

The K-Verband

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...The swift raising of a completely novel unit, equipped with completely new kinds of arms.-Grand Admiral Karl Donitz, 1914

Germany was the last of the powers to enter the belligerent powers to enter the fields of midget submarines. In theory this gave the Germans a position of some advantage in that they could learn a good deal from the experience of their Italian and Japanese allies together with whatever intelligence they had gained of British operational methods and material. However. Despite the efforts of there allies in this field and the known threats imposed by the British. It was not until the end of 1943 that the *Kriegsmarine* began a serious investigation of the subject. Even then, it was threat of invasion which provided the stimulus rather than any desire to take the offensive against the Royal Navy.

They had however, been two attempts to interest the *Kriegsmarine* in midget submarines prior to 1943. In October 1941 professor Drager of the Dragerwerk Company submitted a paper to OKM in which he proposed the construction of midget submarines with displacement of 120 tons. Drager foresaw these crafts been used in the defence of the European coastline, to support the VP-Boote and for use in mercantile cruisers. Drager’s midget was a torpedo like craft powered by a diesel motor using nitrogen injection; He believed that his craft would be of considerable value in the waters surrounding the British Isles and in the Mediterranean, where there small size would make them difficult to spot. However his enthusiasm for his invention was not reciprocated by OKM. At the end of 1941 victory for the axis powers seemed almost assured and Britain was certainly in no position to mount a invasion of Europe. There seemed no conceivable use for the sort of Craft that Drager was proposing and on January 22 1942 he was told by state Councilor Rudolf Blohm:

Even if the small U-Boat can be brought to the point of fulfilling technical requirements, we cannot regard it as adequate for operational purposes because, carrying only two torpedo’s, it has a minimal armament and because in adverse weather conditions heavy seas do not allow such vessels to be used adequately in operations. Furthermore the radius of operation, in the light of increasing distances over which we are having to wage war, is insufficient.

However, in February 1942, Dipl. Ing. Adolph Schneeweisse of OKM put forward a proposal for midget submarines which could be carried by Type X or Type XI U-boats. Schneeweisse had made an exhaustive study of U-boat patrol reports and had come to the conclusion that, as the Royal Navy become more proficient in ant-submarine warfare, so the ability of U-boats to penetrate escorts screens and attack merchant vessels would be greatly reduced. To put this argument foreword at a time when U-boats where indulging in the second “happy time” off the eastern seaboard of the United States took a great deal

of moral courage. Schneeweisse argued that the considerable sinking off the American Coast was a short term trend and that eventually the U-boat's would have to return to the Atlantic convoys. He proposed that the only way to deal with the convoy escort was to overwhelm them with massed attacks by small submarines. He therefore proposed the constitution of an *Unterwassersturmbot* (underwater assault craft) of about ten tons displacement, armed with three F5 or two or three G7a or G7e torpedoes and capable of speeds of 30 knots. Three or four such boats could be carried on a type XB U-boat and two on a type XI. His preliminary sketch bore a considerable resemblance to the later *Bieber* one man submarine.

At the same time as Schneeweisse was putting forward his idea, by coincidence the German Naval Attaché in Tokyo, Rear-Admiral Wenneker, was requested to obtain details of the Japanese Ko-Hyoteki two man midget submarine and was provided with a list of forty six questions to ask concerning its construction. After some hesitation by the Japanese authorities, Wenneker and the Italian Naval Attaché were allowed to visit Kure on the 3rd April 1942 where one of the type AKo-Hyoteki was paraded for their inspection and Wenneker received the answer to some but not all of his questions. Although Wenneker reported back to Berlin, nothing seems to have come to light of this initiative.

Schneeweisse's ideas appear to have met the same fate as Dräger's. The Kriegsmarine was an intensely conservative force-far more so than the Royal Navy-and was commanded by officers with little or no operational or sea-going experience. The weakness at the top in the Kriegsmarine was reflected in the often ham-fisted nature in which Naval operations were conducted. Their short-sightedness in not investigating midget submarine designs is extremely hard to understand. It is even harder to understand when one considers that just across the North Sea from the German lay a cornucopia of targets. In the Orkney Islands lay the great harbor of Scapa Flow, further south was the naval base of Rosyth, while even closer to Germany lay the port complex of the Tyne, Humber and Thames. On the English South Coast- a short trip from the French coast-where the great Naval bases of Portsmouth, Portland and Davenport, Seldom can a belligerent be presented with such a variety of targets so close to hand.

