

German Submarine Warfare 1914-1918
in the Eyes of
British Intelligence

Selected Sources from the British
National Archives, Kew

Edited by Hans Joachim Koerver

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Front cover photo: German Submarine U-41 photographed from British Q-ship BARALONG, 24 September 1915, moments before the fire is opened.

Back cover photo: German Submarine U-110, 1918.

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Für meine Eltern, Renate und Johann Koerver.

Pour ma femme, Helene Koerver-Riviere.

Meinem Kommilitonen, Dr. Jörg Wiesemann.

*Meinem Grossonkel Wilhelm Koerver (1900-1918), U-Boots-
Maschinisten-Anwärter auf U-92, untergegangen mit allen
seinen Kameraden am 9. September 1918 auf einer Mine der
Northern Barrage vor den Orkney-Inseln.*

CONTENT

Preface	ix
Abbreviations, synonyms, measures	xlvi
Chapter I German Submarines, their flotillas, and their school	
The Submarines	1
The Submarine Flotillas	5
The Submarine School	20
Chapter II German Navy Submarines, April 1918	
Silhouettes	34
Tabulated Details	36
U-Cruiser, Converted Mercantile Type	56
U-Cruiser	60
Ocean-Going Type	63
Minelaying Type	97
Early U-Type	100
UB-Small Ocean Going and Coastal Type	100
UC Minelaying Type	115
Appendix I, Tactics of Attack	128
Appendix II, Procedure when hunted with Hydrophones	132
Appendix III, Navigation	134
Operation instructions	137
Plates	142
Chapter III Room 40: German Submarine Warfare 1914-1918	
The First Phase, Aug. 1914 – Feb. 1915	163
The Second Phase, Feb. 1915 – Jan. 1917	170
Flanders as Submarine Base	189
Unrestricted Submarine Warfare	199
Mediterranean Submarine Warfare	216
The U-cruisers	228

Chapter IV Losses and gains 1914-1915

1914:

U-15, sunk 9 August	237
U-9, Kaplt. Weddigen, and the sinking of HMS Cressy, Hogue, and Aboukir, 22 September	238
U-18, sunk 23 November	242

1915:

German W/T instructions: Unrestricted submarine Warfare	243
U-8, 4 March	244
U-12, 5-10 March	248
U-29, Kaplt. Weddigen, 8-18 March	250
U-20, 30 April – 13 May, and Lusitania	257
U-40, 18-23 June	274
U-36, 17-24 July	279
U-24 and the Sinking of the Arabic, 19 August	284
U-27, 4-19 August, sunk by Baralong	290
U-41, 14-24 September 1915, sunk by Baralong	298
Deserted carrier pigeon from UB-6	309

Chapter V Submarine warfare 1916 and 1917

1916:

UB-26, 30 March-5 April	311
German W/T instructions: Restricted submarine war	317
S.S. BRUSSELS and Captain Fryatt	318
U-49 and U-50 prize crews captured 18 November	325

1917:

UC-31 prisoner 29 January	331
U-76 to the Arctic, 9-27 January	337
The Zimmermann-Telegram	340
German W/T instructions: Unrestricted submarine warfare	343
UC-39, 3-8 February	345
U-83, 31 January-17 February	349
UC-32, 17-23 February	355
German List of tonnage sunk by U-Boats of the High Seas Fleet, February-	360
U-93, 3 prisoners of war, 30 April	362
U-81, 18 April-1 May	378

UC-26, 30 April-9 May	386
UB-21, two POWs, 18 July	393
German List of tonnage sunk by U-Boats of the High Seas Fleet, 1 February-31 May	398
UC-44, 31 July-4 August	400

