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**The Other Critical Convoy Battles of 1943: The Eclipse of the Schnellboote in the English Channel and the North Sea**

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In the historiography of the Second World War at sea, the convoy battles for SC122 and HX229 in March 1943 represent the turning point in the Battle of the Atlantic.<sup>1</sup> What Jürgen Rohwer has labeled "the critical convoy battles of March 1943" gave way, in a few short weeks, to Black May.<sup>2</sup> During that month, forty-one U-boats were lost (25% of the operational strength of the U-boat command) and, on 24 May, Admiral Karl Dönitz suspended the campaign. While scholars have focused on the mid-Atlantic and the U-boat campaign, they have largely overlooked the Royal Navy's decisive victory in the struggle to maintain the coastal convoys along Britain's south and east coasts.<sup>3</sup> The campaign by coastal forces from 1940 to 1945 for control of the narrow seas between Britain and France was a vital part of the war at sea. The convoys that ran along Britain's south and east coasts carried the coal on which Britain's southern cities and war industries depended. The coastal convoys also represent a vital missing link in the story of the Atlantic struggle. After crossing the Atlantic, cargoes were often transhipped for movement around the coast in smaller ships. They were also, by 1943, playing a vital role in the build-up of military resources in the United Kingdom as part of Operation Bolero. To deliver Bolero requirements, the size of coastal convoys had to more than double during 1943, and larger, ocean-going ships had to be routed along the south coast of England. It was vital to ensure the safe arrival of these ships and their precious cargoes, and, in 1943, that was in question.

From 1940 until 1942, the Royal Navy struggled to come to terms with the German *Schnellboote* (S-boats) operating in the English Channel. Referred to as "E-boats" by the British (E for enemy), the tonnage of British

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1. This chapter has been supported by a grant from the Wheatcroft Collection and I would like to record my thanks to Kevin Wheatcroft.

2. Jürgen Rohwer, *The Critical Convoy Battles of March 1943: The Battle for HX.229/SC122* (Annapolis: Naval Institute Press, 1977).

3. The number of works devoted to the coastal campaign is small. See, for example, Bryan Cooper, *The E-boat Threat* (Abingdon: Purnell, 1976); Alexander McKee, *The Coal Scuttle Brigade* (London: New English Library, 1973); Robert Jackson, *Churchill's Moat: The Channel War, 1939–1945* (Shrewsbury: Airlife, 1995); J.P. Foynes, *Battle of the East Coast* (Isleworth: self-published, 1994); Peter C. Smith, *Hold the Narrow Sea: Naval Warfare in the English Channel, 1939–1945* (Annapolis: Naval Institute Press, 1984). There is a larger volume of work dealing with coastal forces: Lieutenant Commander Peter Scott, *The Battle of the Narrow Seas: A History of the Light Coastal Forces in the Channel and North Sea, 1939–1945* (London, Country Life, 1945); Gordon Williamson, *E-boat vs MTB: The English Channel, 1941–45* (Oxford: Osprey, 2011); Gordon Williamson, *Kriegsmarine Coastal Forces* (Oxford: Osprey, 2009); Gordon Williamson, *German E-boats, 1939–45* (Oxford: Osprey, 2002); Harold Pickles, *Untold Stories of Small Boats at War: Coastal Forces Veterans Remember* (Edinburgh: Pentland Press, 1994); Leonard C. Reynolds, *Home Waters MTBs at War: Channel and North Sea MTB and MGB Flotilla Operations, 1939–1945* (Stroud: Sutton, 2000); Jean-Phillippe Dallies-Labourdette, *Deutsche Schnellboote, 1939–1945* (Stuttgart: Motorbuch Verlag, 2006); Hans Frank, *Die Deutschen Schnellboote im Einsatz: Von den Anfängen bis 1945* (Berlin: E.S. Mittler & Sohn, 2006).

coastal merchant shipping sunk along the east and south coast of Britain by these powerful motor-torpedo boats grew. But, in 1943, the campaign suddenly collapsed with just six merchant vessels being sunk by the S-boats. This chapter seeks to locate the coastal campaign as an integral part of the Battle of the Atlantic, analyzing the threat posed by the S-boat together with the development of countermeasures by the Royal Navy and Royal Air Force (RAF). It will examine the evolution of British tactics, the development of new weapons systems, and the intelligence struggle against the S-boats. It will also analyze critical failures and delays to respond on the part of the *Kriegsmarine*. Historians have failed to recognize that, between 1940 and 1943, the British were able to create a sophisticated, multi-layered, sea-air defense-in-depth along the south and east coasts of the United Kingdom, using a variety of weapons platforms, and utilizing real-time intelligence and electronic information sources. It was the success of this system of defense that neutralized the S-boat as a threat to the coastal convoys.

### **The Fall of France and the Emergence of the S-boat Threat**

The *Schnellboote* first appeared as a threat to British ships during the Dunkirk evacuation in 1940 and, during that year, S-boats sank twenty-three British ships (47,985 grt). Although in comparison to the first "happy time" enjoyed by the U-boats in 1940, these were not particularly large numbers in terms of the overall tonnage of British ships lost, but the figures were nonetheless significant. U-boat, S-boat, auxiliary raider, surface warship, mine, and *Luftwaffe* attacks against shipping each contributed to the overall tonnage war, which was the primary strategy of the *Kriegsmarine*. In addition, the S-boats targeted a particular sector of British merchant shipping: short coastal traffic.

At the outbreak of war, coastal shipping made up a significant proportion of the British merchant fleet. In 1937, 1,479 steam and motor vessels totaling 1,151,880 grt and employing 21,324 British and 261 foreign seamen were primarily engaged in the British coasting trade.<sup>4</sup> During the war, the coastal convoys fulfilled two significant strategic functions in terms of the British economy. First, they brought coal from the coalfields in northeast England and Wales to the southeast of England (for the purposes of heating homes and fueling the power stations vital to maintain British war industries). In 1852, William Cory had initiated the use of steam colliers to bring coal into the capital. Coal carried by sea quickly came to dominate the London market, and the growth of power-intensive industries in the capital such as heavy engineering, chemicals, shipbuilding, and armaments was fueled by plentiful supplies of coal.<sup>5</sup> The movement of coal from the mines

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4. Board of Trade, *Statistical Abstract of the United Kingdom*, no. 82 (London: HMSO, 1938), table 272, pp. 366-67.

5. John Marriott, "Smokestack: The Industrial History of the Thames Gateway," in Philip Cohen and Michael J. Rustin, eds., *London's Turning: The Making of the Thames*

in the west and north of Britain depended on coastal traffic and, by 1939, London alone required 10,250,000 tons of coal *per annum* to maintain her "gas, electricity, water, sewerage, transportation and hydraulic power."<sup>6</sup> The requirements of the southeast meant that convoys along the east coast had to run on an almost daily basis, and along the south coast on the basis of every other day.<sup>7</sup>

The second strategic function of the coastal convoys was that they allowed the transshipment of cargoes from larger vessels that had crossed the North Atlantic and their delivery closer to their point of use. In some cases, this involved incorporating ships that had made the Atlantic run into coastal convoys; in others, it meant unloading cargoes from larger ships into small coasting vessels. This could be done in port or in sheltered anchorages using the derricks of the larger ships. With both coal deliveries and the onward transshipment of cargoes that had crossed the Atlantic, the coastal convoys played a vital role in easing the strain on overburdened ports and the British railway network which struggled to cope with wartime demands. Ports, starting with the Port of London in 1940, were targets of the *Luftwaffe* after the Fall of France in June 1940. Britain's inland transport system (rail, road, and waterways) simply did not have the capacity to expand to replace the cargo capacity of the coastal convoys. On both sides of the Channel, there was an acute understanding that the coastal convoys "carried the coal on which London absolutely depended."<sup>8</sup> The *Führer der Torpedoboote*<sup>9</sup> commented on 5 July 1940 that "England is forced to carry on the traffic to London in order to keep Southern England going. This will be done regardless of results."<sup>10</sup> The narrow and shallow confines of the English Channel placed this traffic largely beyond the reach of U-boats and major surface warships. The development of defensive minefields off the English coast placed further restrictions on the ability of the *Kriegsmarine* to target British shipping off the east and south coasts.<sup>11</sup>

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*Gateway* (Aldershot: Ashgate, 2008), pp. 22-23.

6. Nick Hewitt, *Coastal Convoys, 1939–1945: The Indestructible Highway* (Barnsley: Pen and Sword, 2008), p. 7.

#### 7. British Coastal Convoys, Late 1943

Route	Code Id.	Frequency	Av. No. Ships	Time on Passage
Nore-Methil	FN	6 days in 7	33	54 hours
Methil-Nore	FS	every 4 days	33	54 hours
Southend-Portsmouth	CW	every 4 days	20	24 hours
Portsmouth-Southend	CE	every 4 days	20	24 hours
Portsmth.-Bristol Chan.	PW	1 day in 2	16	48 hours
Bristol Chan.-Portsmth.	WP	1 day in 2	16	48 hours

Figures from The National Archives, London (hereinafter TNA), Admiralty Records (hereinafter ADM) 1/15815, "Coastal Convoys: An Appreciation," 11 October 1943.

