for providing this capability is then described as well as detailing the training they received to meet this task. Their actual performance in subsequent operations is illustrated by accounts of their actions in support of action in North Africa during Operation Torch and landings in Normandy during Operation Overlord. In contrast, evidence of criticism of their title, CONOPS and utility at the operational level is also provided. Contemporary strategic analysis tools are then applied to gauge the effectiveness of their operations and assess the degree of strategic fit between their CONOPS and the operating environment. The product of this analysis is a list of enduring key success factors that remain relevant to the support of expeditionary air operations. The current RAF CONOPS for the support of

expeditionary operations is then measured against these enduring key success factors in order to assess the strengths and weaknesses of the current system and identify measures that could enhance current or future performance.

The conclusion is reached that the Servicing Commandos supremely filled their primary role of supporting operations in the environment for which they were created. However, they were less successful when the operating environment did not match that envisaged, they did not fit within the regular RAF CONOPS and they failed to retain the support of senior RAF leaders. As a result, as soon as the requirement for their particular skills within the RAF no longer existed, they were promptly disbanded. Whilst the modern RAF CONOPS for expeditionary operational support embraces many of the key success factors identified by the experiences of the Servicing Commandos, there remains a doctrinally unfulfilled requirement to provide a forward arming and refuelling capability similar to that provided during the Second World War (WWII). Indeed, recent attempts to provide this capability on an ad-hoc basis during recent operations have failed due to deficiencies in ground crew force protection skills, which were the core capabilities of the Servicing Commandos. It is not proposed to reproduce a modern-day formed unit equivalent to the Servicing Commandos. However, the skills, capabilities and key success factors relevant during WWII can be applied to current first-line squadron ground crew units to provide an equivalent capability that embraces the strengths of the Servicing Commandos while avoiding the structural weaknesses that led to their swift disbandment. Therefore, the experiences of the Servicing Commandos are very relevant to current RAF expeditionary operations. Almost 60 years after the disbandment of the Servicing Commandos, the importance of esprit de corps, flexibility, training, self-sufficiency and the support of senior leadership remain enduring key success factors in support to modern expeditionary air operations.



Servicing Commandos arming a Typhoon during Operation Overlord

Air Historical Branch (RAF)

*Aircraft maintenance strategies provided by dedicated squadron ground crew were not optimized for the full spectrum of air operations*

#### **The Servicing Commandos**

The RAF quickly discovered during the early stages of WWII that conventional aircraft maintenance strategies provided by dedicated squadron ground crew were not optimized for the full spectrum of air operations. In particular, during the battle for France in Spring 1940, the need for efficient logistical and engineering support to maximize aircraft availability was acute. At this time, the RAF was 'so desperately short of fighters that a system had to be devised under which it was hoped that aircraft could be used alternatively in France or at Home'.<sup>3</sup> The CONOPS devised was for the fighters to be maintained at their home base in the UK, whilst specially formed Wing Servicing Flights/Echelons were established to provide a forward refuelling,

re-armament and repair capability for aircraft in France. These CONOPS allowed aircraft to be used effectively in operations over France, yet their UK-basing meant that they were less vulnerable to German attack. However, the Wing Servicing Flights were ill prepared, ill trained and ill equipped and proved to be unsuccessful, due to flaws in their organisation.<sup>4</sup> The Commander in Chief Fighter Command, Air Chief Marshal Sir HCT Dowding, later wrote that these units were not very efficient<sup>5</sup> and Commodore Combined Operations, Mountbatten, expanded on this comment by noting that 'the difficulties of these servicing parties in the past has been a lack of esprit de corps, lack of training and lack of coordination'.<sup>6</sup> The RAF was not able to accept this state of affairs as future operations in N Africa,



A Typhoon taking off from a Landing Ground in Normandy

Air Historical Branch (RAF)

*The Servicing Commandos would not be expected to fight for the airfields, but in the circumstances under which they would be operating, opposition could be expected and they would have to be prepared to defend themselves and their aircraft*

Sicily, Italy, Normandy and the Far East envisaged similar forward maintenance of aircraft, away from their main operating bases and organic squadron ground crew. A more robust support solution was therefore sought. The RAF was quick to devise an improved strategy and worked closely with the Combined Operations Headquarters. In his letter to the Deputy Chief of the Air Staff, Director Fighter Operations proposed a more effective solution.<sup>7</sup> Key to his plans was the early operation from captured enemy airfields. This would involve:

Installing the essential minimum of communications, refuelling and re-arming equipment and personnel . . . It must be a very highly trained organisation, having high morale and esprit de corps . . . The desired result can

probably be obtained by forming a number of Flight Servicing Units as permanent entities on the establishments of Fighter Groups. Because they are a permanent entity, they can be highly trained both in servicing aircraft and in the business of going in over the beaches or perhaps airborne to an advanced aerodrome. They obtain RAF esprit de corps by their association with the Group. They should obtain 'Combined Operations' esprit de corps by their thorough training, which they must inevitably be given for the purposes of going in over the beaches. (They should be 'RAF Commandos'.)<sup>8</sup>

Mountbatten, Commodore Combined Operations, in his letter to the Chief of the Air Staff gave his strong support to these proposals, highlighting that 'although they would not do any direct

fighting if all went well, the very nature of their duties may involve them in tight corners and they will have to be taught to fight with a Tommy-gun like the military commandos'.<sup>9</sup> He therefore also agreed that it would be 'best to call them 'Servicing Commandos' even if the title were slightly inappropriate'.<sup>10</sup> His strong support to the formation of these units led to his subsequent adoption of the title 'founder of the Servicing Commandos'.<sup>11</sup>

However, even at this early stage there was resistance among some senior RAF officers towards these units. Early criticism concentrated as much on the title 'Servicing Commando' as on the role they were to play or the type of training they would receive. Air Chief Marshal Dowding expressed his concern that a number of men with valuable technical skills were to be lost to 'Commando' work.<sup>12</sup> The Chief of the Air Staff, Air Chief Marshal Portal replied that the members of these units would 'need to be tough and able to hold their own in an emergency' and therefore needed to be trained in combined operations.<sup>13</sup> However, even Portal's support was not unlimited and he acknowledged Dowding's concern about 'locking up skilled men in these Servicing Commandos' and had 'made it clear that they are not necessarily a permanent feature of the RAF organisation, and may have to be disbanded when we find our temporary surplus of ground tradesmen disappearing'.<sup>14</sup> Assistant Chief of the Air Staff (Policy), Air Vice Marshal Slessor had similar reservations, commenting that:

*I don't like the term 'Commando' in this connection; they are mobile servicing flights and no more. It's ridiculous if everyone who may ever be landed on the Continent has got to call himself a Commando. The RAF should be, and are, ready to serve anywhere in any circumstances without giving themselves fancy titles.*<sup>15</sup>

Mountbatten would ultimately prevail with his view that 'to call them *Commandos* will go a long way to further their esprit de corps' and the first Servicing Commando Units were subsequently formed.<sup>16</sup> However, the resistance towards the

Servicing Commandos would continue to haunt the units and ultimately lead to their eventual disbandment.

