COASTAL COMMAND IN THE SECOND WORLD WAR

By Professor John Buckley

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Abstract: From 1939 to 1945 RAF Coastal Command played a crucial role in maintaining Britain's maritime communications, thus securing the United Kingdom's ability to wage war against the Axis powers in Europe. Its primary role was in confronting the German U-boat menace, particularly in the 1940-41 period when Britain came closest to losing the Battle of the Atlantic and with it the war. The importance of air power in the war against the U-boat was amply demonstrated when the closing of the Mid-Atlantic Air Gap in 1943 by Coastal Command aircraft effectively brought victory in the Atlantic campaign. Coastal Command also played a vital role in combating the German surface navy and, in the later stages of the war, in attacking Germany's maritime links with Scandinavia.

INTRODUCTION

In March 2004, almost sixty years after the end of the Second World War, RAF Coastal Command finally received its first national monument which was unveiled at Westminster Abbey as a tribute to the many casualties endured by the Command during the War. That it took so long is perhaps an indication of the shadow that other RAF Commands and the Royal Navy have cast over the contribution of Coastal Command, and a reflection of the awkward institutional position in which the Command was placed betwixt the Admiralty and the Air Ministry. Quite tellingly, in the post-1945 years, Air Chief Marshal Sir John Slessor, a future Chief of the Air Staff (CAS) and an erstwhile Air Officer Commanding-in-Chief Coastal Command, was embroiled in a squabble over the contribution the Command had made during the War. As part of a campaign to prevent the formation of a separate US Air Force, the US Navy was claiming that RAF Coastal Command had failed in the War because it had been part of an independent air force and not part of the Royal Navy. It rankled with Slessor and the RAF that elements of the Royal Navy broadly agreed. He grumbled that he had spent considerable effort in 1943 putting Admirals Dudley Pound and Ernest King right about how to use aircraft in battling submarines, yet in 1947 the battle was still not won.[1]

Fighting over resources and the place of Coastal Command both before and during the war had been constant. In November 1940, the First Lord of the Admiralty, AV Alexander, referred to Coastal Command as the 'Cinderella of the RAF' as part of a wider effort to highlight their shortages and to squeeze extra resources out of the Air Ministry to combat the growing threat of the German U-boat arm.[2] The claim was parried by Sir Archibald Sinclair, the Secretary of State for Air, but the impression then (and much repeated since) was of Coastal Command struggling to assert itself against the more glamorous Fighter Command and the long-term vested interests of the Bomber Barons and the Air Staff. The Admiralty complained at many points both before and during the War that maritime air power needs came last when resources were being allocated by the Air Ministry, and that Britain's ability to defend its sea lines of communication and supply were put at risk as a result.

Whilst there is some validity in this interpretation, it should be recalled that the employment of air power resources to meet strategic aims and objectives is more complex than simply aligning aircraft to different Commands, something Slessor and other senior airmen, though not all, appreciated. The RAF required a variety of air assets from different Commands and nations to combine to meet threats, and Coastal Command was only one of the formations that played a part in securing Britain's maritime survival. Indeed, Bomber Command grumbled throughout the War that they were devoting too much effort and too many resources to the maritime war, attacking U-boat installations and production plants, and dropping mines, for example. Air Chief Marshal Sir Arthur Harris on one occasion even referred to Coastal Command as 'an obstacle to victory'.[3] The RAF's war in support of maritime objectives was not solely

dependent on resources allocated to Coastal Command; it is tempting and too easy to see Coastal Command and the resources it received in isolation from other forms of air and naval power in this regard.

It is, however, the case that Coastal Command played a pivotal role in defending the United Kingdom in the Second World War, particularly between the summer of 1940 and the late spring of 1943, when the Atlantic campaign raged. Indeed, alongside the defence of the British Isles in the late summer of 1940 by the RAF, most obviously Fighter Command, it can be argued that Coastal Command's contribution to Britain's survival in the first major Atlantic campaign of 1940-41 stands as the RAF's most vital effort of the war.[4]

PREPARATIONS FOR WAR

The transition made by Coastal Command was all the more remarkable considering its plight on the outbreak of war in 1939. The Command had been created in 1936 when the RAF was restructured into the organisational formation that was to fight the Second World War, principally Fighter, Bomber and Coastal Commands. Yet the roots of the Command, its equipment, and doctrine lay further back into the post-First World War period when the future of land-based maritime air power was shaped. During the Great War at sea, the most important part played by the Royal Naval Air Service (and latterly the RAF) had been the contribution to the defeat of the U-boat menace in 1917, but by the 1920s the newly formed RAF Coastal Area (the forerunner to Coastal Command between 1919 and 1936) had been repositioned away from trade defence. With little credible threat to trade defence from a major power (other than the perennial French) the future of maritime air power was perceived by the Admiralty as naval co-operation and by the Air Ministry as a small highly specialised imperial prestige force.[5]

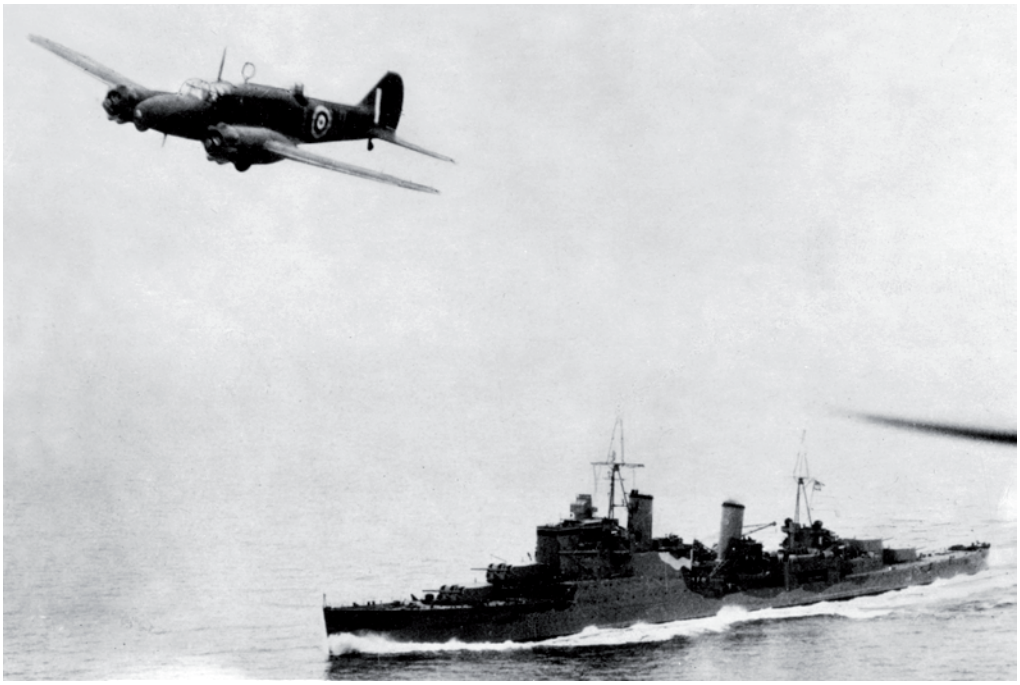
By 1925, Coastal Area (save the Fleet Air Arm which remained part of the RAF until 1937) had been reduced to just eleven front-line aircraft – all flying boats – supported by 18 further training aircraft.[6] The next decade or so saw the RAF and Royal Navy bickering over the role of, and investment in, maritime air power, although until 1937 the Admiralty's primary concern remained the return of the Fleet Air Arm to the Navy. Land-based maritime air power was something of an adjunct and there was little agreement between the Royal Air Force and the Royal Navy over its most effective role. For the Navy, the primary concern was for Coastal Area to function as a reconnaissance force to patrol the waters around the British Isles, principally to aid the surface fleet in its likely actions against enemy naval forces. Some strike potential was considered useful, but was a secondary concern, as the Admiralty was unwilling to accept that properly prepared naval vessels were vulnerable to air attack, despite the implications of the Mitchell Trials in the USA.[7] For the Air Staff, particularly by the 1930s, the primary concern was the concentration of air power resources on the development of the main bombing fleet to act as a deterrent and to pose a credible threat to enemy powers.

