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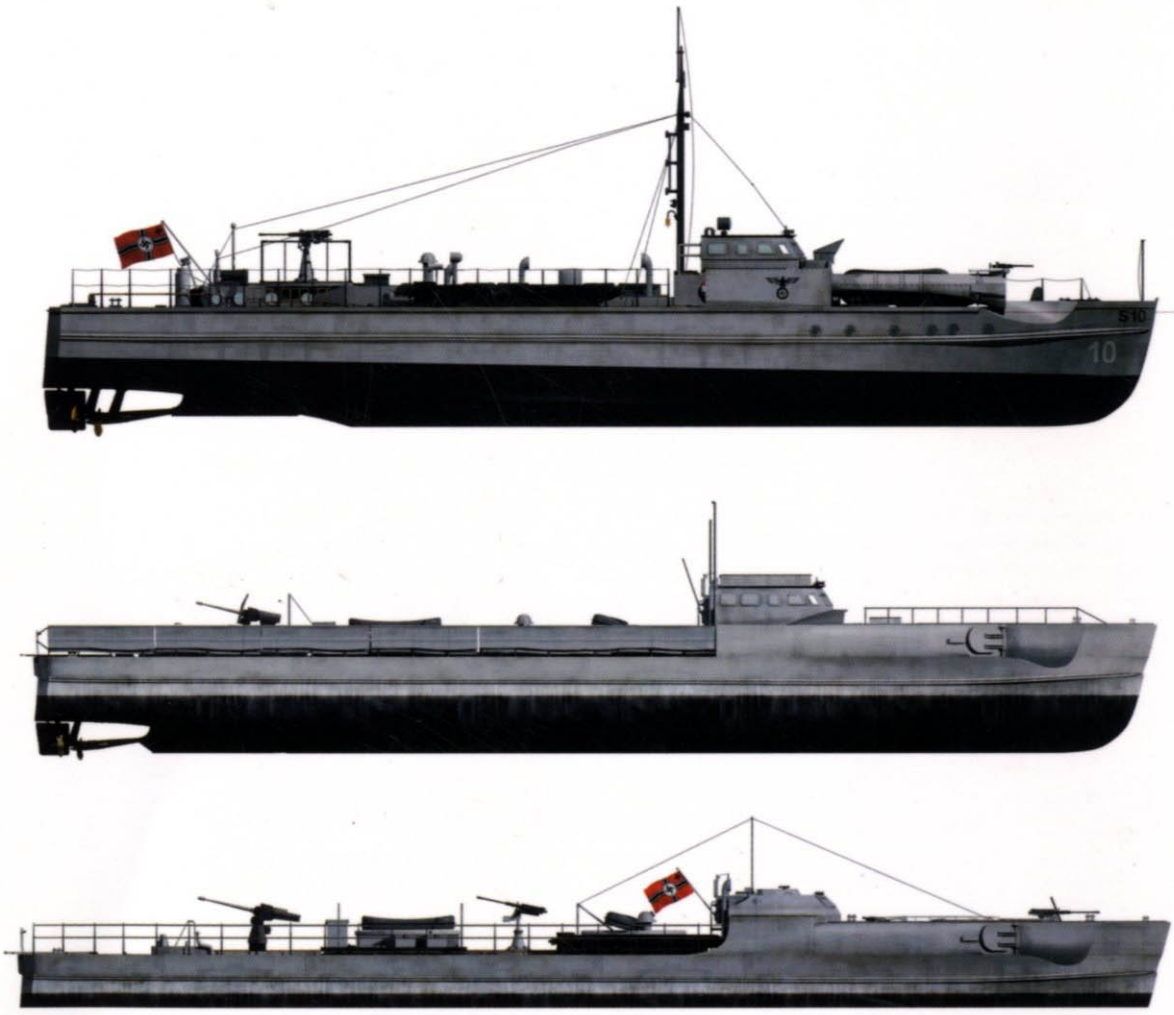
German E-boats 1939–45



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Author's Note

This book is respectfully dedicated to the late Korvettenkapitän Hermann Büchting, holder of the Knight's Cross of the Iron Cross, and former commander of 1 S-Bootsflotille, who completed over 60 successful operational sorties in both the English Channel/North Sea and Black Sea areas. The author had the pleasure of corresponding regularly with Herr Büchting prior to his death in 1992. Hermann Büchting, a fluent English speaker, was ever willing to provide assistance, information and photographs to naval enthusiasts, historians and scholars with a special interest in the E-boats. Most of the photographs in this book are from Hermann Büchting's personal albums and are provided courtesy of English collector Richard Mills, to whom they were gifted on Herr Büchting's death.

GERMAN E-BOATS 1939–45

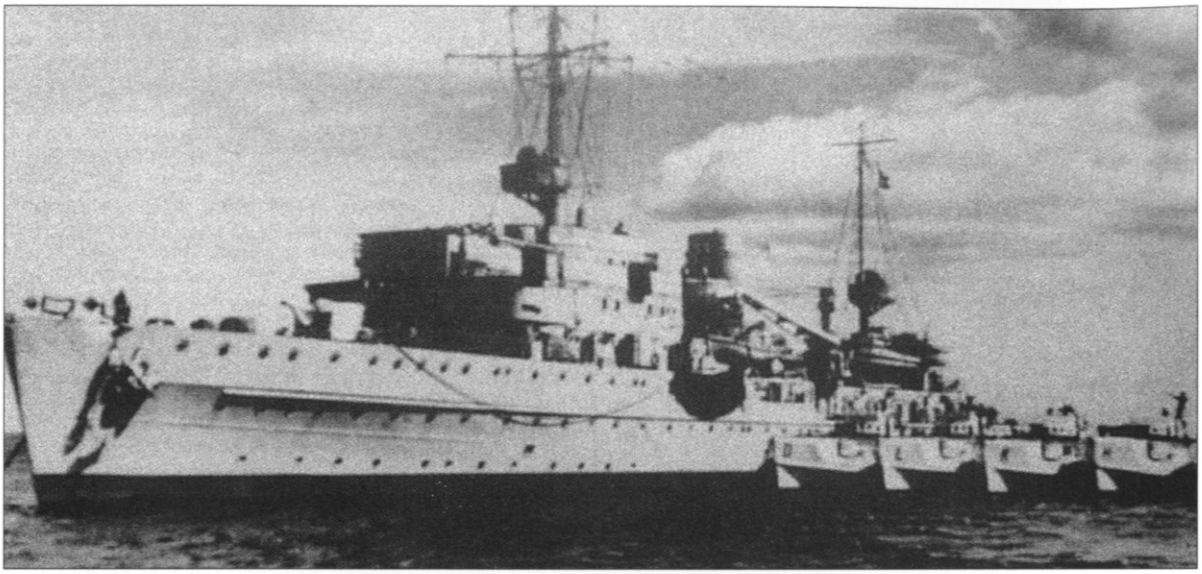
INTRODUCTION

Germany had been involved in the construction of high-quality and extremely fast motorboats since before the end of the nineteenth century, with one of the most influential manufacturers being the firm of Otto Lürssen. In 1908, a boat built by this firm, and powered by a Daimler engine, had reached speeds of 50 knots. Being built purely for speed, however, such boats were far too fragile for combat use. The first fast motorboats built for the Kaiserliche Marine were unable to be fitted out as torpedo boats due to a general shortage of torpedoes and were used instead as sub-chasers (UZ or U-Boot Zerstörer).

By the outbreak of the First World War, the German Navy had also experimented with remote-controlled boats. These were termed FL-boats (Fernlenkboote) and were effectively remote-controlled bombs, their bows packed with high explosives, intended to be steered directly at their targets – initially British 'Monitors' operating off the Flanders coast. A similar idea was resurrected in World War II with the appearance of the Linsen motorboats used by the Kleinkampfmittel verbände. These boats had their bows packed with explosives and were driven straight at their targets, the operator diving overboard at the last moment, to be picked up later by a control boat.

True motor torpedo boats made their appearance with the L-boats, later renamed LM-boats (Luftschiffmotorenboote), so-called because

A classic image of the E-boat, moving at speed, its bows raised high and causing a substantial bow wave to form. These three boats, moving in line astern, are from 1 Schnellbootsflotille and are of the late-war S-100 type with armoured bridge. The forward 2cm flak gun can just be seen at the bows.



The E-boat tender *Carl Peters* with boats of the S-Bootslehr division moored alongside. The tender itself was not a particularly large ship, and gives some indication of the diminutive size of the typical E-boat. Note that these boats from the training division have their code letters painted on the bow.

they were powered by the same engines used in the Zeppelin airships. The manufacture of these boats was once again pioneered by the firm of Otto Lürssen in Vegesack, though other firms were soon involved in their manufacture, particularly the Naglo firm in Zeuthen near Berlin, Oertz of Hamburg and Roland of Hemelingen. The first four boats, LM-1 to LM-4, were armed with only a 3.7cm gun. From LM-5 to LM-20, each boat was fitted with a single bow torpedo tube, backed up with machine gun armament. LM-21 to LM-33 were planned but not completed.

The designations of the last boats planned to appear in World War I were based on a combination of the name of the shipyard wherein they were built and the type of powerplant. Thus, Lüsi 1 and 2 were to be built by Lürssen and have motors built by Siemens/Deutz, Köro 1 and 2 were to have Körting engines and were to be built by Roland, and Juno 1 to 4 were to have had Junkers engines and be built by Oertz. They were all intended to be much more powerful boats, with twin bow torpedo tubes as well as a 2cm cannon. In the event none were ever completed.

The fast motor torpedo boats were used principally in the Baltic and off the coast of Flanders. Although no major successes against enemy shipping are recorded, these boats had at least shown that such small, fast, torpedo-armed craft had considerable potential.

After World War I, the terms of the Versailles Treaty totally banned Germany from possessing submarines and severely restricted possession of surface vessels. Though Germany was left with a small fleet of torpedo boats, these were not fast motor torpedo boats, but larger, slower, steam-driven boats displacing around 900 tons and were almost the size of a small destroyer.

The new German navy that was reborn from the ashes of the old Kaiserliche Marine was small. However, due the loss of almost her entire navy with the scuttling of the High Seas Fleet at Scapa Flow and the dismantling of her U-boat Fleet, Germany was forced to start anew, and the ships the new Reichsmarine and its successor, the Kriegsmarine built, were fast, modern ships that had been developed to take full advantage of the latest technologies.

Despite this, the Kriegsmarine, even at its most powerful, could never have hoped to match long-established and numerically superior fleets such as the British. Major surface units such as the *Bismarck* and *Tirpitz* may well have been more than a match for any single equivalent ship in any enemy navy at the time they were launched, but as they would inevitably be met with an overwhelming superiority of numbers when they did put to sea, for example what happened to the *Bismarck*, their moment of glory would be fleeting before they inevitably succumbed.

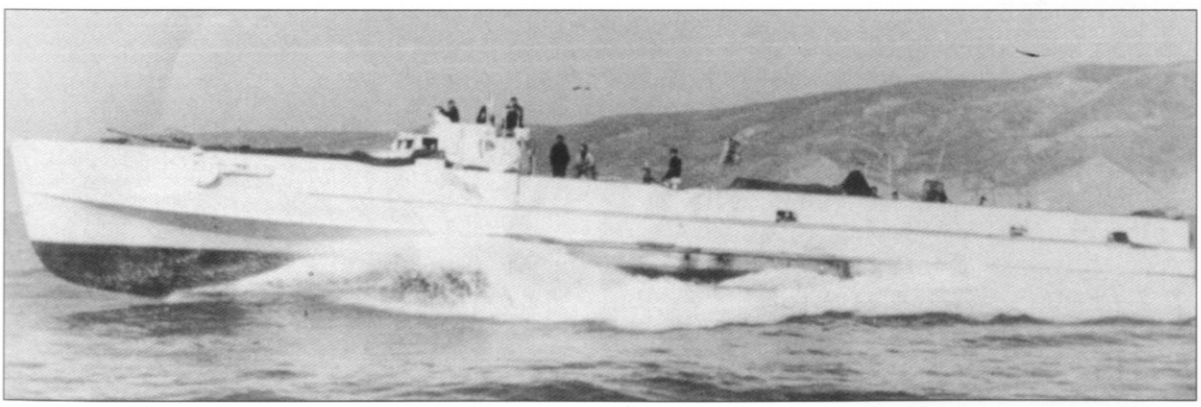
For many in Germany, it seemed that the only way of countering the might of the Royal Navy was to build substantial numbers of small, torpedo-bearing craft. In submarines, this was to result in a large number of the small Type II being constructed, and for the surface fleet, the concept found its outlet in the development of the fast motor torpedo boat.

Once again it was to be the smaller vessels of the navy (and predominantly the U-boats) that would come nearest to inflicting defeat on Germany's enemies. The E-boat fleet may have been relatively small, but its achievements were significant, ranking it amongst the most successful and cost-effective elements of the Kriegsmarine in World War II.

Note: The term E-boat is generally accepted to have been a British term derived from the designation Enemy Boat. As this term is far more widely recognised than the correct term S-boat (from the German Schnellboot or fast boat), it will be used throughout this work except where German terminology is used, such as in flotilla titles, etc. In effect, the terms E-boat, E-boats, and S-boot are all interchangeable.

As with the U-boats, design and development of the E-boats was carried out in secret, behind the guise of several commercial 'front' businesses. One such was the civilian firm of Navis GmbH in Berlin, actually run by naval officer Kapitän zur See Lohmann, who arranged for the 'private' purchase of several partially completed LM-boats by civilians acting as front-men for the navy, to prevent their being taken over by the Allies. Yacht manufacturing concerns and boating clubs such as Travemünder Yachthafen AG, were also set up, the latter being tasked with development of fast motor torpedo boats under Korvettenkapitän Beierle, whilst giving the appearance of simply producing civilian sporting craft.

These boats were used in the mid-1920s, albeit unarmed, on secret training exercises with larger surface warships to prove the concept of



A later high forecastle model moving at speed, its bows raised out of the water to show the black anti-fouling paint used on the lower hull. This model is of the same basic type as those which later had the armoured bridge fitted, as evidenced by the 2cm gun just visible, projecting from its tub on the foredeck. However, it still has the earlier style of open bridge over the wheelhouse. Note that the colour scheme used on most E-boats was a grey so pale that it almost appears white on monochrome photographs.

the fast, manoeuvrable, torpedo-carrying boat. The potential for such boats was not lost on the Reichsmarine. Once again, the Lürssen firm was heavily involved, as were others such as Abeking and Rasmussen in Bremen and the Kasparwerft in Travemünde. With their intended use hidden behind the designation UZ(s) U-Boot Zerstörer (schnell) or fast sub-chaser, development continued.

One of the main questions taxing the minds of those intent on perfecting the design of the ideal fast motor torpedo boat was the delivery of the main weapon – the torpedo. Three main methods of discharging the torpedo were considered:

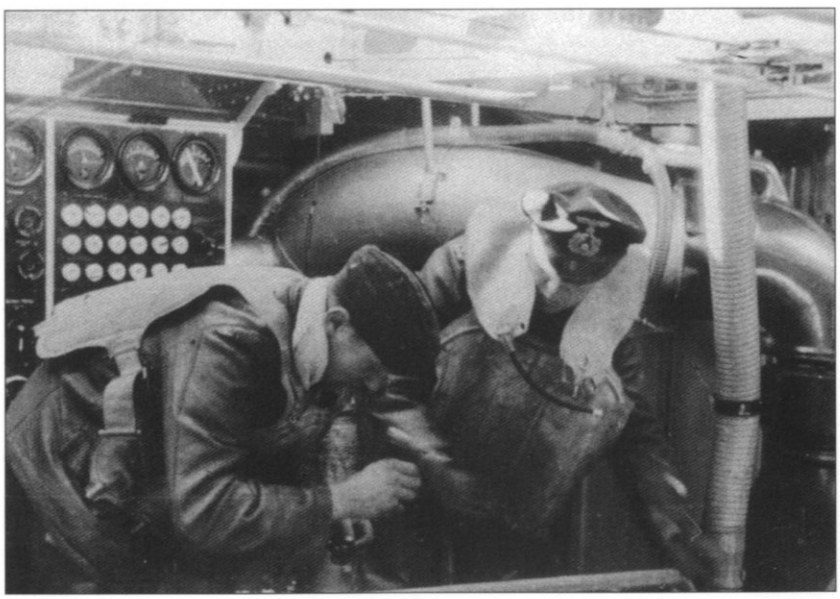
Bow Launch What was to become the standard method, with torpedo tubes mounted on the bow of the boat, launching the torpedo nose first towards the target. Though this may seem obvious today, other, more extreme methods were considered.

Stern Launch–Tail First This rather dangerous-sounding method saw torpedoes being launched tail first (i.e. nose pointing in the same direction as the boat), from tubes at the stern, requiring the boat to make a tight turn to port or starboard to avoid its own torpedoes.

Stern Launch–Nose First This required the boat to turn 180 degrees away from the target and launch torpedoes towards the enemy whilst it made off in the opposite direction. This method had some merit and was actually used on some very small E-boats.

Not surprisingly, the method selected was the bow-mounted tube.

The highly experienced Lürssen firm became involved again in the manufacture of motor torpedo boats for the Reichsmarine on an official basis in 1930, with the 52 ton UZ(s)-16 (eventually to be renumbered as S-1). The boat soon proved itself in tests and was the basis for all future E-boat development. The basic E-boat design changed little over the course of its development. In all, there were 13 identifiable models, which could reasonably be considered under three main categories, early-, mid- and late-war types. Many of the changes were subtle and are not immediately apparent even when studying photographs of the vessels.



The 'Chief' (in peaked cap) and one of his engine room crew in the diesel motor room of an E-boat. Note the black leather protective clothing worn. This was very similar to that used by U-boat crews and indeed by engine room crews on many surface ships.