Chapter VI A month of U-boat warfare - September 1917

U-28, sunk by wreckage, 2 September	409
U-88, sunk by mine, 7 September	413
UC-42, blown up by own mines, 10 September	414
U-49, rammed by merchant ship, 11 September	415
U-45, torpedoed by enemy submarine, 12 September	420
UC-45, sunk by accident, 15 September	424
UC-72, bombed by seaplane, 22 September	425
UC-33, rammed by patrol boat, 26 September	426
UC-21, sunk in mine nets, 27 September	435
UC-6, bombed by seaplane, 28 September	437
UC-55, artillery and depth charges, 29 September	438
Submarine patrols, sinkings, losses	440
Successes: 166 ships, 321,002 BRT	443

Chapter VII Last Year in the Atlantic

1917:

Wolfram-Ore	447
UC-65, 21 October-3 November	451
U-58, 12-17 November	461
U-48, 22-24 November	467
UB-81, 28 November-2 December	476

1918:

U-110, 27 February-15 March	483
UB-55, 21-22 April	492
UB-85, 16-30 April	495
UB-110, 4-19 July	502
UB-124, 9-20 July	511
UB-109, 28 July-29 August	519
U-92, sunk 9 September	526

Chapter VIII Mediterranean operations

1915:

U-21 to Constantinople, 25 April – 30 May
and the Sinking of HMS ships Majestic and Triumph 527

1916:

U-35 in Cartagena, Spain, 21st June 533

1918:

UC-35, 28 April - 17th May 543

UB-52, 28 April - 23 May 554

U-64, 11-17 June 568

UB-53, 2-3 August 586

UB-68, Oblt. Karl Dönitz, 28 September - 4 October 593

U-34, sunk 8 November 601

Chapter IX Striking the Atlantic coast of North America

1916:

U-53 to Rhode Island, Connecticut,
17 September – 28 October 605

Cruises of U-DEUTSCHLAND to America 609

1918:

American Intelligence: German Submarines off the Atlantic
Coast of the United States, May-September 614

British Intelligence: German Submarines off the Atlantic
Coast of the United States 643

Appendix

A Maps 651

B Photographs 661

C Minefields laid by U-boats 663

D British decyphering of German naval and
diplomatic messages 665

E British Intelligence on U-boat construction 671

F British Statistics on U-boat Warfare 689

G World merchant Tonnage 1914-1917 692

H British merchant Tonnage Lost 1914-1918 693

I Overall World merchant Tonnage Lost 1914-1918 695

J	U-boat casualties 1914-1918	697
K	Surrender of Imperial U-boat fleet 1918-1919	705

Bibliography		711
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Index		719
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Preface

Editor's perspective	xi
The German Navy 1900-1914	xii
The World merchant fleet 1914	xv
U-boats	xvi
Britain and the German submarines 1914-1918	xiii
German submarine warfare 1914-1918	xxi
German naval construction 1914-1918	xxxix

This book contains an immense amount of detail about Imperial German submarine warfare for the period of the First World War, 1914-1918. The wealth of data covers technical design, personnel, tactics, individual U-boat cruises, casualties and much related information about the Central Powers' Allied opponents. The text is entirely based on documentary sources at the National Archives, Kew, England. The materials examined and cited here include prisoner-of-war statements, intelligence analyses, deciphered wireless traffic communications, as well as testimony of survivors of sunken ships.

The objective strives to offer a representation of the First World War at sea on several levels as we near its centennial, including:

- Background of the German naval construction program, 1900-1918, when the emphasis remained overlong on the pre-eminence of the battleship at the expense of submarine construction and deployment;
- Discussion of the lead-up to unrestricted submarine warfare;
- Implications of a British naval officer's manual dated April, 1918 in which exacting technical information about German submarines is detailed;
- A review of what lay behind the door of Room 40 of the Royal Navy's Intelligence Division; and a look at eyewitness reports from German U-boat POWs as well as from crews of sunken allied merchant ships, reports of allied warships engaged in anti-submarine warfare operations, and deciphered German radio communications messages.

Britain

When the first volume (in the twenty-eight volume set) of the *History of the Great War Based on Official Documents* was just short of completion in 1923, the Admiralty announced that their Lordships were not interested in overemphasising the role of German submarines. Several changes had to be made, most especially to material that dealt with submarine warfare through April, 1917 because:

"1. These chapters provide gloomy reading from the British point of view and there is much in them to encourage potential enemies who may consider that it is in their competence to subjugate the Empire by a large submarine building program.