The vision of a short sharp air campaign saw maritime air power not only as redundant, but as a distraction and a dangerous drain on scant resources.[8] In 1936, the Air Staff even pondered fitting new maritime patrol aircraft with engines better suited to high-altitude bombing duties, at the expense of their ability to act at low level against maritime targets.[9]

One consequence of this debate was the lack of effective land-based maritime strike aircraft by 1939. The United Kingdom's own anti-shipping trials, largely based around the *HMS Centurion* tests from 1929 onwards, had demonstrated that dive bombing was the most effective way of hitting a moving vessel at sea, a fact later underscored repeatedly in the Second World War.[10] Yet, the Air Staff argued that high-altitude level bombing was up to the task of stopping an enemy naval force, largely because it allowed them to avoid investment in specialised maritime bombers, aircraft which would be of little value in a major bombing campaign against continental targets. Despite lobbying by Air Marshals Sir Arthur Longmore and Sir Philip Joubert de la Ferté, both early Commanders-in-Chief of Coastal Command, by 1939 there was no dive-bomber in Coastal Command.[11] Even the torpedo bomber survived only because the types deployed to the role (the Vickers Vildebeest and the Hawker Horsley) could also double-up as general purpose bombers, or had been ordered simply to keep their manufacturers in business; indeed, neither type was initially designed as a torpedo bomber.[12] The Bristol Beaufort was to prove the only purpose-designed torpedo bomber the RAF acquired, and its development was not without mishap and delay, resulting in its not being in service at the outbreak of War.

The Royal Navy's primary inter-war desire for a maritime patrol and reconnaissance aircraft had also fallen short by 1939. When the first air rearmament schemes began in 1934, the Air Staff had allocated resources to the introduction of a short-range land-based patrol aircraft. The Royal Navy and Coastal Area wanted flying boats, and would continue to argue this case into the early Second World War, but the Air Staff demurred, arguing they were too expensive to build and maintain.[13] Flying boats were therefore rejected predominantly on financial grounds; the annual costs of maintaining a twin-engine flying boat were over three times those of a twin-engine land-based aeroplane.[14] Alas, the Avro Anson, the land based aircraft adopted by the RAF for short-range maritime duties in 1935, though reliable, was simply inadequate; it carried insubstantial ordnance and had limited range, such that it could not patrol the width of the North Sea. Despite these weaknesses, the Anson remained the principal patrol aircraft at the outbreak of War.

Coastal Command was also to suffer from the dramatically increased pressure placed on the British aircraft industry in the mid-to-late 1930s. Priority was given to fighter and bomber design and production, so replacements for ageing flying boats, a new torpedo bomber and the Anson all failed or were seriously delayed. Orders for maritime



Avro Anson of 612 Squadron over a Royal Navy warship in early 1941.

aircraft were given to companies considered by the Air Council as higher risk, such as Saunders-Roe and Blackburn, or to better companies but whose priorities lay elsewhere. Ultimately because of the failure of the Blackburn Botha patrol aircraft / bomber and the SaRo Lerwick, twin-engine flying boat, the Air Staff had to sanction buying in American aircraft to plug the gap – initially the Lockheed Hudson (though these were only available in limited numbers by September 1939) and ultimately the Consolidated Catalina flying boat.[15]

What also proved to be a most critical failing of the inter-war era was the lack of focus on trade defence by Coastal Area/Command, despite the evidence of the Great War. In the absence of a major threat, there was no necessity for a large investment in anti-submarine warfare capability by the RAF, but to allow the role to wither so much proved highly damaging and was to contribute to the near disaster of the 1940-1 campaign in the Western Approaches and the Atlantic. The RAF's lack of interest was compounded by the Royal Navy's overweening faith in ASDIC, which caused the Naval Staff to claim in 1937 that, 'the submarine should never again be able to present us with the problem it had in 1917'.[16] The two Services' approaches combined to lower Coastal Command's immediate anti-submarine capability in 1939 quite significantly, a capability undermined still further by combined Service tactics not having been worked through, and by the RAF not having properly tested its anti-submarine bomb against a submarine.[17] With a procurement programme that had fallen woefully short, inadequate ordnance and

equipment, and a poorly defined purpose, Coastal Command entered the Second World War in something of a mess.