DEVELOPMENTAL DETAILS

Early-war low forecastle types

S-1

The first true E-boat, this vessel started its life under the designation UZ(s)-16. Built by the Lürssen firm, it was a 52 ton boat with a length of 26.9 metres and a beam of 4.37 metres. She was driven by three Daimler Benz 800bhp V12 diesels with a 100bhp Maybach engine coupled to the central propeller shaft for use when manoeuvring at low speed. S-1 had a top speed of 34 knots and a crew of 12. Commissioned in August 1930, she was used for testing until December 1936, and sold to Spain.

S-2 to S-5

The first operational E-boats for the German Navy, these four vessels were also ordered from Lürssen. Slightly larger than their predecessor, at 27.9 metres, and with a beam of 4.5 metres, these boats weighed in at 58 tons. These boats, like S-1, were powered by three Daimler Benz 800bhp V12 diesel engines, and a supplementary Maybach engine was coupled to the centre shaft for manoeuvring. Top speed was 32 knots. This class carried 7,500 litres of fuel, giving an operational range of 350 nautical miles at top speed, extending to 2,000 nautical miles at an economic 7 knots.

The boats were of wooden construction with an oak keel and frame, and with the hull split into eight watertight compartments. Armed with two bow torpedo tubes and carrying four torpedoes, supplementary armament was provided by a 2cm MG C/30 amidship and a 7.92mm MG08 at the bow. Like their immediate predecessor, these boats required a crew of 12.

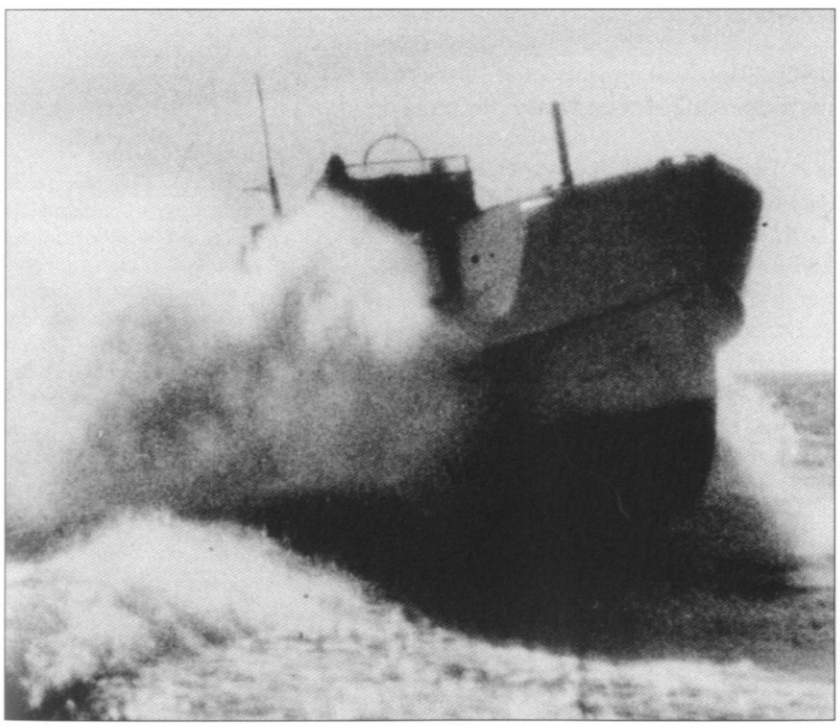
S-2, 3, 4 and 5 were formed into the 1st E-boat Half Flotilla. By the end of 1936, however, all were considered obsolete and sold to Spain along with S-1.

S-6

Fortunately, only one boat of this class was produced. Displacing 85 tons, it measured 32.4 metres in length with a beam of 5.1 metres. Its main drawback lay in the three lightweight MAN L7 two-stroke diesels that powered it. In terms of reliability and performance, the engines were a total disaster, giving a whole catalogue of problems. The boat was basically a liability and of no real use to the Navy. It was sold to Spain along with its five predecessors.

S-7 to S-13

The possibility of a future war with France saw the navy requiring a boat with



This rather hazy, but interesting shot shows an early high forecastle type boat with open bridge atop the wheelhouse. Just visible is the large direction-finding loop on the bridge. Also of interest is the fact that the pedestal mount for the foredeck machine gun has been fitted but the weapon itself has not been mounted. Once again, note the huge bow wave.

the specifications that would allow it to operate against French ports, thus requiring greater range than the existing models. The existing designs were not capable of upgrading to an additional fuel capacity without adversely affecting their power/weight statistics. The resultant new design was the 86-ton S-7 class, with a length of 32.4 metres and a beam of 5.1 metres. Three of these boats (S-7 to S-9) were fitted out with MAN diesels and others (S-10 to S-13) with the more reliable Daimler Benz type.

The Schnellboots-kriegsabzeichen. Interestingly, when this badge was redesigned in 1943, the opportunity was taken to revamp the design of boat illustrated. Although somewhat stylised, the earlier first pattern, at left, clearly shows one of the early high forecastle boats with enclosed cabin-type wheelhouse and still retaining portholes, whilst the second pattern at right shows a much sleeker late-type boat with streamlined bridge and no portholes.

S-14 to S-17

This class was larger yet again. These vessels were 34.6 metres in length with a beam of 5.3 metres. S-14 and S-15 displaced 93 tons whilst S-16 and S-17 displaced 100 tons. A crew of 18 was required. These boats were powered by MAN 11-cylinder two-stroke diesels, which once again proved to be far from reliable. So exasperated was the navy with the poor reliability of the MAN engines that it decided that in future this firm's engines would not be considered for use in E-boats. It is interesting that the MAN diesels proved so unsatisfactory having given such great service in the U-Bootwaffe, whilst conversely, high performance E-boat engines installed in U-boats (U-180 for example) proved equally unsatisfactory.

S-18 to S-25

This group was of very similar specification and identical size to the S-14 class but were powered by Daimler Benz MB501 four-stroke diesels, a far more reliable unit.

Mid-war high forecastle types

S-26 to 29, 38 to 53, 62 to 133, 159 to 166

The first of the S-26 models were built by Lürssen. Displacing 112 tons, they were 34.9 metres in length with a beam of 5.3 metres. These boats were powered by the 20-cylinder Daimler Benz MB501, and required a crew of 24.

S-30 to 37, 54 to 61

Also built by Lürssen, the S-30 class was marginally smaller than the S-26, displacing 100 tons and having a length of 32.8 metres and beam of 5.1 metres. The slightly smaller size was due to the fitting of the 16-cylinder Daimler Benz MB502 engines. This class also required a crew of 24.

Late-war armoured bridge types

S-139 to 150, 167 to 169, 171 to 227, 229 to 260

This class was visually quite similar to the S-26 type, but was in fact one metre longer and was powered by the supercharged Daimler Benz MB511 engine. All had a much lower profile due to the new bridge design. The

armoured bridges had in fact begun to be fitted from S-67 onwards in the S-26 series, but were common to all the S-139 and S-170 classes.

S-170 to 228, 301 to 425, 701 to 825

The S-170 class was to be the largest of the E-boats. Displacing 121 tons, they were 35 metres in length and had a beam of 5.3 metres. The last batch to be constructed, S-701 to S-825, were also powered by the supercharged MB511 engine.

It is interesting to note that the E-boat War Badge (Schnellbootskriegsabzeichen), awarded to E-boat crews after their third combat sortie, was unique amongst such badges in that it was specifically redesigned to reflect new developments in E-boat construction. The first badge, instituted in May 1941, depicted one of the early high forecastle types, but still with the relatively high cabin type of bridge. In 1943, a second type was introduced. The Commander of 2 S-Bootsflotille, Kapitän zur See Rudolf Petersen, was involved in producing the design for this second version, which shows the later, sleeker type with the armoured bridge in a form that also imparts a greater impression of the speed of the boat.

Miscellaneous

S-501 to 507, S-510, S-512 to 513

These were all ex-Italian Navy boats taken over by the Germans. Small, displacing just 29.4 tons, they were a mere 18.7 metres in length with a beam of 4.7 metres. Twin propeller shafts drove them at a top speed of 44 knots. They were armed with twin torpedo tubes and a single 2cm Breda machine gun. The crew complement was 13.

S-601 to 604

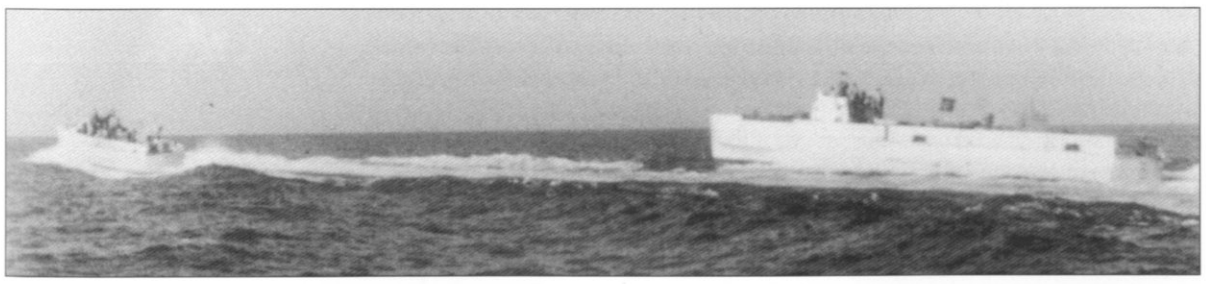
Displacing some 61 tons, these were ex-Yugoslav Navy boats. At 28 metres in length and with a beam of 4.5 metres, they were almost as large as the German-made E-boats. Like the German boats, they were driven by three propellers, but were powered by petrol rather than diesel engines, and with a smaller 100bhp manoeuvring engine. Armament consisted of two torpedo tubes and two 2cm guns.

S-612 to 630

Another former Italian Navy type, this model displaced 70 tons, was 28 metres in length and had a beam of 4.3 metres. Driven by three propellers, they too were powered by petrol engines. They were armed with twin torpedo tubes and two 2cm Breda machine guns.

Smaller boats

As well as the larger, powerful S-boat classes, a number of smaller craft were also produced.



Two of the early high forecastle type boats moving at relatively low speed. Note that the bows are rather low to the water, though the triple screws are still churning up a considerable wake. These boats have the open bridge over the wheelhouse.

Crewmen pull the mooring ropes of their boat, drawing her into the quayside. This shot clearly shows the canvas dodger screens fitted over the boat's railing to avoid the afterdeck becoming swamped.

LS-boats

The intention was that these boats would be carried on and launched from larger craft (the proposed, though ultimately rejected, Type III U-boat was to carry two such small motor torpedo boats of the LS type). A small number were also allocated to some of the auxiliary cruisers. In the event, from a total of 34 proposed craft, only 15 were actually built. Most ended up being assigned to 21 S-Bootsflotille based in the Aegean.

These boats displaced just 13 tons and were only 12.5 metres in length with a beam of 3.5 metres. They were powered by two Daimler Benz MB507 diesel engines and required a crew of seven. Armament consisted of two torpedo tubes and one 2cm gun. Not all were actually completed as torpedo boats, some being used as minelayers.

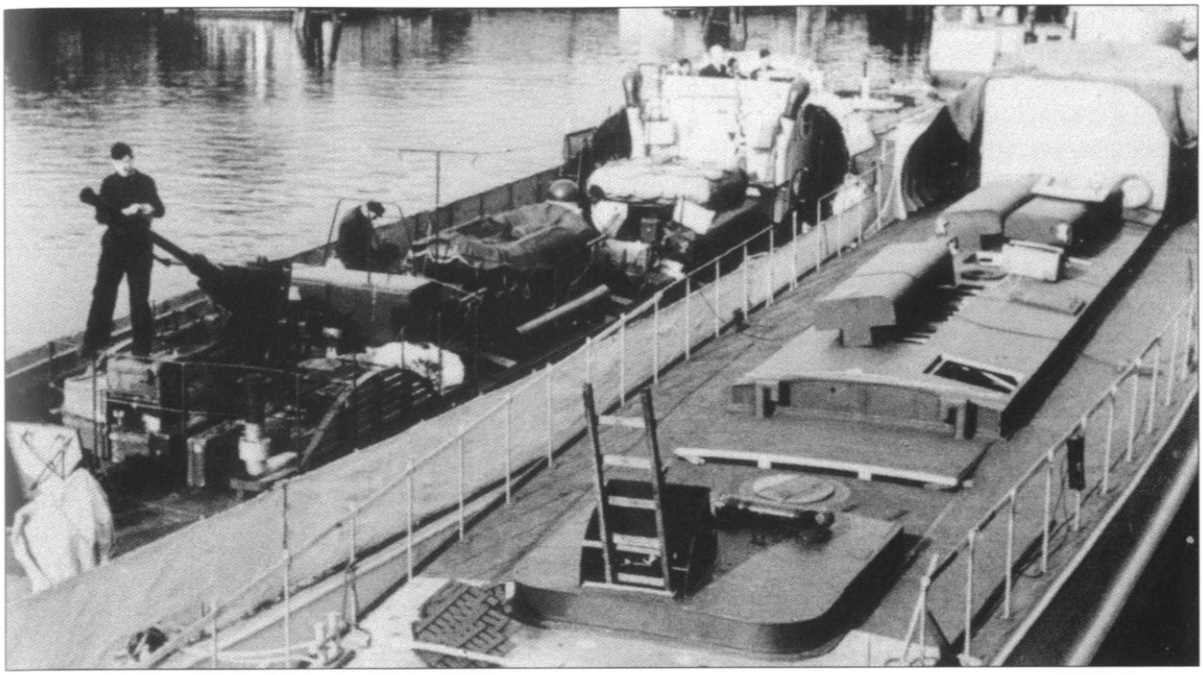
KM-boats

Displacing 18 tons, these boats had a length of 15.6 metres and a beam of 3.5 metres. Powered by two BMW petrol engines, they could achieve a top speed of around 30 knots. Two configurations were produced, a minelayer capable of carrying four mines, and a torpedo boat with two stern-mounted torpedo tubes. In both cases, a 7.92mm machine gun was provided as supplementary armament. A total of 36 boats of this type were produced.

Other concepts

One thing common to all E-boats was that in the search for ever higher speeds, the use of lightweight materials was paramount so that inevitably, no armour protection was provided. This meant that, although more powerfully armed than most of their counterparts in Allied navies, the E-boats were just as vulnerable as any other such craft to enemy counter fire. E-boats would rely almost totally on their speed to protect them from the attentions of the enemy. Although late-war E-boats did receive some armour protection to the bridge area, their hulls were just as vulnerable to anything other than small-calibre enemy fire.

A fully armoured version of the E-boat was proposed. This would have been approximately the same size as the standard E-boat at around 35 metres with a 5.4 metre beam. Displacing around 110 tons, it would have been able to attain speeds in excess of 40 knots. Armament was to include three 2cm guns, and an unusual torpedo



An interesting shot showing the afterdecks of two E-boats. The one at left still has its canvas dodgers fitted whilst that at right has had them removed. In fact the boat at right seems to have been stripped down. Its stern 3.7cm flak gun has been removed. Note the open hatch and ladder leading to the junior ratings' quarters/galley area.

tube arrangement with two in the bow and two in the stern. In the event, the project never progressed further than the planning stage.

The Kriegsmarine also possessed a considerable number of motor escort boats, known as Räumboote or R-boats. These varied considerably in size up to around 175 tons. Slower than the E-boat, they had a top speed of around 25 knots and an armament consisting of a 3.7cm gun and up to three 2cm guns. These were used for coastal escort duties.

A plan was devised to produce a hybrid gunboat, somewhere between the fast E-boats and the slower R-boat, which would carry a substantial armament. These were to be known as MZ-boats (Mehrzweckboote). Armament would consist of a forward twin 3.7cm gun, a 2cm gun in a cupola on the bridge and a quadruple 2cm Flakvierling amidship over the engine compartment. This plan also failed to materialise fully, due principally to shortage of materials and the feared impact on production of the standard R-boats.

GENERAL DESCRIPTION

Hull

Though many of the E-boats differed in external detail as the series was developed, the general structure of the boats was broadly similar. Generally speaking, most very small boats were of wooden construction, medium-sized boats like the E-boats were of mixed construction and large boats were of all-metal construction.

The E-boats' hulls were of mixed wooden/metal construction, with the keel, longitudinals and deck beams in wood and the frames and diagonal stringers in light metal alloy. The deck superstructures were also made of light metal alloys. The bulkheads were in 4mm-thick steel below the water line and of slightly thinner light metal alloy above.

Below decks

Inside the hull, the forwardmost compartment contained the WCs and washroom for the crew. Moving through the first bulkhead, the next area contained the petty officers' accommodation, with bunks for five men, plus a small compartment for the coxswain. Through the next bulkhead, on the port side was the radio room, and on the starboard, the captain's cabin. Moving aft, the next compartment contained two large fuel cells, one either side of the central walkway. These contained up to 6,000 litres of fuel.

In these mid-engined boats, the central compartment contained the two diesel engines that powered the outer port and starboard shafts, with a central walkway between them. The centrally mounted diesel engine that drove the middle shaft was in the next compartment, with walkways either side.

The next compartment held yet more fuel cells, capable of holding almost 8,000 litres of diesel fuel. The penultimate compartment was the lower ranks' accommodation area, normally housing up to 15 men, as well as the boat's magazine. Finally, the small aftermost compartment housed yet more fuel cells, typically holding up to 4,000 litres.

A crewman in life jacket checks the depth charges carried on his boat. Normally, when loaded, three charges were carried in each of two stern racks.