As plans progressed, the CONOPS of the Servicing Commandos became more clearly defined. Operations would take place in 5 stages.<sup>17</sup> In the first stage, aircraft would be flown from their home bases, perhaps with a forward station in the beach area. The second stage would follow as soon as the Army had seized an enemy airfield and the surface made fit for use by the Airfield Construction Branch.<sup>18</sup> Possibly concurrent with the second stage, the third stage would involve Servicing Commandos, their equipment and transport disembarking into landing craft and being put ashore on the beaches. They would then 'install the essential minimum of communications, set up fuel and ammunition dumps and sufficient equipment for refuelling, rearming, between flights and daily inspections, minor repairs and replacements and the necessary gear for aircraft pickets, ground marking, entrenching and cooking'.<sup>19</sup> The Servicing Commandos would not be expected to fight for the airfields, but in the circumstances under which they would be operating, opposition could be expected and they would have to be prepared to defend themselves and their aircraft.<sup>20</sup> No elements of the RAF Regiment were envisaged for force protection at this stage, as the Army would initially remain responsible for protection of the airfield once captured.<sup>21</sup> During the fourth stage, Servicing Commandos would support operations by servicing, rearming and refuelling aircraft at the forward aerodrome, while aircraft would remain based at their main airfield. This stage would continue until lines of communication had been established and the forward echelon of a squadron's personnel and equipment had arrived at the airfield.<sup>22</sup> The fifth stage would begin once all of the squadron's equipment, ground and flying personnel and aircraft had arrived and started full operations from the forward airfield. At this stage, the Servicing Commandos would withdraw and prepare to 'leapfrog' onto the next forward airfield.<sup>23</sup>

It was soon realised that not all RAF ground crew would be suitable for the type of missions

envisaged for the Servicing Commandos. Commandos would need to be willing, motivated volunteers and fit enough to withstand the demanding environment of their operations. In order to attract suitable recruits, SECRET memos were distributed to units requesting volunteers for the Servicing Commandos.<sup>24</sup> Notices appeared in station orders stating 'volunteers required for a dangerous task'.<sup>25</sup> Candidates were to be 'of A1 physique, of not more than 35 years' and of specified trades.<sup>26</sup> Commanding Officers were to interview candidates and only if they fulfilled all necessary criteria were they told of the duties they were likely to perform. Volunteers briefed on the role of the Servicing Commandos were warned

not to discuss or pass on the information to service personnel or anyone else. In addition, due to the importance of the role they would undertake, commanding officers were told that they were not permitted to reject volunteers on the grounds that their loss could impair the smooth running of the unit.<sup>27</sup> This latter caveat was strictly observed and one volunteer recalls that even his Station Warrant Officer, dismayed that he was about to lose a valuable armourer, was unsuccessful in preventing his posting to the Servicing Commandos.<sup>28</sup> Many airmen, frustrated and bored with routine RAF support operations in the UK and seeking adventure, volunteered for the Commandos and the first units soon began their training.

*While Unit Armourers were given instruction in various weapons, Fitters and Riggers were trained on these systems as well so that they could assist in weapon loading*



Servicing Commandos relax, while armourers load bombs onto a Mustang of No 122 Squadron  
Air Historical Branch (RAF)

Air Vice Marshal Slessor had complained that the 'RAF should be, and are, capable of serving anywhere in any circumstances'.<sup>29</sup> His sentiment closely matched that of Winston Churchill, who stated that 'it must be clearly understood by all ranks that they are expected to fight and die in the defence of their airfields'.<sup>30</sup> However, Slessor's vision of a RAF that was already capable of conducting operational support in testing conditions did not match the reality of the time. A former Servicing Commando recalls that during his basic training, RAF ground crew received a great deal of training in performing parade drill with .303 rifles, but spent little practice actually firing them and undertook practically no training in forming an effective defence against an airfield attack. They received no training in firing automatic weapons and were completely unprepared for participating in amphibious landings.<sup>31</sup> A training programme for the Servicing Commandos was therefore designed to dramatically reverse this shortfall. In order to foster cohesion and esprit de corps at the earliest opportunity, members of Servicing Commando Units started their training together as a formed unit as soon as they had been formed. One early change for Servicing Commandos during training was that their RAF blue tunics and trousers were replaced with Army-style khaki uniform, the only items that distinguished them from the Army were a RAF blue side cap, blue shoulder flashes and chevrons combined with a blue shirt.<sup>32</sup> Personal weapons included a mixture of rifles with bayonets, Sten guns, anti-tank rifles, revolvers, Tommy guns, Bren guns and grenades.<sup>33</sup> Initial instruction included infantry-style training from Army, RAF and RAF Regiment Officers and SNCOs and comprised weapons drill, marching, physical training, living in field conditions and swimming fully clothed with equipment and weapons. To reinforce this training, they camped in tents in nearby fields instead of living in standard RAF barrack rooms. All unit members were taught to drive by teams of civilian driving instructors, which encompassed instruction on all of the unit's vehicle types. Driver training was supplemented by practising driving in military convoy formation, which on occasions included convoy defence and mock air attacks.<sup>34</sup>



Air Historical Branch (RAF)

*Upon successful graduation from the course at Inverary, Servicing Commandos were awarded the Special Combined Operations badge*

Technical instruction was given on a variety of aircraft including Spitfires, Hurricanes, Typhoons, Kittyhawks, Tomahawks, Mosquitoes and Whirlwinds. Technicians were taught to be multi-skilled and engine and airframe fitters were expected to assist each other as one trade. While Unit Armourers were given instruction in various weapons, Fitters and Riggers were trained on these systems as well so that they could assist in weapon loading. Armourers were also trained in mine detection and mine and bomb disarming and disposal. All unit members received training in refuelling and rearming and even non-tradesmen (such as cooks and medics etc) were encouraged to help by transporting fuel and ammunition etc. In addition, the signals officer and signals staff received specialist training in VHF radios at RAF