2. *The encouragement of these ideas by means of an official publication is very much to be deprecated, particularly at a time when we are advocating the abolition of the submarine.*"¹

Following World War I, the Royal Navy wanted to downplay a strategic Achilles heel. In his book *The World Crisis: 1911-1918*, Winston Churchill had come to the same conclusion when he wrote:

*"It is commonly said that the German drive to Paris and the unlimited U-boat warfare both 'nearly succeeded.' [... For the U-boat warfare there] was never any chance of it. Whereas any one of a score of alternative accidents would have given the German Army Paris in 1914, the sea-faring resources of Great Britain were in fact and in the circumstances always superior to the U-boat attack."*²

The following pages illuminate wartime realities. Also, not many years later Churchill had a resounding change of mind about the perils of U-boats.

Germany

After the war was lost the German public opinion of its navy was at an all-time low: the navy had caused the war with England in 1914; further, it had caused the war with America in 1917 leading to the Revolution in Germany in 1918. The assorted failures led to the ignominious mass scuttling of the Imperial High Seas Fleet at Scapa Flow in June, 1919.

Tirpitz and Scheer rushed their memoirs into print in 1919. Scheer coasted on his success at the Battle of Jutland; Tirpitz blamed the Kaiser for preventing use of the High Seas Fleet at the very start in 1914, as well as from stopping him from deploying the full force of the U-boat arm. *Der Weltkrieg 1914-1918: Bearbeitet im Reichsarchiv* was written as a series of fifteen volumes and published between 1925 and 1930. It is a credible work though it does not as exhaustive as its British counterpart.

Amid the wealth of detail in the official German histories encompassing the surface navy in the Pacific, the Black Sea, Baltic, and in the North Sea down to the smallest minelayer, there was no focused, organized study of the submarine merchant war.

In 1925, Admiral Michelsen, commander of submarines in the North Sea in 1917 and 1918, produced a semi-official *apologia* excusing the failure of the submarines. Admiral Galster published a critical work about submarine warfare in the same year. His book fired up discussion among the pensioned former flag officers of the old Imperial Navy, but nothing came of it.

A serious examination of submarine warfare as prosecuted by Germany did not occur until 1932 with the first of five volumes of Rear Admiral Arno Spindler's *Der Handelskrieg zur See mit U-Booten, 1914-1918*. In it, Spindler takes pains to present the crews and their war patrols in the best possible light. Chivalry still

¹ NA, ADM 116/3421, p. 11.

² Churchill, *World Crisis*, p. 736.

counted for something in World War I and Spindler wanted it documented. The second volume presents the merchant warfare element in elaborate in detail, including tables and maps. Volume three covers the period from the autumn of 1915 to the New Year of 1917 but is poorly organized. However, merchant statistics are helpful as well as reliable, e.g. patrols per boat, ships and BRT sunk.

Publication tempo abruptly slowed to a snails pace thereafter. The fourth volume was printed in 1941 but was not published until 1964. It covers the epochal period from January to December 1917 and is exact and clear, with all cruises and sinkings listed in order. The final volume came out in 1966 and wraps up the last year of the war, from January to October, 1918. There are detailed accounts of cruises and sinkings redacted from U-boat logbooks. Spindler also makes an effort to present statistics, but with only partial success. The numbers are confusing, contradictory, and incomplete. There are sinking numbers per commanding officer and per boat and year but not per patrol, and there are no numbers detailing patrol days. Numbers associated with patrol days have to be tabulated individually, page by page. In all, this is not the most glowing official history ever produced but considering the context of the mere twenty years that separated the two epic blood-lettings in human history, we should be grateful that any scholarship at all was attempted.