8. Captain Peter Dickens, *Night Action: MTB Flotilla at War* (London: Purnell, 1974), p. 28.

9. *Schnellboote* flotillas were commanded by the *Führer der Torpedoboote* (FdT) until 1942 when a new post of *Führer der Schnellboote* was created.

10. ADM 223/28, Appreciation of the Situation by FdT, 5 July 1940.

11. ADM 1/15815, "Defensive Minelaying Policy in Home Waters."

Their most effective weapon in the circumstance was the *Schnellboot*. Capable of speeds in excess of forty knots, equipped with two torpedo tubes and two reloads together with a 20mm cannon and 40mm heavy machine guns, the S-boat was a formidable weapon of war in 1940. They were over 110 feet in length, powered by three Mercedes-Benz diesel engines (2,500 bhp). The S-boat was a heavyweight with the speed and grace of a lightweight. "Like the panther it possessed a savagery out of all proportion to its size, and leaping forward it could slay a victim twenty times its weight if its fangs [the torpedoes] found a vital mark."<sup>12</sup> S-boats possessed the means to sink a battleship, and the British soon learned to have a healthy respect for their devastating effectiveness against merchant shipping, especially light coastal vessels.<sup>13</sup> As Hans Frank has noted, during the Dunkirk evacuation, "the sinking of two destroyers, severe damage to a third, together with three steamers sunk, showed the capabilities of the S-boats despite there only ever being two or three out of a total of nine operational at a time because of engine troubles."<sup>14</sup> Second Officer V.P. Wills-Rust was the senior survivor from SS *Abukir*, sunk by *S-34* on 28 May 1940 after leaving Ostend. Hit by a torpedo, the ship sank in seconds, killing many of the 200 passengers on board. Rust later described the incident:

Although I was trapped, I could see everything over my head. The stern burst into flames and I saw flames forward. I could see the water coming up and over my head. The ship hit bottom and turned over, the debris was thrown off me and I was released and I came to the surface.<sup>15</sup>

The S-boats were able to reap a solid harvest of victims during the May-June evacuations from the continent, and, with the coast of France secured in June 1940, they were able to operate from French, Belgian, and Dutch ports until 1944. In practice, as some units were rotated to and from other theaters of operation, only three or four S-boat flotillas were operational in the North Sea and English Channel at any one time from 1940 to 1943.<sup>16</sup> Requiring considerable maintenance and awkward to repair, each flotilla had

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12. Theodore Roscoe, *United States Destroyer Operations in World War II* (Annapolis: Naval Institute Press, 1953), p. 357.

13. The scale of casualties resulting from a torpedo strike on a coastal vessel was often considerable. When MV (Motor Vessel) *Underwood* was sunk on convoy WP 457 on 6 January 1944, there were nine survivors from a crew of twenty-three.

14. Hans Frank, *German S-boats in Action in the Second World War* (Barnsley: Seaforth, 2007), p. 21.

15. ADM 199/2132, Survivors Report by Second Officer, V.P. Wills Rust, 5 June 1940.

16. **Flotillas Operating in the English Channel against East Coast Convoys, 1940-45**  
1940 – 1st 2nd 3rd  
1941 – 1st 2nd 3rd 4th 5th 6th  
1942 – 2nd 4th 5th 6th 8th  
1943 – 2nd 4th 5th 6th 8th 9th  
1944 – 2nd 4th 5th 6th 8th 9th 10th  
1945 – 2nd 6th 8th 9th 10th

four or five boats ready to dispatch on any particular sortie. Despite this, the S-boats were the ideal weapon to interdict the coastal shipping lanes, and, in the summer of 1940, they combined with the *Luftwaffe* to force a cessation of daylight traffic along certain pinch-points on the coastal routes. Convoying, usually involving around twenty-five merchant ships together with attendant escorts and minesweepers, offered one way forward. But in the circumstances of 1940, there were simply not enough escort vessels to go around. Hastily converted ocean-going trawlers and whalers with crews from the Royal Navy Patrol Service had to be pressed into service as auxiliary warships to provide escort to the coastal convoys. They were no match in speed or firepower for the S-boats. Given the shortages of destroyers, makeshift escorts were frequently the best which the Royal Navy could provide in 1940-41. However, even destroyers found S-boats difficult targets to hit. First Lieutenant Peter Dickens on the Hunt-class destroyer HMS *Cotswold* later wrote:

[S-boats] presented us with new problems in tactics and gunnery. We often heard and saw them as they strove to close our convoys, but to take a damaging shot at the ghostly shadows while they shimmered fleetingly in and out of our ken seemed beyond the capability of our ponderous [fire] control system.<sup>17</sup>

It was not until 1941-42 that the number of escort vessels began to improve, and British shipyards began to turn out an increasing number of motor launches, motor gunboats, and motor torpedo boats to defend the coastal shipping lanes. At the same time, the RAF slowly turned its attention to how air power could be used to neutralize the S-boat threat. It took time for the improving defenses to make a difference at sea. In 1941, S-boats sank twenty-nine ships totaling 58,854 grt and, in 1942, twenty-three ships at 71,156 grt. However, in 1943, the S-boat campaign along the Channel Coast collapsed with just six sinkings of 15,138 grt.<sup>18</sup>

In academic and public perceptions, the eclipse of the S-boat campaign has been overshadowed by the changing fortunes in 1943 in the struggle in the Atlantic. It is the emergence of the motor gunboat and the development of British coastal forces which are most frequently put forward as the principal reasons for the eclipse of the S-boat, insofar as the collapse of the S-boat campaign has been analyzed at all. In reality, it was not the emergence of a single weapons system to combat the S-boat threat that brought about the poor harvest for German coastal forces along the English Channel in 1943. Tactical changes, better utilization of intelligence, and, most crucially of all, German failure to upgrade the S-boat's weapon and defensive systems brought about the crisis of 1943 for the S-boat arm of the *Kriegsmarine*. Even then it is important to recognize that, while the British

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17. Dickens, *Night Action*, p. 28.

18. Stephen Wentworth Roskill, *The War at Sea, 1939-45*, Vol. III, *The Offensive*, Part II, *1st June 1944–14th August 1945* (London: HMSO, 1961), p. 479.

had managed to largely neutralize the threat to coastal convoys by 1943, it was another thing again to eliminate the S-boat threat by the destruction of German forces. S-boats continued to trouble British shipping in the North Sea even at war's end.

### **Success of the Convoy System: Escort and Tactical Innovation**

In 1940, especially following the losses of destroyers at Dunkirk, the British lacked sufficient escort vessels to cover both the Channel and the Atlantic convoys. The number of available destroyers, frigates, corvettes, and sloops available for Channel and east coast operations improved during 1941 and 1942, but urgent operational requirements could lead to temporary reductions. By the end of 1943, the number of destroyers available on the east coast dipped markedly as a result of requirements in the Mediterranean.<sup>19</sup> In addition, under the stress of wartime operations, some of the older destroyers proved increasingly unreliable and troublesome. By 1943, the Town-class destroyers, four of which were allocated to the Rosyth Command, were condemned as "virtually useless" against S-boats, and there were complaints that some of the older destroyers were "subject to continual breakdowns and minor defects due to old age."<sup>20</sup>

There was also a recognition in late 1940 that, while heavier ships possessed the caliber of guns necessary to sink an S-boat, hitting them was highly problematic. In response, a turret mounting was developed to house twin six-pounder, quick firing guns previously developed and used as coast defense artillery. Replacing an existing turret, the twin six-pounder mounting was installed on eight destroyers operating along the English Channel.<sup>21</sup> Able to fire eighteen rounds a minute, the twin six-pounder could place a considerable volume of fire on any target. Although it was not until December 1944 that the twin six-pounder accounted for an S-boat, the commanding officer's report confirmed the general appreciation that it was a handy weapon against light enemy craft, noting, "This is the first time that a kill has been made by a six pounder and in my opinion at short ranges (that is below 3,000 yards) one cannot ask for a better weapon."<sup>22</sup> Increasingly, the larger ships operated in conjunction with light coastal forces.

During 1941, the number of light vessels available to escort the coastal convoys increased considerably, but they still faced considerable problems

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#### **19. Number of Destroyers Available on the East Coast**

	October 1941	October 1942	October 1943
Rosyth	25	24	14
Nore	21	24	19

Figures contained in ADM 1/15815, C-in-C Nore to Admiralty, 16 October 1943.

20. ADM 1/15815, C-in-C Nore to Admiralty, 16 October 1943.

21. These eight destroyers included HMS *Walpole*, *Montrose*, *Mackay*, *Wivern*, *Worcester*, *Windsor*, *Whitshed*, and *Campbell*.