Digby. The next stage of their training took place at the Combined Operations Training Centre at Inverary. This stage of training included lectures and demonstrations of weapons, army movements and naval vessels. They practised loading vehicles into various types of landing craft and rehearsed several beach landings. Numerous weapons firing sessions took place, during which all personnel fired each of the unit's various weapons, and included live firing exercises at night.<sup>35</sup>

Upon successful graduation from the course at Inverary, Servicing Commandos were awarded the Special Combined Operations badge. This resulted from a recommendation made by a Wing Commander Williams, who had been sent by the Senior Engineering Officer of Army Co-operation Command to observe Servicing Commando Training at Inverary in March 1943; he was 'struck by the tremendous moral effect a 'badge' would have'.<sup>36</sup> Further observations from his visit included a recommendation to supplement the establishment with an administrative officer, as the size of each Servicing Commando Unit had risen following the addition of further armament personnel and ground signals airmen. He also considered that the scale in arms, equipment and vehicles be increased to meet their task.<sup>37</sup> As a result, a typical Servicing Commando Unit at full strength rose to 187 men, three Warrant Officers and three Officers supported by one 5cwt Hillman Van, two 15cwt Commer Trucks and 12 three-ton trucks. Vehicles were specially fitted with equipment, tools and spares in waterproof steel bins for amphibious working, which could be removed and set up in airfields for operations.<sup>38</sup> Whilst their establishment may initially appear excessive, it must be remembered that their task was large and on occasions, Servicing Commando Units supported up to 184 sorties in a single day.

Having been trained and prepared for operations, there was an inevitable pause for Servicing Commandos between completion of their training and their actual employment on operational duties. There was no clear role for personnel trained to Commando status within routine RAF CONOPS, and Servicing Commandos were normally attached to regular RAF Units that

operated the aircraft types that they were expected to support. For example, many members of No 3210 Servicing Commando Unit spent the period between October 1943 and June 1944 at RAF Friston (after completion of their Commando training at Inverary, and prior to their operational deployment in Normandy). Here, they continued to hone their technical aircraft skills, while at the same time maintaining their personal fitness and practicing infantry skills.<sup>39</sup> Although strikingly different from regular RAF ground crew due to their khaki uniforms, they were soon appreciated by the squadrons that received their extra support. Indeed, squadron commanders noticed significant rises in serviceability when supported by the Servicing Commandos, in one case rising from 80-85% up to 95-98%.<sup>40</sup> As a result, respect between the squadron aircrew and Servicing Commandos grew and their readiness for operations increased.

During WWII, Servicing Commando units were employed in a variety of operational theatres including N Africa, Sicily, Italy, Normandy and the Far East. To describe representatively their performance on operations, two campaigns have been chosen: North Africa and Normandy. These have been selected as they illustrate one example where the Servicing Commandos were utilized effectively, and earned great praise, and a further example where despite performing extremely well, their CONOPS were criticised for being less relevant. Accounts of their actions in both campaigns are described, followed by the post-operational assessment of their contributions by senior officers.

The first use of the Servicing Commandos took place in November 1942 in support of the invasion of North Africa under Operation Torch.<sup>41</sup> Two RAF Servicing Commando Units, Nos 3201 and 3202 sailed with the Eastern Task Force with the aim of taking over and defending key airfields immediately after capture by the army and to service aircraft as soon as possible. Despite being machine-gunned and strafed by enemy aircraft during the landing, 3201 and 3202 were able to disembark successfully and complete the 12-mile march to their initial airfield Maison Blanche.<sup>42</sup>



Weapons and equipment are brought ashore in North Africa during Operation Torch  
Kellet & Davies (1989)

*Despite being machine-gunned and strafed by enemy aircraft during the landing, 3201 and 3202 were able to disembark successfully and complete the 12-mile march to their initial airfield Maison Blanche*

The advance parties found the initial Hurricane aircraft from No 43 Sqn waiting for them and they immediately set to work removing long-range petrol tanks and preparing them for operations. They were joined later that day by Spitfire aircraft from Nos 93, 111 and 242 Sqs. By late afternoon, they were at full strength and supported operations until late that night.<sup>43</sup> The first RAF amphibious landing had been carried out successfully and support to operations was in place. Over the next few days, the Servicing Commandos continued to re-arm, refuel and repair aircraft despite daily Luftwaffe bombing and strafing attacks. Anti-personnel devices

and delayed actions bombs were dealt with by the units' armourers as there was no dedicated bomb disposal unit.<sup>44</sup> The units undertook the maintenance of more squadrons for a far longer period than intended, as there were difficulties in assembling the regular fighter squadron ground crew and equipment and moving them to the forward area to join their aircraft.<sup>45</sup> In the opinion of the Air Officer-in-charge of Administration at HQ Eastern Air Command, 'the success achieved by the fighter squadrons during this period was undoubtedly due very largely to the loyal and extremely hard work of the Servicing Commandos who have certainly proved their value in a



Servicing a Mustang during Operation Overlord  
Air Historical Branch

*Operation Overlord was the establishment of a foothold on the European Mainland at Normandy. Six Servicing Commando Units were involved in the operation, four of which went ashore on D-Day+1*

campaign of this nature'.<sup>46</sup> As the operation progressed, the Servicing Commandos moved from Maison Blanche to support subsequent operations at Djidjelli, Souk el Arba, Bone and other airfields under very challenging conditions. The weather was poor, living conditions were basic, airfield and road surfaces were bad, supply was problematic and the servicing workload was high. During the advance, they serviced Spitfires, Hurricanes, Wellingtons and US Mitchells, often under enemy attack.<sup>47</sup> For example, having travelled the 400 miles to Souk el Arba to service aircraft of Nos 72 and 93 Squadrons in support of the advance on Tunis and Bizerta, No 3201

Servicing Commando Unit was observed by two enemy ME 109 aircraft. Putting their training into practice, they dug slit trenches and dispersed aircraft in anticipation of an attack, which followed shortly afterwards when the airfield came under attack from a dozen enemy ME109s and FW 190s. The attacks caused fires to petrol, oil and ammunition dumps and destroyed one aircraft and damaged six others. Two Servicing Commandos were killed, two badly wounded and four received slight wounds. One hour later, a formation of 10 Stukas attacked the base, followed by another wave of Stukas with fighter escort. Throughout these raids, servicing of aircraft continued and

repairs to fuel and ammunition dumps were carried out.<sup>48</sup> By the end of April 1943, Commando personnel had moved to a new airfield under construction near Medjez al Bab, less than eight miles from the front line. Here, in the last major effort in North Africa, the Servicing Commandos serviced 184 aircraft on 8 May alone. This was to be their last major contribution to the operation in North Africa and the units were then given refresher courses prior to subsequent action in Sicily in July.<sup>49</sup>