We can only speculate why so few details about the German submarine war were published so late. Britain quashed serious effort because the submarine war had been so surprisingly successful. The Germans were unenthusiastic because contrary to all their memoranda, propaganda and public oaths it was not successful enough. To the contrary, U-boats were the chief reason that brought America into the war on the side of the Allies. One might even say that the submarines had lost the war for Germany.

Editor's perspective

The First World War still fascinates and confounds us. Everything about the war is super-sized. Arguments about cause and effect abound. Paul Halpern³ is a great source for understanding the maritime aspects of the war. John Lambert⁴ fascinates with his explanation of the technical revolution in warships, especially submarines. Joachim Schröder⁵ gives us a fine overview on the submarine war as well as the internal political discussion that prevailed in Germany, using relevant numbers and charts. In 1968 Stegemann⁶ attempted to demonstrate with his statistical analysis (based on Spindler's⁷ numbers) the debatable view that unrestricted warfare was no more efficient than restricted warfare. Schroeder also

³ Halpern, *Naval History of World War I*.

⁴ Lambert, *Sir John Fisher's Revolution*

⁵ Schroeder, *Die U-Boote des Kaisers*.

⁶ Stegemann, *U-Boot-Krieg*.

⁷ Spindler, *Handelskrieg*.

picks up the argument that the Navy erred in its program to continue to build dreadnoughts.

I examined Erich Groener's⁸ numbers on the Navy's construction program as well as Spindler's tabulations of submarine cruises and sinkings. Bendler⁹ offered detailed information on UB- and UC-boats. In the British National Archives I found the declassified work done in Room 40¹⁰ contained a wealth of cruise details and lists¹¹ of sunken merchant ships. I also found so much other vivid, compelling details that I decided to publish them in a book. The statistical data model that resulted is based on:

- 1,604 German warships ordered, in yards and in service from 1900-1918. Relying heavily on Groener it is estimated that the numbers are definitive.
12
- 5,408 British, Allied, and neutral merchant ships sunk by U-boats between 1914 and the end of the war. I identified 10,874,287 BRT of shipping sunk cited in both Spindler and British sources. This comprises 97.5 % of the 11,153,506 BRT shipping sunken by submarines as published by the Admiralty in 1919.
- 3,101 German submarine war patrols in the period 1914 to 1918 with the caveat that many cruises by small coastal UB-I and UC-I boats could not be identified. For ocean-going submarines, some patrols were hard to label as purely "military" or "merchant war".

To trace history statistically via precise numbers, like a certified public accountant, is impossible. Numbers do have a central place in combination with a wealth of other, supporting information. Therefore, within the limitations of the statistical genre, I hope that the quality of the data presented here is sufficient to assist judgements and interpretations in other contexts. Taken together with details from British sources, the objective of this book is to gain insight into the reality of the Imperial German Navy at the dawn of submarine warfare.

The Germany Navy 1900-1914

Naval Arms Race

Germany started to expand its fleet as the 19th century drew to a close. Within a few short years the German fleet had grown exponentially. Admiral Tirpitz with the Kaiser's approval planned to create at least the second largest fleet in the world over a period of twenty years. It was called the "*Tirpitz-Plan*" (Berghahn).

⁸ Groener, *Deutsche Kriegsschiffe*.

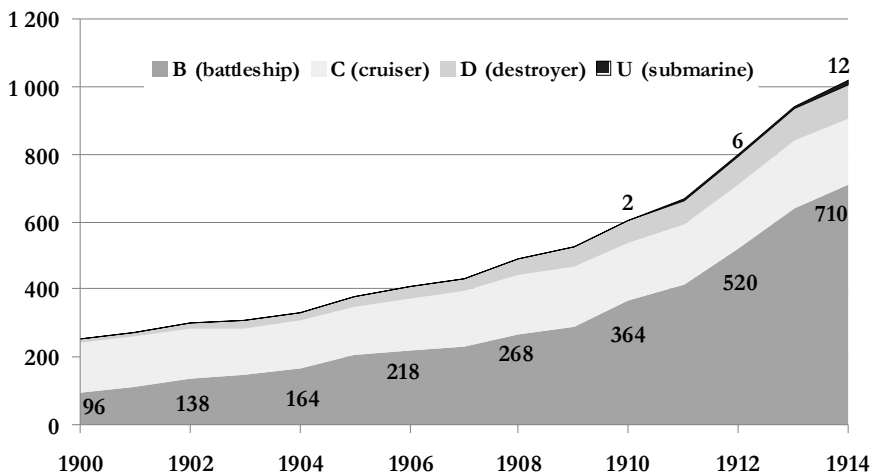
⁹ Bendler, *UB und UC-Boote*.