Yet the Kriegsmarine does seem to have maintained some momentum in this field, despite the rejection of Dräger's and Schneeweisse's proposals. In the summer of 1942 Capitano di Fregata J.V. Borghese, the redoubtable commander of the Italian Decima Mas, visited a German base near Brandenburg to watch the development and training of German assault frogmen. He was not impressed:

From everything I saw (and my opinion was confirmed by the way the Germans began this particular warfare), I drew the conclusion that they were barely initiated into this spear of underwater surprise weapons: they had not yet produced anything that would compare with our human torpedo and explosive limpets, but were wasting time in somewhat crude and childish experiments which we had long since discarded.

It was the threat of invasion that finely pushed a recalcitrant Kriegsmarine into the field of midget submarine development. As invasion forces massed in England, the fact slowly dawned on the Kriegsmarine's high command that they had virtually nothing in their armory with which to oppose a seaborne landing. In order to design and operate such craft a small unit known as Klienkampfverband (K-Verband, or small battle unit), was established under the command of Rear Admiral Helmuth Heye. Heye had previously commanded the cruiser Admiral Hipper and had since served in a number of staff appointments; at the time of his new appointment he was serving as chief of staff to the fleet commander. Heye had been Donitz's original choice for the post but the latter was persuaded by the chief of personnel that Heye could not be spared from his current appointment. Accordingly, Vice Admiral Weichold was given the job. Weichold was not a success, however and was speedily relieved by Heye, whom Donitz described as "a resourceful man full of ideas"

Heye's appointment was unique in that he was simultaneously an operational commander The representative of his service at the high command and the officer responsible for procurement and production, but, as Donitz commented,

This dual role was unique and was contrary to every principle of Organisation. But in this particular case it was a necessary move, designed to ensure the swift raising of a completely novel unit, equipped with completely new kind of arms.

Heye established the K-Verband at a base at Timmersdorfer Strand near Lubeck and this was where the mangled remains of X6 and X7 were brought together with the Welman. Heye was unconventional in his approach to training the men of his new command. He believed in fostering moral as an essential ingredient of success and thus organized his men on the Nelsonian "band of brothers" ethos. There was little formal discipline in the unit, mere lip service was paid to the Kriegsmarine's bureaucracy and rank badges were not worn. There were considerable similarities between the spirit of the K-Verband and that of the Decima Mas, but any comparison of the two ends there.

Speed was of the essence in constructing and testing a weapon, and Heye was given some formidable powers by Donitz:

As speed was essential there was no question of lengthy tests and trials. At my suggestion the Commander-in-Chief gave me considerable powers which enabled me to short circuit tedious bureaucratic procedure and to have direct contact with all departments of the Naval Staff and-especially important-with industrial concerns. Unless I had made full use of these powers, the formation and equipment of the K-Force would hardly of been feasible in the short term available

Heye was under no illusion about the magnitude of the task facing him:

We ourselves possess no practical experience in this form of warfare, we know broadly that the Italians and the British possessed several different forms of small battle weapons, but we know nothing of the Japanese operations with midget submarines.

However, although Heye may have got what amounted to a license to organize his own production programme, he was handicapped by two restrictions. First, Donitz would not let him have any men from the U-Boat arm: Heye would have to scrape his crew from other sections of the Wehrmacht. Heye recruited from all three arms of the Wehrmacht and apparently was not particularly choosy about where his men came from. Lieutenant Richard Hale RNVR, of the minesweeper HMS Orestes, recalled the interrogation of a *Marder* operator captured on 8th of July 1945 during operations of Normandy.

“...the prisoner turned out to be eighteen years old who had been in cells for some crime and had been let out to do his suicide job.”

Secondly the need to produce the new weapons as quickly as possible meant that there would be little time for research and development: the new craft would have to be built from components of existing craft or weapons.

The first German weapon was based on the standard G7e torpedo. Designed by *Stabsingenieur* Mohr and developed at the torpedo *Versuchs Anstalt* (TVA) at Eckenforde. Mohr played a considerable part in the development of the craft. Including doing much of the testing, and the name given to the craft, *Neger* (Nigger) was a pun on his own name, Mohr been the German for Moor. The weapon was extremely simple. The G7e torpedo was fitted with a small cockpit covered with a Plexiglas dome for the single operator to sit in. The craft was powered by an electric motor similar to that used in the conventional torpedo. It weighed some 5 tones and had a range of some 30 nautical miles at 3Kt. The weapon was a single G7e which was slung underneath it. The craft could not dive but possessed nearly sufficient positive buoyancy to support the torpedo. A larger version of *Neger* called *Marder* was built which incorporated a diving tank and could submerge to a depth of 25m for very short periods.