22. ADM 1/30193, Report by Commanding Officer, HMS *Walpole*, enclosure 1 in "Actions against E-boats on 22-23 December 1944: Recommendations for Honours and Awards," 1 March 1945.

in trying to deal with S-boats which were faster, more heavily armed, more capable in rough seas, and better able to survive major damage.<sup>23</sup> Motor Torpedo Boats (MTB) were in short supply in 1940, but, following the fall of France, British boatyards were remarkably successful in responding to emergency contracts for more MTBs and more fast motor launches (MLs). In March 1941, orders were placed for a new kind of fast, heavily-armed boat – the motor gunboat (MGB). The initial order was rapidly expanded to forty boats. Motor torpedo boats and motor gunboats lacked the weapons to deal effectively with S-boats in any form of high speed combat. During the course of the war, only six (out of an overall eighty-two) British MTBs and MGBs were sunk by S-boats and only eight (out of ninety-three) S-boat losses came from attacks by MTBs and MGBs. A torpedo was an effective weapon against a slow moving merchant ship, but against a fast moving light craft it was all but useless. Machine guns and cannon could pepper the hull of a torpedo boat without inflicting fatal damage. In fast-moving engagements, cutting across the enemy line and dropping a shallow-set depth charge to explode underneath the next passing enemy vessel was considered more effective than gunfire in inflicting fatal hull damage. Failing that, ramming was the next best option.

The qualitative inferiority of Allied MTBs and MGBs from 1940 to 1943 placed a heavy emphasis on numbers and tactics. In April 1942, *Führer der Schnellboote* (FdS) Rudolf Petersen noted that British coastal forces were now so numerous that they were "superior in force" to the S-boats ranged against them.<sup>24</sup> Those tactics owed a great deal to Robert Hichens who rose to become a Lieutenant Commander in charge of the 6th and later 8th MGB Flotillas.<sup>25</sup> Given command of *MGB 64* in January 1941, Hichens achieved such distinction that he became flotilla leader within nine months. Hichens believed in the Nelson tradition of engaging the enemy as closely as possible regardless of the damage done to British coastal forces.<sup>26</sup> The damage done to the enemy might not result in a sinking, but it would disrupt their operations and repairs would take time. An S-boat damaged off the British coast might not be able to make it back to a German-held port.

With any engagement, the S-boats lost the element of surprise that was significant in the approach to a convoy or the unobserved execution of a mining operation. Gunfire was sufficient to drive off S-boats or to disrupt their attack. For example, on the night of 19-20 November 1941, a group of

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23. The top speed of the Motor Torpedo Boat was thirty-three to forty-one knots, depending on type. The Fairmile D Gun Boat top speed was twenty-nine knots. The S-boat top speed was forty to forty-five knots, depending on hull type and engine fit.

24. ADM 223/28, *Führer der Schnellboote* (FdS) war diary, 22 April 1942.

25. Robert Peverell Hichens (2 March 1909–13 April 1943), Distinguished Service Order (DSO) and Bar, Distinguished Service Cross (DSC) and two Bars, was the most highly decorated officer of the Royal Navy Volunteer Reserve. See Lieutenant Commander Robert Peverell Hichens, *We Fought Them in Gunboats* (London: Michael Joseph, 1944) for his unfinished memoir of coastal forces actions.

26. Bryan Cooper, *The Battle of the Torpedo Boats* (London: Pan, 1972), p. 76ff.



S-boats from 2nd S-boat flotilla was attacked by *MGB 64* (Hichens in command) and *MGB 67*. The German vessels were returning from an attack on an east coast convoy in which three British ships had been sunk. In the process, *S-41* and *S-47* had collided. *S-41* was under tow when a group of five S-boats was attacked by British forces. The British MGBs were unable to inflict fatal damage on any of the S-boats they engaged at short-range (their heaviest armament at this stage in the war was mounted aft, which limited the chances of a fatal shot). However, German forces felt compelled to break off the tow of *S-41*. After transferring her crew and opening her seacocks, *S-41* was left to sink, which she did, but not before the vessel had been located and boarded by the MGB crews.<sup>27</sup> As Roskill noted in the official history, the sinking wreck yielded "large quantities of equipment – charts, log-books" before she sank.<sup>28</sup> Hichens put it rather more directly in his unfinished wartime memoir:

The order was given to gut the boat. Sailors swarmed all over her, appearing from all the hatches with arms full of equipment. Roberts removed all the W/T equipment, gunners took what guns they could detach and pans of ammunition. Charts, books, log, compasses, searchlights, revolvers, even pictures of Hitler were bundled into the gunboats.<sup>29</sup>

The retreating S-boats were later attacked by British fighter aircraft, and the Air Ministry erroneously claimed one sunk and one damaged.<sup>30</sup>

Hichens was also the inspiration in 1942 for taking the reach of coastal forces to the enemy coast. To the defensive work of coastal forces, he sought to add the weapon of blockade by trying to intercept enemy forces as they sortied from their continental bases. By March 1942, MGBs were ready to conduct offensive patrols off the Dutch coast. On the night of 14-15 March, one patrol encountered a group of S-boats as they came out from Ijmuiden to intercept east coast shipping. According to Roskill, one S-boat was lost and RAF Spitfires joined in the pursuit of the retreating boats the next morning.<sup>31</sup> The Air Ministry was ready to claim their share in the victory. *The New York Times* reported that "cannon-equipped Spitfire [had] set one enemy vessel afire and damaged four others."<sup>32</sup> By such actions, British forces felt that they were gradually getting onto even terms with the S-boat threat.

The British steadily maximized the impact of their coastal forces. In 1942,

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27. Stephen Wentworth Roskill, *The War at Sea, 1939–1945*, Vol. I, *The Defensive* (London: HMSO, 1954), pp. 500-01.

28. Scott, *Narrow Seas*, pp. 36-37; Williamson, *E-boat vs MTB*, p. 48.

29. Hichens, *Gunboats*, p. 27.

30. "British Rout Nazis in North Sea Fight," *The New York Times*, 22 November 1941, p. 5.

31. Stephen Wentworth Roskill, *The War at Sea, 1939–1945*, Vol. II, *The Period of Balance* (London: HMSO, 1960-62), p. 162.

32. "7 German E-boats Blasted by British," *The New York Times*, 16 March 1942, pp. 1, 3.

C-in-C Nore introduced the idea of a standing offshore patrol to serve as a protective screen for shipping along the east coast. "This was known as the Z-line, which was an imaginary line about 30 miles off the East Coast, running for a distance of approximately 100 miles between Cromer and Harwich."<sup>33</sup> Arriving on station, British coastal forces would simply cut engines and wait the arrival of the enemy. Hydrophones were used to listen for the approach of the S-boats.<sup>34</sup> Invariably, gaps could be found in the patrol line, but it was still a significant deterrent. Infiltrating or exfiltrating British waters, S-boat crews increasingly had to expect contact with MTBs and MGBs.

The construction of additional fixed defenses along the English coast added to the difficulty for the S-boats. The siting of seven Maunsell Army and Navy forts in the approaches to the Thames estuary in 1942-43 augmented the fixed coastal defenses covering southeastern England.<sup>35</sup> Constructed out of concrete before being towed into position, they were searchlight and radio platforms as well as being equipped with 40mm and 3.7-inch guns. Their primary purpose was to serve as an outer anti-aircraft defense for London as well as covering the Thames estuary against German mine-laying operations. They could, of course, engage any surface target that was unwise enough to come into view.

### **Success of the Convoy System: Coastal Command, the Scientific and Intelligence War**

Backing operations at sea level, and an increasingly important factor in combating the S-boat threat, was RAF Coastal Command. Air to Surface Vessel Radar (ASV) had been pioneered in the mid-1930s, and by the middle of 1941, around half the aircraft of RAF Coastal Command were fitted with ASV.<sup>36</sup> However, there were still considerable issues with the reliability and effectiveness of the Mark I and II sets. In the summer of 1941, 16 Group RAF Coastal Command started reconnaissance flights across S-boat approach routes to the British coast. The wake of a fast moving boat was highly visible at night, while the approach of an aircraft would be drowned out by the boat's engines.<sup>37</sup> An S-boat, however, was unlikely to fall victim to a bombing or torpedo attack from the squadrons at the disposal of 16 Group, but at least the experiment served to demonstrate the principle.<sup>38</sup> In October 1941, Wing Commander Constable-Roberts, staff

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33. David Jefferson, *Coastal Forces at War: The Royal Navy's "Little Ships" in the Narrow Seas* (Sparkford: Haynes, 2008), p. 153.