¹⁰ NA, HW 7/1, 2 and 3.

¹¹ NA/ADM 137/3921, additionally ADM 137/4817, ADM 137/4814, ADM 1/8509/1.

¹² For two dreadnoughts in the 1917 planning cycle there is contradictory information. For that reason, they are treated here as "never laid". *In dubio pro reo*.

Table 1: The German Navy 1900-1914 in 1,000 BRT ¹³



Numbers of ships by column: B-battleships; C-cruiser; D-destroyer, torpedo boats, mining vessels; U-German submarines. The total size of the Navy is given in Brutto Register Tonnage (BRT).

With characteristic theatricality and no small amount of disingenuousness Churchill announced before the war

“All sorts of sober minded people in England began to be profoundly disquieted. What did Germany want this navy for? Against whom, except us, could she measure it, match it, or use it?”¹⁴

“It is nothing. It is less than nothing. It is too foolish, too fantastic to be thought of in the twentieth century. Or is it fire and murder leaping out of the darkness at our throats, torpedoes ripping the bellies of half-awakened ships, a sunrise on a vanished naval supremacy, and an island well guarded hitherto, at last defenceless? No, it is nothing. [...] It would be a pity to be wrong. Such a mistake could only be made once – once for all.”¹⁵

“The British Navy is to us a necessity and, from some points of view, the German Navy is to them more in the nature of a luxury. Our naval power involves British existence. It is existence to us; it is expansion to them ...”¹⁶

Naval planning at this time was driven by numbers: number and speed of ships, number of guns carried, their calibre and range, numbers of departments and personnel, and so forth. It was axiomatic in those years that a fleet one third stronger than its opponent would annihilate an enemy. Britain only needed to build more ships than Germany and maintain a forty percent advantage. “Two keels for

¹³ Numbers based on: Groener, *Deutsche Kriegsschiffe*.

¹⁴ Churchill, *World Crisis*, p. 23.

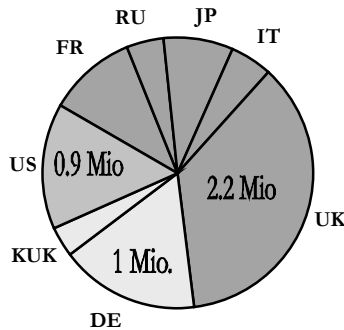
¹⁵ Churchill, *World Crisis*, p. 30.

¹⁶ Churchill, *World Crisis*, p. 61.

one” became the slogan of the British naval armament. An arms race with Germany commenced.

Tirpitz gave the axiom a different twist. As long as the Imperial Navy counted for at least two-thirds of British assets, Germany could hope to make it too dangerous for Britain to enter into a war against her. Thus, *risk-theory* was born. On the other hand, should Britain enter into a conflict with America, Russia or France then Germany would become a valuable ally or, at least, an ‘honest broker.’ Britain moved to checkmate what was perceived to be a strategic danger by looking for - and finding - agreements with her traditional enemy, France, in 1905 and with Russia in 1908. In this fashion the competing coalitions of the Great War began to take shape.