The *Neger* operator was provided with rudimentary controls: a wrist compass; a self contained Drager breathing set and a crude aiming device consisting of a graduated scale marked on the Perspex dome and a aiming spike on the nose of the craft rather like a foresight on a rifle. A handle in the cockpit released the torpedo, which started and ran at a pre-set depth. One disadvantage of the craft was that on occasions the torpedo started but failed to release, carrying the upper unit and operator to oblivion

In theory, and especially in the eyes of the shore based planners, the vision of a swarm of *Neger* or *Marder* overwhelming an invasion fleet was a attractive one. But in reality the position was very different. The operator was too low to see properly and the Perspex dome was too easily obscured by oil or other scum in the water, rendering the operator blind. If he opened the Perspex lid to get a better view, he risked swamping the craft. These problems meant that in operations the craft would suffer an appalling casualty rate of between 60 and 80 per cent.

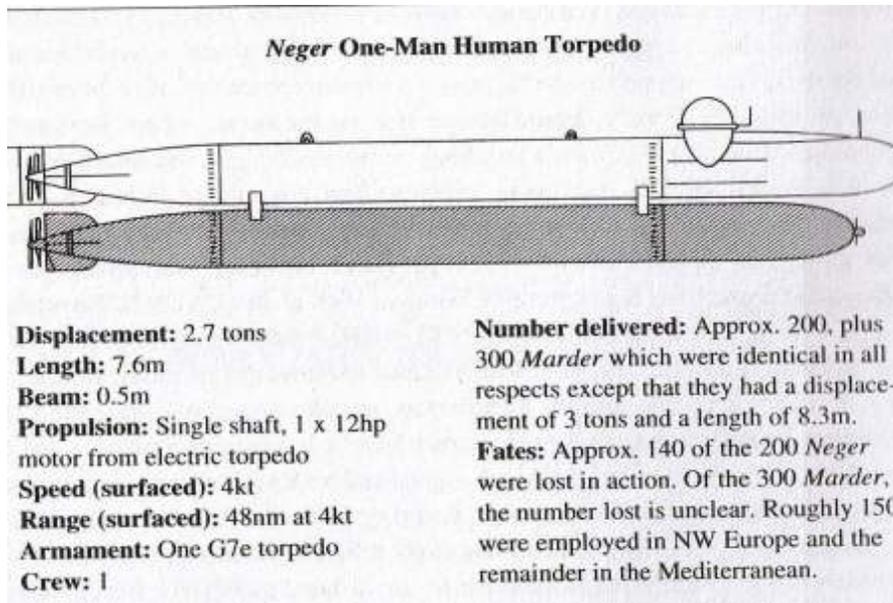


Fig. Sketch of Neger

A successor to the *Neger/Marder* combination was the *Molch* (Salamander). This was a basically a slug like craft 10m long, a carrier for G7e torpedoes which were slung externally on either side. As with other German designs, it was to use as many existing components as possible.

The fore section contained the twelve Type 13 T210 battery troughs which drove the 13hp electric motor. The size of the battery meant that the *Molch* was a comparatively large craft, with a displacement of 8.4 tones (without torpedoes) but the device did have a substantial underwater range-50 nautical miles at 5 kt was impressive.

Behind the battery in the after section was the operator's position. He sat between two trimming tanks whose relatively small size and position must have made them virtually useless in compensating for the weight of the battery, In fact when the first production model went out on trials. It proved impossible to make her submerge and therefore most *Molch* operators were carried out with the craft running awash.

The controls were extremely simple. A magnetic compass was fitted externally, although in some boats a automatic pilot was fitted together with a simple hydrophone. A periscope was fitted but it was negated by the fact that it could only be rotated by 30 degrees either side of the centerline.

Finely behind the operator was the electric motor. Despite the problems associated with the *Molch's* handling, series production was begun in June 1944 and a total of 393 units were completed by the end of February 1945. Production was largely centered at the works of Deschimag AG Weser at Bremen.