Above decks

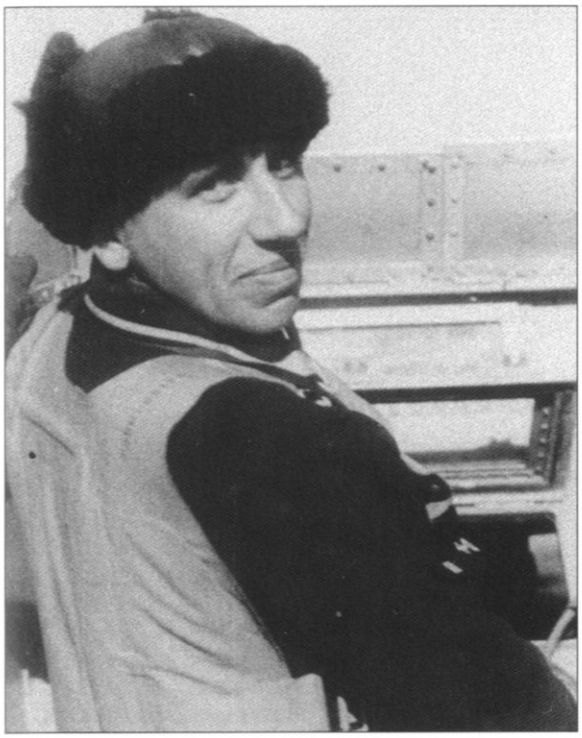
There were three basic types of configuration covering most of the E-boat types. The earliest had a low forecastle, the mid-war type a high forecastle, and the later types a high forecastle and armoured bridge.

Low forecastle

This type was identified by its low forecastle and exposed torpedo tubes. The tubes passed through a steel bulkhead, forward of which, between the tubes, was positioned a pedestal-mounted machine gun, just ahead of a small breakwater. The boat's inflatable dinghies were usually stored here, being screened to some degree from enemy fire by the torpedo tubes.

To the rear of the bulkhead was the cabin-like bridge/wheelhouse with a mast mounted to its rear. Just abaft the rear of the torpedo tubes the two spare torpedoes were stored on deck, on special cradles. The deck superstructure amidship was over the engine compartment, and was liberally covered with ventilators and skylights.

To the rear of this midship superstructure, the forward end of the aft superstructure had mounted upon it a circular platform with a surrounding guardrail, on which the 2cm Flak C/30 or C/38 was mounted on a pedestal. At the aftermost point on the upper deck could be fitted two depth charge racks, though these were by no means universally used.



A petty officer (indicated by the gold braid around his collar) on the bridge. The fur hat suggests the photo was taken during winter operations, certainly on one of the boats with an open bridge atop the wheel house.

High forecastle

In an attempt to improve the handling characteristics of the E-boats in heavy seas, the forecastles were raised, this having the effect of enclosing the torpedo tubes. The earlier boats fitted with a high forecastle generally had a clear foredeck, though a base for a pedestal mount for a machine gun was provided as per the early models. This weapon, however, rarely seems to have been fitted. The inflatable dinghy was moved back towards the midship area, leaving the rest of the foredeck uncluttered. This early high forecastle design has an instantly recognisable curve to the line of the foredeck just forward of the bridge.

These boats still had a relatively prominent and unprotected bridge/wheelhouse area, to the rear of which was the long midship superstructure on the forward end of whose roof was mounted an inflatable escape raft. On the roof of the superstructure were positioned several ammunition lockers. Just abaft the superstructure was the heavy flak mount comprising a 40mm Bofors, 3.7cm flak gun or quadruple 2cm Flakvierling. To the rear of the flak mount was the small after superstructure, the roof of which contained ammunition lockers and smoke generators as well as an entry hatch to the crew accommodation. On the aftermost part of the deck were often located twin depth charge racks, each of which would hold three charges.

Generally, apart from the raised forecastle, the appearance of this type was little changed from the earlier low forecastle models.

Later high forecastle models

Later high forecastle models had significant changes in appearance. The forward gun position, instead of being fully exposed, now became a sunken 'tub', thus providing more cover for the gun crew. The weapon generally mounted here, instead of the machine gun of the earlier models, was a 2cm cannon. On the aft end of the forward superstructure (over the boat's engine room) a twin 2cm flak gun was generally fitted, and the usual heavy flak gun was mounted at the forward end of the aft superstructure. The most obvious change on this type was the bridge. Whereas early models had an enclosed bridge/wheelhouse, these later models had an open bridge above the wheelhouse, giving this area a somewhat higher profile.

High forecastle armoured bridge

In an attempt to provide more protection for the commander and crew in the wheelhouse, most later boats had a so-called 'Skullcap' armoured bridge fitted (these were also retrofitted to some earlier boats). This had a very low silhouette with chamfered edges and armoured flaps, which could be closed over the vision ports. The foredeck was flat and lacked the upswept curvature of the earlier type just forward of the bridge. A 2cm flak gun (sometimes fitted with an armoured shield) was

positioned in a gun tub on the forecastle, level with the torpedo tube doors.

To the rear of the bridge was the midship superstructure on the forward part of which was mounted the boat's binnacle and an inflatable life-raft. In the centre of this superstructure was a circular platform bearing a twin 2cm gun with armoured shield and, to the rear, a large rubber dinghy and numerous ammunition lockers.

In the space between the midship and rear superstructures was positioned a four-barrelled 2cm Flak-vierling, (alternatively a 3.7cm flak gun or 4cm Bofors). The roof of the rear superstructure contained a hatchway into the interior, ammunition lockers and smoke discharger pots. As with other variants, depth charge racks with the capacity of three charges for each could be mounted.

Watched by an attentive petty officer, and assisted by some of his crewmates, a sailor loads shells into a magazine clip for the 2cm flak gun. The breech of the gun can be seen just by the crewman's right shoulder. Note the shells lying on the canvas sheet by his left leg.

ARMAMENT

The basic forward armament of the E-boat consisted of a forecastle-mounted 7.92mm machine gun, and two bow torpedo tubes (with two spare torpedoes carried). On the afterdeck was mounted a flak gun, originally 2cm but eventually upgraded, and on some boats a complement of depth charges.

Machine guns

The basic machine gun armament was the 7.92mm MG38 which had the facility to be belt or magazine fed. Earlier MG08 and MG151 types were also widely used. Both were excellent weapons heavily used by the German Army. The MG38 was effective up to 2,000 metres and had a cyclic rate of 900 rounds per minute for the MG38 and 1,550 rounds per minute for the MG42. This made these weapons quite devastating. The down side, however, as already found by the Army, was that such a high rate of fire required substantial supplies of ammunition to keep the weapon fed. This could be problematic for infantry or other troops in having to carry heavy ammunition containers, but on board ship this was less of a problem.

On the early, low forecastle boats, the machine gun was fitted to a simple pedestal mount on the deck between the two bow torpedo tubes. The torpedo tube structures gave the machine gunner some degree of protection from enemy fire from the flanks, but the position was totally exposed from the bow. On later boats with the raised

forecastle, the forward gunner's position consisted of a tub sunken into the foredeck, giving a measure of all round cover.

On many of the later boats, the forward machine gun was replaced by a heavier 2cm MG C/38 cannon giving the boat considerably more 'punch' when firing forward. In many cases, however, the option to fire forward would be limited as, when travelling at speed, the bow rose in the water quite significantly, obscuring the gunner's view of the sea in front of him.

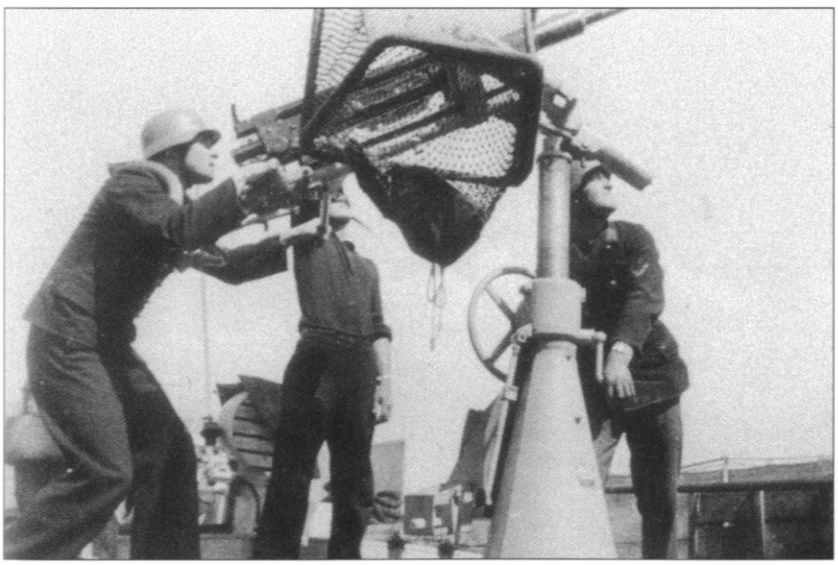
A number of dismounted machine guns were also carried and could be fitted to various mounts when necessary.

Flak guns

Early boats carried a 2cm MG C/30 flak gun on a pedestal mount sited on a circular platform amidship over the engine room. This was the same weapon provided for flak defence on most U-boats in the early part of the war. Its rate of fire was disappointingly low and, as with the U-boats, it was soon replaced by the improved MG C/38. It was magazine fed with a cyclic rate of fire of around 240 rounds per minute and a range of over 12,000 metres.

Initially, as mentioned above, the bow machine gun was also replaced by a 2cm MG C/38, and this was followed by the fitting of a twin 2cm mount on the aft flak platform. Even this improvement, however, was considered inadequate by most boat commanders. As a result, a small number of selected boats in 2, 4 5 and 6 Schnellbootsflotillen were armed with captured 4cm Bofors guns in addition to the 2cm flak armament.

By late 1944, the gun armament was standardised at one 2cm MG C/38 forward, two twin 2cm flak guns amidship and a 4cm or 3.7cm flak gun astern. In a few cases, quadruple 2cm Flakvierling mounts were fitted astern, giving some boats a fairly hefty armament of ten 2cm cannon. Though impressive on paper, the penetrating power of the 2cm weapon was poor, leading to them being contemptuously referred to as 'doorknockers' by the Germans.



Gun drill on the after 2cm flak gun. The type of mount shown here with a single-barrelled weapon suggests one of the earlier types of boat. Later boats carried a 3.7cm or 4cm flak gun backed up by a twin-barrelled 2cm. Note the mesh screens that caught ejected shell casing for recycling.

No matter what the armament fitted to E-boats, they would rarely come out best in a contest with enemy aircraft. The E-boat itself, though light and fast, could hardly be considered a stable gun platform. Many wartime close-up photos of E-boats will show the hulls covered with small patches where the structure had been peppered with small arms fire or shrapnel.

Torpedoes

The main armament of the E-boat was the torpedo. All E-boats carried two bow

tubes, with two spare torpedoes carried in racks on deck just behind the tubes from where they could be quickly loaded. The standard torpedo carried was the 53.3cm (21 inch) G7a. Some 7.2 metres in length and weighing 1,530 kilos, this weapon was steam driven. Its single propeller drove it along at a maximum speed of 44 knots, giving it a range of 6,000 metres. At its optimum lower speed of 30 knots, its range extended to 14,400 metres. In the nose of the torpedo was the warhead, typically with 280 kilos of mixed explosive (trinitrotoluene, hexanitrophenylamine and powdered aluminium). Into this was set a detonator with a small propeller. This propeller was in effect a timing mechanism, which charged the detonator whilst spinning, as the torpedo sped through the water. The detonator would not fully charge until it had covered about 30 metres, ensuring against premature detonation damaging the boat that had launched it. The detonator on the G7a was a contact type, activated by physical contact with the target.

Live firing exercises with the 2cm gun. The muzzle flash can be clearly seen. Although the crew are wearing steel helmets, it is almost certainly only an exercise. The NCO observing would be unlikely to be standing in such a casual pose if the boat were actually under attack from an enemy aircraft.

Around half the length of the torpedo was taken up by a compressed-air cylinder. This was followed by a fuel tank and a combustion chamber in which the air and fuel mix was ignited, driving a small four-cylinder engine that in turn powered the torpedo's propeller. Exhaust gases were vented through the hollow bore of the prop shaft. The torpedo was fitted with a gyroscope controlling its rudders to ensure it kept on course, and a depth gauge that controlled its dive planes. The torpedo was extremely expensive, costing well over 20,000 Reichsmarks each, and was a highly sensitive piece of equipment. Fortunately for the E-boats, its use on a surface ship was not beset by quite the same level of technical problems as was suffered by U-boats when launching the torpedo from a submarine.

The visible stream of bubbles caused by the vented exhaust gases could be problematic in the use of the G7a by U-boats, giving a sharp-sighted lookout an approximate bearing on the submarine which launched it, but such considerations were of little significance for their use by surface ships.

The more advanced, electrically driven G7e, widely used on U-boats, was not carried by E-boats. However, the advanced, long-range torpedo (the T3d) with a range of up to 57,000 metres, but a slow speed of just 9 knots and carrying a 281 kilo warhead, was used in limited numbers by E-boats attacking the Allied beachhead in Normandy. This allowed the E-boats to fire their torpedoes from a safe distance. The torpedoes would run true until reaching the target area, after which they would circle until hitting a target. The T5 homing torpedo was also used by E-boats in the latter part of the war, but without significant results.

Mines

Mines were another very important addition to the armoury of the E-boats. Those predominantly used were the RMA and RMB types, though captured Russian-made MO8 mines were also used. The torpedo-tube-launched TMB as used in the U-boat arm was also used to good effect by the E-boats, as were LMB and LMF types (acoustic/magnetic). A good number of the sinkings achieved by the E-boats were by the use of mines.

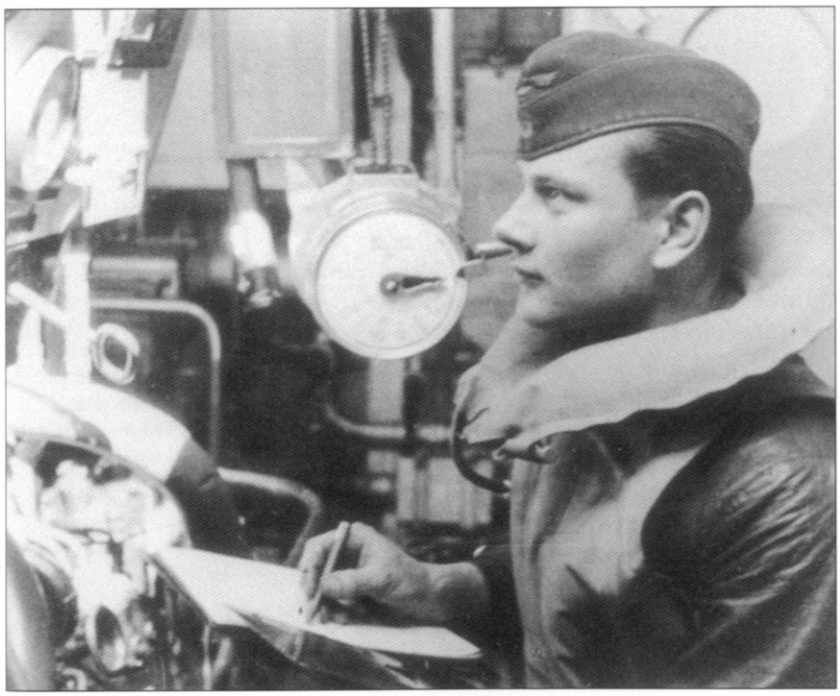
POWERPLANT

The earliest E-boats were fitted with an experimental new diesel engine produced by the MAN firm (Maschinenfabrik Augsburg-Nürnberg). Designated the L7 Zn 19/30, it was a two-stroke, seven-cylinder, in-line engine developing 1,200bhp at 1,000rpm. It proved unreliable, however, although its design allowed for easy access to components, meaning that repairs could be carried out in situ.

MAN also developed a larger 11-cylinder engine, the Zn 19/301. This engine proved to be even less reliable than its predecessor, problems being encountered with overheating and excessive vibration. Ultimately, it was decided that MAN engines would not be used in any further E-boats. It is ironic that MAN's two-stroke U-boat engines were far ahead of their competitors in terms of reliability during World War I, yet their attempts to develop a diesel engine for the E-boat resulted in abject failure.

As an alternative to the MAN design, diesel engines were also produced by the Daimler Benz firm. The MB502 was a four-stroke, 16-cylinder 'vee' engine also developing 1,200bhp but at a faster engine speed of 1,550rpm. Though more reliable than the MAN design, it had the drawback of requiring removal from the boat and transport back to the workshop for any major repairs. This was a difficult and time-consuming task involving removal of part of the superstructure/decking.

Daimler Benz subsequently developed a large, 20-cylinder engine, the MB501, which would develop over 2,000bhp, but was unable to build them fast enough, so many boats were of necessity completed with the smaller MB502. The MB501 also necessitated



An engine room artificer carefully monitors the gauges for his diesel engines. Although cramped by the standards of larger surface ships, the engine room of an E-boat was positively roomy compared with that on a U-boat.

lengthening the hull slightly to accommodate the larger powerplant. Both the MB501 and MB502 engines were also produced in a supercharged version, designated appropriately as the MB511 and MB512.

COLOUR SCHEMES

The basic colour scheme used on most E-boats saw the hull, superstructure and bridge vertical surfaces finished in a very pale grey, with the deck, superstructure and bridge/wheelhouse roof painted a darker grey. The hull below the waterline was painted in black anti-fouling paint.

Pre-war E-boats carried their boat number in white and/or black numerals on either side of the bow, and a large cast-metal eagle and swastika national emblem was fitted to the upper hull side in line with the bridge/wheelhouse. These were rarely fitted to boats after the outbreak of war.