OPENING PHASE

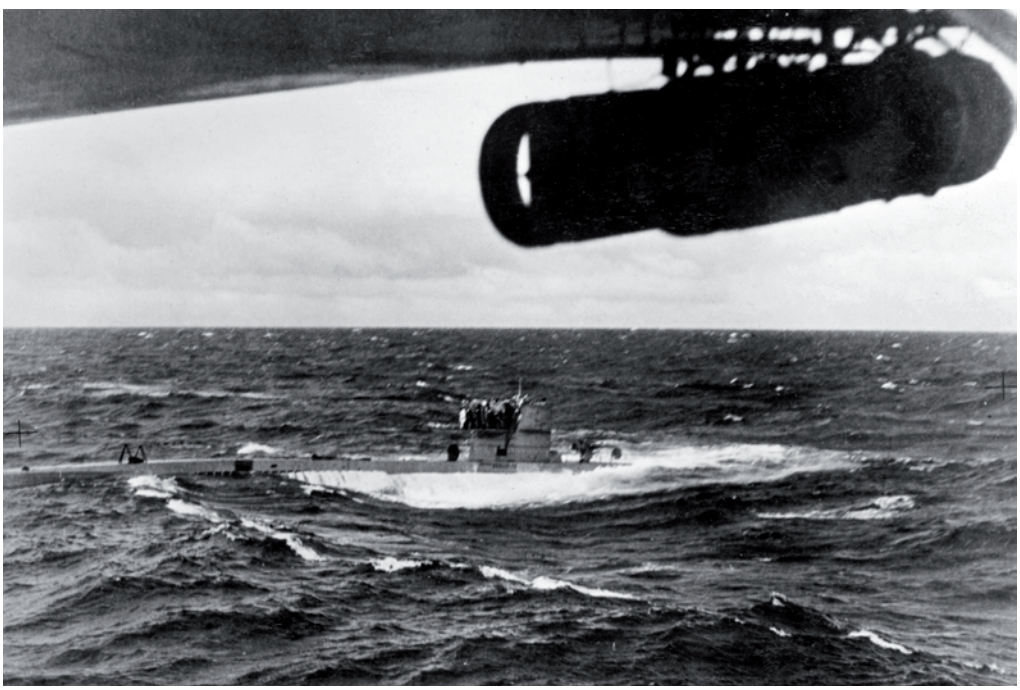
On the outbreak of war the command was equipped with seventeen squadrons, ten of which flew the inadequate Anson. Two squadrons were still equipped with biplane flying boats – Supermarine Stranraers and SaRo Londons – whilst the two torpedo-bomber squadrons soldiered on with the obsolete Vildebeest. The only truly modern aircraft were the two squadrons of Short Sunderland flying boats and the one of imported Lockheed Hudsons. Both aircraft were well regarded with excellent range and capabilities, but were in short supply. Shorts could only produce a trickle of Sunderlands (three per month) and Lockheed were only just beginning to deliver Hudsons in greater quantity, though this was hindered by having to ship them across the Atlantic and reassemble them when in the United Kingdom. Ultimately, Coastal Command was still well short of its 1937 target strength of 339 when war came.[18] Organisationally, there were three frontline groups, No.15 based at Mount Batten (Plymouth), No.16 at Chatham and No.18 at Donibristle (Rosyth), working closely with the Royal Navy.[19] Leadership of Coastal Command was still the responsibility of Air Marshal Sir Frederick Bowhill, who commanded from Northwood. He had been in charge since 1937 and was regarded as having excellent leadership qualities, though this estimation did not apparently extend to his attention to detail and administration.[20]

The opening stages of the War demonstrated that the initial priorities for Coastal Command were in need of some revision. Pre-war planning had placed reconnaissance and naval co-operation as the principal tasks, ahead of convoy protection. The Air Staff even argued that convoys would make such vulnerable targets for enemy aircraft that they should be rejected as a viable option.[21] Other than the RAF having to deploy four squadrons of Blenheims as fighters to cover East Coast convoys in the autumn of 1939, aircraft which by December had transferred fully into Coastal Command, this aerial threat to convoys did not develop to crisis levels.[22] It was soon, however, abundantly clear that shortcomings in ASDIC equipment had elevated the importance of providing extra air cover for convoys. Fortunately, although U-boats were proving an irritating nuisance, there simply were not enough of them to cause havoc. Individually, U-boats achieved some of their best tonnage hauls of the War in the autumn of 1939 and spring of 1940, but with so few available - under sixty U-boats in total, many of which were short-range Type IIs - they could not do enough.

British trade defence forces were therefore afforded time to regroup. Paradoxically, the British had to readopt First World War methodology as the hard learned lessons of 1917 proved entirely applicable to 1939-40. The basic principle that it was best to wait for U-boats to show their hand rather than looking for them was as valid in 1940 as it was in 1917, even if it went against the grain for the Admiralty and, indeed, Coastal Command.[23]

Coastal Command shifted the balance of its operations as 1939 passed into 1940. The German surface fleet proved much less active and threatening than had been imagined by the Admiralty, and with convoys being heartily embraced once again in October 1939 air cover for them became a priority, alongside general patrolling work as a deterrent against U-boat attacks.[24] As early as 13 November 1939, Bowhill issued a directive placing the destruction of U-boats as an equal priority task with attacks on enemy surface vessels.[25] Coastal Command staff worked hard to allocate their scant resources to their various tasks, but with the added burden of having to cover for the Anson's inadequate range. As the longer-ranged Hudsons became available, they were initially absorbed into establishing the patrol line right across the North Sea – a task beyond the Anson's capabilities. By mid-1940, Coastal Command still had only four flying boat squadrons, two land based reconnaissance squadrons, and one long-range fighter squadron to cover the Western Approaches. That many U-boat successes throughout the first few months of the war occurred well within range of Hudsons and Sunderlands was indicative of the patchy coverage caused by inadequate numbers.[26]

The Command was confronted with further worrying developments: its aircraft were occasionally spotting U-boats in daylight, although by visual methods only at this stage and, therefore, hardly ever at night. The first Air-to-Surface Vessel (ASV) radar (or RDF as it was still known in the UK) Mark 1 ASV was introduced in early 1940, but was little



27 August 1941, a Hudson of 269 Squadron surprised a U-boat on the surface and, after the aircraft dropped depth charges the German crew surrendered. Photograph taken from a Catalina after the attack.

trusted by RAF crews who still preferred to rely on visual sightings.[27] Yet even if sightings were achieved, Coastal Command aircraft could offer little in the way of offensive capability, and thus close co-operation with Royal Naval surface units was essential, if limiting. To a significant extent, this impotence was caused by the wholly inadequate anti-submarine bomb. The bomb had been introduced in 1931, but bizarrely was never properly tested against a submarine, despite trials taking place in the mid-to-late 1930s.[28] Within weeks of the outbreak of the War, serious doubts about the anti-submarine bomb began to emerge and, over the ensuing twelve months, faith in the weapon had evaporated altogether. Up to the end of August 1940, some 133 U-boats had been sighted north of 56 degrees North by Coastal Command aircraft. Most were attacked with anti-submarine bombs, but not a single sinking was confirmed, and it appeared that only one had been damaged. Blue-on-blue incidents provided telling evidence of the ineffectiveness of the anti-submarine bomb, and aircrews reported that the bomb's peculiarities rendered it dangerous to use. A replacement weapon was urgently required.[29] Initially this proved to be the 450lb depth charge, but only flying boats were large enough to carry it, and it was dangerous to use at night due to the need to be sure about the altitude from which it was deployed. Nevertheless, even the early depth charges were three and a half times more likely to damage a U-boat and could claim a sinking, unlike the anti-submarine bomb.[30] Ultimately, it would take until 1942 for a fully functioning and properly effective aerial depth charge to be in widespread use.[31]

Despite its lack of teeth, Coastal Command aircraft could contribute to successes against U-boats by locating and harrying U-boats long enough for naval vessels to press home attacks. The first such success occurred in January 1940, but truly independent kills remained beyond Coastal Command.[32]

By the summer of 1940 the Command, in conjunction with other arms and Services, appeared to be on the way to putting in place the pieces to contain the German threat posed to maritime trade. Increases in the numbers of more modern aircraft, improved co-operation with the Royal Navy and better tactics had brought Coastal Command to a higher level of capability. However, the RAF still lacked an effective air maritime striking capability; Bomber Command proved woeful in this regard, whilst Coastal Command's torpedo bomber force, such as it was, was still slowly converting to Bristol Beauforts.