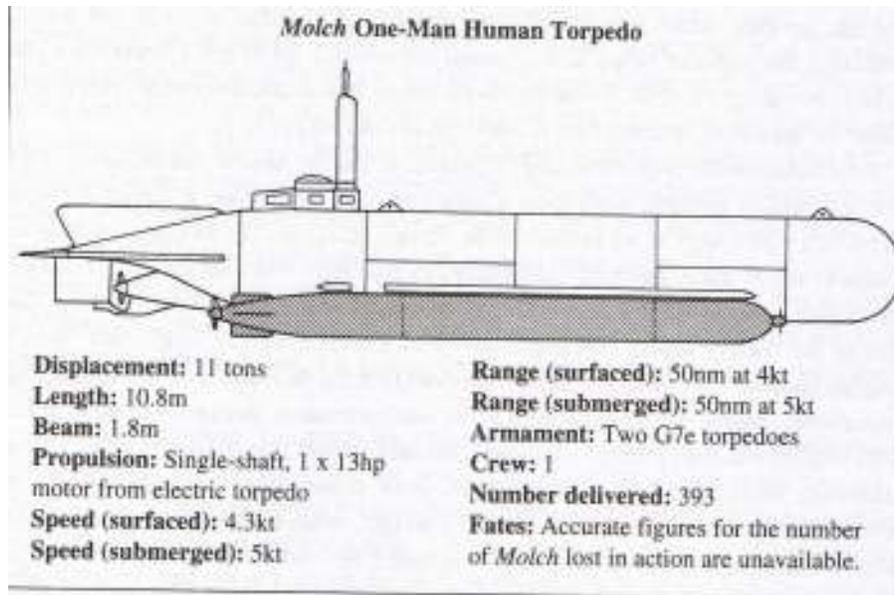


Fig. Sketch of Molch

An altogether different creature was the *Bieber* one-man submarine, whose development arose from the capture of the Wellman W46 at Bergen on November 22nd 1943.

The Welman was a one man craft with extreme lethality to its operators but it acted as a spur to Korvettenkapitan Hans Bartels (picture below left) to develop something similar.



In a service not known for eccentrics, Bartels stood out like a beacon. During the 1940 Norwegian campaign he had take surrender of a Norwegian destroyer and a entire flotilla of torpedo boats. He then designed and built a minesweeper to his own specification. Followed by eleven more, and then invited OKM to pay for them. When Grand Admiral Erich Raeder indignantly refused, Bartels moored one of the minesweepers in a canal opposite German Naval Headquarters in Berlin where Raeder could inspect the craft. Raeder took a dim view of these proceedings and Bartels was packed of to the destroyer Z34 to cool his heels in the real Navy.

Bartels evidently found considerable inspiration in the Welman and on February 4th 1944 he began negotiations with Flenderwek of Lubeck for the construction of a similar craft. On 15th March 1944 the first prototype, known as either the Bunte-Boot (after Director Bunte of Flenderwerke) or Adam, was complete.

Trials with Bartels himself doing much of the testing, where run on the River Trave, and on 29th March 1944 the craft was accepted for service.

Twenty four (24) production models were ordered as a first batch of an eventual run of three hundred and twenty four (324). Deliveries throughout 1944 comprised three (3) units in May, six (6) units in June, nineteen (19) in July, fifty (50) in August, one hundred and seventeen (117) in September, seventy three (73) in October and fifty six (56) in November. Although air raids on Kiel destroyed some components, Allied bombing failed to disrupt production to any appreciable degree.

The Bieber displaced 6.3 tons when armed with its two G7e torpedoes.

It was 29ft 6in long, 5 ft 3in in the beam and had a draught of 4ft 6in. Surface propulsion was provided by a 32hp Opel Blitz (petrol) automotive engine which gave a range of 100 nautical miles at a speed of 6.5kt. Reservations had been expressed about the use of a petrol motor in such a small craft. But these were dismissed by Dr Bunte. Petrol engines were cheap to make and could be supplied in quantity, and an added advantage was they made very little noise when running. However the reservations were well founded. Like all petrol engines, the Opel in the Bieber gave off carbon Monoxide in its exhaust. Thus the operator sat in a lethal atmosphere if he ran the engine for any longer than 45 minutes with the upper hatch shut.

Operators were however supplied with breathing apparatus and twenty(20) hours worth of Oxygen, but many must have succumbed to CO poisoning while on operations.