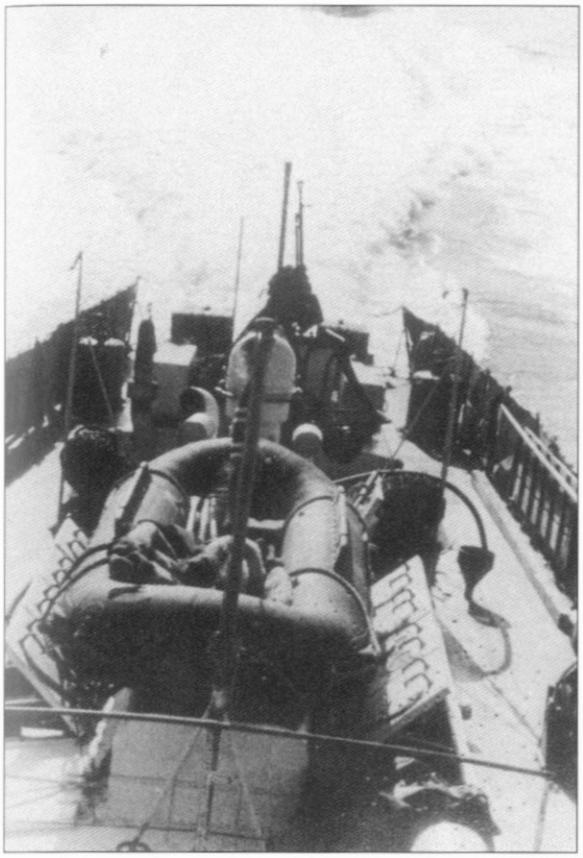
During the war years, some attempts were made to add disruptive camouflage schemes. These seem to have been more commonly used on boats operating in the English Channel. Some had a ripple-effect, two-tone grey scheme applied to the upper part of the hull above the level of the afterdeck, whilst others had similar schemes applied to all vertical surfaces. In the main, however, E-boats relied on their speed to make them difficult targets for the enemy to hit, therefore camouflage schemes did not play such a large part as with other surface vessels.

Engine room crewmen performing maintenance on one of the diesel engines. One of the pistons has been removed for examination as the 'Chief' points to an area of damage. Major repairs usually required the removal of the engine from the boat.

E-boats occasionally carried a flotilla emblem, usually painted on the hull side by the bridge, prowling panthers and tigers being particular favourites.

RADAR

Radar was never successfully introduced into the S-Bootwaffe. Although a few individual boats had radar sets fitted on an experimental basis, there was never any attempt to fit radar sets as standard, principally because none had been developed that were totally suitable for use on such craft. What was used with some success were passive radar receivers that detected radar transmissions from enemy ships and thus at least



Looking astern from the bridge. Note the rubber dinghy on top of the superstructure above the engine room. The hatches are open to allow ventilation of this area. The weapon on the after deck appears to be a 2cm flak gun, going by the slender barrel.

alerted the E-boats to the enemy presence. The primitive 'Biscay Cross' wire-wrapped wooden antenna used first on U-boats was put to use on some E-boats in late 1942. Later, improved versions such as Samos and Naxos, also developed for use on U-boats, were fitted to several boats, but even in late 1944, many boats still had no such equipment fitted.

British vessels that the E-boats would be expected to engage did have the advantage of having radar equipment fitted and could thus track the German movements with relative ease. In order to confuse enemy radar, the E-boats made use of two further pieces of equipment developed for use in U-boats, the Thetis decoy buoy and the Aphrodite balloon. The latter was a helium-filled balloon from which dangled strips of foil. Anchored by a short cable, they returned a strong radar 'signature' intended to attract the enemy's attention and allow the E-boats to avoid detection.

ORGANISATION OF THE S-BOOTWAFFE

The E-boats had originally fallen under the command of F.d.T. (Führer der Torpedoboote), or Flag Officer Torpedo Boats, though it should be pointed out that the term torpedo boats used here related to the larger vessels that resembled a small destroyer. In 1942, the torpedo boats passed into the command of the F.d.Z. (Führer der Zerstörer), or Flag Officer Destroyers, and the Navy's E-boat forces came under the control of the newly appointed Flag Officer E-boats, known as the Führer der Schnellboote, or F.d.S.

E-boats were organised into flotillas, of which there were eventually a total of 14, and which ultimately operated in four main theatres, the English Channel/North Sea, the Baltic/Far North, the Black Sea and the Mediterranean/Aegean. Some E-boats were committed for use in the Baltic during the invasion of Poland, but so quickly was the Polish Navy subdued that they saw little or no action. The following flotillas served in each of these areas:

English Channel/North Sea 1, 2, 3, 4, 5, 6, 7, 8, 9, 10, 11
Baltic/Far North 1, 2, 3, 5, 6, 7, 11, 21, 22
Black Sea 1
Mediterranean/Aegean 3, 7, 21, 24

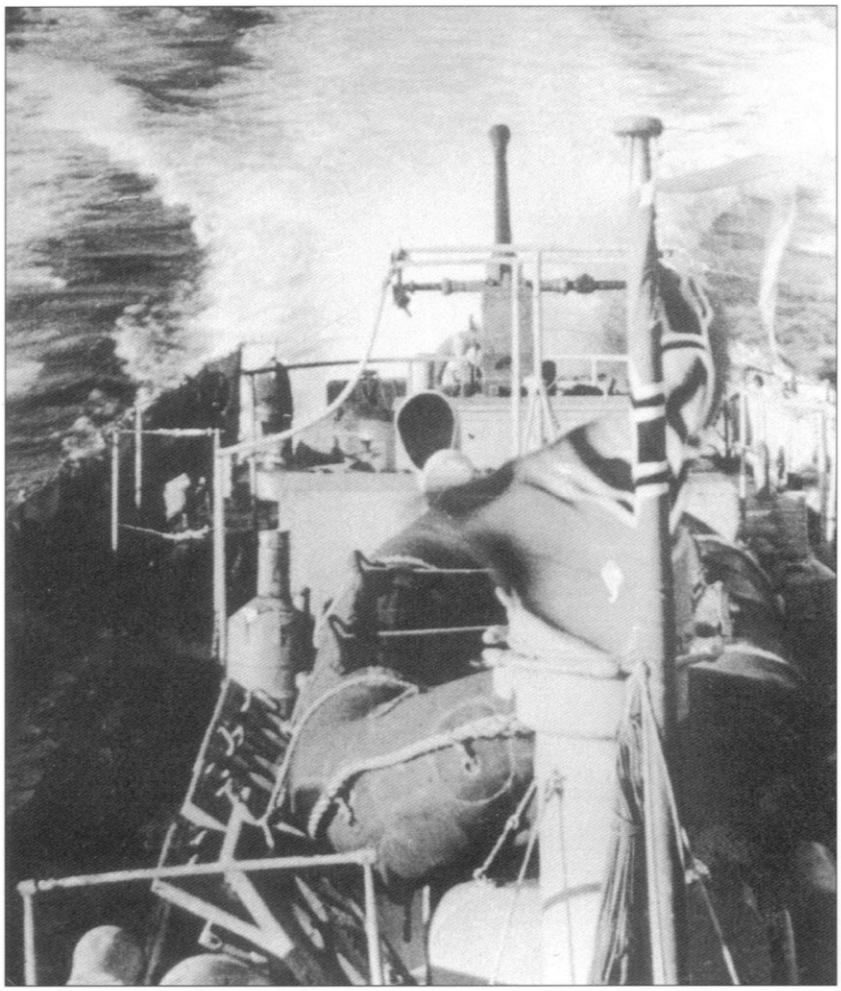
Most of these E-boat flotillas operated as autonomous units with the exception of those operating in the Mediterranean, which were formed into 1 Schnellbootsdivision.

A specific training flotilla for E-boat crews was formed in July 1942, as the Schnellbootsschuleflotille at Swinemünde. This training establishment was divided into two sections, 1 Abteilung at Swinemünde-

Eichstaden and 2 Abteilung at Kaseburg. It was enlarged into the Schnellbootslehrdivision, itself comprised of three training flotillas in November 1943. 1 S-Bootsschuleflotille was formed in November 1943 and based in the Baltic with the escort ship *Adolf Lüderitz*, 2 S-Bootsschuleflotille was formed in April 1944 and served in both Norwegian and Baltic waters with the escort ship *Tsingtau* and 3 S-Bootsschuleflotille was formed in June 1944 and based in Kurland with the escort ship *Carl Peters*.

Initially, each E-boat flotilla had its own tender/escort ship. As the size of the E-boat fleet grew, and wartime shipyard capacity was stretched to its limits, the construction of further intended tender/escort ships were cancelled.

Although relatively small, the E-boat force was highly successful and became a real threat to Allied shipping. A total of 23 Knight's Crosses of the Iron Cross were awarded to both flotilla commanders and individual E-boat commanders who were notably successful. Of these, eight particularly proficient E-boat men who had been decorated with the Oakleaves to the Knight's Cross were also decorated with the E-boat Badge with Diamonds, a personal gift from the C-in-C Navy in recognition of their exceptional achievements. (Nine small diamonds were set into the swastika of a standard E-boat Badge, which had been made in real silver and gilded.)



A similar view on a different boat. This boat packs a much heavier punch in the distinctive shape of a 4cm Bofors gun. The flag flying from the staff is the Reichskriegsflagge or State War Flag, the battle ensign of the Navy.

OPERATIONAL USE

A look at some of the operational activities of the E-boat may give a better perspective on their military significance.

At the outbreak of the Second World War, 1 S-Bootsflotille was in Baltic waters engaged on stop and search patrols looking for contraband. It had been intended to use the flotilla in the campaign against Poland but the Polish Navy was so quickly subdued that the flotilla never saw action and was moved back to home waters for use in the west. 2 S-Bootsflotille was based in Heligoland, but this unit was of

THE ENGLISH CHANNEL/NORTH SEA		
1 S-Bootsflotille	Tenders	*Tsingtau, Carl Peters*
2 S-Bootsflotille	Tenders	*Tanga, Tsingtau*
3 S-Bootsflotille	Tender	*Adolf Lüderitz*
4 S-Bootsflotille	Tenders	*Tsingtau, Hermann von Wissmann*
5 S-Bootsflotille	Tenders	*Tsingtau, Hermann von Wissmann, Carl Peters*
6 S-Bootsflotille	Tenders	*Tsingtau, Tanga, Carl Peters, Adolf Lüderitz*
7 S-Bootsflotille		
8 S-Bootsflotille	Tenders	*Tsingtau, Adolf Lüderitz*
9 S-Bootsflotille	Tender	*Tsingtau*
10 S-Bootsflotille		
11 S-Bootsflotille		

questionable value, equipped as it was with boats fitted with the dreadful MAN diesel engines. One of these boats had been so badly damaged by heavy seas during one storm that she was written off and cannibalised for spares.

1 S-Bootsflotille was moved into Heligoland to allow 2 S-Bootsflotille to re-equip with newer boats, the older vessels being passed over to the Training Flotilla, but it too was so badly hampered by bad weather that it achieved little over the remainder of the year, eventually being pulled off active service for refitting. It was an inauspicious start for the S-Bootwaffe.

The next significant duties carried out by E-boats in the west was during the invasion of Norway. 1 S-Bootsflotille committed five operational boats, S-19, 21, 22, 23 and 24, to operations around Bergen. S-19 and S-21 collided en route to their operational area. S-19 was so badly damaged she took no further part in the action. The other boats were used to ferry troops from larger ships to shore and also secured some of the smaller villages deep in the nearby fjords and assisted in the rounding up of Norwegian Navy units.

2 S-Bootsflotille, with S-9, 14, 16, 30, 31, 32 and 33, took part in the capture of Kristansand before being committed to patrol and anti-submarine duties. Here, once again, the older MAN-powered boats, S-9, 14 and 16, were all but useless due to lack of reliability of their powerplant.

The first real combat actions of the E-boats in the west came in May 1940 when E-boats providing escort to the battlecruiser *Scharnhorst* were detached to intercept a British naval force consisting of a cruiser and seven destroyers intent on tackling the *Scharnhorst*. Some of the more modern boats, S-31, 32, 33 and 34, attacked the destroyers and S-31 succeeded in torpedoing and so severely damaging HMS *Kelly*, that she was barely saved.

By late May, both 1 and 2 S-Bootsflotillen were operating against Allied shipping in the English Channel. Despite several attacks by RAF aircraft, none was lost, but at the same time, no sinkings of enemy ships by E-boats were achieved.

On 22 May, the French destroyer *Jaguar* was torpedoed and badly damaged by boats from 1 S-Bootsflotille, running aground where she was eventually finished off by Luftwaffe bombers. One week later the destroyer HMS *Wakeful*, packed with troops being evacuated from Dunkirk, was torpedoed and sunk with heavy losses by S-30. The next day,

30 May, 1 S-Bootsflotille again engaged enemy destroyers, this time off the Dutch coast, torpedoing and sinking the French destroyer *Siroco* and so badly damaging the destroyer *Cyclone* that she had to be taken into dry dock and was eventually scuttled.

Reinforcements in the shape of boats from 3 S-Bootsflotille arrived in Rotterdam in June, but as this new flotilla had been equipped with 'cast-offs' from 2 S-Bootsflotille (the dreadful MAN-powered boats) these reinforcements were as good as useless.

A view taken looking forward from the quarterdeck of an E-boat moving at some speed. The extreme slope of the deck is evident and must have made movement rather awkward to say the least. This boat seems to be carrying spare depth charges rather than torpedoes in the deck racks.

With the signing of an armistice on 21 June, all of the French Atlantic bases fell into German hands and 1 S-Bootsflotille moved into Cherbourg from whence, on 29 June, it made a sortie into the waters around the Isle of Wight, attacking British shipping though none were sunk. A few days later, however, a further sortie saw an attack on the remnants of a convoy, already hit by Luftwaffe dive-bombers, in which three merchantmen were hit by torpedoes from E-boats. Two sank and one was badly damaged.

On 25–26 July, a further attack, on convoy CW8, saw three more merchantmen sunk. The British increased the level of escort protection for the convoys and reduced their nominal size, but these measures did not prevent convoy CW9 from being attacked by boats from 1 S-Bootsflotille in August, with two ships sunk, a further two damaged and one more sunk due to a collision when manoeuvring violently to avoid a torpedo launched by an E-boat. On 4 September, another successful convoy raid by the same flotilla saw five merchantmen sunk and another damaged with no losses or significant damage to the E-boats themselves. A final convoy raid before the flotilla was moved back to Germany in late October saw three more merchantmen added to its tally.

During the late summer of 1940, 1 S-Bootsflotille also provided air-sea rescue cover for the Luftwaffe as Göring's air offensive against Britain grew. Meanwhile, 2 S-Bootsflotille had been operating out of Ostend, mainly used on minelaying duties. Over 130 mines were laid by the flotilla, although one boat, S-23, was lost when it struck a mine itself.

In mid-August, the torpedo depot was blown up in a suspected act of sabotage, with resultant collateral damage to several E-boats. Replacements were later received, only for them to be damaged in RAF air raids. Some attempts were made to combine the operations of boats from 2 S-Bootsflotille in Ostend and 3 S-Bootsflotille in Rotterdam. Strength had been gradually whittled down by enemy action and

damage due to accidents such as the ramming of S-29 by her sister boat S-28. These misfortunes only served to highlight the basic fragility of these vessels. Though very fast and well armed, they had no armour protection and were easily damaged. By the end of 1940, only eight operational boats were available in the Atlantic/Channel ports.

1941 began quietly for the E-boat force in the west. On 25 February, however, all that changed with a successful combined operation by 15 E-boats on convoy FN417, which saw the destroyer HMS *Exmoor*, along with one of the merchantmen she was escorting, being sent to the bottom. Further success came in March when, in a combined Navy/Air Force operation, 17 E-boats were involved in an attack on a convoy that resulted in seven merchantmen totalling over 13,000 tons being sunk. Subsequent similar operations were less successful and the E-boats eventually moved back to minelaying duties though even this was hampered by appalling weather conditions.

The first three E-boat flotillas were joined by 4 S-Bootsflotille in July 1941. Once again, this newly arrived flotilla was used principally on minelaying operations, around Portland Bill, Dungeness, Dover, etc. These operations, where boats carried mines that could be laid if no enemy ships were encountered on which torpedoes could be used, did bring some rewards in the form of sporadic sinkings.

Operations in the second half of 1941 saw an initial build-up in E-boat strength, but persistent bombing raids on E-boat bases did cause significant damage. One feature of action in the Channel that was becoming more common was combat between the E-boat and its British equivalent, the MTB (Motor Torpedo Boat) and the MGB (Motor Gun Boat). On a number of occasions E-boats were intercepted by MTBs or MGBs waiting in ambush for them on their return to port after operations, and running battles ensued that, although inconclusive in

Looking up into the open bridge area from amidship. Note the large direction-finding loop. The standard large rubber dinghy is in the left foreground whilst on top of the forward engine room superstructure is a second, square inflatable life raft. This appears to have been taken on a bright winter's day, judging by the combination of fur hats and sunglasses being worn.

terms of sinkings, saw further damage inflicted on many E-boats, which required considerable resource to repair. Strength was weakened further when 2 S-Bootsflotille was ordered to give up half its boats to form the nucleus for a new flotilla, 8 S-Bootsflotille.

The year ended on a more positive note for the E-boats when 4 S-Bootsflotille carried out a convoy attack on 23 November, resulting in three enemy ships sunk and a further one damaged. This success was repeated just five days later when a further three enemy ships were sunk and an attack by MGBs successfully fended off without loss.

Typically, the bad winter weather at the start of 1942 heavily curtailed E-boat operations. The British had, in any case, been monitoring German radio traffic for some time and this, coupled with their use of radar, allowed them to detect E-boat movement and either route convoys so as to avoid the E-boats, or vector warships in to ambush them.

A dead-on bow view of an E-boat travelling at top speed. Given how high the bow rides out of the water, it is difficult to imagine just how effective the 2cm bow gun would have been on the later-style boats to which it was fitted. It must have been almost impossible to fire forward of the boat, or indeed to even see a target.

Some of the E-boats based in the Channel ports were used to mount diversionary attacks to draw British units away from Operation Cerberus, the successful break-out of German capital ships from the Channel ports, or 'Channel Dash' as it has become known. In bitterly fought gun battles with British MTBs and MGBs in February, one of 2 S-Bootsflotille's boats, the S-53, was caught and boarded by the enemy, only to be blown up by her captain as the enemy were about to take control. In mid-March, an attack on a British convoy by boats from 4 S-Bootsflotille saw the destroyer *Vortigen* torpedoed and sunk by E-boats.