THE ATLANTIC CAMPAIGN 1940-41

Coastal Command's greatest challenge, and indeed its most important contribution to Allied victory, came in the first sustained U-boat campaign against Britain, which lasted for some twelve months from the summer of 1940. The crisis exploded because of the radical shift in the strategic balance of power on the continent following the collapse of France in June 1940 and the earlier occupation of Norway. From this point onwards the Germans could deploy U-boats and aircraft much closer to the Western Approaches, dramatically increasing their time on patrol. No longer did U-boats have to slip through

the North Sea into the Atlantic, as from France's north-western ports they were already practically there. In effect, by the late summer of 1940 Coastal Command faced a significant increase in the level of threats and enemy assets it would have to confront on a regular basis, notwithstanding the immediate possibility of resisting an invasion of Britain itself. And still further, Bowhill was called upon to deploy aircraft to the Mediterranean now that Italy had joined the War on Germany's side.

The German U-boat arm, under the command of Vizeadmiral Karl Dönitz, was now in a position to put into action its *Rudeltaktik* concept, better known in English as the Wolfpack. Featuring groups of co-ordinated U-boats to swamp convoy escort forces, usually attacking on the surface to confound ASDIC, and at night to reduce visual sightings, Wolfpacks soon began to inflict appalling casualties on Allied shipping. Until June 1940 the Allies suffered the loss of around 50,000 tons per month in the Atlantic, but for the ensuing twelve months that rate rocketed up to a monthly figure of 266,000. In total, from all causes, the British lost 585,000 tons of shipping in June 1940 and averaged 450,000 tons per month for the next year, levels which if maintained would have crippled Britain's ability to wage war.[33]

U-boats were also soon operating further out into the Atlantic. Until the fall of France, Atlantic shipping losses composed around a quarter of the total, but from then on that

A Short Sunderland I of 210 Squadron on shipping escort duties, Summer 1940.

balance shifted to 60%. Naturally this exposed Coastal Command's dearth of long-range aircraft, such as the Sunderland. Yet, even in the deteriorating situation of the autumn of 1940, the importance of air cover for convoys when it could be provided was amply demonstrated; convoy SC2, despite taking heavy losses, was protected during daylight by Coastal Command Sunderlands which compelled the U-boats to dive and lose contact for a time.[34] U-boats of the period had limited underwater capability and endurance; they were in effect submersible torpedo boats rather than true submarines. Once forced underwater to avoid continued detection by lurking aircraft, U-boat speed dropped away dramatically from around 17 knots on the surface to well under ten when submerged; this underwater speed was exceeded even by convoys. Thus, even though Coastal Command aircraft lacked much in the way of offensive weaponry to tackle U-boats, they *could* suppress them, improving the chance of convoys evading the submarines or at least reducing losses. This was titled the Scarecrow Effect by Air Chief Marshal Sir Philip Joubert de la Ferté, Bowhill's replacement as AOC-in-C, Coastal Command. The very fact that U-boats focused their attacks increasingly in the Mid-Atlantic Gap, beyond the range of Coastal Command aircraft, was testimony to the value of air cover.[35]

Coastal Command also had to confront the Luftwaffe's long-range aircraft which from the autumn of 1940 onwards could also reach well out into the Atlantic from airfields in Northern France; some of these aircraft, such as the Focke Wulf 200 Condors, were also equipped with bombs and took a not inconsiderable toll on Allied shipping. Yet the Condor was not well suited to such operations and when confronted by Sunderlands, usually lost out. But once again it was the lack of long-range aircraft that was hampering Coastal Command's operations. To add further to Coastal Command's responsibilities, the threat of Germany's surface fleet grew once France's Atlantic ports became available to Germany's battlecruisers and cruisers, and still further when new ships such as the powerful battleship *Bismarck* entered service. Keeping tabs on these raiders was a crucial role, but success was patchy. Perversely, for much of the first half of the War, Coastal Command had the skills to operate more successfully at sea against surface targets, but lacked the striking power to do so; Bomber Command had the firepower, in theory, but soon demonstrated an inability to operate effectively at sea. High-level bombing proved repeatedly impotent against moving targets at sea.[36]

The key for Coastal Command by the autumn of 1940 was to obtain sufficient aircraft to meet its burgeoning responsibilities. More aircraft were still required for close-in protection of shipping around the British Isles, and the Luftwaffe remained a significant threat here too, but it was the shortage of long-range aircraft that was most pressing. Bowhill and the Admiralty began agitating for increased numbers of long-range aircraft, but the Air Ministry was determined to maximise numbers of such aircraft for bombing duties; this too was a vital concern. In June 1940 the Air Staff had even blocked the allocation of long-range aircraft for Coastal Command operations from Iceland.[37]

Thus was set the tone of Coastal Command's relationship with the Admiralty on one side and the Air Ministry (usually backed by Churchill) on the other, for the next three years. As Joubert de la Ferté later remarked, when it came to resources Coastal Command was 'kicked by the Admiralty for not asking enough and blamed by the Air Ministry for asking impossibilities'.[38] As the Atlantic campaign took a decided turn for the worse in the autumn of 1940, the inter-Service squabbles grew more intense, not aided by non-Service voices stirring-up trouble. At a War Cabinet meeting in November, Max Beaverbrook (then Minister for Aircraft Production) suggested transferring Coastal Command in its entirety to the Royal Navy, as this might solve many issues, although not, of course, the underlying problem of aircraft shortages for which he may ultimately be responsible. Even the First Sea Lord, Admiral of the Fleet Sir Dudley Pound, baulked at the idea of such a change in the middle of the Atlantic campaign; he just wanted more aircraft of the necessary types for Coastal Command. John Slessor, later an AOC-in-C Coastal Command himself, was less polite about the protagonists in this putative transfer:

> Beaverbrook's crass ignorance of air-sea warfare was only excelled by the unsoundness of his judgement on anything connected with the conduct of the war. [Admiral Roger] Keyes was a very stupid old blue water Admiral whose ignorance and fear of Air Power in principle were sharpened by his personal vendetta with his brother-in-law, Trenchard.[39]

The full transfer idea came to nothing, but operational control was technically handed over to the Admiralty, though as they were working closely with Coastal Command anyway it is difficult to identify if the organisational change made that much, if any, practical difference. Slessor and Air Chief Marshal Sir Sholto Douglas, another future AOC-in-C Coastal Command, certainly thought it did not.[40] Indeed, though a planned move of Coastal Command HQ from Northwood to a location closer to the Admiralty was agreed, it never took place due to logistical issues, and this seemed to cause no obstacle to the functioning relationship of the Royal Navy and Coastal Command.[41]

Though the planned transfer was rejected, it was undoubtedly a factor in the Air Ministry suddenly agreeing to find extra aircraft for Coastal Command, including three more squadrons: Wellingtons, Beauforts and Beaufighters.[42]

Reinforcements for No.15 Group Coastal Command covering the North-western Approaches were added at a steady rate, with new bases being opened in Iceland, Northern Ireland and the Hebrides. By the early summer of 1941, these extra air assets, alongside increases in naval escorts for convoys and intelligence work, began to bear fruit and the losses in the Atlantic began to recede. In the second half of 1941, Atlantic shipping losses fell back to a rate of around 100,000 tons per month.