The work of the Servicing Commandos during this operation was viewed in extremely high regard. A report on the early stages of the operations in N Africa stated that 'the work performed by the Servicing Commandos was magnificent. Commanders of all units who came into contact with them were unstinted in their praise . . . They are the ideal maintenance organisation for forward airfields'.<sup>50</sup> Further praise came from a report by the Middle East News Service, which described their operations as follows:

This campaign was notable for the first employment of our Servicing Commandos. They are composed of highly skilled mechanics trained to fight — men with a spanner in one hand and a tommy gun in the other. One particular Commando maintained four fighter squadrons at a high rate of operations for approximately three weeks. The squadron and maintenance personnel working in the early stages on aerodromes deep in mud, in extremely primitive conditions, and with meagre supplies reaching them along slender lines of communication, showed infinite resource.<sup>51</sup>

The Servicing Commandos therefore seemed to have fulfilled Mountbatten's expectations when utilized in the role for which they had been formed and when the pace of operations matched the scenario for which their CONOPS were devised. However, when employed at Normandy in support of Operation Overlord, the pace of operations did not match those expected and the degree of strategic fit with the operating environment was achieved to a far lesser degree.

Operation Overlord was the establishment of a foothold on the European Mainland at Normandy.

Six Servicing Commando Units were involved in the operation, four of which went ashore on D-Day+1. Royal Engineer Airfield Construction Units prepared forward airfields straight away and these were immediately manned by Servicing Commando Units.<sup>52</sup> The experience of No 3210 Servicing Commando Unit is typical of the events encountered by other units during this operation.<sup>53</sup> Landing in France at 11:00 hrs on D-Day+1, they immediately set off for their first objective, the airfield B3 at St Croix-sur Mer. Despite having lost two vehicles and the equipment within them to enemy fire, they were able to 'dig in' and set up operations. No members of the unit were lost during the landing. Operations began immediately, and they had the honour of receiving the first Allied aircraft to land in Normandy on 9 June. At this stage, one member of the unit, LAC Warren, was mentioned in despatches for his conduct during the landing.<sup>54</sup> The following week was intense. During the day, they continued to refuel, re-arm and repair aircraft, mainly Typhoons. Although not directly attacked by German ground forces, they were subjected to occasional air attacks by Luftwaffe aircraft and experienced artillery bombardments during the night. Ground crew learned to protect themselves by digging foxholes inside their tents and only one injury was sustained during this phase.<sup>55</sup>

One unexpected disappointment for the Servicing Commandos was that just prior to the invasion, they were told to hand in their khaki uniforms and ordered to wear their RAF blue-grey uniforms. This would later cause trouble as after a few days working in dirty, dusty conditions, their uniforms bore a striking resemblance to German uniforms and generated hostility amongst the local French population. With the resourcefulness for which RAF ground crew are renowned, they were soon able to 'acquire' replacement khaki uniforms and a more favourable dress situation was restored.<sup>56</sup>

On 15 June, the unit moved to another airfield B4 at Beny-sur-Mer, where flying operations continued despite being only several hundred yards from a German strong point being attacked by Allied ground forces. Relieved a few days later by regular squadron ground crew, 3210 then



Servicing Commandos rearming a Spitfire during Operation Overlord  
Air Historical Branch

*He had concerns about the over-emphasis of the assault aspect in the training of Servicing Commando personnel as despite being 'subject to shell fire and sniping Servicing Commando personnel have, in both the Sicily and "OVERLORD" operations, walked ashore...*

moved to their next forward landing strip B9 at Lantheuil before moving forward once again on 30 June to B7 at Martragny. The unit received a commendatory letter from Air Commodore Montgomery and won praise from squadron commanders, yet the unit was disappointed that they had not worked to the intensity that they had expected.<sup>57</sup> As regular maintenance units had now 'caught up' with the progress of the invasion, 3210 were effectively redundant and were utilized in far more mundane work. They were subsequently employed in the repair and salvage of damaged

aircraft at various airfields and the cannibalization of gliders in the Benouville district.<sup>58</sup> On 16 July, they moved forward to the airfield B12 at Ellon where they serviced Spitfires and Mustangs, initially under heavy shelling. However, the airfield became gradually quieter as the invasion stalled and on 28 July, the unit was given 48 hours notice to return to the United Kingdom.<sup>59</sup> The Commanding Officer of No 3210 Servicing Commando Unit reported that 'it can be said that the men carried out duties expected of them in a manner which does credit to the Unit, but it must

be recorded that they could have coped with at least three times the work and were disappointed that more could not be found for them'.<sup>60</sup> He added that 'the general feeling of the unit was of pride in having operated the first airfield on the continent, and of regret that they were unable to see the conclusion of the campaign'.<sup>61</sup>

The assessment of the performance of the Servicing Commandos at Normandy by senior engineering officers and operational commanders echoed these sentiments. In his report on the use of the Servicing Commandos in Operation Overlord, the Chief Engineer Officer 2nd Tactical Air Force, Group Captain Oisbury, stated his belief that the high technical qualifications of the Servicing Commandos were invaluable and that their contribution was absolutely essential during the early stages of the assault operations.<sup>62</sup> 'A large number of aircraft were made serviceable at the beachhead advanced landing grounds by the exchange of propellers, carburettors, constant speed units, flaps, rudders and many other such components, thus enabling aircraft to fly back to base and assisting the high rate of serviceability which existed during the assault period'.<sup>63</sup> However he summed up with the conclusion that although the Servicing Commandos were 'essential for the assault phase of the waterborne invasion', it was unnecessary to retain them once the wing personnel had landed and taken over the maintenance of their aircraft.<sup>64</sup> The Air Officer Commanding in Chief 2nd Tactical Air Force, Air Vice Marshal Elmhirst, in his covering letter suggested that 'the provision of six Servicing Commandos was extravagant and that three such units would have met the need of the Tactical Air Force'.<sup>65</sup> He considered that such tactical groups should be provided with refuelling and rearming parties, as they were 'a cheaper unit being less specialised'.<sup>66</sup> He had concerns about the over-emphasis of the assault aspect in the training of Servicing Commando personnel as despite being 'subject to shell fire and sniping Servicing Commando personnel have, in both the Sicily and "OVERLORD" operations, walked ashore . . . training in boat work, cliff scaling, skill at arms, etc, should be secondary'.<sup>67</sup> This latter criticism seems unfair, as it was only good fortune

that conditions in Normandy were more benign than anticipated, a situation that could easily have been reversed. Nevertheless, the comments of the Air Officer Commanding in Chief 2nd Tactical Air Force were much more negative than those of the Chief Engineer and would impact on the future employment of the Servicing Commandos.