E-boats often became embroiled in running battles with escort vessels. In one case, S-111 was heavily damaged in combat with MGBs. She was overtaken and boarded, but a number of other E-boats arrived in the nick of time and drove off the British. The damaged S-111 was taken in tow, but on her way back to port was attacked by RAF fighters and sank whilst under tow.

A return to minelaying operations saw two enemy destroyers damaged and two merchant ships sunk by E-boat mines before atrocious spring weather temporarily curtailed further operations. No major successes were scored until 6 July when convoy WP183 was attacked and an armed trawler and five merchant ships totalling some 13,000 tons sunk. Difficulty in finding targets made it clear to the Germans that the British had changed the pattern of their convoy sailings and in the late summer of 1942, most E-boats once again concentrated on minelaying operations.

Boats operating in the North Sea were not involved in any significant actions until September when a running battle between E-boats and British MGBs resulted in an outstanding success for the E-boats. The British MGBs were badly shot up in the duel and one, MGB335, was captured, allowing its radar set and other sensitive equipment to fall into German hands.

A: Early-war low forecastle E-boats

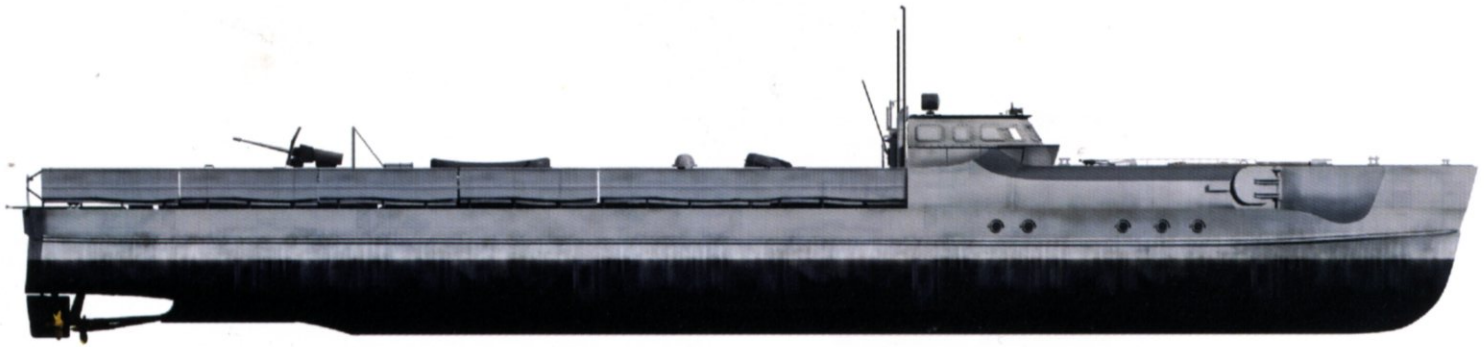
1

2

B: An early-war E-boat on the attack

C: Mid-war high forecastle E-boats

1



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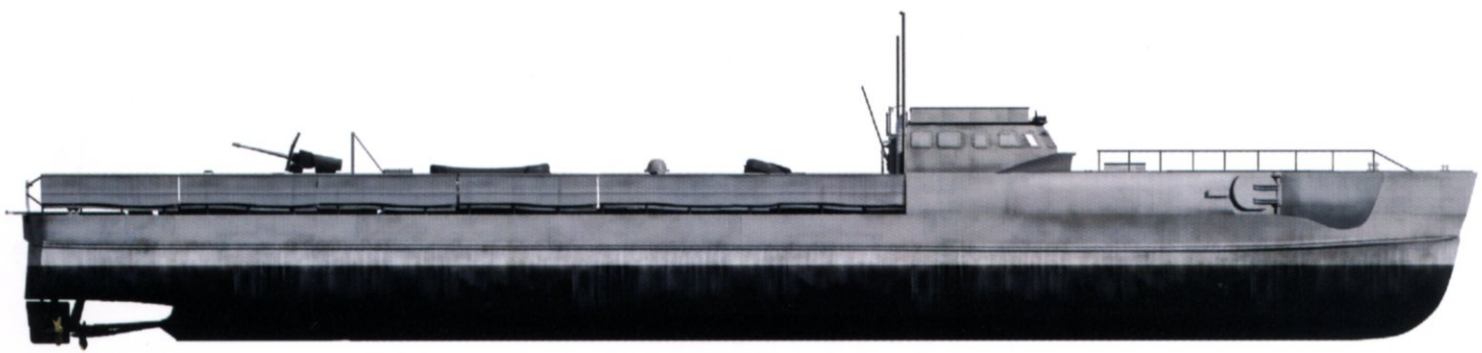
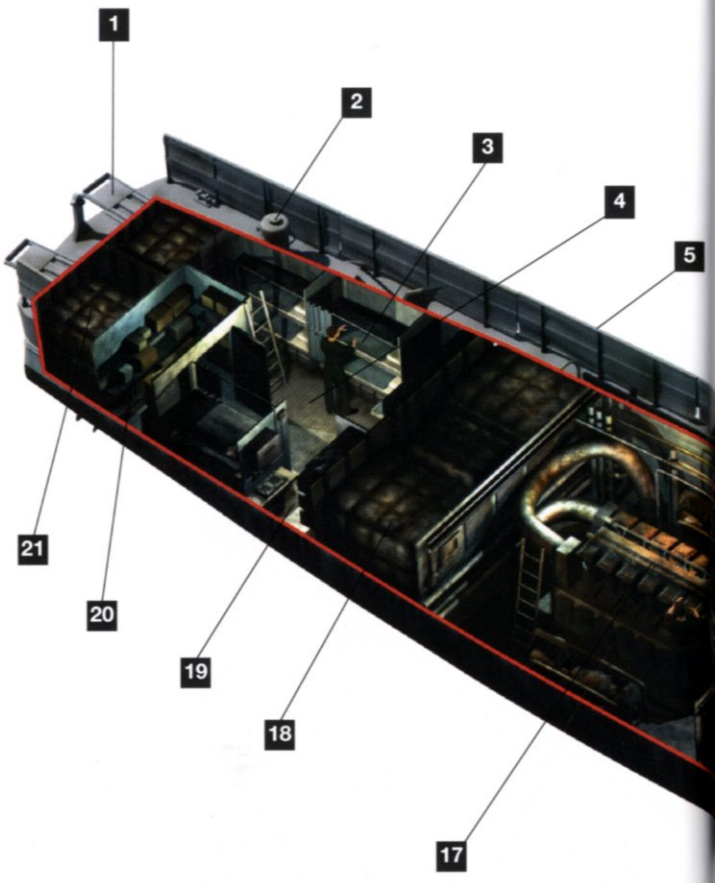


D: SECTIONAL VIEW OF AN S-100 TYPE E-BOAT

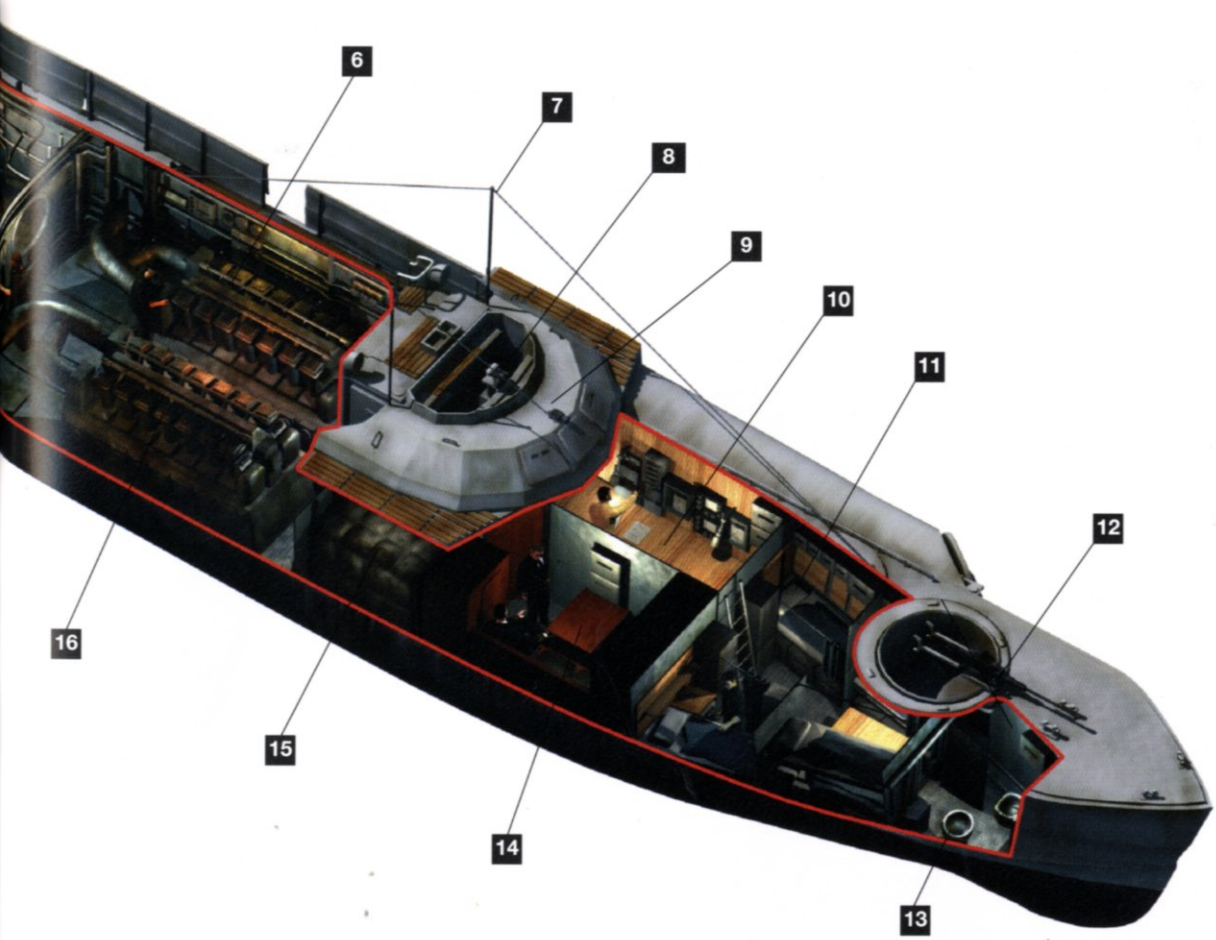
KEY

1 Depth charge rack
2 Smoke generator
3 Folding bunks
4 Junior ratings' accommodation
5 Canvas 'dodger' normally fitted over deck rails
6 Port engine
7 Antenna
8 Attack binoculars
9 Armoured bridge
10 Radio room
11 Senior ratings' accommodation
12 Bow 2cm flak gun
13 W.C.
14 Captain's quarters
15 Fuel cells
16 Starboard engine
17 Centre engine
18 Fuel cells
19 Galley
20 Ammunition locker
21 Fuel cells



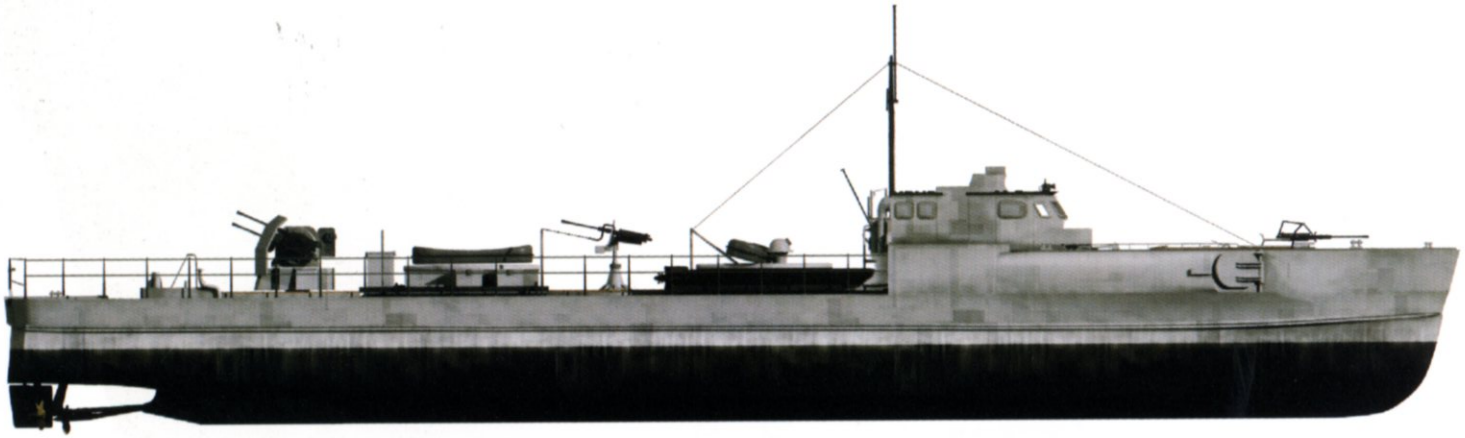
SPECIFICATIONS

Length: 35m
Beam: 5.3m
Draught: 1.7m
Displacement: 112 tons max.
Top Speed: 39 knots
Range: 700 nautical miles
Crew: 24
Armament: 4 torpedoes
3 x 2cm guns
1 x 3.7cm gun



E: Late-war high forecastle E-boats

1



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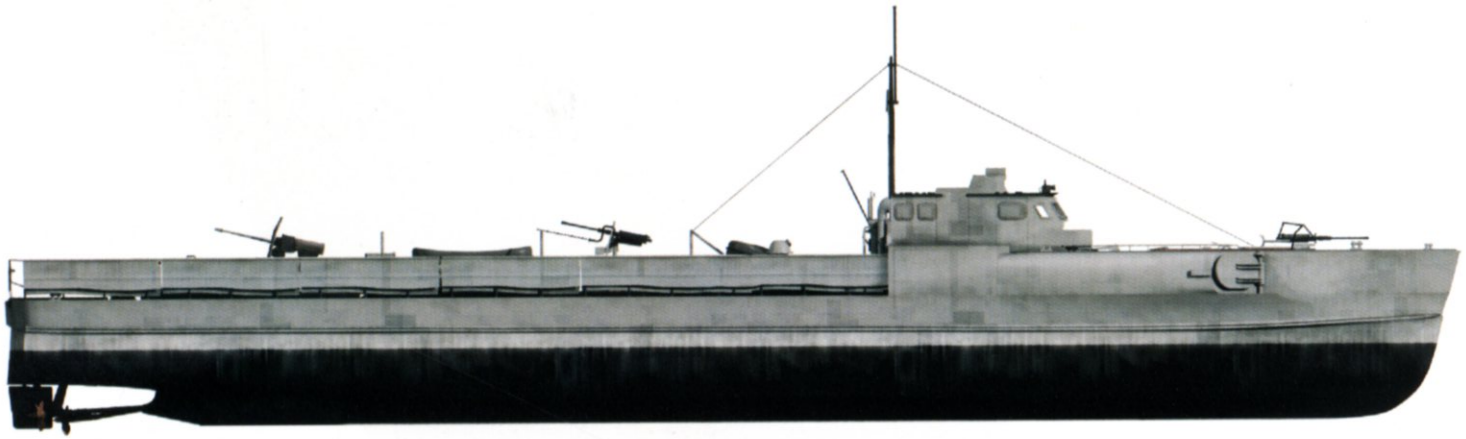
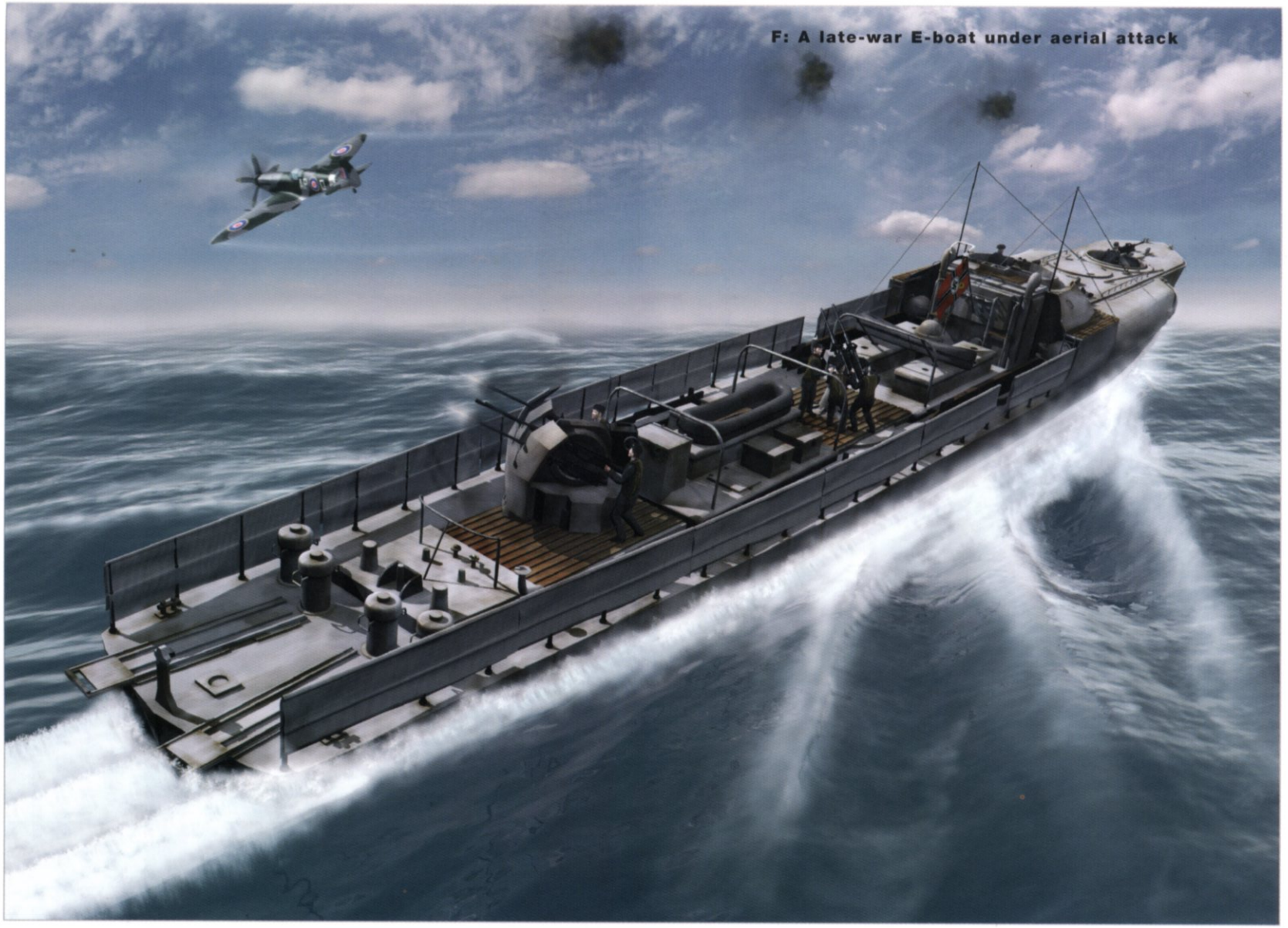
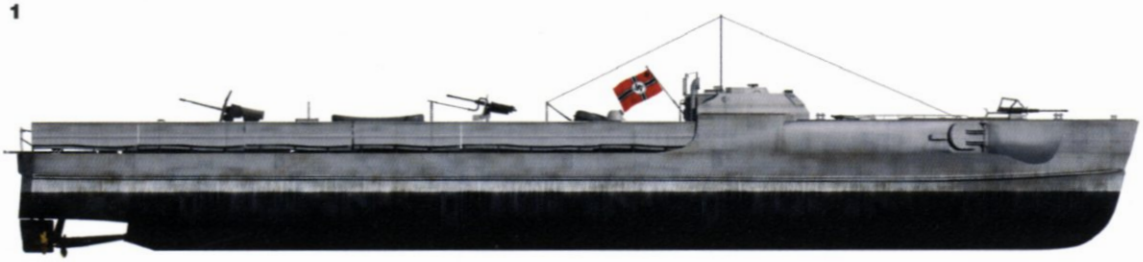