34. Hewitt, *Coastal*, p. 169.

35. The forts were at the Nore, Red Sands, Shivering Sands, Tongue Sands, Knock John, Rough Sands, and Sunk Head.

36. Chris Ashworth, *RAF Coastal Command, 1936-1969* (Sparkford: Patrick Stephens, 1992), p. 66.

37. ADM 223/28, Report by FdT, December 1941.

38. Hewitt, *Coastal*, p. 152.

officer of 16 Group RAF, attached to the Royal Navy's Dover Command, began the first experiments in the use of the home chain radar network to guide Coastal Command aircraft against enemy shipping and developing S-boat attacks. Roberts reported:

The information of early approach of enemy light forces by Type 271 10cm RDF stations has allowed our own [air] forces to intercept before any damage could be done. This fortunate state of affairs has resulted in a complete cessation of enemy ... minelaying or torpedo attack along our convoy routes in this area.<sup>39</sup>

By 1943, 16 Group had a larger complement of squadrons and its principal weapon against the S-boats was the radar-equipped, twin-engine Whitley bomber, while the Fleet Air Arm operated Albacore and Fairey Swordfish. The role of radar-equipped aircraft was "primarily to give warning" of approaching S-boats.<sup>40</sup> They were then to mark their location for surface forces by flare or flame floats. However, by May 1943, the Director of Air Warfare and Flying Training was looking forward to the installation of High Frequency Wireless Telegraph sets which would allow direct radio contact between "convoy escorts, counter attacking force and homing aircraft."<sup>41</sup> Some of the difficulties affecting Royal Navy/RAF cooperation against the S-boats were removed by a meeting at the Air Ministry on 20 August 1943 when the RAF agreed to dedicate ten Wellington XIII aircraft and ten Albacores. Under the control of 415 Squadron, the Wellingtons became operational at Thorney Island and Bircham Newton in October and the Albacores by the end of the year.<sup>42</sup>

The impact of the scientific and intelligence war on the coastal campaign is difficult to quantify as the documentary record is fragmentary at best. However, some insights can be gained from files in the British National Archives dealing with S-boats in the Mediterranean.<sup>43</sup> By 1941, the British were using HUMINT (agents and interrogations of captured personnel), SIGINT (signals intelligence), and photo-reconnaissance to monitor S-boat activity. The amount of information which could be derived from such sources was considerable. For example, a twenty-four page dossier of information was put together on every aspect of S-boat operations following the interrogation of survivors from *S-38*, sunk 20 November 1940.<sup>44</sup> Short-

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39. Imperial War Museum, Air Commodore J. Constable-Roberts papers, Documents 1183.

40. ADM 1/15815, Minutes by Director of Air Warfare and Flying Training, 11 May 1943.

41. Ibid.

42. ADM 1/15815, "Coastal Convoys: An Appreciation," 11 October 1943; Ashworth, *Coastal Command*, p. 89.

43. ADM 223/610 and ADM 223/611, "E-boats in the Mediterranean."

44. ADM 186/806, German E-boat *S-38* Interrogation of Survivors, February 1941. Interrogation of S-boat personnel continued to reap rich rewards throughout the war, see, for example, ADM 186/809, "German E-boats *S-141* and *S-147*: Interrogation of

range radio chatter on VHF while S-boats were at sea added further detail to the Royal Navy's understanding of German coastal forces, and, in 1944, a book was opened at HMS *Hornet* (the Coastal Forces shore base at Gosport) to log every piece of information on S-boat personnel. British Naval Intelligence was able to build up remarkably detailed insights into the movements of boats, flotillas, maintenance issues, operations, and personnel. Those insights can be glimpsed on information sheets included (seemingly by accident) in one file in the British National Archives.<sup>45</sup>

The development of Allied radar coverage off the east and south coasts had a significant impact on the S-boat campaign. Radar direction finding (RDF) had been developed on the River Debon at Bawdsey Manor during the mid-1930s. Rushed into service in early 1941, Type 287 radar towers had a relatively short range and were superseded by later models. Despite the initial problems, by mid-1941 the approach of S-boats towards the British coast was usually (but not always) detected by shore-based radar at a range of approximately eighteen miles, allowing intercepting forces to be vectored in their direction.<sup>46</sup> The low-lying nature of the east coast was a particular difficulty and, between Bawdsey and Cromer, the eight radar stations required 200-foot-high towers to allow them to function.<sup>47</sup> Despite this, gaps in coverage and breakdowns were considerable. To try and improve matters, in December 1942, C-in-C Nore proposed an alteration in the marked safe route along the east coast between Shipwash, Cross Sand, and Hearty Knoll to bring the route farther inshore and more firmly under the effective cover of the RDF stations along the coast.<sup>48</sup> After considerable debate and consideration of the navigational and tactical difficulties of bringing the channel inshore, the proposal was accepted and implemented in February 1943.<sup>49</sup> Nevertheless, in October 1943, C-in-C Nore still had to report to the Admiralty that "Conditions vary greatly on the East Coast and failures to obtain contacts, even inside the restricted range, are frequent."<sup>50</sup> When radar did work, and when near enough, radar-equipped vessels could find and fix S-boats. For example, the Type 271 radar was fitted to corvettes and frigates from March 1941 onwards. With refinements and upgrades, the Type 271Q was able to detect S-boats over six miles distant.<sup>51</sup> A frigate

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Survivors," July 1944.

45. For example, the file contains collected details on *S-153* (build, length, beam, draught, height of superstructure, engines, horsepower, maximum and cruising speed, endurance, crew size, and commanding officer), making reference to the Combined Services Detailed Interrogation Centre (CSDIC). It also contains a detailed history of the 7th S-boat Flotilla. See ADM 223/611, "E-boats in the Mediterranean."

46. ADM 1/15815, Minutes by Director of Local Defence, 14 January 1943, on file "C-in-C Nore: Proposed Alterations to Searched Channels."

47. *Ibid.*

48. ADM 1/15815, C-in-C Nore to Admiralty, 29 December 1942.

49. ADM 1/15815, Herbert Morrison to C-in-C Nore, 12 February 1943.

50. ADM 1/15815, C-in-C Nore to Admiralty, 16 October 1943.

51. ADM 1/30193, Recommendation for immediate award Leading Seamen Edward

operating in conjunction with MTBs and MGBs could vector them towards a group of S-boats to the point where they appeared on the less-efficient radar sets of the smaller British vessels. Although the S-boats possessed the speed to evade or outrun British coastal forces, the certainty that they could not linger in any one spot deprived them of their tried and trusted means to locate a coastal convoy. As Gordon Williamson has noted:

By early 1943 it was becoming clear that the previous ... tactic of lying in wait on a known convoy route in order to make a night-time ambush was no longer working. This was principally due to the heavy use of radar by both shore stations and Allied aircraft.<sup>52</sup>

Information on the position and direction of S-boats was supplemented from late 1941 onwards by intercepts from German VHF radio traffic. S-boats relied heavily on short range VHF to coordinate their movements. The radio chatter from a group of S-boats at sea was considerable, so much so that in January 1943, Petersen ordered radio silence in the approach to target and emergency use only of VHF within forty-five miles of the enemy coast.<sup>53</sup> The order appears to have been entirely disregarded. In one action in September 1944, eighty-six separate messages were picked up from three S-boats in a seventy-one minute period.<sup>54</sup> In another action in December 1944, five British vessels detected ninety transmissions during an action lasting ninety-eight minutes.<sup>55</sup> Although these messages were often very short, and could consist of a single word such as "melden" (instruction to report), they were often broadcast in the clear, making only limited use of code words. They frequently contained tactical and positional information. At short ranges, the carrier wave for S-boat VHF radios could be picked up by wireless operators on Allied ships even if the Germans were not broadcasting.<sup>56</sup> To take advantage of the radio chatter in October 1941, a search for German-speakers who could join British coastal forces was initiated. They came from all directions, from the Merchant Navy, Women's Royal Naval Service, and from civilian life.<sup>57</sup> Listening stations were set up on the east coast and at key coastal forces bases. Given the short range of VHF, the amount of warning which they could provide was often fairly minimal.<sup>58</sup> To compensate, some coastal forces flotillas took German-speaking radio operators (known as "headache operators" after their

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Dowdall (radar), 28 December 1944, enclosure in "Actions against E-boats on 22-23 December 1944: Recommendations for Honours and Awards," 1 March 1945.

52. Williamson, *E-boats*, p. 33.

53. ADM 223/28, FdS memorandum on Torpedo Attacks, 20 January 1943.

54. ADM 1/29955, "Control Frigate and Coastal Force Action with E-boats," 18-19 September 1944, 14 October 1944.

55. ADM 1/30193, Enclosure 10 in "Actions against E-boats on 22-23 December 1944: Recommendations for Honours and Awards," 1 March 1945.

56. Hewitt, *Coastal*, p. 168.

57. *Ibid.*, p. 152.

58. Dickens, *Night Action*, p. 29.

headphone apparatus) to sea to provide real time intelligence on S-boat movements and intentions.<sup>59</sup> For example, in the case of the 21st MTB flotilla, a German Jew was used to eavesdrop on the S-boat radio channels. He could give slightly faster warning of the approach of S-boats towards the east coast convoy route. At sea, he provided a running commentary on the enemy's position and intentions.<sup>60</sup> This real-time tactical intelligence had considerable value, and it also allowed the British to build up a detailed picture of their adversaries even down to the level of individual personalities.