Three type T13 T210 battery troughs powered a 13hp electric motor for submerged drive. This gave the Bieber a range of 8.6 nautical miles at 5.3kt. The hull was made of 3mm thick sheet steel and gave a safe diving depth of 60ft, although some Bieber went well below this to 100ft and more on operations. Four internal bulkheads and three longitudinal ribs reinforced the hull plating. There was no compensating or trimming tanks, just a single diving tank in the bow and another further tank in the stern. Although the Bieber handled well on the surface when it was submerged it was a different story.

The Bieber proved virtually impossible to control when dived, this was due to the fact it had no trimming arrangements.

The Bieber was built in three sections which bolted together. The bow section contained nothing more than the main diving tank. Between the first and second bulkhead was the compartment where the operator sat with his head poking up into the 28inch coning tower. The control panel was directly in front of the operator's seat and was compact and austere. The coning tower was fitted with glass ports which were the operator's principal means of seeing where he was going. A periscope was fitted but it was fixed in a forward facing direction. Maintaining the craft at periscope depth was virtually an impossibility due to the lack of any trimming arrangements.



Fig The control panel

Behind the operator was the compartment containing the Opel petrol engine. In theory this was sealed off from the main compartment but in practice the insidious petrol vapor permeated every part of the boat. The final compartment of the boat contained the aft diving tank there was facilities for the operator whatsoever. He was given a ration of chocolate which had been improved with the addition of stimulants such as caffeine and Cola, but that was all.

The two G7e torpedoes were slung on a rail in semi recessed positions on either side of the craft. The rail ran from a fitting on the keel to a swinging eyebolt above. There was a pneumatic cylinder to which air was admitted in order to fire the torpedo. The piston in the cylinder then traveled towards the rear, releasing a clamping eyebolt and forcing back a trip lever on the torpedo. The torpedo then started and ran foreword under its own power, suspended from the rail until it cleared the submarine. The firing mechanism was if anything too simple and there was to be serious incidents of “negligent discharge” In which a number of crafts where wrecked and there operators killed. An alternative armament to the torpedo was the mine. Two GS mines could be carried by each craft, fitted with either magnetic/acoustic or Magnetic/pressure fuses.

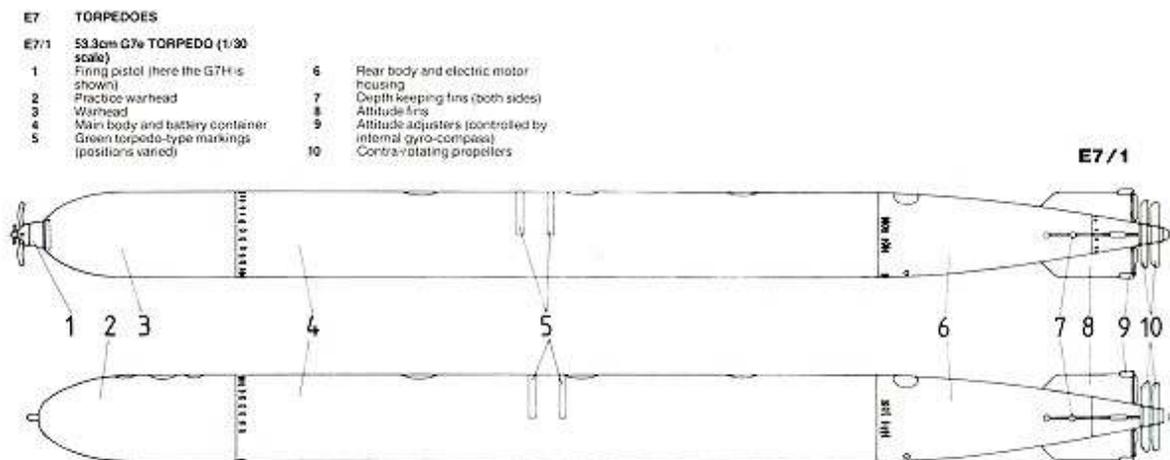


Fig. Diagram of G7e Torpedo

Captain W.O.Sheflord RN, an authority in the Royal Navy on all aspects of diving and submarine escape, was responsible for surveying a Bieber found abandoned in France after the Normandy campaign. In his report on the Bieber he compared it to the British *Welman* (which is not much of a recommendation), although it was superior in certain points. He was of the opinion that the torpedo was a superior armament to the explosive charge carried by the British *X-Craft*, Even though the use of the torpedo meant the craft had to risk detection in order to attack its target.