F: A late-war E-boat under aerial attack

G: Late-war E-boats with the amoured bridge

1



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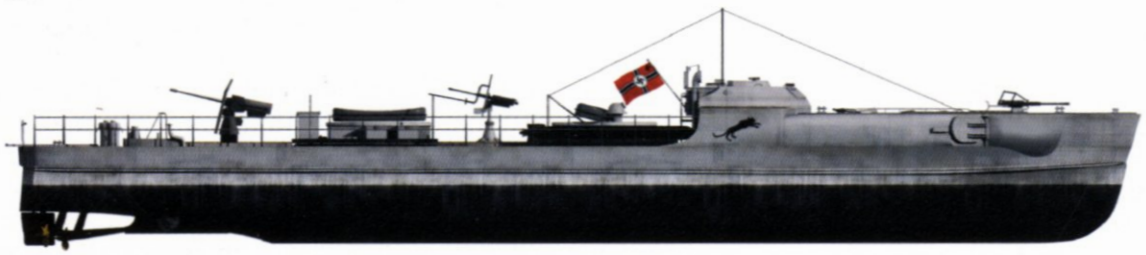

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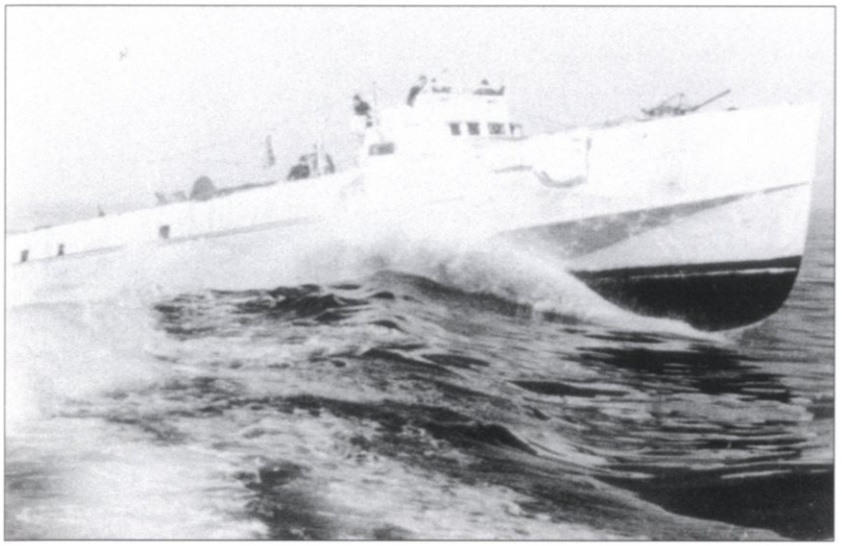


ABOVE **Starboard view of a later-type high forecastle boat with 2cm bow gun and open bridge. Canvas dodgers have been fitted.**

BELOW **Port side view of a similar boat. The dark grey finish to the decking can just be seen on the foredeck, contrasting with the almost white vertical hull surfaces. This pale grey finish was established as being the most effective for such small, fast-moving boats.**

It was not to be until the beginning of October that an attack on a convoy would bring success to the Channel port E-boats. An armed trawler from convoy PW266 was sunk and a destroyer damaged. North Sea boats also scored a success on 6 October when a convoy off Great Yarmouth was attacked. Three merchant-men, one trawler and one motor launch were sunk and two more ships lost to mines. Convoy PW250 was also successfully attacked by E-boats on 18 November and an armed trawler and three merchant ships sunk. On 30 November, a further armed trawler was sunk and one damaged in an attack on convoy PW256. One final successful attack on convoys by the Channel E-boats came on 2 December when convoy PW257 was attacked. However, although one merchant ship and one destroyer were sunk, two E-boats were severely damaged in an attack by British aircraft on their journey back to base.

The North Sea boats ended the year on a high point when 17 boats took part in an attack on a British convoy, sinking five merchantmen, though two E-boats sustained heavy damage from the convoy escorts.

By early 1943 it was becoming clear that the previous E-boat 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. In effect there was no place left for the E-boat to 'hide' when waiting in ambush.

The usual dreadful weather conditions in the North Sea in the early part of the year, coupled with reducing numbers of E-boats available due to combat attrition, had in any case precluded any successful convoy attacks. Attempts to launch concentrated attacks by large numbers of boats were almost invariably detected and the boats met by British MGBs and aircraft. Not only torpedo attacks against convoys, but minelaying operations, too, were being hampered. Radar tracking showed the British exactly where the Germans were laying their mines and in

most cases these were swept soon afterwards.

Fortunately, E-boats did score some early successes in the Channel, with an attack on convoy WP300 on 27 February seeing one merchantman, two armed trawlers and an LCT (Landing Ship-Tank) being sunk and a number of prisoners taken. On 13 April, an attack on convoy PW323 by six E-boats from 5 S-Bootsflotille brought the sinking of one freighter as well as the destroyer *Eskdale.* Thereafter, the Channel boats reverted principally to minelaying operations for the next six months or so.

A stern view of an E-boat. Note that the canvas dodgers were only fitted over the side rails. Although this boat is clearly carrying depth charges, even when no depth charge racks were fitted, dodgers were not fitted over the stern rails. This boat carries a 4cm Bofors gun as its main stern armament.

On one occasion in September 1943 a massed minelaying operation by both North Sea E-boats and Luftwaffe aircraft was launched. Twenty-nine E-boats were involved though two collided on their way out of port and took no further part in the action. One was badly damaged in action with the MGBs and another was rammed and sunk. This represented 13 per cent of the E-boat force destroyed or damaged in order to lay a minefield that would be quickly swept and cleared thereafter. This was not a fatal level of loss, but constant attrition at such rates could not be countenanced over a sustained period.

On 24 October, a mass attack by 32 boats was launched on Convoy FW1160, involving boats from 2, 4, 6 and 8 S-Bootsflotillen. It was, of course, detected by British radar and intercepted. Boats from 6 S-Bootsflotille sank just one trawler before being engaged by a destroyer and a number of MGBs and driven off after sustaining heavy damage. 4 S-Bootsflotille fared little better. Only one MGB was damaged and the German force driven off by fire from escorting destroyers and MGBs, with S-63 and S-88 being sunk. Both 2 and 8 S-Bootsflotillen had barely made contact with the enemy before being soundly driven off, but with no losses or serious damage. The Channel E-boats had slightly better success on the following day when they intercepted convoy CW221 and sank three merchantmen.

Only the fact that some successes were scored due to minelaying over this period gave the Germans any cause to rejoice. Strengthening of escorts and the beefing up of dedicated anti-E-boat air patrols meant that success in the North Sea was becoming harder and harder to achieve. This fourth year of the war had been a disappointing one for the E-boats in the west. Only 16 ships had been sunk, representing just over 26,000 tons – a drop of some 30 per cent from the previous year's achievement.

The milder weather in the Channel at the start of 1944 allowed the Channel boats to launch an attack on a convoy much further west

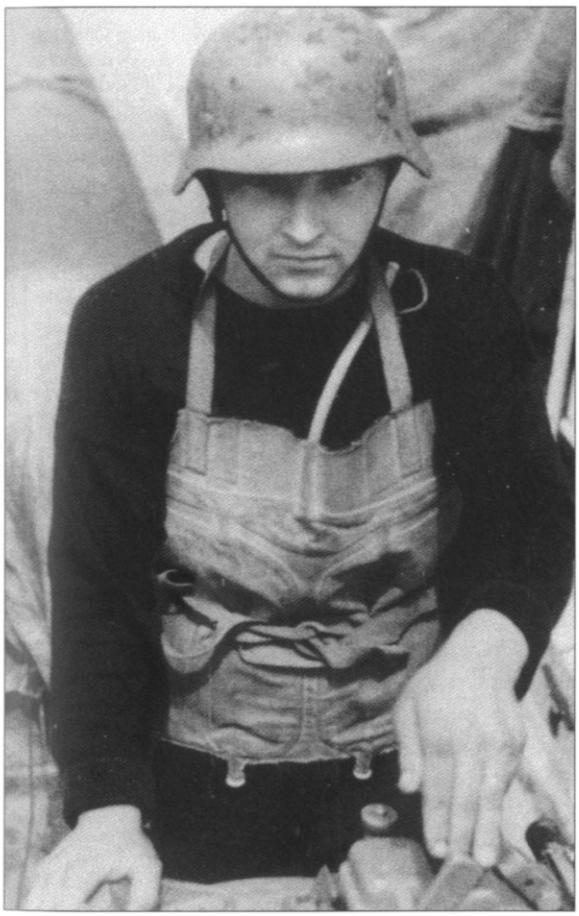
than they had previously operated – off Lands End – when three merchantmen and an armed trawler were sunk. This success was repeated on 20 January when an attack on convoy CW243 resulted in two merchantmen and one armed trawler being sunk. During this period the North Sea boats had had little opportunity to sortie from their bases due to appalling weather conditions. One abortive sortie in late February saw S-94 and S-128 collide and both have to be scuttled.

March brought little increase in good fortune, with the E-boat bases being treated to heavy bombardment from Allied aircraft resulting in the loss of S-93 and S-129. From April onwards, the North Sea boats concentrated mainly on minelaying operations.

One of the Channel boats greatest successes came on 27 April when a combined force of nine boats from 5 and 9 S-Bootsflotillen attacked a force of eight American LSTs escorted by the corvette *Azalia*. The Allied force had failed to detect the E-boats until it was too late and two LSTs were sunk and one severely damaged. The loss of life was heavy, estimated at well over 500. These LSTs had in fact been involved in a live practise exercise for the forthcoming D-Day landings and were to disembark their troops on the beaches at nearby Slapton Sands.

The Allied invasion of Normandy on 6 June 1944 should have given the E-boats plenty of opportunity for target but so fierce were the Allied defences that in terms of the overall size of the invasion armada, relatively little damage was caused. A number of landing craft were sunk by E-boats with torpedoes as was the frigate *Halstead*. Three more ships were destroyed by mines laid by the E-boats.

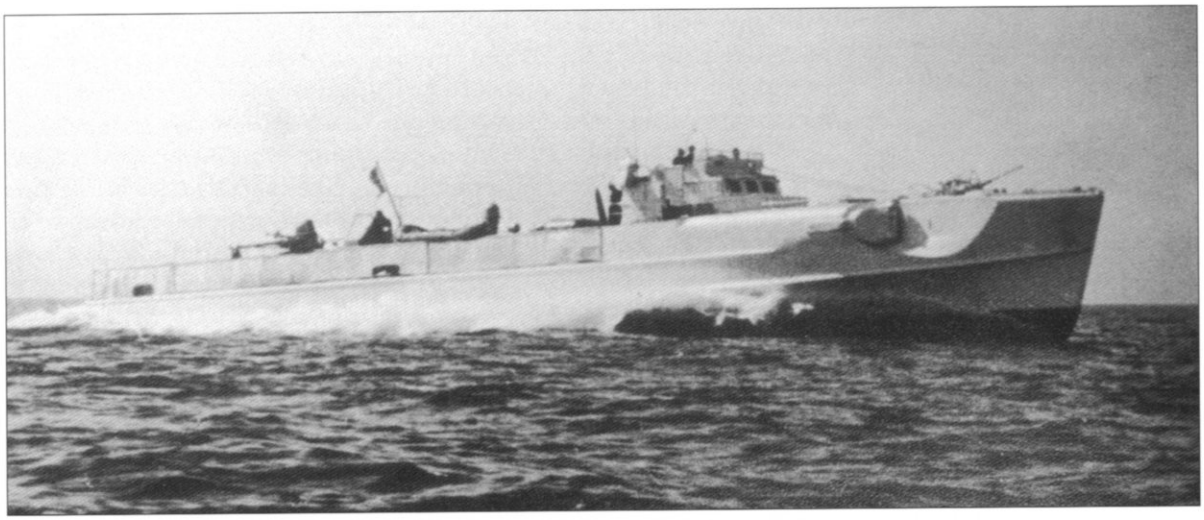
A steel-helmeted crewman, a look of great concentration on his face, stands at his position just to the starboard side of the bridge, operating the mechanism that will fire the torpedo from its tube.



During this period, however, S-139 and S-140 were themselves mined and S-178, S-179 and S-189 sunk by Allied aircraft. Some E-boat flotillas were also beginning to suffer a serious shortage of torpedoes. Further disaster struck on 14 June when an RAF bombing raid on Le Havre resulted in 14 E-boats being destroyed.

A convoy attack on 30 July brought mixed fortunes to the E-boats. A convoy consisting of 11 merchantmen and eight LSTs with attendant escorts was attacked by three boats from 6 S-Bootsflotille. Of only six torpedoes launched, five were direct hits, a superb success rate. However, only one enemy boat actually sank, though four others were seriously damaged. By comparison, long-range torpedoes were used for the first time on 4 August, and through to 18 August a total of 91 such torpedoes was fired. A total of only three ships was sunk and one freighter, one old cruiser, one repair ship and one minesweeper damaged.

The French channel bases were evacuated shortly thereafter and operations continued from bases in Rotterdam and Ijmuiden in Holland. The remaining E-boat bases in the west were subjected to constant attention from RAF bombers, though



Although small in relation to other surface ships, the German E-boat was considerably larger than its British or US equivalents, the MTB/MGB and the PT Boat. The diminutive size of the crew figures on this boat's bridge gives some idea of just how large the E-boat was, yet still capable of making a good 40 knots.

minelaying operations, particularly in the Scheldt estuary, were continued through the latter part of the year.

By early 1945, there were only 26 operational E-boats remaining in the west. One attempt at a convoy attack on 22 January by boats from 9 S-Bootsflotille saw only one straggler from the convoy sunk, and heavy damage suffered by E-boats in subsequent gun battles with MGBs. Continued minelaying in the Scheldt estuary did, however, bring some success when a French destroyer and an armed trawler were mined and sank.

On 22 February, a combined operation was launched whereby boats from 4, 6 and 9 S-Bootsflotillen attacked and drew away the escorts from convoy FS1734 whilst boats from 2 and 5 S-Bootsflotillen attacked the convoy itself. Only two ships were sunk, however. From January to March it is estimated that 28 enemy ships were sunk and a further eight damaged by E-boats in the west.

The final wartime operation of the E-boats operating on the Western Front came on 12 April 1945 when a minelaying sortie in the Scheldt estuary was intercepted by a British frigate with attendant MGBs. The E-boats escaped their pursuers, and the mines they had successfully laid sank three enemy ships and disabled a further one.

Two things become abundantly clear from studying E-boat operations in the Channel and North Sea. Firstly, the boats themselves were not particularly robust, though that is a feature of all such boats, which sacrifice armour protection for speed, and that battle damage was a frequent occurrence. Secondly, a surprising number of E-boats were in collision with other E-boats, often causing such damage that they had to be scuttled. Given the extremely high speeds at which they travelled, and the confusion which must have reigned as E-boat and MGB pursued each other through a convoy in the thick of battle with gunfire and tracer filling the air, this too is perhaps a natural hazard for such vessels.