By early 1942, the British had established a defense in-depth (horizontal and vertical) for their coastal convoys. That defense started at the "Z-line" with the support of the aircraft of 16 Group and culminated with the close-in protection of the ships by their escorts. Radar, RDF, and "headache" operators provided information to respond to any attempted penetration of the "Z-line" by German forces. By the end of 1943, consideration was being given to integrating these elements with efficient air-to-sea wireless telegraphy links. Ultra decrypts and information derived from interrogations of S-boat personnel allowed the Royal Navy to build up a detailed picture of the boats and flotillas operating against the British coast.

### **German Responses: Weapons Systems**

The Germans were acutely aware of the changing fortunes of the war at sea. The steady strengthening of anti-S-boat forces in the English Channel and improvements in British radar meant that, as early as December 1941, the *Führer der Torpedoboote* (FdT) had concluded that there was a need to take action, stating that "German defensive and offensive ability could be increased only by continual improvement of equipment and type, and the present advantage over the enemy could be maintained only if an improved type of S-boat were to be produced."<sup>61</sup> Within six months, the FdS, a newly-created post, was ready to conclude that his boats were "no longer master of the situation in the Western area."<sup>62</sup> The extent of the task now facing S-boats along the Channel coast was brought home to him after an action on 10 September 1942. *MGB 335* was captured along with her confidential books, radar, radio gear, and marked-up maps after a gun battle. The badly-damaged boat was taken to Den Helder, where Petersen and *Beobachtungsdienst*, or *B-Dienst* (the *Kriegsmarine's* naval radio intercept and decoding service), carried out an extensive examination of the boat and its secret material.<sup>63</sup> To keep the capture and its intelligence windfall secret,

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59. Jefferson, *Coastal Forces*, p. 164.

60. Dickens, *Night Action*, pp. 29-30.

61. ADM 223/28, Report by FdT, December 1941.

62. ADM 223/28, Report by FdS to Group West, 25 May 1942.

63. Angus Konstam, *British Motor Gunboat, 1939-45* (Oxford: Osprey, 2010), p. 44, incorrectly lists this boat as scuttled by the British. Jak Mallmann Showell, *German Naval Code Breakers* (Hersham: Ian Allan, 2003), p. 59, places this incident in 1940. For

the *Kriegsmarine* claimed that the boat had been sunk. Petersen's reactions revealed his shock at the full realization of the capabilities of British coastal forces:

- A) Speed less than an S-boat, probably about thirty knots.
- B) Gunnery armament far heavier.
- C) Seaworthiness ... not regarded unfavorably.
- D) MGB has radar and radio equipment such as has been recommended for the last two years for the S-boats and which is only just beginning to be produced ...
- E) Has other equipment not yet recognized.
- F) Has VHF aerial but no set. Possibly also infra-red signaling.
- G) Bridge is armored ...
- H) Simple construction and engines. Appearances of having been built simply and quickly.<sup>64</sup>

Duly impressed, and concerned, Petersen issued an order calling for S-boats to stay together on passage to the convoy lanes and to undertake evasive routing when leaving port. He also required the introduction of armoring of bridges, weapons upgrades, and the rapid progression of the radar program.<sup>65</sup> Petersen's order reflected the urgent need to upgrade the defensive and offensive systems of the S-boat, to think about tactics, and to consider changes to the design. Failure to upgrade and update weapons and other critical systems would manifest themselves in the collapse of the S-boat campaign in 1943.

As early as mid-1942, Petersen had concluded that it was "vital ... to develop new types of boats, mines, torpedoes, gunnery and signal equipment."<sup>66</sup> Given the demands of the U-boat war and the campaign in Russia, there was little improvement. The standard G7a torpedo with which the S-boat arm entered the Second World War was still being used by S-boats in 1945. This was despite the fact that, powered by compressed air, it left a trail of bubbles in its wake which could give away the fact that an attack was in progress. It was also an indicator to escort vessels of the approximate direction of the attacker. The G7a was designed for long-range torpedo attacks by submarines (up to 6,000 meters), whereas S-boat attacks were made at ranges of less than 3,000 meters. Developed for use by U-boats, the electric drive G7e torpedo was tried but abandoned. Operational experience in 1942 showed that the time of travel of the G7e from launch to target was too slow for hit-and-run attacks on coastal convoys, which usually

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additional information, see entry 11 September 1942, *Kriegstagebuch der Seekriegsleitung* (hereinafter KTB der SKL), Teil A, Band 37 (Berlin: E.S. Mittler & Sohn, 1993), p. 229, and ADM 223/28, Remarks by FdS after inspection of *MGB 663*.

64. ADM 223/28, Remarks by FdS after inspection of *MGB 663*.

65. ADM 223/28, FdS War Diary, 10 September 1942.

66. ADM 223/28, Report by FdS to Group West, 25 May 1942 in Tactical and Staff Duties Division (Foreign Documents Section).

consisted of quite small and easily-missed vessels.<sup>67</sup> The slow running speed of the G7e made it completely unsuitable as a weapon against fast moving destroyers.

The need to upgrade the standard torpedoes used by S-boats was underlined by the fact that, after 1940, torpedo attacks against British coastal convoys were made at increased distances. Meticulous records of S-boat torpedo firings were maintained and they were later captured by the British.<sup>68</sup> The hit rate (number of torpedoes fired versus number of sinkings) improved from 1940 (25%) to the end of 1942 (over 50%) before falling away in 1943 (30% in December 1943). By the end of 1944, the rate had fallen to around 15%.<sup>69</sup> The G7a remained in operational service, although, by late 1943, homing versions of the G7e were also becoming available to S-boat flotillas.<sup>70</sup>

If there was a failure to update the torpedoes used by S-boats there was at least a limited upgrade of S-boat deck guns. Early examples of S-boats carried just a single 20mm anti-aircraft gun in addition to multiple light machine guns. The later S-38 class was designed with a special 20mm gun turret between the forward torpedo tubes, which gave considerable firepower forward as well as protection for the gunner. Experience in the Channel in 1941 and 1942 showed that this was insufficient, and the S-100 design (introduced in 1943) featured additional armament such as a twin 20mm cannon amidships and a heavier gun aft (37mm). Existing S-boats were retrofitted with additional and heavier weaponry (including 40mm guns in the aft position) as they became available and according to the whims of commanding officers.<sup>71</sup> A heavy weapon mounted aft was an effective way of dealing with pursuit by enemy coastal forces, which became increasingly common from 1941 onwards. However, they could not be mounted on some of the older S-boats. A 40mm gun produced a recoil equivalent to 1.5 tons,

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67. Entries 30, 31 October 1942, KTB der SKL, Teil A, Band 38, pp. 645-46, 665-66.

68. **Average S-Boat Torpedo Firing Distances**

<b>Year</b>	<b>Distance</b>
1940	900 meters
1941	1,700 meters
1942	1,800 meters
1943	2,000 meters
1944	1,700 meters

ADM 292/204, Underwater Weapons Department (Admiralty), German Torpedo Documents.

69. *Ibid.*

70. ADM 223/611, Admiralty to Home and Mediterranean Stations, 13 July 1944, "E-boats in the Mediterranean."

71. Interestingly, in 1944, a further evolution of the S-boat design was developed. The S-700 class would feature the addition of a forward-firing 3cm cannon and additional, aft-facing torpedo tubes to target any pursuing vessel. Although the hulls of a number of vessels were completed before the end of the war, shortages meant that they would be finished to the S-100 specification.



which the age-weakened frames of some boats could not support.<sup>72</sup> The fitting of heavier weapons required six weeks dockyard time, severely reducing operational availability.<sup>73</sup>

### **Defensive Systems and Target Acquisition**

The purpose of increasing the number of deck weapons was primarily defensive in nature. The torpedo and mine would remain the principal weapons of the S-boats, and Allied merchant ships their principal targets, until the Normandy invasion of 1944. There were other attempts to improve S-boat defensive systems, but they did not come to full fruition. Short-range VHF radios (Type Lo 1 UK 35) together with visual signals (flag semaphore and lights) remained the principal means by which S-boats worked together, even though the British were using S-boat VHF transmissions to intercept and disrupt operations in the English Channel. S-boat navigation continued to rely on old-fashioned techniques and a wheelhouse-mounted RDF loop, which could also be used to locate enemy ships when they were transmitting. This had both offensive and defensive applications. Attempts to equip S-boats with radar were a limited success.<sup>74</sup> The FuMo 71 Lichtenstein B/C radar had a limited range (3,000 meters for a merchant ship) and a limited arc (thirty-five degrees ahead of the boat). They were marinized cast-offs from the *Luftwaffe* night fighter force and were fitted to a small number of S-boats during 1943. However, S-boat radar was to prove disappointing with inadequate range even in the hands of the best operators.