Further developments of the Bieber where planned which included a two man version of the Bieber. These were to be named *Bieber II* and *Bieber III*. However these design

where to remain nothing more than drawing board projects. There cancellation came about as a directive issued by OKM at the beginning of 1945 to the effect that all work on all craft not in series production should be suspended however this directive was largely ignored.

The fact that Admiral Heye was virtually independent ensured that work proceeded on a number of designs until the end of the war.



Fig. Sketch Bieber one man midget submarine

Among the more ingenious of these was that for the *Seeteufel* (sea devil), which was an amphibious craft fitted with a side propeller and caterpillar tracks. The requirements for a tracked craft arose from difficulties expressed from launching *Mulch* and *Marder* in the water without dockside facilities. The *Seeteufel* could simply make its own way into the water.

As built, the prototype had a two man crew and was much larger than other midget types.

Propulsion was by means of a 80hp petrol engine which could be switched to drive either the single screw or the caterpillar tracks. For submerged drive the boat had a 30hp electric motor, which gave a speed of 8kt which was very good considering that the

Seeteufel had the worst water resistance than any other German midget U-boat. The petrol engine was installed in the bow beneath a fixed snorkel mast which also contained the periscope, a rod Ariel and the magnetic compass with lighting transmission.

Behind the petrol engine was the crew compartment. All controls were grouped into a aircraft like column placed forward of the driver's seat beneath a Plexiglas dome. Despite the fat shape of the boat, *Seeteufel* handled well under water. The diving depth was 21Mtr. Tests with the craft proved satisfactory except that on land it was found the engine lacked power and the tracks were too narrow. In water however, the craft handled perfectly well. Heye was impressed and entered into negotiations with the automobile manufacturer Carl Borgward for series production of the *Seeteufel* with a more powerful 250hp diesel engine. However these plans came to nothing; the prototype *Seeteufel* was taken to Lubeck where it was destroyed at the end of the war.

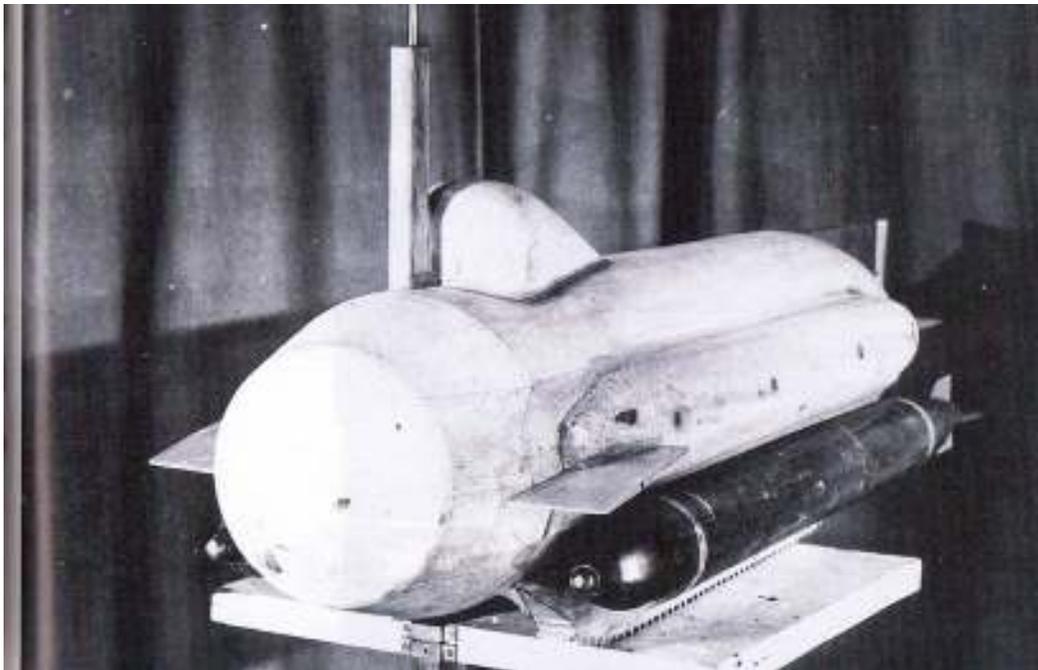
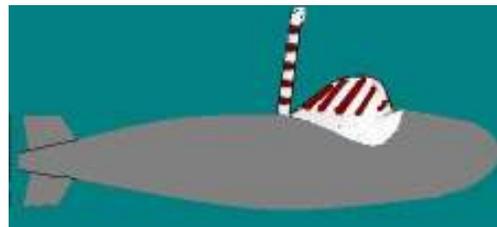