As already noted, there had been some minimal E-boat activity in the Baltic during the opening phase of the Polish campaign, but the campaign ended before any could be used in actions of any significance. In 1941, however, during the build-up for Operation Barbarossa, the invasion of the Soviet Union, it was once again envisaged that

BALTIC/FAR NORTH

1 S-Bootsflotille	
2 S-Bootsflotille	
3 S-Bootsflotille	
5 S-Bootsflotille	
6 S-Bootsflotille	
7 S-Bootsflotille	
11 S-Bootsflotille	
21 S-Bootsflotille	Tender *Carl Peters*
22 S-Bootsflotille	

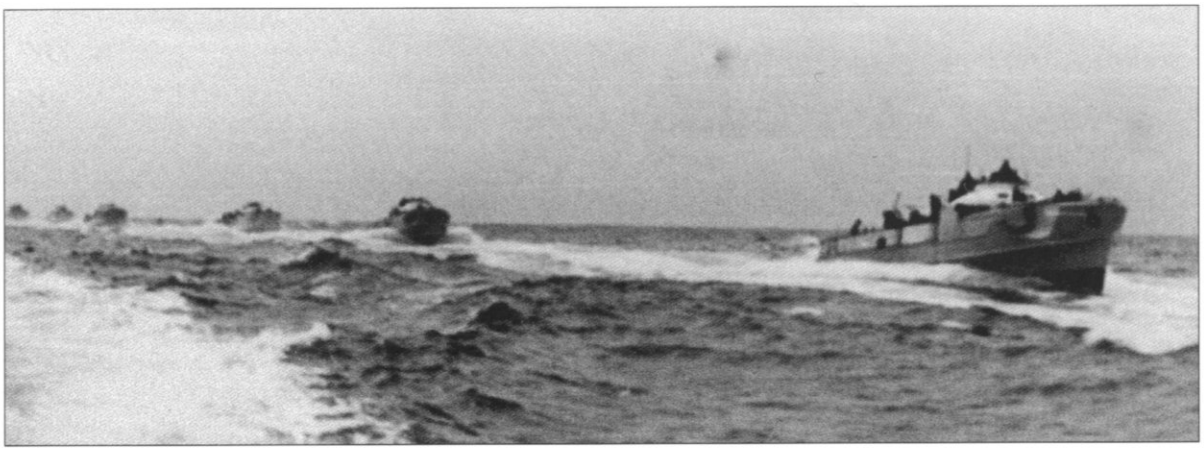
there would be a role for E-boats in the Baltic. Initial operations were predominantly for the purposes of minelaying although one boat from 1 S-Bootsflotille, S-35, destroyed the Soviet submarine S3 with depth charges, off the Latvian coast. A few days later, however, S-43 and S-106 were lost to Soviet mines.

On 26 June, boats from 3 S-Bootsflotille were engaged against Soviet forces, sinking a minesweeper and severely damaging a destroyer and a submarine. In late July, another Soviet submarine, the *Smely*, was sunk in the Gulf of Riga by E-boats from 3 S-Bootsflotille. Heavy E-boat commitment to minelaying operations in the Gulf of Finland drew to a close in late September/early October once Soviet naval forces in the area had been neutralised. The onset of winter also brought severe icing, dangerous conditions for the relatively flimsy E-boats.

Victory! An officer attaches victory pennants to the radio antenna on the side of the bridge. It was common practice both in U-boats and E-boats for pennants to be made up and flown in the return to base, each with the estimated tonnage of the victim painted on it.

From late 1941 to early 1944, the Baltic was used as a fairly safe training area for the E-boat fleet, with little or no operational sorties being undertaken in this area. In September 1944, Finland concluded a peace treaty with the Soviet Union and the Baltic lost its status as somewhat of a safe haven for E-boat training. Very little in the way of significant action was seen by E-boats in the Baltic thereafter, until the closing days of the war, when E-boats were used extensively for evacuating refugees from the path of the advancing Red Army. Amazingly, in these last hectic days, not one single E-boat was lost to enemy action.

On the invasion of the Soviet Union, Naval High Command had decided there was a necessity for E-boats to be stationed in the far north of Norway to protect supply routes between Norway and Finland. The tender *Adolf Lüderitz* was duly despatched to Tromsø in December 1941 with a number of boats from 8 S-Bootsflotille in tow. Towing the boats was intended to save engine wear during the difficult passage through the turbulent northern waters. In January the boats moved on to Vardø. From this new base, a few abortive minelaying sorties were launched towards the Kola Inlet, most being called off due to appalling



A flotilla of late-type E-boats with armoured bridges move in line astern during training exercises in the Baltic.

weather conditions, before the flotilla moved to a more suitable new location at Kirkenes on 27 January. Here, too, the atrocious weather conditions prevented any successful sorties being completed. Even in June, when the next serious attempt was made to carry out a major minelaying operation, bad weather forced its abandonment.

In late June, 6 S-Bootsflotille arrived to relieve 8 S-Bootsflotille, which returned to Kiel and was subsequently disbanded and its boats allocated to other flotillas. The new arrivals in fact had no more success than their predecessors and their first sortie was also abandoned due to weather conditions. It never saw serious action and was ultimately withdrawn from the far north and moved to its new base in Rotterdam. InDecember 1942, 8 S-Bootsflotille was re-formed and once again sent to Norway, being based at Bodø for a brief period. It saw no operational use and was returned to Kiel in January 1943. A final attempt at establishing an E-boat base in the far north was made in November 1944 when 4 S-Bootsflotille was moved to Kristiansand. It was withdrawn again the following month having seen no operational use.

It is difficult to understand why boats clearly unsuitable for use in the type of heavy seas usually encountered around the North Cape and along the edge of the Arctic Circle were repeatedly committed to such areas even after having proven themselves unable to mount any useful operations.

The Black Sea

1 S-Bootsflotille

To counter very active Soviet naval activity in the Black Sea following the German invasion of the Soviet Union, it was decided that German naval forces would be required in the area. The biggest single problem, however, would be getting them there. Fortunately, in the same manner in which E-boats could be moved to the Mediterranean via inland waterways, both E-boats and small submarines of the Type II class could be moved into the Black Sea. As far as the E-boats were concerned, 1 S-Bootsflotille was chosen and its boats moved from Hamburg to Dresden along the Elbe, then from Dresden to Ingolstadt by land, then into the Danube and through to the Black Sea. The first E-boats arrived in the Black Sea in June 1942 and by the middle of the month, six were operational.

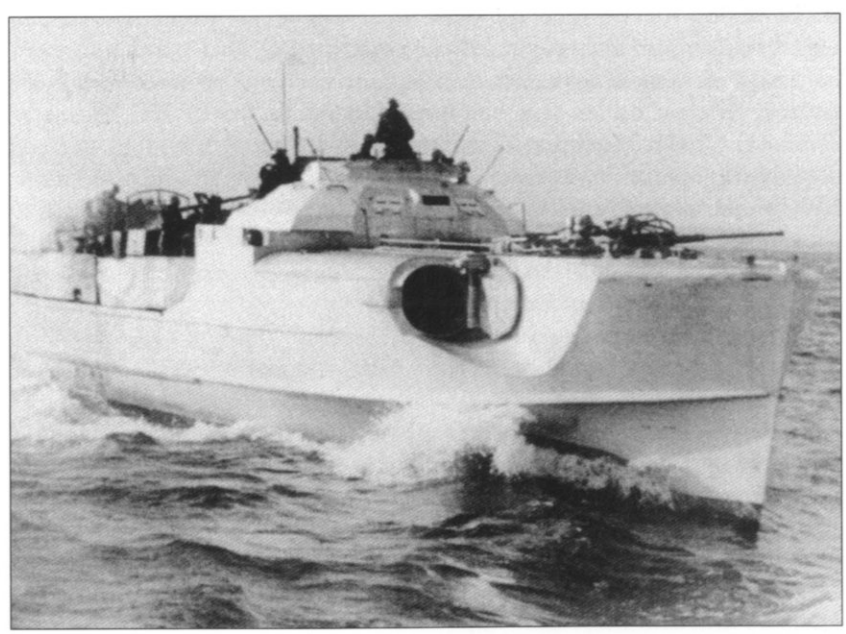
Very soon thereafter 1 S-Bootsflotille began combat sorties to intercept Soviet naval traffic into Sevastopol. By July, it was established in a former Red Navy base at Iwan Baba from where it carried out numerous escort sorties to protect German shipping in the area.

In September, the E-boats were committed to action against Soviet ships evacuating Red Army personnel from the Taman Peninsula and between 2 and 5 September, they succeeded in sinking 19 enemy ships. Their base was attacked several times by enemy aircraft but no significant damage was done to the E-boats' operational capabilities.

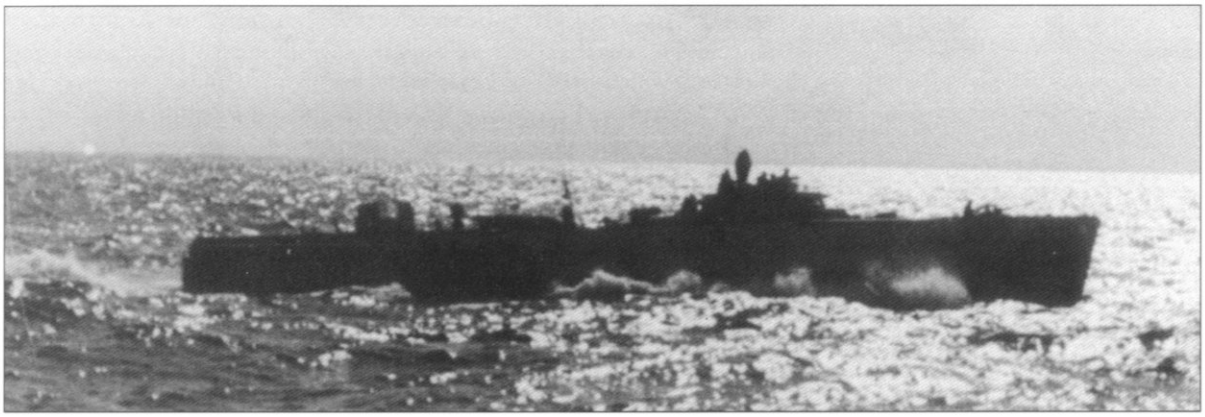
By February 1943, Germany's fortunes in the Crimea were on the wane and the E-boats were obliged to take part in operations against Soviet troop landings at Myschako, where they sunk one minesweeper, one gunboat and laid numerous mines. Further attacks on the beachhead saw the destruction of numerous pontoons, barges, etc., forming part of the Soviet landing operation.

In May 1943, as Italy ceased naval operations in the area, a number of Italian boats came into German hands and were formed into the 11 S-Bootsflotille. These were used primarily on escort and anti-submarine duties, but critical lack of spares for these foreign boats saw their effectiveness gradually reduce until the flotilla was disbanded in October 1943. As Soviet strength in the area grew, the E-boats frequently found themselves under attack from the Red Air Force and their successes were restricted to a few minor coasters being sunk.

March 1944 saw the closure of the large Romanian naval harbour at Galatz and RAF operations to drop mines along the Danube, effectively closing it to traffic. The E-boats were used to cover the evacuation of German personnel from Odessa before establishing new bases in Sevastopol and Constanza. By now the Wehrmacht was on the retreat on the southern sector of the Eastern Front. The E-boat base at Constanza came under heavy air attack from British bombers, three E-boats being sunk and a further three seriously damaged.



A late-type armoured bridge E-boat. The bow 2cm gun is shown to good effect here, as are the torpedo tube doors. Note also the armoured flaps over the bridge vision ports. The boat does not carry a number on the bow as was normally the case with the training flotillas so it is presumed that this shot may show a boat returning to bay after having expended its torpedoes. Its apparent slow speed certainly does not suggest a boat about to fire its torpedoes during an attack.



An atmospheric shot of an E-boat from 1 Schnellboots-flotille on the Black Sea at sunset. The lack of excessive bow wave suggests she is moving at only moderate speed. Note the large gunshield on the weapon on the afterdeck, suggesting it is the 3.7cm flak gun.

The final straw for 1 S-Bootsflotille came when Romania concluded peace negotiations with the Soviets and promptly changed sides, declaring war on Germany. At this point the remaining E-boats were scuttled to prevent them falling into enemy hands.

The Mediterranean

3 S-Bootsflotille
7 S-Bootsflotille
21 S-Bootsflotille
24 S-Bootsflotille

The decision was made in 1941 that E-boats would be highly suitable for use in the relatively shallow and calm waters of the Mediterranean, to interdict the supply convoys bringing precious provisions to the Allies in North Africa and to the besieged island of Malta. The Germans were determined to keep their intention secret both to maximise the effect and to prevent any Allied attempt to intercept the boats en route. For these reasons, it was decided to move the boats to the Mediterranean using the rivers and canals of France, choosing the smaller boat types to make their progress through these inland waterways less problematic and disguising them as air-sea rescue craft.

The first unit to arrive in the Mediterranean comprised five boats from 3 S-Bootsflotille. The half-flotilla made its first patrol sorties in December 1941, but without meeting the enemy. It was then used in minelaying operations around Malta. In mid-January, the second half of the flotilla arrived and by early February the assembled flotilla had moved to a new base at Porto Empedocle on Sicily. From here it renewed its minelaying operations off Malta, scoring some successes when the destroyers *Southwold* and *Kujawiak* were sunk by E-boat mines and a number of other vessels damaged.

By May, the flotilla was being used in aggressive patrolling off Tobruk as the Allied forces there came under extreme pressure from Rommel's Afrikakorps. On 15 June, the cruiser *Newcastle* was torpedoed and damaged and the destroyer *Hasty* sunk. As Tobruk teetered on the brink and the Allies began evacuation by sea, E-boats were used to attack the vessels evacuating personnel from the Tobruk garrison, and a number of prisoners were taken. August saw 3 S-Bootsflotille return its attentions to Malta once again and a convoy of ships bringing essential supplies was attacked and four merchant ships sunk.

Reinforcements arrived in October 1942 in the form of 7 S-Bootsflotille and the combined flotillas were actively involved in minelaying operations. On one such operation on 12 March 1943, a force of enemy warships was detected and immediately attacked, resulting in the sinking of the destroyer *Lightning*. The position of the Axis forces in Italy was becoming perilous, however, and the E-boats were becoming more involved in laying defensive rather then offensive minefields. With an Allied invasion of Sicily imminent, the base at Porto Empedocle was evacuated and the E-boats moved first to Palermo on the north of the island and then on to Salerno on the mainland. Administratively, the 3 and 7 S-Bootsflotillen were combined to form 1 Schnellbootsdivision in mid-July. Both flotillas were involved in defensive patrolling of the Straits of Messina prior to the Allied invasion of the mainland.

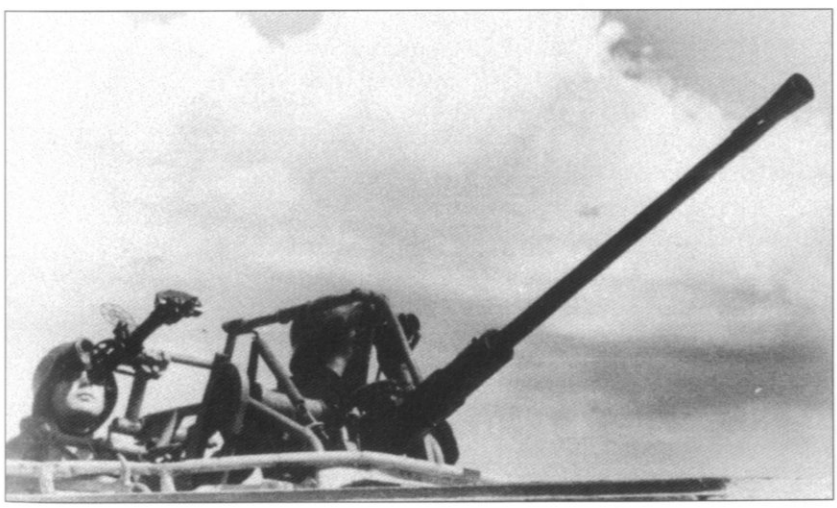
One of the most impressive achievements of the Mediterranean E-boats came with the surrender of the Italians. At this time S-54 and S-61 were in Taranto harbour. They left immediately, but dropped mines in the harbour as they departed. Shortly thereafter, the Allies arrived and, on entering the harbour, HMS *Abdiel* ran on to one of the mines they had laid and was sunk with heavy loss of life. Meanwhile, the two E-boats had encountered and sunk the Italian gunboat *Aurora* and captured two Italian merchant ships. Moving on, they encountered the Italian destroyer *Quintino Stella* and sank her also. Finally, almost out of fuel, they entered the harbour in Venice where they demanded, and obtained, the surrender of the Italian garrison.

On 9 September, the Allies landed an invasion force at Salerno. Both 3 and 7 S-Bootsflotillen were ordered to attack and, although they failed to inflict any significant damage on the invasion fleet, sank the US destroyer *Rowan*.

By mid-November, there was little benefit to be had from maintaining E-boat operations in the western Mediterranean, and all available E-boats were moved eastwards into the Aegean.

By late September 1944, boats operating in the Aegean included 3, 7, 21, 22 and 24 S-Bootsflotillen. Of these, only 3 and 7 S-Bootsflotillen possessed boats that were of any combat usefulness; 21 S-Bootsflotille was equipped with the LS-boats, which were too small and weakly armed to be of any significant use; 22 S-Bootsflotille was equipped with KM-boats, which were of even less use than the LS types; 24 S-Bootsflotille was equipped with captured Italian boats which, though fast, were also very small and lightly armed.

It had been intended to use these Aegean boats for the mining of enemy supply routes and for torpedo attacks on shipping when chances arose. In effect, the combination of poor



Gun crew on the bow 2cm flak gun of a late-type E-boat. Note that two men crew the gun, one to fire and one to reload. The loader is scanning the skies with binoculars for enemy activity.

Hermann Büchting awards a pennant to his crew for successfully shooting down a Soviet aircraft. The photo was taken during operations in the Black Sea in the summer of 1942, hence the tropical dress. The red pennant with black iron cross on a white circle was in fact an officially recognised award, the Wimpel für anerkannte Abschüsse feindlicher Flugzeuge, instituted in 1940. The shooting down of an enemy aircraft by an E-boat was quite an achievement.

weather conditions and overwhelming Allied air superiority left little opportunity for their use. The boats were used mostly for patrol and anti-partisan operations and were frequently involved in skirmishes with British MTBs in which they usually came off worse, especially in the case of the boats from 21, 22 and 24 S-Bootsflotillen. By the end of September only 17 boats were still in serviceable condition among the five operational flotillas.