Therefore the reservations about the concept of the Servicing Commandos raised prior to their formation did not recede during the War. Despite the praise received after their initial engagement in N Africa, concerns continued to be voiced about their utility and senior officers queried whether the optimum organisation for supporting forward operations had been found. Even before Operation Overlord, on 27 August 1943, a meeting was held by the Vice Chief of the Air Staff, Air Officer Commanding in Chief Fighter Command, Air Officer Commanding North West African Tactical Air Force, Assistant Chief of the Air Staff (Policy), Director of War Organization and Director General of Organisation to discuss the future of the Servicing Commandos.<sup>68</sup> They agreed that the policy of Servicing Commandos was outmoded and should be abandoned. They did not criticize their performance on operations, but considered it more important that personnel with their training should be part of a recognized unit such as a Squadron Wing or Airfield Headquarters.<sup>69</sup> Director of War Organization was tasked to see how this could be reconciled with Operation Overlord requirements and he subsequently convened a meeting on 29 September 1943.<sup>70</sup> At this meeting as it was suggested that the name 'Commando' and the Combined Operations Badge were undesirable as it led to separatism, especially as all units in the 2nd Tactical Air Force were by then receiving field and assault training. However, it was concluded that there was insufficient time to disband the Servicing Commandos and transfer their vital function to Squadron Wings in time for Operation Overlord. Furthermore, they realized that the effect of removing the 'Commando' name and Combined Operations Badge would be detrimental.<sup>71</sup> As a result, the Servicing Commandos continued in their existing form and were able to deploy during Operation Overlord.

These previous exchanges explain the negative tone expressed by the Air Officer Commanding 2nd Tactical Air Force when he commented on the performance of the Servicing Commandos during Operation Overlord. Indeed, his recommendation at that stage could have led to the disbandment of the Servicing Commandos, had it not been for the paper written by the Director of War Organization on 8 August 1944 highlighting the requirement to 'retain surplus Servicing Commando Units intact in the UK for future use in the war against Japan'.<sup>72</sup> However, upon their return from the Far East, the final Servicing Commando Units were disbanded as no future roles for their capabilities were envisaged.

#### Analysis of the Performance of the servicing commandos

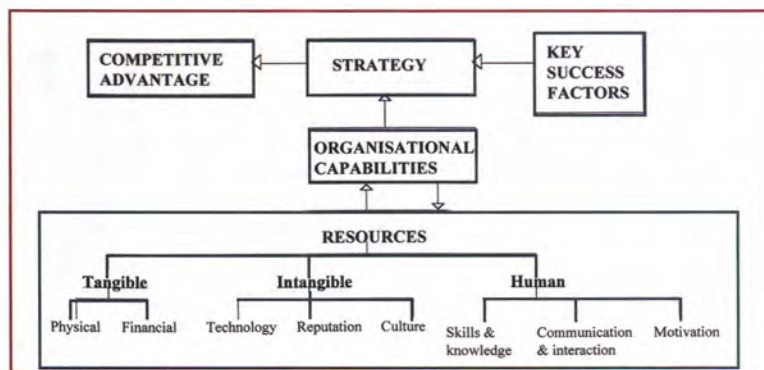
The effectiveness of the Servicing Commandos will now be analysed using contemporary strategic analysis techniques. A model by Grant is chosen as it links resources, capabilities and key success factors as well as emphasizing the importance of strategic fit to the operating environment and promoting the significance of competitive advantage; the goal of any successful strategy.<sup>73</sup> The aim of this section is to identify enduring key success factors that remain relevant to the support of modern RAF expeditionary air operations.

#### Resources, capabilities and competitive advantage (After Grant, 1995)

Grant identifies organizational capabilities as being made up of tangible resources, intangible

resources and human resources.<sup>74</sup> In terms of tangible resources, the Servicing Commandos were equipped with sufficient tools, vehicles, radios and armaments for their task and were well provisioned in consumables such as spares, fuel, bombs, ammunitions and food. Their role was vital and was therefore financed for the scenarios they were likely to encounter. Amongst intangible resources, the Servicing Commandos possessed outstanding esprit de corps. Having completed their training together and prepared themselves for operations they were a close-knit, highly bonded unit, with a strong sense of identity. They were the fittest, most capable and most highly trained technicians within the RAF and were justifiably proud of their role and reputation.

The early success of Servicing Commandos enhanced their sense of identity and reputation for providing high quality support in the most demanding environments. The simple measure of their Combined Operations badge and 'Commando' status further embedded this culture. When analysing human resources, it is notable that the Servicing Commandos were drawn exclusively from volunteers, were highly motivated and hungry for success. They received intensive training in all essential disciplines ranging from infantry skills to technical maintenance skills. As they were a relatively small sized, self-contained unit, they knew each other intimately and were therefore able to communicate well, avoiding communication barriers of hierarchy.



All necessary resource and capability requirements were therefore in place.

Grant defines Key Success Factors as the prerequisites for success.<sup>75</sup> For the Servicing Commandos technical and infantry skills and the right kit were clear success factors, achieved by their intense training programme and equipment establishment. Their numbers had to be as low as possible, realized by multi-skilling and self-sufficiency. In addition, esprit de corps and cohesion were vital to their success, attained by their formed unit identity and collective training. They were flexible and mobile and thus able to support operations in unfamiliar and demanding environments. Finally, their strategy could be realized as they had the support and backing of senior leadership figures, initially provided by the sponsorship of Commodore Combined Operations, Mountbatten.

The ultimate aim of any strategy is to achieve competitive advantage. Competitive advantage in this context is the superiority of the Servicing Commando strategy over alternative strategies available to provide the forward refuelling and rearming capability under demanding operational conditions. In this case, the alternatives were the use of the 1940 Servicing Echelons model or the employment of regular squadron ground crew. In comparison to the Servicing Echelons, the Servicing Commandos had a clear competitive advantage due to their sense of identity, cohesion and esprit de corps. Similarly, they possessed a competitive advantage over regular squadron ground crew as they had far superior technical and infantry skills, which were essential to be effective and self-sufficient in a hostile environment.