Bowhill continued to agitate for more aircraft. The waters close to the British Isles were becoming relatively safe due to the increase in numbers of aircraft available to Coastal Command, but there were crucial shortages in the longer-range types of aeroplanes such as Sunderlands, Whitleys and Wellingtons. It was also true that crews on Wellingtons and Whitleys (twin-engine aircraft) were being asked to patrol across great expanses of ocean in aircraft that could not fly on one engine if problems occurred. Bowhill was nevertheless persuaded to give up hope of obtaining any of the new four-engine bombers entering service in the RAF. The Whitley was also the only aircraft in Coastal Command that was equipped with the new LRASV (long range ASV) equipment, essential for night-time sorties, yet squadrons were short of aircraft and the Air Staff was still planning to transfer a Whitley squadron to other duties.[43]

FIGHTING BACK: ENHANCING ANTI-U-BOAT CAPABILITY, 1941-1943

By the summer of 1941, shipping losses had been brought under control and though still high were, for the time being, sustainable. Convoys were now escorted across the Atlantic, and Hitler had moved some of his submarine fleet to the Mediterranean. Coastal Command had played a vital role in the 1940-41 campaign, perhaps its most important of the War, but it was still a scarecrow force, effectively incapable of inflicting serious damage on U-boats. The next step for Coastal Command was therefore to develop the equipment and tactics to begin inflicting casualties on the enemy; imposing attrition on U-boats would in the long term play a major role in winning the Battle of the Atlantic.

This was a driving factor in the reappointment of Air Chief Marshal Sir Philip Joubert de la Ferté as AOC-in-C Coastal Command in June 1941 as replacement for Bowhill who was moved on to Ferry Command after four years in post, a move that did not please him.[44] Joubert, who had previously headed Coastal Command in 1936-7, brought intelligence and imagination to the Command, as well as experience of the development of advanced technical equipment. He also, however, brought some baggage, having previously fallen foul of Churchill in 1940 over media appearances and interviews, which resulted in him becoming the country's best known Air Marshal, much to the irritation of the Prime Minister who ordered that Joubert should focus on his job.[45] Air Chief Marshal Sir Wilfrid Freeman, Vice-Chief of the Air Staff, was also unsure as to whether Joubert would toe the Air Ministry line in the way that Bowhill generally had, perhaps an indication of the delicate balancing act that the head of Coastal Command had to maintain.[46] Ultimately, however, Joubert lost the support of the Admiralty and this sealed his fate. After only sixteen months in charge, Admiral of the Fleet Sir Dudley Pound lobbied for Joubert to be replaced by someone with better operational grip; this proved to be Air Marshal John Slessor, though he could not take over until early 1943.[47] Nevertheless, during Joubert's tenure Coastal Command was transformed into a force much more capable of locating, attacking and destroying U-boats.

A crucial development that began shortly before Joubert arrived in June 1941 was the appointment of Professor Patrick Blackett as Scientific Advisor to Coastal Command, thus initiating the input of civilian specialists into the workings of the Command. Blackett was well known to Joubert who had pressed for his appointment to close-out weaknesses in the Command's assimilation of new technology, principally ASV radar. This initiative soon developed into an Operational Research Section (ORS), mirroring the type of work done successfully at Fighter Command.[48]

Blackett's main brief was to boost the effectiveness of ASV equipment in Coastal Command. New centimetric wavelength ASV equipment appeared to be the best long-term solution, but Blackett argued that the second generation ASV equipment, LRASV (or ASV II), based on a 1.5 metre wavelength, was perfectly capable of doing a decent job. Over half the Command's aircraft were fitted with ASV equipment by mid-1941, but it was not having the impact imagined; ASV was only locating U-boats before visual contact was made in 20-25% of cases. Blackett's team soon began watching Coastal Command's operations and providing analysis. Their most important recommendation was to wean crews off reliance on visual sightings and to switch to LRASV equipment, preferably whilst using cloud cover wherever possible. Aircraft were likely to be spotted by U-boats before the aircraft visually sighted the U-boat and this was affording too much time for the U-boat to escape. In order to increase the likelihood of hitting and damaging a U-boat, an attack had to be initiated quickly, within 30 seconds of the U-boat spotting and reacting to the aircraft, and preferably within 15 seconds.[49] If aircraft hid in clouds and used ASV to locate U-boats, their chances of surprising and attacking quickly were considerably improved. Professor Evan Williams, who replaced Blackett in early 1942, noted that by using the new tactics and relying on LRASV, Coastal Command aircraft improved their chances of locating a U-boat fivefold, although this effect would not be indefinitely valid as the Germans were likely to introduce detectors matched to the wavelength of LRASV equipment.[50]

A further ORS initiative included changing camouflage schemes. No 15 Group Coastal Command had requested in early 1941 that they be allowed to repaint the undersides of their aircraft light blue as the standard black, a counter-measure to searchlights, was redundant over the sea. The ORS went further and pressed for the undersides of Coastal Command aircraft to be painted white to camouflage the aircraft in grey and cloudy skies by better reflecting the light, making the aircraft 20% less likely to be spotted from the sea. RAF officers took some convincing, but by the autumn of 1941 white undersides were standard.[51]

Though there were many other ORS initiatives, some developments lay outside their remit, but were also crucial innovations such as the development of the Leigh Light. A technical deficiency and major problem with LRASV equipment was that it went blind

during the final 1,000 metres run-in to an attack on a U-boat.[52] As darkness was an ideal period for air attacks on U-boats as it concealed the aircraft from observation, Wing Commander Humphrey de Verd Leigh, largely on his own initiative, developed a searchlight solution that allowed the target to be illuminated in the final moments of the attack, enhancing the chances of success. Despite some resistance from Joubert, who initially favoured a different solution, the Leigh Light proved successful and enhanced the chances of achieving an accurate surprise attack.[53]

New Torpex-filled depth charges that increased lethal radius by some 30% and new detonators added to the mix of measures. As diving to escape began to prove increasingly perilous some submarines began to try and fight it out on the surface relying on their guns to dissuade aircraft from pressing home accurate attacks. Coastal Command crews pointed out that once their depth-charges had been used, their .303 machine-guns were of limited use against U-boats. Heavier cannon and guns were eventually introduced to provide aircraft with an effective weapon against surfaced submarines.