Introduction of radar on S-boats did lead to some attempt at tactical innovation. On the night of 7-8 March 1943, the 2nd, 4th, and 6th S-boat Flotillas attempted to put into practice the tactic of radar lurking. Boats of the 4th Flotilla used radar to monitor the convoy lanes while the 2nd and 6th Flotillas remained just beyond. If radar responses suggested an enemy convoy, the 2nd and 6th Flotillas were to approach the convoy lane. Poor visibility precluded the necessary coordination, and only the boats of the 6th Flotilla attacked. Driven off by the destroyer HMS *Mackey* and two MTBs, *S-114* and *S-119* collided, resulting in the sinking of the latter.

If radar on S-boats was not a success, then at least German scientists developed passive radar detection and ranging equipment. The FuMB 29 "Bali" multi-directional antenna and FuMB 10 "Borkum" signal detector used radar and radio emissions from Allied warships to detect their positions. Unfortunately for the Germans, it took until March 1944 for the first sets to be delivered. The poor state of German shipboard radar hurt the S-boats both defensively and offensively. In June 1942, a tactical innovation

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72. ADM 223/611, S.O. Sichel to Speer, 15 May 1944, "E-boats in the Mediterranean."

73. ADM 223/611 Speer to Operations Group South, 1 May 1944, "E-boats in the Mediterranean."

74. Experiments were also conducted to see whether S-boats could be rendered invisible to Allied radar by the use of rubberized coatings known as *Tarnmatte*. Trials would begin in 1944.

was introduced known as the *Stichansatz*, whereby a dispersed group of S-boats, acting on information from *B-Dienst* or *Luftwaffe* reconnaissance, would take station along the convoy route. On detecting the convoy, the boats were to attack. The tactic did produce some useful results, especially in a convoy action on 8 July when six merchant ships were sunk.<sup>75</sup> However, dispersing forces made them more vulnerable to British coastal forces. It was a measure of desperation on the part of the S-boat command that the *Stichansatz* was introduced. On 20 January 1943, Petersen ordered that it be discontinued in its present form as a result of the strength of enemy defenses.<sup>76</sup>

### **Intelligence**

After 1940, *B-Dienst* had been able to expand its network of coastal stations rapidly, and the growth of marine radio traffic (including shore-to-ship) in 1942 and 1943 gave the service an increasing volume of sensitive information to decode. The *B-Dienst* remained a highly efficient service, but the difficulty of operating in the Channel deprived the S-boats of significant opportunities to pick up survivors out of the water for the purposes of interrogation. Two survivors were picked up from the 600-ton coaster SS *Angularity*, sunk on 5 February 1941 in the Shipwash Channel. Under interrogation, they gave away details of convoy organization, destroyer types in operation along the east coast, and perceptions about the dangers of torpedo and mine attack.<sup>77</sup> By 1943, S-boats could no longer afford to linger in the Channel to rescue survivors for interrogation.

### **Cooperation with the *Luftwaffe***

The importance of cooperation with the *Luftwaffe* was recognized in 1940. The *Führer der Torpedoboote* commented that "The traffic in the Channel can only be paralysed by full use of the *Luftwaffe* by day, and ... [S-boats] at night."<sup>78</sup> However, the effectiveness of the *Luftwaffe* in the west declined markedly after 1940 as the campaign in Russia, and then the need to defend Germany's cities from aerial bombardment, drew resources farther east.<sup>79</sup> In a paper written in October 1942, FdS noted tersely that "Owing to the relative weakness of the German Air Force ... there have been gaps in the reconnaissance network."<sup>80</sup> The development of the *Stichansatz* was one response to the failure to secure effective cooperation with the *Luftwaffe*. By

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75. Frank, *S-boats*, p. 53.

76. ADM 223/28, FdS memorandum on Torpedo Attacks, 20 January 1943.

77. ADM 223/28, FdS War Diary, 7 February 1941.

78. ADM 223/28, Appreciation of the Situation by FdT, 5 July 1940.

79. See Sönke Neitzel, "Kriegsmarine and *Luftwaffe* Co-operation in the War against Britain, 1939-1945," *War in History* 10:4 (2003), pp. 448-63. See also Sönke Neitzel, *Der Lufikrieg über dem Nordatlantik und der Nordsee 1939-1945* (Bonn: Bernard & Graefe, 1995); Sönke Neitzel, "Die Zusammenarbeit zwischen Schnellbooten und *Luftwaffe*," *Militärsgeschichte* 4 (1995), pp. 55-63.

80. ADM 223/28, Report by FdS, October 1942.

April 1943, FdS demanded "Fighter reconnaissance by aircraft equipped with radar [as the] only reliable method by which aircraft can contact convoys at night."<sup>81</sup> The demand brought about no significant and lasting improvement. Just as damagingly, requests to cover with fighter sweeps the dawn return of S-boats to their continental bases and to attack British coastal forces were invariably given a lower priority than the need to respond to bomber operations against the Reich.<sup>82</sup> In May 1943, FdS complained that, in the opening weeks of the year, his S-boats had been attacked "16 times during their operations, even though there was no moon, and visibility was bad."<sup>83</sup> He was convinced that S-boats would, in the near future, "be located by night fighters as soon as they left port and that ... losses would mount accordingly." The only way to counter this growing threat was to deploy *Luftwaffe* fighters against the Coastal Command aircraft used in the anti-S-boat campaign. In summing up the S-boat campaign in 1943, the FdS concluded that "The gradual cessation of air and S-boat co-operation was one of the main reasons why S-boat successes decreased in 1943."<sup>84</sup>

### Armoring

In response to encounters with increasingly heavily-armed British light vessels in 1942, experiments were undertaken with *S-67* to produce a design for an armored bridge that could be retrofitted to S-boats already in operational use. For the boats on the Channel coast, this work was usually done in Rotterdam and did not require a lengthy refit period. The armored design (known as the *Panzerkalotte*, or "armored skullcap") was also incorporated in new boats of the S-38 class to produce a variant of the class, the S-38b. The 1943 S-100 class continued the pattern of armoring the bridges of S-boats. However, there were limits to the process of up-armoring and up-gunning. Armoring added greatly to the weight of the vessel, placing additional strain on critical systems and decreasing performance.<sup>85</sup>

The next logical step beyond up-armoring a wooden boat was to introduce a fully-armored S-boat built in steel. A steel S-boat was better suited to mass production than the existing wood design. However, it was not until after 1945 that the German Navy would realize the goal of a steel S-boat. In the circumstances of the Third Reich, where the *Heer* and the *Luftwaffe* had control of the lion's share of Germany's industrial capacity and the annual production of steel, the *Kriegsmarine* had difficulties in securing its minimum requirements for shipbuilding. In any case, within the *Kriegsmarine* (and especially after Dönitz became its head in January 1943),

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81. ADM 223/28, Report by FdS, 19 April 1943.

82. See, for example, ADM 223/28, FdS War Diary, 23 April 1942.

83. ADM 223/28, Note by FdS on Enemy Air Attacks, 30 May 1943.

84. ADM 223/28, FdS Observations on S-boat Operations in the West during 1943, 31 December 1943.

85. See, for example, ADM 223/611, Speer to Operations Group South, 1 May 1944, "E-boats in the Mediterranean."

U-boat construction was privileged over all other forms of construction. Moving to a steel-hulled S-boat design was simply out of the question in 1942-43. The British operated under fewer restrictions and, in early 1942, produced six examples of the Steam Gun Boat (SGB) class of motor torpedo boats. At 260 tons and 137 feet in length, and with two steam turbine engines capable of thirty knots, the steam gunboats were able to carry "one 3-in, two 6-pdrs, and three twin 20-mm guns, with two 21-inch torpedoes."<sup>86</sup> Reynold's description of them as "mini-destroyers" is apt.<sup>87</sup> An initial lack of armor to protect critical systems was remedied by up-armorings, but it took some time to overcome early teething troubles. For example, following a night action off the south coast on 28-29 May 1943, Lieutenant T.W. Boyd, commanding *SGB 4*, reported that "Gunnery communications, already the subject of frequent correspondence, again proved a failure."<sup>88</sup> Nevertheless, operational experience pointed to the potential of the steel-hulled motor torpedo boat. The Germans lacked the industrial capacity to adopt the design and to turn out sufficient numbers, and so too did the British. The SGB class was halted at just seven vessels in 1942 in order to prioritize destroyer construction.

The failure to upgrade the offensive and defensive systems of the S-boat meant that FdS considered it vital to increase the number of boats available in the west. However, there could be no quick fix. In December 1941, FdT called for an operational fleet of forty S-boats in the west to strike a "decisive blow" against the east coast convoys.<sup>89</sup> At the same time, he recognized that, given the current rate of production, "this was not a practical possibility."<sup>90</sup> It was not until the introduction of the 1943 building program (seventy-two boats specified) that the *Kriegsmarine* embraced the goal of a massively enlarged S-boat force. That program, however, would not begin to bear fruit until mid-1944.