The resources and capabilities of the Servicing Commandos therefore gave them a clear competitive advantage over the alternative support models proposed at the time. Achievement of competitive advantage, however, is a necessary but not sufficient prerequisite for a winning strategy. Grant also identifies the achievement of strategic fit as critical for strategic success.<sup>76</sup> The concept of strategic fit describes the compatibility between a strategy and the strategic environment; a strategy

may be well formulated, but will nevertheless fail if it fails to take into account the environment in which it is intended to operate. The Servicing Commando strategy assumed the strategic environment of a fast-tempo operation where airfields were regularly captured as ground forces rapidly advanced. This strategic environment was present in North Africa, where the Servicing Commandos were able to advance to new airfields after only a short period as soon as regular squadron ground crew caught up with them.

Strategic fit was therefore achieved and their performance deemed a total success. However, the strategic environment during the Normandy invasion was very different. After initial success during the first few weeks, the ground advance stalled, regular squadron ground crew caught up with the Servicing Commandos and there were no further airfields to which the Servicing Commandos could 'leapfrog'. The Servicing Commandos were then redundant and (mis)employed on 'odd jobs' before being repatriated with a sense of disappointment. Strategic fit was therefore not achieved in this case and their performance criticized.

The Servicing Commandos were trained and equipped for a specific task within a specific environment; when the actual strategic environment did not match the anticipated strategic environment, their value was greatly reduced. Furthermore, the transfer of Mountbatten from Director of Combined Operations to Supreme Allied Commander to South East Asia in 1943 meant that a key success factor had been lost. When analysed from the viewpoint of strategic fit and loss of key success factors, their rapid disbandment was inevitable.

The preceding analysis identifies five key success factors that are relevant not only to the operational environment of WWII, but have enduring value. Of prime importance is the continued importance of esprit de corps, cohesion and sense of identity to a military unit expected to operate under hostile conditions. Secondly, units need to be agile and flexible and be able to respond to changes in the strategic environment and thus achieve strategic



RAF ground crew repair a damaged engine compressor during Operation TELIC in 2003  
 Headquarters Strike Command Corporate Communications

*During Operation TELIC in 2003 . . . insufficient air-to-air refuelling assets forced aircraft to return to base for refuelling and turn-round maintenance, often before they had had the opportunity to deploy their weapons*

fit; units that can only perform specific tasks under specific circumstances are inherently weak. Thirdly, the importance of proper training and equipment is vital. Fourthly, personnel need to be multi-skilled and self-sufficient in order to ensure that the size of the unit is reduced to the minimum possible. Finally, support from senior leadership figures is fundamental, without which even the most successful strategy will be undermined. The degree to which these enduring key success

factors are applied today is now analysed by assessing current technical support to modern RAF expeditionary air operations.

**The relevance of the servicing commandos to current RAF CONOPS for support to expeditionary air operations**

Throughout the Cold War, maintenance support to fixed wing, fast jet aircraft was primarily centred on fixed bases utilizing hardened aircraft shelters.

During this period, there were few operations that necessitated the type of support offered by the RAF Servicing Commandos during WWII. However, since 1989, the RAF has been increasingly engaged in expeditionary operations, where operations are conducted from unfamiliar airfields, in remote locations, far from organic support structures and under enemy attack. This shift in strategic context has demanded a corresponding change in the support strategy for this demanding type of operations. Guidance for the Air Operations Logistic Doctrine and the Air Logistic Concept of Operations is contained within Air Publication 100C-72. This publication explains that Deployed Operations Bases (DOBs) are supported by transferring into the operational theatre the minimum amount of maintenance support, manpower and equipment necessary to sustain the operation. To supplement squadron ground crew, Air Combat Service Support Units (ACSSU) have been formed in order to provide specialist skills beyond those of formed unit support staff. ACSSUs offer a variety of functions. For example, Tactical Armament Squadron provides a specialist expeditionary armament capability, whilst Tactical Communications Wing provides communication and information systems and tactical air traffic control services necessary to support deployed air operations.<sup>77</sup> While a forward rotors turnround and refuelling capability is provided to the helicopter force by Tactical Supply Wing, there is no doctrinal provision for a similar function for fast jet, fixed wing aircraft detached from their DOB.<sup>78</sup>

The majority of recent expeditionary air operations have relied on fixed wing, fast jet aircraft being able to reach their objectives by utilizing air-to-air refuelling and have therefore rarely demanded a forward arming or refuelling capability. Nevertheless, the Commanding Officer of the Joint Force Air Component Headquarters identifies the support of vertical short take off and landing aircraft from aircraft carriers as a relevant operational scenario that could require the provision of a fixed wing, fast jet forward rearming and refuelling capability.<sup>79</sup> A landing weight restriction on this type of aircraft means that aircraft laden with heavy weapons are unable to land back on the aircraft carrier. Operations

are thus far more flexible if aircraft support can be supplemented by a shore-based, forward arming and refuelling facility, whilst maintenance and deeper organic support take place afloat. He further claims that the availability of sufficient air-to-air refuelling assets cannot be guaranteed for all future expeditionary air operations.<sup>80</sup> One recent operational example supports his reservations. The Senior Engineering Officer of the RAF Harrier force operating from Kuwait during Operation TELIC in 2003, recalls a period of operations when insufficient air-to-air refuelling assets forced aircraft to return to base for refuelling and turn-round maintenance, often before they had had the opportunity to deploy their weapons.<sup>81</sup> To enhance operational effectiveness, it was proposed to establish a forward first-line maintenance and refuelling facility at a recently captured Iraqi airbase at Talil in Southern Iraq. Here, the minimum number of ground crew, tools and equipment required would have deployed to Talil and utilized a transport C-130 Hercules aircraft as a refuelling platform in order to return Harrier aircraft to operations in the shortest time possible, therefore avoiding the requirement to return to the DOB in Kuwait. Although the CONOPS were considered viable and sufficient technicians, tools and equipment were available, the proposed deployment to Talil did not take place because of concerns regarding the level of force protection that could be provided. The ground crew had the right technical skills, but were not self-sufficient enough to defend themselves and their aircraft. They were therefore reliant upon specialist force protection skills from the RAF Regiment that could not be made available in time.<sup>82</sup> This recent scenario is very similar to the circumstances for which the Servicing Commandos were formed during WWII, yet because of inadequate skills and a lack of self-sufficiency, the potential operational advantage could not be realized. On this occasion, RAF ground crew were once again unable to meet Slessor's vision of the RAF being 'capable of serving anywhere in any circumstances'.<sup>83</sup>

The experience from Op TELIC and the potential operational scenarios envisaged by the Commanding Officer of the Joint Force Air Component Headquarters therefore suggest that



RAF ground crew service a Tornado GR4 during Operation TELIC in 2003  
Author's Personal Collection

*Perhaps the most pragmatic option would be similar to that proposed by Director General of Organisation in 1943; providing a forward arming and refuelling capability with a recognized formed unit such as first line squadron ground crew*

future expeditionary air operations could require the same type of support capability provided by the RAF Servicing Commandos during WWII. A capability similar to that provided to the helicopter force by Tactical Supply Wing is thus required for fast jet, fixed wing aircraft. The RAF has provided this function in peacetime. During the 1990s, a Tornado Turn Round Flight was established in Scotland to refuel Germany-based Tornado aircraft conducting low-level flying training in Scotland. However, there currently exists no formal doctrine to support these scenarios under

demanding operational conditions and exercises are not regularly carried out to practice these skills. In order to fill this capability gap, an appropriate manning structure and the necessary skills need to be identified.