Ultimately, the efficiency of sightings and attacks on U-boats by aircraft rose significantly as 1942 progressed. Between 1939 and 1941 Coastal Command had independently accounted for one U-boat. In the first six months of 1942 they sighted 83, attacked 79 and sank two more, but when all the new measures and equipment came into use, the figures rose to 505 sightings, 346 U-boats attacked and 24 sinkings.[54] The lethality of Coastal Command attacks on U-boats rose from 2-3% in 1941 to 40% by 1944.

A development of this greater success in 1942 was the Bay Offensive in which Coastal Command assets were specifically assigned to attacking U-boats as they crossed the Bay of Biscay. German submarines had generally travelled on the surface at night to charge their batteries, safe in the knowledge that air cover was usually present in the shipping lanes and around convoys. But when Coastal Command aircraft equipped with LRASV, Leigh Lights and improved tactics began scouring the Bay of Biscay, night-time offered even greater danger than daytime. The Germans resorted to diving at night and providing air patrols for surfaced U-boats during the day.[55]

The Bay Offensive fell away in significance in the late autumn of 1942 when the Germans began equipping U-boats with *Metox* radar detectors that alerted German crews to the presence of Allied aircraft using LRASV. The ORS at Coastal Command had predicted such a move and the only real solution was to move onto CMASV or ASVIII radar which used shorter wavelength and would defeat *Metox*. Unfortunately that would take until the spring of 1943 to materialise. Until then, stop-gap solutions such as flooding the area with LRASV transmissions to panic U-boats into diving repeatedly were developed.[56]

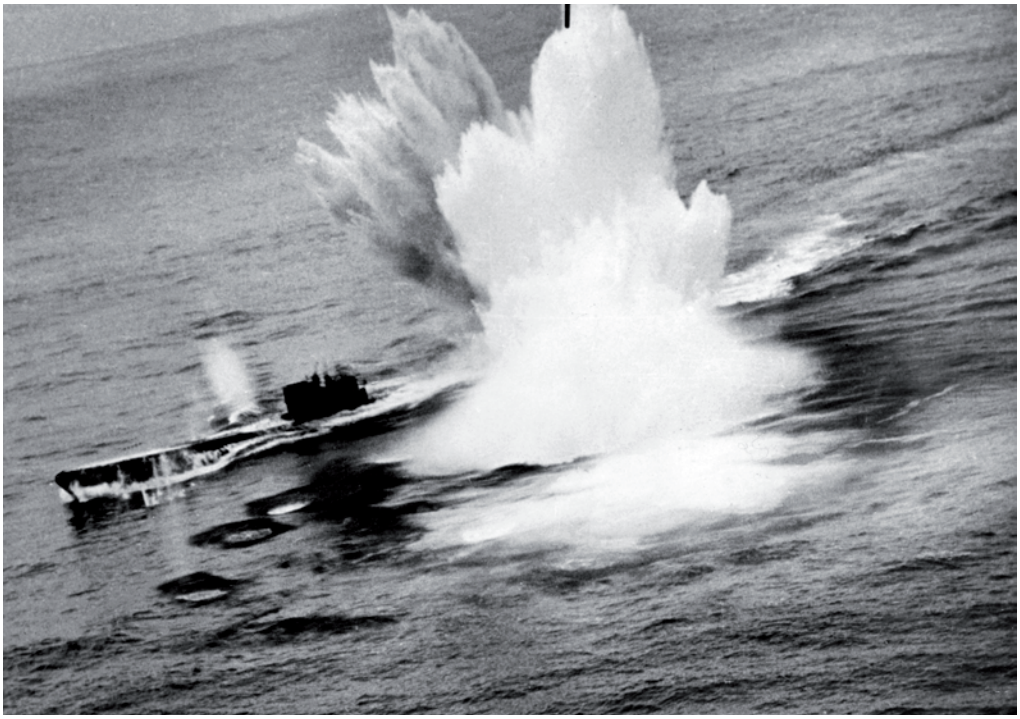
THE MID-ATLANTIC AIR GAP 1942-3

The success of the Bay Offensive was to play a role in blinding the Allies to the growing problem of the inadequate air cover in the mid-Atlantic, principally because the Admiralty and Coastal Command spent much of the first nine months of 1942 lobbying Churchill and the Air Ministry for aircraft to support the Bay Offensive; there was no pressing concern over the mid-Atlantic, as there was little activity there. Consequently, of the aircraft coming into Coastal Command that summer, none were suitable for operations in the mid-Atlantic.

Yet, by the autumn of 1942, the Battle of the Atlantic had turned against the Allies once more. The loss of *Ultra* intelligence due to the addition of a fourth rotor to German naval intelligence *Enigma* machines increased numbers of operational U-boats, and the need to provide secure escorts across the entirety of the Atlantic following the entry of the USA into the War, were major contributory factors to the dramatically increased shipping losses, which peaked in the November of 1942.

Yet, arguably the most important factor, and perhaps the key to victory, was the provision of air cover in the mid-Atlantic which became increasingly essential as U-boat activity was now concentrated in this area, where Allied aircraft could not operate. The best way to provide air cover in the mid-Atlantic was far from clear, however. Joubert considered it inefficient for Coastal Command to fulfil this role, as at such extended ranges the chances of his aircraft linking up with the convoy they were to escort fell away significantly.[57] More importantly still, the number of aircraft with 'very long range' (VLR) capability was tiny – only the Mark I Liberator was up to the task and, though they had been around since 1941, they were in such small numbers and with no provision for replacement, they offered no solution, something of which the Admiralty was well aware.[58] Escort carriers seemed to offer a better option for the mid-Atlantic, and a small supply of them had been secured from the USA. But the Admiralty was much more interested in using them in other roles and had sent them to dockyards for refitting and conversion; by the autumn of 1942 and for the near future, escort carriers provided no immediate answer.[59]

Consequently, and despite Joubert's concerns, Coastal Command would have to do the job, if suitable aircraft could be found. Unfortunately, the British did not have an easily and quickly adaptable home-grown aircraft for the task. The only viable option in the short term was to convert Liberator Mark IIs into VLR aircraft. As built, their range was substantially lower than Mark Is (1,800 miles compared to 2,400 miles), but they could be altered to increase range to a suitable level by removing self-sealing fuel tank equipment and other ancillaries. John Slessor, then ACAS (Policy) and soon to be AOC-in-C Coastal Command, was not entirely happy about the proposed conversion programme, but there was no alternative. Yet, even when finally agreed, the process was painfully slow as the aircraft required considerable work and modification; it was spring



Photograph taken from Short Sunderland III of 422 Squadron RCAF while attacking a U-boat in the Atlantic with depth charges and machine gun fire, 1944.