### **The Convoy Engagements of Late 1943**

The problems facing the *Kriegsmarine's* S-boat force became manifest in late 1943. The lengthening nights in the autumn of 1943, and the build-up of supplies in Britain for the opening of the Second Front in 1944, presented significant possibilities to renew the offensive against British coastal convoys. The opportunity was particularly important, perhaps even decisive, since, on 6 July 1943, a decision was taken to increase the frequency of coastal convoys from six days to seven days a week in order to facilitate the

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86. Leonard C. Reynolds, *Dog Boats at War: A History of the Operations of the Royal Navy D Class Fairmile Motor Torpedo Boats and Motor Gunboats, 1939-1945* (Stroud: Sutton, 1998) p. 251.

87. *Ibid.*

88. ADM 1/14391, After Action Report by Lieutenant T.W. Boyd, 29 May 1943.

89. ADM 223/28, Report by FdT, December 1941.

90. *Ibid.*

movements of supplies under the Bolero plan.<sup>91</sup> With the railways "working to capacity," this was regarded as the only possible way to get the necessary supplies and equipment in place for an invasion in the summer of 1944.<sup>92</sup> The number of ships in convoy would also be increased and larger vessels permitted to make the passage. From September, the amount of traffic along the coast was expected to more than double, making very tempting targets for the S-boat flotillas along the French, Belgian, and Dutch coasts. Although the decision to introduce seven days a week convoying was taken in July, it had still not been implemented by September. Concerns about the S-boat threat and the Royal Navy's ability to protect larger coastal convoys introduced a certain hesitancy that led to an on-going review of the situation. The need for larger and more regular convoys was set against concerns about the renewal of the S-boat campaign during the winter of 1943-44. Although there was an appreciation that British coastal defense had come a long way since 1940, there was an acute awareness of the need to deliver the Bolero cargoes. Consideration was given to improving coastal defenses, including the protective mine belts (both surface and deep set) along the east and south coast, to guard against S-boats and also U-boats that might venture inshore in pursuit of the rich traffic.<sup>93</sup> The idea was ultimately rejected on the grounds that it would impede freedom of maneuver as D-Day approached.<sup>94</sup>

The S-boat flotillas had spent the summer months up-arming and up-gunning the boats already in service. During this period, the operational strength of flotillas had been halved. By the middle of September, the 2nd, 4th, 6th, and 8th S-boat Flotillas were in Dutch waters in preparation for the campaign.<sup>95</sup> In late September, S-boats and the *Luftwaffe* launched a joint mining campaign that was approved by *Seekriegsleitung* (SKL). On the night of 24-25 September 1943, the S-boat Flotillas in Dutch waters departed from IJmuiden and Rotterdam on a torpedo and mine-laying operation. The mine-laying phase of the operation went well but, in this opening encounter of the campaign season, the torpedo operation was a disaster. Encountering two armed trawlers, *S-96* and *S-88* of the 4th Flotilla launched torpedoes, one of which hit and sank HMT *Franc Tireur*. They were intercepted and engaged by two motor launches (*ML 150* and *ML 145*), which proceeded, in turn, to ram *S-96*, inflicting serious damage to all

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91. ADM 1/15815, Cyril Hurcomb (Permanent Under Secretary, Ministry of War Transport) to Rear Admiral J.H. Edelsten (Assistant Chief of the Naval Staff), 19 November 1943.

92. Ibid.

93. ADM 1/15815, "Defensive Minelaying Policy in Home Waters."

94. One comment on the proposal (signature unreadable) was that: "It is likely that were every British mine in Home Waters to self-detonate to-night, we should find this less disadvantageous than their presence in the not too far distant future," ADM 1/15815, 21 July 1943.

95. The 2nd and 6th Flotillas were at IJmuiden and the 4th and 8th Flotillas at Rotterdam.

vessels.<sup>96</sup> A surface engagement followed, which ended when scuttling charges were fired on *S-96* and the crew took to the water. The seriously damaged *ML 150* was towed back to port. Five other S-boats were damaged in the action, reducing temporarily the offensive capacity of the Dutch-based flotillas. A further mine-laying operation on 7 October was successful, but, three days later, the *Luftwaffe* pulled out of the joint offensive in response to Hitler's desire to see the bombing of British cities. Despite the orders of SKL, Petersen broke off the campaign to return to mixed torpedo/mining operations.

The problems facing the S-boat flotillas were further underlined during a large operation on the night of 24-25 October when thirty-one S-boats (2nd, 4th, 6th, and 8th S-boat Flotillas) crossed the Channel to intercept east coast convoy FN1160.<sup>97</sup> This was an attempt to test the British defenses by a maximum effort against the east coast convoy route.<sup>98</sup> The operation was not supported by *Luftwaffe* reconnaissance, and it was conducted on the basis of *B-Dienst* intercepts. British forces in the vicinity included five destroyers, eight MGBs, four MLs, and nine MTBs.<sup>99</sup> The radar on *MGB 610* broke down, but "new centre line hydrophones" were used for the first time to locate the enemy.<sup>100</sup> Radar on the other boats enabled British Coastal Forces to establish contact with the S-boats at 2,000 to 3,000 yards, and the hydrophones enabled them to "roughly assess the enemy's course" and speed.<sup>101</sup> A series of running battles between British Coastal Forces and their German opponents resulted in sixteen separate engagements.<sup>102</sup> German attempts to attack the convoy were frustrated, and British losses were confined to HMT *William Stephen* and one MGB damaged. German forces, meanwhile, lost *S-63* and *S-88*.<sup>103</sup> Radar failure on *MGB 610* potentially enabled a crippled S-boat to escape destruction. There were indications that at least one of the German vessels had been equipped with passive radar detection equipment.<sup>104</sup> Severe storms during the rest of 1943 curtailed

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96. Scott, *Narrow Seas*, p. 170.

97. See maps in ADM 1/3716, Report on Coastal Forces Action on Night of 24-25th October 1943, Commanding Officer HMS *Midge* to C-in-C Nore, 28 October 1943.

98. Mike Whitley, *Deutsche Seestreitkräfte 1939-1945: Einsatz im Küstenvorfeld* (Stuttgart: Motorbuch Verlag, 1995), p. 65.

99. Admiral Sir John Tovey to Admiralty, 18 November 1943, incorporated and published in "Coastal Force Actions," *Supplement to The London Gazette*, 15 October 1943, pp. 5493-5523.

100. ADM 1/13716, Report on Coastal Forces Action on Night of 24-25 October 1943, CO HMS *Midge* to C-in-C Nore, 28 October 1943.

101. ADM 1/13716, Report on *MGB 603* (radar) and *MGB 609* (hydrophones) contained as enclosures to Report on Coastal Forces Action on Night of 24-25 October 1943, CO HMS *Midge* to C-in-C Nore, 28 October 1943.

102. For German accounts of the action, see ADM 223/28, KTB entry for 24 October 1943.

103. Reynolds, *Dog Boats*, pp. 87-88.

104. ADM 1/13716, Report to CO HMS *Midge* from Commander *MGB 609* on night action of 24-25th October 1943, 27 October 1943.

operations, bar one against CW221 on 4 November, which resulted in the sinking of two merchant ships.<sup>105</sup> Homing torpedoes were used for the first time, but the victory came at a cost. Retiring to the Dutch coast, *S-74* was lost in an attack by British Beaufighter aircraft. *Luftwaffe* fighter cover was requested but unavailable, owing to the need to intercept an anticipated raid on Germany by enemy bombers. In the opening phases of the campaign season, British defenses had held. Casualties to the coastal convoys had been minimal, while the operational strength of the S-boat flotillas in Dutch waters had been significantly eroded.

Surprisingly, the convoy battles of late 1943 occurred against a background of weakened escort forces along the south and east coast as a result of operations in the Mediterranean. There were significant problems with the defensive forces available on the south and east coast even though, on paper, they appeared formidable.<sup>106</sup> As early as June 1943, Captain (Destroyers) at Rosyth had raised grave concerns about the ability of weakened escort forces to cope with the larger coastal convoys required by the Bolero build-up and the expected renewal of the S-boat offensive with the long nights of winter.<sup>107</sup> Such was the paucity of available escorts that convoys were often sailing with just one destroyer. Convoy CW221, attacked on 4 November, was protected by a single destroyer together with lighter craft. A minimum escort of two destroyers per convoy had become the norm by 1942.<sup>108</sup> The loss of two merchant vessels from an eighteen-ship convoy was testament to the efficiency of the available forces and the defense in depth, which had been developed along the English coast after 1940. CW221 did, however, provoke bitter complaints about inadequate escorts from the merchant seamen whose ships were involved in the convoy.<sup>109</sup> The mate of the SS *Fulham* explained to a security officer that visited his ship that as Merchant Navy personnel were being "sought for the much talked of Second Front [he] personally ... would be only too pleased to take part, as he would at least get decent and reasonable protection."<sup>110</sup> The

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105. Whitley, *Deutsche Seestreitkräfte*, p. 66.