Three potential manning structures are available to meet this task. One solution would be to form an ad-hoc unformed unit made up of engineering personnel from various RAF units whenever the capability is required. However, such a unit would not possess the vital *esprit de corps*,



RAF ground crew load an ALARM missile during Operation TELIC in 2003  
Headquarters Strike Command Corporate Communications

*In contrast to the majority of RAF ground crew during WWII, all current ground crew in the modern RAF are volunteers, physically fit and possess highly capable technical skills*

cohesion and sense of identity, identified in the preceding analysis as a necessary key success factor. A second option would be to create an addition ACSSU, specifically trained to provide this capability. Such an ACSSU would be very similar to the solution adopted by the Servicing Commandos, would be an ideal unit to meet the demand when required, and would possess the necessary capabilities, *esprit de corps*, cohesion and sense of identity. Unfortunately, such a solution would also share the same structural weaknesses that generated resistance to the Servicing

Commandos and led to their disbandment; they would be tailored to provide support only under specific operational circumstances, would offer little utility when not engaged in such narrowly defined operations and would be an expensive overhead to maintain during peacetime operations. Perhaps the most pragmatic option would be similar to that proposed by Director General of Organisation in 1943; providing a forward arming and refuelling capability with a recognized formed unit such as first line squadron ground crew.<sup>84</sup> This solution offers the most appropriate skill



RAF ground crew load a Stormshadow missile during Operation TELIC 2003  
Headquarters Strike Command Corporate Communications

*The provision of a fixed wing, fast jet forward arming and refuelling capability may well be an area that officers commanding forward support wings in the future will wish to consider, thus meeting the final key success factor of senior leadership support*

set, yet retains the formed unit esprit de corps and offers the advantage of offering full utility during peacetime and when not engaged on this particular type of support to operations. All of the advantages of the Servicing Commandos would be potentially retained, the weaknesses that led to their rapid disbandment would be avoided, and the key success factors of esprit de corps and flexibility would be achieved. The need for 'fancy titles', that aroused so much hostility during WWII, would also be avoided.

However, the lesson from the attempt by the Harrier force to operate from Talil in 2003 has shown that if the first line squadron ground crew structure is adopted to provide this capability, then additional skills would be required in order to fulfil the enduring key success factors of training and self-sufficiency. In contrast to the majority of RAF ground crew during WWII, all current ground crew in the modern RAF are volunteers, physically fit and possess highly capable technical skills. Ground crew are now multi-skilled by

technical trade, enabling a reduction in the size of the logistical footprint required on operations.

In addition, all ground crew personnel receive annual training in basic field skills and weapons firing drill. However, the field and weapons skills possessed by current RAF ground crew are insufficient for them to be totally self-reliant in terms of self-defence. In contrast to the Servicing Commandos, they are unable to defend forward operations on an airfield effectively without specialist force protection support from the RAF Regiment. Determining the level of force protection required is a function of risk. Whilst Servicing Commandos in WWII were able to take the risk of defending themselves and their aircraft with relatively small numbers, the operational context of modern operations has now changed. Due to greater media exposure and a reduced domestic tolerance of casualties, the strategic consequences of losing aircraft and personnel to the enemy on the ground are far greater today than during WWII and a higher priority is now placed on force protection. However, experience in Talil has also shown that total reliance on the full support of specialist force protection offered by the RAF Regiment cannot be guaranteed and even if such support were to be available, the ground footprint would be excessive. Enhanced force protection skills for first-line ground crew would reduce this dilemma. If, however, supplementary support from the RAF Regiment is assessed as necessary, then reductions in the manning footprint could be achieved by training RAF Regiment personnel in ground crew activities that require little technical skills such as assisting squadron armourers in the manual aspects of weapon loading. The addition of an RAF Regiment SNCO to the squadron manning would provide the means for delivering the enhanced training necessary, co-ordinating force protection during operations and liaising with any RAF Regiment staff assigned to assist.

The additional skills identified above would impose a significant training burden. However, not all squadron ground crew would require this level of training. Experience suggests that only up to 15-20% of first-line ground crew would

be required to fulfil this task, resulting in the formation of a small cadre of personnel needed to perform this task. The maintenance of such a capability would require regular practice. As a result of their experiences in Talil, the Harrier force is currently leading the way in preparation for such operations, and other aircraft platforms could learn much from their experience and from the support provided to the helicopter force by Tactical Supply Wing. The provision of logistic support to air operations is currently undergoing a transformation as a result of a recent End-to-End logistics review, resulting in a focus on the forward elements of logistical support. The provision of a fixed-wing, fast jet forward arming and refuelling capability may well be an area that officers commanding forward support wings in the future will wish to consider, thus meeting the final key success factor of senior leadership support.

### Conclusion

This paper has therefore shown that just as air operations must be flexible, agile and quick to react to changing operational environments, so must the ground support structure that is put in place to facilitate these operations. The RAF was ill-prepared to support the type of operations that took place during the Battle of France in 1940, but quickly remedied this deficiency by the formation of the Servicing Commandos. The capability offered by the Servicing Commandos was tailored to solve a precise set of circumstances, and when these situations were reproduced, the results were outstanding. All essential elements of the strategy were identified: high quality, motivated servicemen were recruited; suitable and effective training identified and delivered; fit-for-purpose tools and equipment provided; and incredible esprit de corps, cohesion and sense of identity established. Despite the opposition of those who disliked their name and function, the Servicing Commandos became established and adopted an influential figurehead as their founding father in Mountbatten, Commodore Combined Operations. The rationale for the formation of the Servicing Commandos seemed to have been proved during their successful use in operations in North Africa. The value of their training and formed unit identity was demonstrated under demanding

conditions and they justifiably received great praise for their work. However, the Servicing Commandos were able to operate with such apparent success only because the operational context so closely matched the anticipated environment for which they had been formed and trained. As campaigns progressed, despite performing magnificently, the value of their efforts at the operational level was diminished, because the operational environment did not offer them the opportunity to demonstrate their full capabilities. This was typified by the experience at Normandy where, having quickly and effectively established support to air operations on the European Mainland, Servicing Commandos were quickly caught up by regular squadron ground crew and became redundant. No doubt, had British forces been able to maintain the anticipated fast pace across Northern Europe, and the requirement to regularly 'leapfrog' to forward air bases continued, then the Servicing Commandos would have been able to prove their worth. Criticism of the Servicing Commando's CONOPS and separatist identity followed and as soon as the war in the Far East was over, led to their prompt disbandment.