1943 before the new VLR Liberators became operationally available in sufficient numbers to begin making a difference.[60]

With the 'air gap' closed by Coastal Command, their efforts eventually being supplemented by Royal Navy escort carriers, and with other intelligence and resource measures coming into play, by the late spring of 1943 the U-boat threat began to abate. Shipping losses fell away whilst Dönitz's fleet began to haemorrhage, nearly 100 being lost in the May-July period. By the summer of 1943, he had to withdraw his U-boat fleet from the Atlantic to prevent its destruction, and Coastal Command had been crucial in forcing this decision. Although the U-boat threat would never entirely melt away, and Coastal Command would continue to play a key role in containment, by the late summer of 1943, the Battle of the Atlantic had been won.

DEFEATING THE GERMAN SURFACE FLEET

The U-boat was to prove the principal threat to Britain's maritime security in the Second World War, but the German surface navy still persisted and had to be contained or neutralised in some manner by the Allies. Coastal Command's role would eventually expand to play an important part in this effort and would develop into a potent offensive arm which was deployed against the Axis shipping fleet in the closing stages of the war.

Yet back in 1942 Coastal Command was about to reach its nadir against the German surface fleet. When the Asia-Pacific War broke out in December 1941, a proportion of Coastal Command's already small force of strike aircraft was hurriedly transferred to the Indian Ocean causing alarm at the Admiralty over the RAF's decreased ability to act against German surface vessels around the British Isles. Rear Admiral Arthur St George Lyster, the Fifth Sea Lord and Chief of Naval Air Services, predicted in December 1941:

> It is very obvious that the strength of the home Coastal Command is inadequate. ...a breakout which is not intercepted and destroyed would take some laughing off, especially if it was done by any of the Brest party.[61]

On 11 February 1942 Lyster's Brest party, the elements of the German surface fleet still holed up in French Atlantic ports since 1941, did exactly as he had feared. The battlecruisers *Scharnhorst* and *Gneisnau*, along with the heavy cruiser *Prinz Eugen*, departed Brest and steamed quickly up the English Channel heading back to Germany; they remained undetected for close on twelve hours. The British response was sluggish at best and the reaction poorly co-ordinated. Coastal Command aircraft failed in basic reconnaissance tasks and then lacked the wherewithal and the resources to intervene in a meaningful manner. By 13 February the German ships were home in port in Germany, though two had hit mines. The RAF exacted some form of revenge a few weeks later when a bombing raid put the *Gneisnau* out of action for good, but what became known as the Channel Dash had been an embarrassing fiasco. As *The Times* noted the German fleet had 'succeeded where the Duke of Medina-Sidonia failed'.[62]

Joubert's response at the subsequent Board of Inquiry was to state lamely that 'one does what one can with the aircraft one has got'.[63] More tellingly, the Inquiry concluded that relying on Bomber Command to intervene against fleeting German surface vessels, a task for which they were untrained, was a clear mistake. Coastal Command aircraft had at least pressed home attacks against the naval ships, whereas out of 242 Bomber Command sorties only 39 found a target, and there was evidence that it might not have been the correct one in every case.[64] The policy of Coastal Command locating targets at sea for Bomber Command to deal with, along with the meagre force of specialist torpedo bombers, had been repeatedly questioned since the start of the War, but its failings were ruthlessly exposed in February 1942.[65]

Though the Channel Dash was a tactical success for the German fleet, it was, as Admiral Raeder predicted, a strategic blunder. The threat of the German surface navy receded from that point because it was holed up in German ports or transferred to Norway. Bomber Command was freed from targeting the German warships in France and could turn to objectives in Germany itself, whilst Coastal Command's thin anti-shipping forces could be relocated and concentrated in the northern British Isles to counter any moves from Norwegian ports. The German surface fleet represented a lingering threat

to Arctic Convoys, until slowly whittled away, picked off in sea battles (as in the case of the *Scharnhorst*) or eventually dealt with by Bomber Command (the *Tirpitz*).[66]

Coastal Command kept a watching brief on German naval vessels, backed by its increasingly potent strike force, which by the time of Operation OVERLORD in 1944 was more sophisticated and flexible, being well able to deal with lighter German craft such as destroyers and E-boats.

THE ANTI-SHIPPING CAMPAIGN

For much of the War, Coastal Command's role appears passive or reactive – tactically at least, even if at a strategic level it was crucial. Yet this was also misleading, for the Command was increasingly committed to a growing and highly dangerous campaign against Axis merchant shipping. This task had become significant once Norway had been attacked and occupied by Germany; indeed, it was only at this point that Coastal Command was released to attack enemy shipping in the Skagerrak.

Germany was dependent on raw material imports from Scandinavia, the most efficient route into Germany being by shipping along the Norwegian coastline into German ports, later supplemented by Rotterdam once occupied in May 1940. This route offered a tempting target for the British, but Coastal Command initially lacked the aircraft, ordnance and techniques to operate effectively in this anti-shipping role. Bowhill was forced to employ Hudsons as the Beauforts had engine reliability issues and lacked sufficient defensive armament for operations so far from home and beyond escort fighter range. Blenheims also offered an option for anti-shipping duties. Low-level attack was the preferred method as it increased the likelihood of success, if at the expense of higher losses. Blenheim losses on operations against North Sea shipping ran at 20%.[67] Some modest success ensued, but the drain on anti-shipping resources to the Mediterranean in 1941 and then the outbreak of war in the Asia-Pacific theatre set Coastal Command's anti-shipping capability in the British Isles almost back to square one. New aircraft were urgently required to replace the Blenheims, Hudsons and Beauforts, all of which had certain limitations and issues, whilst the Germans were enhancing their defensive capabilities; the increasing deployment of Sperrbrecher ships, laden with flak, was a sobering development. Low-level attacks were abandoned in July 1942 which kept aircraft casualties down, but at the expense of limiting the damage inflicted on merchant ships.[68]

Little headway was made in developing the anti-shipping campaign until the later months of 1942 when Beaufighters and Torbeaus (torpedo equipped Beaufighters) began to arrive in the Command. Initially, much of the new output of these types went to other theatres, but by the autumn it was Coastal Command's turn.[69] Such was the impact of these aircraft with their high speed, flexibility and array of weaponry that Joubert argued for a focus on the Beaufighter as the aircraft of choice in the new Strike Wings that were