106. **Escort Forces available for Coastal Convoys, Late 1943**

Command	Destroyers	ML	MGB	MTB	Corvettes
Nore	12	12	15	10	6
Portsmouth	4	12	6	3	-
Dover	-	6	-	-	-
Plymouth	3	6	3	2	-
Rosyth	15	-	-	-	-

Figures from ADM 1/15815, "Coastal Convoys: An Appreciation," 11 October 1943.

107. ADM 1/15815, Captain (Destroyers) to C-in-C Rosyth, 13 June 1943.

108. ADM 1/15815, C-in-C Nore to Admiralty, 16 October 1943.

109. See ADM 1/15815, complaints from personnel on-board SS *Fulham*, SS *Colonel Crompton*, SS *John Hopkinson*, logged by Security Officer (Portsmouth), 5 November 1943.

110. ADM 1/15815, Report by Security Officer (Portsmouth) in conversation with W. Johnston (First Mate, SS *Fulham*), 5 November 1943.

C-in-C Portsmouth commented, "Although the substance of these reports is from imperfectly informed persons they emphasise once again the necessity for additional escorting destroyers for Channel convoys."<sup>111</sup>

The C-in-C Nore was very eager for the return of the three Hunt-class destroyers that had been detached as part of Operation Husky (in total, forty-three Hunt-class destroyers were operating in the Mediterranean).<sup>112</sup> Although he did not receive them, an additional five Town-class destroyers were found for the Rosyth Command. Given the success of the defense in the opening weeks of the campaign season, and with the Bolero plan "lagging behind schedule" (coal stocks were estimated to be three weeks below minimum Bolero requirements for the spring of 1944<sup>113</sup>), on 25 November, the Naval Staff instructed the commands at Nore, Rosyth, and Portsmouth to begin seven-day-per-week convoying.<sup>114</sup> The C-in-C Nore Command accepted the order only "on the understanding that the situation renders it essential to accept a considerably increased risk."<sup>115</sup> One representative of the Trade Division recorded in the minutes, "I hope that our luck with the East Coast convoys will hold until reinforcements are available."<sup>116</sup> The decision to undertake seven-day convoying was a sign of confidence, as well as urgency, but it was tempered with a sense that the S-boat threat remained serious.

The Atlantic convoy battles of March 1943 were critical in the sense that they established the capacity of the escort forces to hold off the Wolfpacks. In the English Channel against the S-boats, that same critical moment came in September-October-November 1943. The battles of late 1943 established that German forces were no longer able to cross the Channel undetected, that they could not linger around the convoy route until a passing convoy arrived, and they could expect a very hostile reception from British coastal forces prepared to press home their attacks beyond the point at which they themselves would sustain fatal damage. A badly damaged S-boat close to the convoy route was unlikely to make it home, and, with so few S-boats being built, even a low level of loss was unsustainable in the medium term. Such was the productivity of British boatyards that the British could expect rapid replacement of their losses whereas the Germans could not. That, in turn, especially with the looming prospect of invasion in 1944, fed through into a conscious policy to reduce the danger to the existing S-boat fleet in order to

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111. ADM 1/15815, C-in-C Portsmouth to Admiralty, 14 November 1943, in E-boat attack on Convoy CW211 on 3 November 1943, Complaints from Merchant Navy Personnel.

112. ADM 1/15815, Minutes on file "East Coast Convoys: Protection against E-boat Attack," 1 November 1943; Minutes on file "'Destroyer Reinforcements for Plymouth and other Home Commands," 6 November 1943.

113. ADM 1/15815, Director Trade Division, 28 November 1943.

114. ADM 1/15815, Admiralty to C-in-C Nore, Rosyth, and Portsmouth, 25 November 1943.

115. ADM 1/15815, C-in-C Nore to Admiralty, 27 November 1943.

116. ADM 1/15815, W. Stephens (Trade Division), 15 November 1943.



conserve the available resources. By 1944, this became an ingrained feature of the S-boat arm. Glimpses of it can be seen in comments such as an S-boat "carried torpedoes and mines against merchant ships. Should it meet anything else it must not become involved, but must retire behind a smoke-screen. So [S-boat] crews were instructed ... to flee should any opposition be encountered."<sup>117</sup> The executive officer on USS *Frankford* observed in an after action report that S-boat "captains are seldom aggressive in the face of illumination and gunfire."<sup>118</sup> The battles of late 1943 established just how far British forces had come in their development of an effective system of coastal defense. The battles of late 1943 also pointed towards future developments where, by 1945, air and sea forces would increasingly operate together in the destruction of S-boats. As Admiral Tovey reflected after the successful defense of FN1160 in October:

This action gives general proof of a great improvement in the efficiency of the Coastal Forces particularly as regards communications and the use of radar. The small number of material breakdowns also indicates a higher standard of interest and handling by the Commanding Officers and crews of boats and reflects great credit on the maintenance officers and staffs of the bases. Furthermore, it clearly demonstrates the value and essential need of constant training and practice. In addition to the successful defence of the convoy, it is considered permissible to feel a modicum of satisfaction in the number of times the E[nemy] boats were engaged. They were roughly handled six times in or near the convoy route ... Had the RAF been able to attack them after daylight it would have been a strong deterrent to E-boats leaving their return to their bases till so late.<sup>119</sup>

## Conclusion

Towards the end of 1942, C-in-C Nore estimated that, between the start of the war and 14 November, 63,350 transits of the east coast passage had been made by merchant ship. A total of 157 merchant ships had been lost as a result of enemy action, which represented just 0.24 percent of the total number of sailings. He expressed some satisfaction with the figure, noting, "these losses cannot, in my opinion, be regarded as excessive, and compare, I believe, favourably with other convoys sailing through dangerous waters."<sup>120</sup> Despite these successes, the Royal Navy remained anything but complacent. In October 1943, at the start of the winter convoy battles, and influenced by the inadequate number of escorts at his disposal, C-in-C Nore wrote to the Admiralty to demand further resources. He commented, "I

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117. Scott, *Narrow Seas*, p. 9.

118. On 8-9 June, USS *Frankford* engaged S-boats using airbursts to keep them at bay. Roscoe, *United States Destroyer Operations*, p. 359.

119. Tovey, "Coastal Forces Actions," p. 5505.

120. ADM 1/15815, C-in-C Nore to Admiralty, 30 December 1942.

consider the extraordinarily small losses which have taken place over recent months must be attributed principally to good fortune and lack of enterprise on the part of the enemy."<sup>121</sup> He warned, "These two factors cannot be expected to continue indefinitely."<sup>122</sup> The coastal convoys were, in many ways, the poor relation of the bigger struggle taking place in the Atlantic.

In late 1943, C-in-C Rosyth expressed grave concerns about the lack of available escorts, writing that "while every effort is being made to win the Battle of the Atlantic and considerable success is being attained in bringing convoys safely to West coast ports, I view with alarm their passage up and down the East coast unprotected save by a single destroyer."<sup>123</sup> While the view of the Royal Navy on developments during 1943 might be described as cautiously pessimistic, the view on the German side was starkly worse. In his paper on the 1943 S-boat campaign written on the last day of the year, FdS described the situation as a "crisis."<sup>124</sup> His paper was a recognition that, since 1940, British defenses had improved considerably and rapidly. Concurrently, there had been a failure to invest and upgrade the S-boat design and its systems. The significance of the Channel convoys to the British war economy and to the Bolero build-up had not been recognized with the allocation of an appropriate level of resources. There had also been a failure of vision on the part of the German High Command to take a holistic view of the war against enemy shipping. The U-boat war and the Battle of the Atlantic were part of a wider campaign that included operations by major and minor surface vessels, *Luftwaffe* maritime reconnaissance, and bombing and mining operations. Although, in December 1943, FdS would look forward to increased numbers of S-boats promised in the 1943 building program and to a renewal of effective cooperation with the *Luftwaffe*, the reality was that the strategic value of his flotillas was shifting from the offensive to the defensive. In 1944, their principal value would lie not in the interception of coastal convoys, but as a potential threat to the Allied invasion fleet that was building in British waters. Historians have failed to recognize the significance of the coastal convoy battles of late 1943 as a key moment in the winning of the Atlantic campaign. Getting the convoys across the Atlantic was one thing – getting their cargoes to the point of use frequently required transit through another stretch of dangerous waters. The year 1943 was pivotal to both operations.

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121. ADM 1/15815, C-in-C Nore to Admiralty, 16 October 1943.

122. *Ibid.*

123. ADM 1/15815, C-in-C Rosyth to Admiralty, 16 June 1943.

124. ADM 223/28, FdS Observations on S-boat Operations in the West during 1943, 31 December 1943.