An attempt was made in September to transfer the 22 S-Bootsflotille to the Croat Navy, but they were so unreliable that the Germans took the boats back after two deserted to the partisans. In October, 7 S-Bootsflotille handed its boats and personnel over to 3 S-Bootsflotille to form at least one effective unit at or near full strength and was disbanded. 21 and 24 S-Bootsflotillen were disbanded, their boats in any case being all but useless, and 22 S-Bootsflotille's boats were once again handed over to the Croats. Presumably it was felt that they were of so little effective use anyway that passing them to the unreliable Croats constituted no real danger.

In December an abortive attempt was made to attack a reported Allied invasion force at Lussin (the report proved false) whereby the E-boats themselves came under attack by explosive 'Linsen' motorboats of the Kleinkampfmittelverbände (K-Verbände), both forces being unaware that the other was operating in the area.

In the closing weeks of the war, the few remaining E-boats were used on operations with the K-Verbände, but numbers were being whittled down by losses: three boats ran aground and had to be destroyed, two

were lost in a collision, one to Allied bombing and another to partisan actions. The remainder surrendered to the Allies at Ancona on 3 May 1945.

Throughout the war on all fronts, the E-boats had suffered mixed fortunes. The relatively flimsy craft were easily damaged, as can be seen by the number that were lost due to accidental collision, and their use was very much determined by weather and sea conditions. They did, however, constitute a serious menace and indeed took the greatest toll of enemy shipping after the U-boats, and were certainly cost-effective boats in comparison with heavier units of the fleet.

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Despite its apparently substantial size, as shown here in comparison to the gun crew figures, the 2cm flak gun did not have great penetrating power and its efficency was not highly regarded, at least not in its intended anti-aircraft role (it was, however, often used to great effect as an infantry support weapon in the ground role). Note that the gunner leans into a leather-padded metal support that curves around his shoulders.

COLOUR PLATE COMMENTARY

A: EARLY-WAR LOW FORECASTLE E-BOATS

Here we see two examples of the early E-boat type with low forecastle. At top (1) is S-10, from the group S-7 to S-13 built by Lürssen at Vegesack, and commissioned into the Kriegsmarine in March 1935. The low forecastle caused these boats to take on considerable quantities of water when moving at speed through rough seas. Note the large spray deflectors just in front of the bridge. These early boats were fairly lightly armed. The forward armament, a pedestal-mounted 7.92mm machine gun, can be seen affixed on the centreline of the boat just in line with the front of the torpedo tubes, and the aft armament, consisting of a 2cm flak gun on the roof of the rear superstructure. The bridge/wheelhouse was fully enclosed. The tall, cylindrical object just below the flag is a smoke discharger, useful when the unarmoured boats had to withdraw under enemy fire. S-10 survived the war, having served as a patrol/reconnaissance vessel with 51 Vorpostenflotille, rather than as a combat torpedo boat, for the second half of the war and was shipped to the USA. She was to be handed over to the Norwegian Navy in 1947 but was never put back into service.

The lower image (2) shows S-24, also a Lürssen-built boat, commissioned in September 1939, and one of the group S-18–S-25. Outwardly similar to the previous model, she was just over two metres longer, and was powered by 20-cylinder Daimler Benz MB501 diesel engines as opposed to the smaller 16-cylinder MB502 engines used in the S-10 type.

Most E-boats on active service fitted canvas dodgers over the ship's railings to prevent water from swamping the afterdeck. Also of note on these early boats is the presence of portholes on the hull side. These were deleted on the late-war boats.

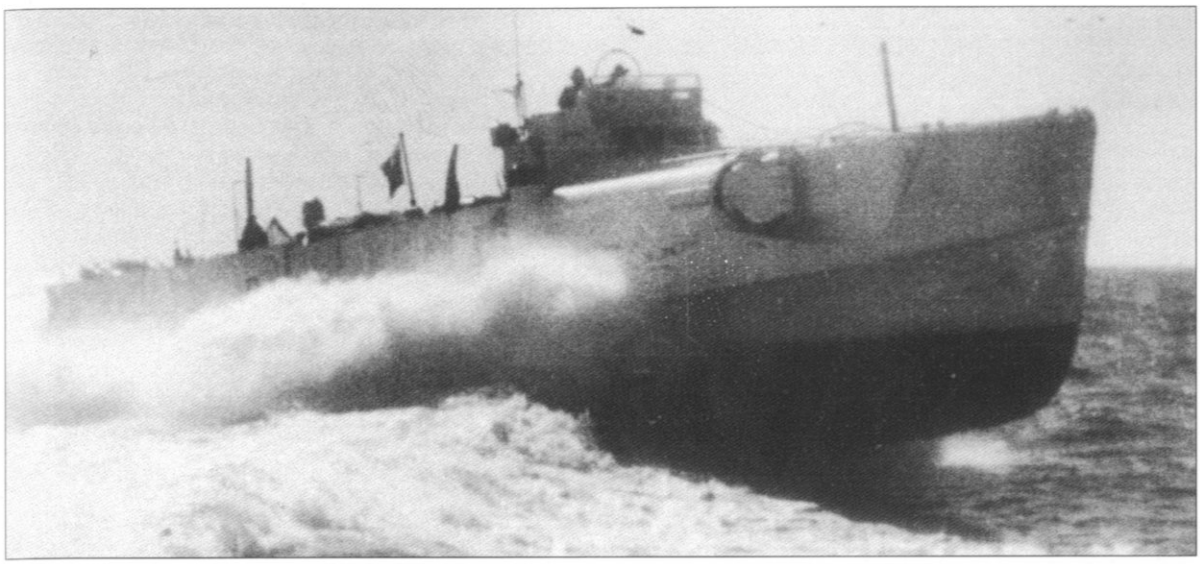
Of particular interest is the tiger emblem painted on her hull side. Immediately below this insignia is painted '30,000 to.', representing the 30,000 tons of enemy shipping sunk by this highly successful boat. Given the (relatively) low cost of manufacture of these boats, even only moderately successful vessels would quickly prove cost effective. Individual boat emblems were extremely common in the U-boat service, but less so on surface vessels. Other known insignia included a black panther and a leaping deer. S-24 was taken out of active service in June 1941 and thereafter used for training. She survived the war and was taken as war booty by the Soviets in January 1946. Her fate thereafter is unknown.

B: AN EARLY-WAR E-BOAT ON THE ATTACK

This plate gives a good idea of how an early E-boat appeared when moving at high speed. Here we see a boat of

This view of the open bridge shows the small signal platform to the rear of the bridge structure, with its safety rail. Here the platform is occupied, during a night operation, by a sailor with a hand-held searchlight.

E-boats being the lightweight, unarmoured vessels that they were, damage and injury during combat actions were common – at least until the advent of the armoured bridge type. This crewman seems cheerful enough despite having received shrapnel injuries to the face.



The enduring image of the E-boat: the fast, sleek, greyhound of the seas, slicing through the waves, its bows high in the water, is reflected in this boat from 1 Schnellbootsflotille pounding across the waters of the Black Sea on a bright sunny day in the summer of 1942.

the 105-ton S-18–S-25 type, built by Lürssen, moving towards her target at top speed, her torpedo tube doors open as she prepares to fire. This view will also give some idea of the usefulness of the canvas dodgers fitted over the ship's rails. One can imagine how much water would be shipped over the afterdeck had these canvas screens not been fitted. This boat does not have her forward machine gun fitted. In fact few wartime photos of these early-model boats show this weapon mounted. It would certainly have been of negligible value during torpedo attacks on enemy shipping and would have been equally ineffective against enemy aircraft.

C: MID-WAR HIGH FORECASTLE E-BOATS

This plate shows two versions of the earlier models fitted with the higher forecastle, a modification which greatly improved the seaworthiness of these small boats.

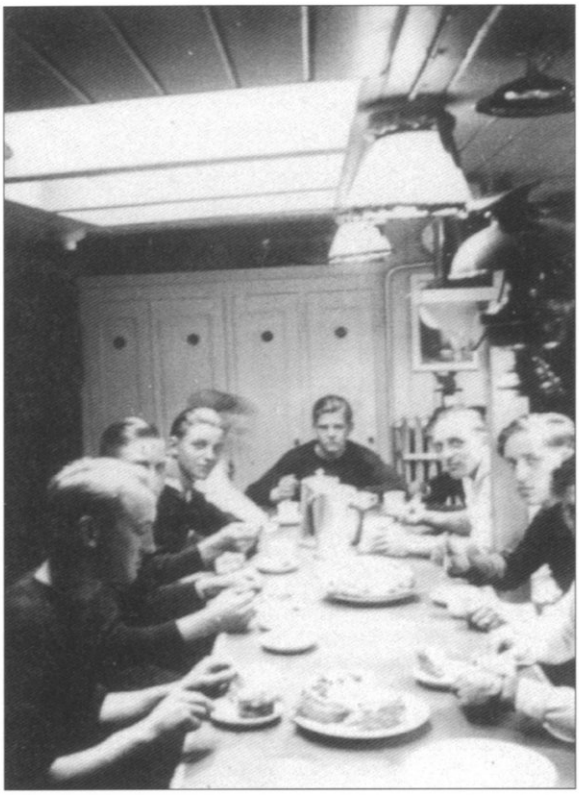
The top view (1) shows a boat from 4 S-Bootsflotille operating out of Ostend in 1942. Note the higher foredeck. This was usually relatively uncluttered. A base for the machine gun pedestal mount was provided, but this weapon seems rarely to have been fitted on this type of boat. Anyone using the weapon would have been totally exposed to any enemy return fire. Note how the rear portion of the foredeck curves upwards just to the side of the bridge/wheelhouse, and how the dark grey colour of the foredeck carries over on to the top of the hull side. The boat shown is unusual in its camouflage-pattern paintwork, the usual pale grey colour, which most E-boats were painted, having a darker grey mottled scheme applied over it. In place of the 2cm flak gun mounted on the afterdeck of earlier types, this boat now carries a heftier punch in the form of a 3.7cm flak gun. This type of boat still has portholes for the forward accommodation, and has the same enclosed cabin-type bridge as fitted on earlier models.

The lower boat (2) is also an early high forecastle type, but has an open bridge fitted above the wheelhouse. Once again, this type rarely seems to be encountered in wartime photographs with a forward machine gun fitted, though a pedestal base was affixed to the foredeck to allow one to be used if necessary. Just forward of the spray deflector in front of the wheelhouse is a large hatch giving access to the accommodation area below.

D: SECTIONAL VIEW OF AN S-100 TYPE E-BOAT

This sectional view shows the interior of the ultimate E-boat design, the S-100 type. It has the fully armoured bridge and a total of 11 x 2cm guns. Starting at the forward end we have the washroom and WC facilities. Next comes the forward accommodation, housing the boat's petty officers. Two double bunks are fitted to each side of the forward end of the compartment, in between which sits a small collapsible table. To the rear of the compartment on the port side is a further bunk, and to starboard a small cabin for the coxswain containing another bunk. Moving aft, on the port side is the radio room containing the boat's w/t equipment whilst to starboard is the commander's cabin. Directly under the bridge area is the forward fuel compartment. On each side of this compartment sits a fuel cell with a capacity of 3,000 litres.

Moving further aft, we reach the forward engine room, containing the two diesel engines that power the outboard propellers. The boat's batteries are stored under the deck plates of this compartment. The next compartment is the rear engine room, which contains the diesel engine that drives the central propeller. This area also contains the small generator motors to provide compressed air for the torpedo tubes. Aft of the engine room is another fuel compartment where a small central fuel cell holding approximately 1,500 litres is flanked by two larger cells holding over 3,000 litres each.



A view of the aft crew accommodation and galley area on an E-boat. Behind the sailor at the end of the table are some of the crew's lockers. The mess table would be folded away when not in use.

A steel-helmeted crewmember throws waste water overboard. This shot shows the spare torpedo on its rack. Note the retaining bands holding it firmly in place. Once again, this boat has the canvas dodger screens fitted.

Moving aft again, we reach the lower ranks' accommodation and galley. Along the port side of the forward bulkhead are the crew's lockers, above two foldaway bunks. On the starboard side is the tiny galley and food store, with a two-ring electric cooker. The remainder of the port side of this compartment is taken up by two more sets of twin bunks. The forward end of the starboard side, just aft of the galley, has a further set of two bunks. The aft part of the starboard side is taken up by the boat's ammunition locker. The remaining available space against the rear bulkhead is taken up by more lockers. In the centre of this compartment is a small folding table, flanked on each side by a three-tier bunk. A ladder also provides access through a hatchway to the afterdeck. The sternmost compartment contains two further fuel cells, one on each side, each with a 2,000-litre capacity.

E: LATE-WAR HIGH FORECASTLE E-BOATS

This plate shows the late-style E-boat before these were modified to give them an armoured bridge.

At top (1) is one of the boats fitted with the excellent quadruple Flakvierling 2cm anti-aircraft gun. Although this could throw up a considerable volume of fire, the 2cm shell itself was not particularly powerful and was contemptuously know by the Germans as the 'doorknocker', so poor was its penetrating power.

Amidship is the by now standard twin 2cm flak gun and forward, in a new recessed 'gun tub', a bow 2cm flak gun. With a combined strength of 11 x 2cm guns, the E-boat could put up a spirited fight against equally light or unarmoured enemy motor torpedo boats or motor gun boats, but even with this apparently substantial armament, the E-boat would always be at a disadvantage against those targets the guns were designed to tackle – enemy aircraft. This design, before the advent of the armoured bridge, had an open bridge compartment above the wheelhouse.

At bottom (2) is a similar boat, but with its canvas dodgers fitted, and with the more powerful 3.7cm flak gun. This gun was far more effective in its penetrating power, but lack of availability often meant the Flakvierling had to be fitted (a problem also suffered by the U-boats in their quest for adequate anti-aircraft armament), or in some cases the excellent 4cm Bofors gun.

F: A LATE-WAR E-BOAT UNDER AERIAL ATTACK

This plate shows a late-war E-boat of the S-100 series in action against enemy aircraft. The boat is heeled over in a hard-to-starboard turn, at high speed. Note the steep angle of the deck as the boat's extreme speed forces its bows high out of the water. All of its guns are in action against the Spitfires attacking it. Even when provided with this far superior armament (when compared to the single 2cm gun with which the early E-boats began the war) E-boats were always at extreme risk when attacked by enemy aircraft. Although the bridge area was by now reasonably well provided with armour protection, the hull and decks were still very vulnerable to cannon or heavy machine gun fire from aircraft. That said, E-boats did often manage to shoot down enemy aircraft attacking them. Unfortunately, a fast, moving, lightweight boat, manoeuvring fiercely as it bounces across choppy seas in an attempt to evade the gunfire from attacking aircraft, does not exactly constitute a stable gun platform for its own weapons.

G: LATE-WAR E-BOATS WITH THE ARMOURED BRIDGE

At top (1) is shown an S-38 type Lürssen boat from the batch S-38–S-53, after her subsequent upgrading and fitting with the armoured bridge. She carries a 2cm bow gun, a twin 2cm amidship and a 3.7cm flak gun on the afterdeck. This can probably be considered as the most typical armament set-up and appearance for E-boats in the latter half of the war.

In the centre (2) is shown S-100, with her canvas dodgers fitted. With the new low-profile armoured bridge, and the typical lack of portholes on late-war boats, the appearance is very sleek indeed. S-100 was built by Lürssen in May 1943, though the next thirty-five boats in the numbering sequence were constructed by Schlichting at Travemünde, before S-136 and S-138–S-150 (also S-100 types) were built once again by Lürssen. S-100 was destroyed in an air raid on Le Havre shortly after the Normandy invasion of June 1944.

At bottom (3) is S-223 from the largest E-boat class to be built. Measuring 36 metres, the additional length more easily accommodated the Daimler Benz MB511 supercharged diesel engines, which gave this craft a top speed of 43.5 knots. Over 100 of this type were built. S-223 was constructed by Schlichting of Travemünde in October 1944 and operated in the North Sea. Involved in one of the last E-boat operations of the war, she struck a mine and sank just north of Ostend on 8 April 1945.

ABOVE **E-boat crewmen restocking their boat's small larder with foodstuffs and other essential supplies. Note the large stock of toilet rolls. The shot is taken on the foredeck and the large hatch leading to the forward accommodation area can be seen partially opened, with a stepladder inserted.**

RIGHT **Two E-boat crewmen, life jackets fitted, scan the skies for signs of enemy aircraft. This photo was taken during operations in the Black Sea, where E-boats often came under attack from Red Air Force fighters.**

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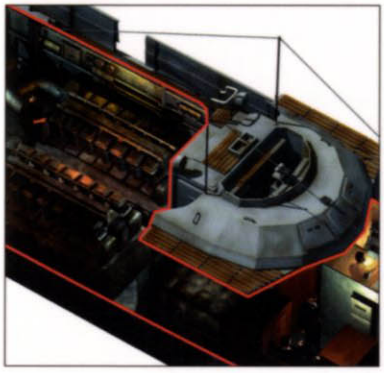

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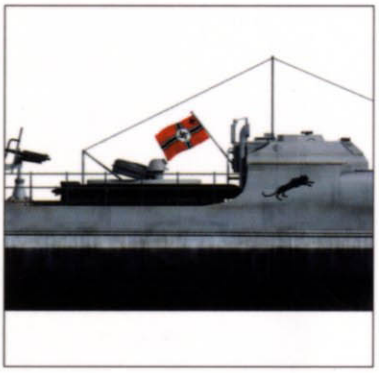

Unrivalled detail

German E-boats 1939–45

By the outbreak of World War II, Germany had done much to replace the Kaiser's High Seas Fleet, which was scuttled following the German surrender at the end of World War I. Forced to build anew, the Kriegsmarine possessed some of the most technically advanced warships in existence. Although the heavy units of the fleet were too small in number to pose much of a threat, Germany was particularly well served by her Navy's smaller vessels, principally the U-boats and the S-boats. Known to the allies as the E-boats ('Enemy'), S-boats performed sterling duties in the Black Sea and English Channel, where they were especially dangerous.

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