More suited to the RAF Servicing Commandos CONOPS was the rapid progress made by American forces following the Normandy invasion, which must have required an equivalent means of ground support to air operations. Whilst this paper has focused on a historical RAF example of support to expeditionary air operations and contrasted it with current RAF support strategies, further research could include studies of how ground technical and logistical support was provided to US air forces as they advanced through France and Germany and contrasting this with current US CONOPS. Other relevant areas of research could include analysis of the methods adopted by the German Luftwaffe to support rapid advances into France and Russia during earlier stages of WWII.

During the Cold War, there was little requirement for the type of support offered by the Servicing Commandos. However, it has been shown that there is now a potential requirement for the provision of forward arming and refuelling

capability, currently doctrinally unfulfilled and practically highlighted during the failed attempt to operate Harrier aircraft from Talil during Operation TELIC in 2003. It does not follow that the Servicing Commandos should be reformed to meet this need; it is the provision of the capability that is required, not the duplication of a unit structure and CONOPS. Fundamental to the provision of this capability are 5 key success factors that are common to both the experiences of the Servicing Commandos and the current technical and logistical requirements of the RAF. The importance of esprit de corps, operational agility, training, self-sufficiency and senior leadership support link current RAF ground crew with the Servicing Commandos in WWII. Whilst this paper has offered the opinion that training a suitable proportion of first line squadron ground crew presents the most suitable solution to meeting this capability gap, the challenge for those who may be called upon to meet this requirement will be the need to secure the resources necessary for training and exercises and ensure that these 5 key success factors are met. The experiences of the Servicing Commandos in WWII have led the way in providing this form of support and their experiences are therefore most relevant to the support of current RAF expeditionary operations.

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- 3 The National Archives AIR 2/8193, Air Chief Marshal Sir HCT Dowding to Air Chief Marshal Sir CFA Portal dated 28 February 1942.
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- 6 Air Historical Branch, A 2/101 Commodore Combined Operations to Chief of the Air Staff dated 25 January 1942.
- 7 The National Archives AIR 2/8193 DFOps to ACAS 15 Jan 1942.
- 8 *Id.*
- 9 Air Historical Branch, A 2/101 Commodore Combined Operations to Chief of the Air Staff dated 25 January 1942.
- 10 *Id.*
- 11 Kellet & Davies (1989), p. iv.
- 12 The National Archives AIR 2/8193, Air Chief Marshal Sir HCT Dowding to Air Chief Marshal Sir CFA Portal dated 28 February 1942.

- 13 The National Archives AIR 2/8193, Air Chief Marshal Sir CFA Portal to Air Chief Marshal Sir HCT Dowding dated 13 March 1942.
- 14 *Id.*
- 15 The National Archives AIR 2/7706 M10 ACAS(P) to DMC dated 2 May 1942.
- 16 Air Historical Branch, A 2/101 Commodore Combined Operations to Chief of the Air Staff dated 25 January 1942.
- 17 The National Archives AIR 2/8193, DFOps to ACAS dated 15 January 1942.
- 18 *Id.*
- 19 AP3397, p. 516.
- 20 *Id.*
- 21 The National Archives AIR 2/7706 M12 DFOps to ACAS(P) dated 4 May 1942.
- 22 The National Archives AIR 2/8193, DFOps to ACAS dated 15 January 1942.
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- 26 The National Archives AIR39/72, Volunteers for Servicing Commandos dated 30 June 1942.
- 27 *Id.*
- 28 LAC McQuillan, in an interview with the author on 17 December 2004.
- 29 The National Archives AIR 2/7706, M10 ACAS(P) to DMC dated 2 May 1942.
- 30 Quoted in AP 3000, p. 2.9.1.
- 31 LAC McQuillan, in an interview with the author on 17 December 2004.
- 32 Grainger (1995), p. 12.
- 33 *Ibid.*, p. 13.
- 34 *Ibid.*, pp. 13-18.
- 35 *Id.*
- 36 The National Archives AIR 39/119, Loose Minute dated 4 April 1943.
- 37 The National Archives AIR 39/119, Report on Servicing Commando Course dated 3 April 1943.
- 38 Grainger (1995), p. 14.
- 39 LAC McQuillan, in an interview with the author on 17 December 2004.
- 40 Grainger (1995), p. 25.
- 41 AP 3397, p. 517.
- 42 White (2002), p. 28.
- 43 Kellet & Davies (1989), p. 11.
- 44 White (2002), p. 28.
- 45 AP3397, p. 517.
- 46 *Id.*
- 47 *Id.*
- 48 Kellet & Davies (1989), p. 14.
- 49 AP3397, p. 517.
- 50 Quoted in The National Archives, AIR 20/4372 E105A The Servicing Commando.
- 51 The National Archives AIR 20/4372, RAF Middle East News Service Air Ministry Bulletin No.9507 dated 22 Jan 1943.
- 52 White (2000), p. 28.
- 53 Kellet & Davies (1989), pp. 93-97.
- 54 *Ibid.*, pp. 93-94.
- 55 LAC McQuillan, in an interview with the author on 17 December 2004.
- 56 *Id.*
- 57 Kellet & Davies (1989), p. 94.
- 58 *Ibid.*, p. 95.
- 59 *Ibid.*, pp. 95-96.
- 60 quoted in Atkinson (2004), p. 164.
- 61 Kellet & Davies (1989), p. 97.
- 62 The National Archives Air 20/4372, Report by Chief Engineer 2nd TAF on Servicing Commandos used in Operation Overlord dated 29 October 1944.
- 63 *Id.*
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- 73 Grant (2002), p. 97.
- 74 *Id.*
- 75 *Id.*
- 76 *Ibid.*, p.16.
- 77 AP100C-72, pp. 1-26 – 1-27.
- 78 *Ibid.*, p. 1-28.
- 79 Group Captain Teakle, in an interview with the author on 20 January 2005.
- 80 *Id.*
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- 83 The National Archives AIR 2/7706, minute 10 ACAS(P) to DMC dated 2 May 1942.
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