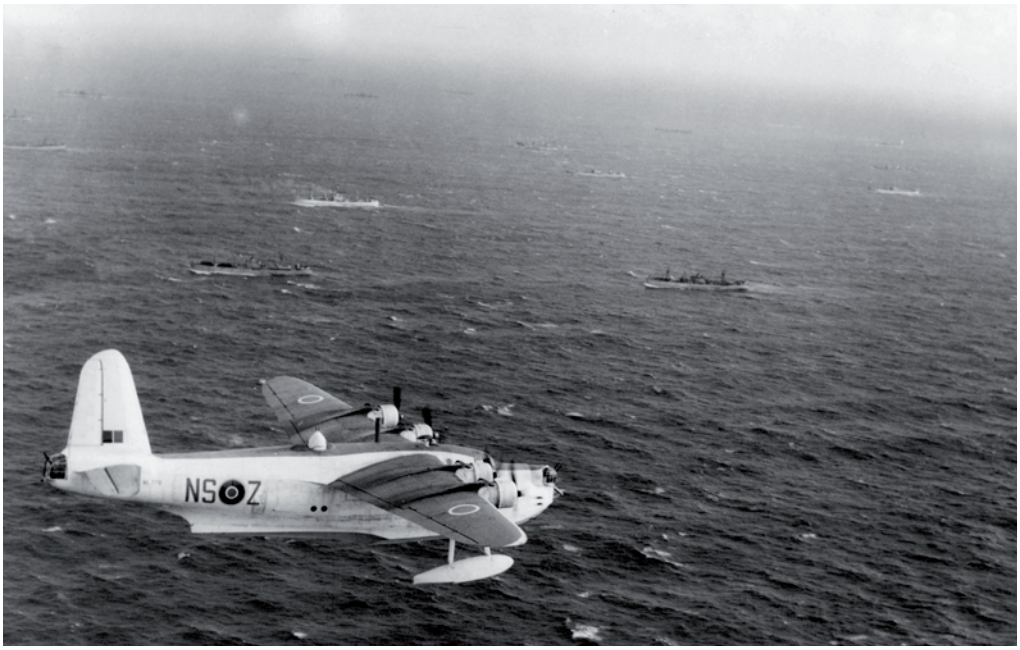
to be developed and deployed in late 1942 specifically for anti-shipping actions. As ever, demand outstripped supply and converted Hampdens had to soldier on as torpedo bombers until sufficient Torbeaus / Beaufighters began to arrive.[70]

The campaign was further underpinned by the intelligence gathered by the Ministry of Economic Warfare and its estimations of the possible impact of an effective anti-shipping campaign on the German economy and state. Coastal Command's ORS also became involved in sharpening upon the methods and tactics of the campaign and they issued a stream of recommendations from 1942 onwards. A key tactical pointer was that fighter and bomber attacks should hit targets first in order to suppress flak resistance prior to attacks by torpedo bombers. Torpedoes, once supplies increased, were still the best way of sinking ships, but delivering them remained very dangerous to aircraft and crews. The use of Beaufighters, which sported a heavy array of forward firing cannons and machine-guns, in this suppression role was to prove highly effective.[71]

In November 1942 the Strike Wing concept was put into action, but the first operation was to prove a 'costly shambles' and it took some months for results to improve.[72] In 1943, the attacks grew in effectiveness as the new aircraft were supplemented by better equipment and enhanced techniques. Rockets were introduced, which, alongside torpedoes, bombs, cannon and machine guns, offered a potent mix. New radar and bomb aiming equipment were incorporated, and the increasing employment of fighter escorts ensured that the Beaufighters were able to achieve many more objectives without interference from the increasingly elusive and absent Luftwaffe. Success off the Dutch coast forced the Germans to switch their main continental port of entry from Rotterdam back to Germany, a far less efficient way of importing raw materials. Neutral shipping had also begun to lose faith in the protection the Germans offered and had long since withdrawn to the Baltic.[73] Nevertheless, Coastal Command losses remained high. Operations off Norway were hampered by the lack of a long-range fighter for escort duties and thus the development of a Strike Wing to operate in this area was hindered.

By 1944 the threat from the U-boat menace in the Atlantic had receded and though effort was given over to supporting Operation OVERLORD, Coastal Command was able to concentrate ever more on the anti-shipping campaign. Indeed, the Strike Wings were employed in suppressing and disabling German light surface assets to aid the invasion in June, as well as Coastal Command playing a vital role in effectively eliminating the U-boat as a threat to the landings and maritime supply routes. Some twenty-three squadrons were deployed to these roles.[74]

Throughout 1944, Coastal Command actions accounted for 170 enemy ships totalling 183,000 tons for the loss of 165 aircraft, which was nearly one aircraft per ship, a much-improved ratio and performance compared to the previous year. By the autumn, Swedish shipping had lost its government's insurance against loss if using German



A Short Sunderland of 201 Squadron escorting an Atlantic convoy on Coastal Command's last operational patrol of the war.

ports, because the threat from the RAF had grown so much. At a stroke, therefore, the German government lost over a quarter of its accessible merchant shipping. The assault by Coastal Command continued into the spring of 1945, yielding still more significant returns; 104 vessels were sunk in less than five months, a figure higher than all the kills between April 1940 and December 1943. Bomber Command's mine laying campaign was proportionally more effective than direct attack in accounting for enemy shipping, and at a much lower cost in sorties, aircraft lost and aircrew casualties; at least two thirds of Coastal Command's total personnel killed in the war came in anti-shipping operations. But the Germans also had to deploy considerable resources to escorting and defending their dwindling merchant shipping fleet, effort that would not have been absorbed by mine laying.[76]

FINAL ASSESSMENT

When Germany finally surrendered in May 1945, Coastal Command's long vigil came to an end. The final months of the war had seen new Type XXI U-boats threatening to overturn the cosy superiority the Allies and Coastal Command had enjoyed over the German submarine fleet since mid-1943, but such innovations came far too late to prove a real problem. Whilst the Command had developed air-sea rescue capability and had housed the RAF's photo-reconnaissance assets, its main roles throughout the war remained trade defence and offensive action against enemy shipping. In both tasks the Command proved successful.

Throughout the War, Coastal Command accounted for over 200 U-boats destroyed, the great majority in the 1942-45 period, sank or damaged over 1 million tons of Axis shipping, and rescued over 10,000 people from the sea. Ultimately, the Command flew in excess of one million hours, suffered the loss of some 2,000 aircraft and sustained nearly 6,000 fatalities between 1939 and 1945.[77]

By 1945, Coastal Command, from relatively inauspicious beginnings, had been transformed into a potent force which had clearly overcome the legacies of the muddled thinking of the inter-war years and had gone on to embrace new approaches and techniques. Ultimately, its most vital contribution was during the 1940-41 Atlantic campaign helping to turn around British maritime interests after they had reached their nadir; this success was achieved with very limited weaponry, technology and scientific intervention.[78] Its later success in sinking U-boats, peaking at 35% of total U-boat losses in 1943, undoubtedly helped to break the back of the German threat to Britain's trade routes, but even at this point it was the allocation of a small number of VLR aircraft to close the Atlantic air gap in the spring of 1943 that effectively sealed the fate of Dönitz's fleet. Whether this might have been achieved earlier remains a contested subject, but ultimately it proved to be the final piece in winning the Battle of the Atlantic and securing the Allies' road to victory.

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