Fig. Model of the Seeteufel

Other designs investigated but not put into series production were the *Delphin* A small streamlined craft which towed a 500kg mine. The craft was quiet fast, with an underwater speed of 14kt, and was powered by a 2.5Ltr Opel-Kapitan closed cycle engine. Only two crafts were built and trials showed some promise, but both were destroyed at Potnitz on May 1 1945 to prevent them from falling into the hands of the British.



Another craft was *Schwertal*, a two manned device armed with two torpedoes which bore an uncomfortable resemblance to the Japanese *Kaiten*. *Schwertal* was a development of the type XXVIIF U-boat whose construction had been halted at the end of 1944. The type XXVIIF was powered by a closed Walther turbine and could achieve a underwater speed of 20.4kt with torpedoes slung and 22.6kt unarmed. The use of the closed-cycle drive conferred numerous advantages including high speed and the ability to dispense with separate systems for surface and submerged drive.

Schwertal was to be a fast and maneuverable underwater craft and was intended to have an ASW role as well as an anti-shipping one. She was to be armed with two torpedoes but other suggested weapons included the 500kg towed mine and underwater rockets to be used against pursuing ships. The high speed of the craft meant that she could not be fitted with a periscope, and a simple Plexiglas dome was provided for surface vision and navigation. An orientation devise consisting of a gyro-stabilized aircraft compass with automatic control for lateral movement and depth-keeping was fitted and performed well on trials. The master magnetic compass was fitted externally in a streamlined pod on top of the rudder assembly.

By the end of 1945 *Schwertal* was ready for trials. All the systems worked in tests on the shore and the power plant had generated the requisite 800hp in test-bed trials however at the end of the war the craft was scuttled at Plon to prevent her falling into British hands. She was subsequently raised by the Royal Navy and after a brief examination, was scrapped at Kiel. A design known as *Schwertal 2* never progressed beyond the drawing board.

Despite the ingenious nature of the design, *Schwertal* would have been lethal to her operators. The problems of controlling a craft underwater at high speed are considerable—a moment's inattention and the craft would plunge beneath its test depth to destruction. Furthermore, the Walther turbine was not tested under operational conditions. Post-war British and American experience found that this method of propulsion was not suitable at all for submarines to use.



Fig Drawing of the Schwertal

A final German Project was *Manta*, Another high-speed with a trimaran hull capable of over 50kt while paining on the surface and a submerged speed of over 30kt, with a Walther turbine and an electric motor for very quiet, submerged creep seed. The central hull contained the departments for the two man crew, while the two outer cylinders contained fuel tanks. The propulsion unit consisted of two Schwertal 2 type units housed in the keel of the outer cylinders. These side units where also fitted with aircraft wheels to allow the craft to launch itself into the water. The armament was four torpedoes, or mines, carried on the wing surface between the outer hulls and the central body.

Manta can only be described as a fascinating design. The whole story of midget submarines is packed with what ifs scenarios. That of a Manta storming through a convoy at 50kt plus, Firing torpedoes or towing mines of 500kg is defiantly one of the best. However Manta, together with Delphin and Schwertal, are little more than reflections of the desperate position facing Nazi Germany at the end of the war. In such circumstances, rather akin to those facing the Japanese, German designers who had hitherto been skeptical of the value of the midget submarines took refuge in any design, however fantastic.

The first operation undertaken by the K-Verband was conducted against allied shipping of Anzio. Following the landings at Anzio on the 22nd of January 1944, Forty Neger were dispatched to Practica di Mare, where they arrived on the 13th April after a difficult journey . Problems finding a launching site-the beaches all had very shallow gradients which meant that some 500 unwilling soldiers had to be conscripted to construct launching ramps and thus it was not until the night of 20/21st of April that the attack could be launched. Twenty three Neger where launched but the subsequent attack was a fiasco. At least four where sunk by the defenses and one was captured intact, found washed up on the beach. Only thirteen craft returned from the operation, which did not result in the loss of a single allied ship. It was an ominous portent for the future.