Table 2: The World Navies 1914 in Mio. BRT ¹⁷



In 1905, the British *Dreadnought* design made conventional battleships obsolete. The Admiralty in 1907 opined, “... with the introduction of the *Dreadnoughts* – a leap forward of 200% in fighting power has been effected.”¹⁸ Britain had a naval advantage and held on to it. In May, 1914 Germany’s battle force – the High Seas Fleet – deployed seventeen dreadnoughts. Great Britain had a fleet of twenty-eight of the class.¹⁹ At the Battle of Jutland sixteen German dreadnoughts faced them all. The Royal Navy in May, 1914 had warships of over 2.2 million BRT in service, Germany deployed less than half that, around one million BRT.

Britain set up a merchant blockade that stretched from Scotland across to Norway using older cruisers, effectively cutting off Germany from world trade. Conversely, for the Royal Navy’s Grand Fleet an advance into the mine, torpedo boat and submarine-infested German Bight was too risky. They could do nothing except wait for the Germans to venture out. Said Lord Beresford ruefully in 1914:

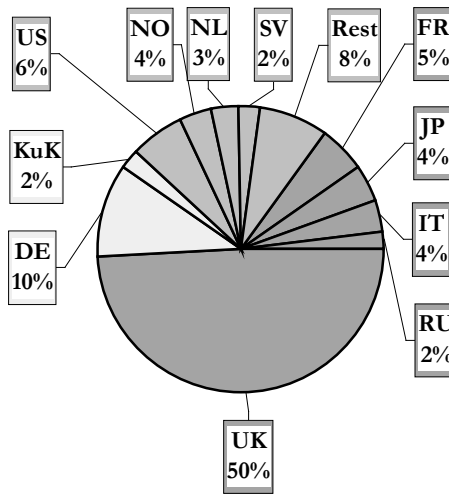
¹⁷ Nauticus, 1914, pp. 638 passim, numbers for 15 May 1914.

¹⁸ Lambert, Fisher’s Revolution, p. 136.

¹⁹ Nauticus, 1914, pp. 638 passim, numbers for 15 May 1914.

*“We are going to have a new British tradition, and a new British doctrine, that the main fleet is to remain in harbour because the fleet is in danger at sea! ... Nelson would turn in his grave...”*²⁰ But even if the German High Seas Fleet sortied: *“Georges Clemenceau once remarked that if the British destroyed the German Navy it ‘would make a nice hole in the water’ but would not win the war.”*²¹

The World Merchant Fleet 1914
Table 3: Merchant Tonnage in summer 1914²²



World merchant tonnage in the summer of 1914 was around 42.4 Million BRT. Germany’s merchant navy with 4.4 Million BRT was second only to Britain’s 20.8 Million BRT. Russia, Italy, Japan and France - the Allies - had merchant fleets totalling about 6.4M BRT. The Austro-Hungarian Empire’s merchant fleet stood at about one Million BRT. Important neutrals like the United States, Norway, Sweden, the Netherlands along with the rest of the world’s merchant fleet possessed some 9.8 Million BRT. Most of the German merchant vessels were interned at the outbreak of war in neutral countries. (Two and a half million BRT of interned German vessels were confiscated during the war and converted to serve as Allied reinforcements.)

This world merchant fleet consisted of over 22,000 vessels with more than 100 BRT. Only 8,000 ocean-going vessels from 1,600 BRT upward, resulting in 35M BRT, were the core of the oceanic merchant traffic, while the resting 14,000 vessels were used in coastal and continental waters, distributing the overseas

²⁰ Lambert, Fisher’s Revolution, p. 165

²¹ Still, Crisis, p. 77.

²² Salter, Allied Shipping Control, pp. 7-8.

imports to smaller harbours or concentrating the exports in bigger ones. Sailing vessels still made up twenty percent of ship total and around 10% of the tonnage.

The worldwide ship building capacity in 1914 was over 3.3M BRT: 1.9M BRT on British yards, and 0.38M BRT on German yards.²³ 11M BRT of merchant vessels were build in the Allied and neutral countries from 1915 to 1918, and 0.6M BRT in Germany.²⁴

Blockade perceptions

For her survival as an island nation, Britain was wholly dependent on overseas trade in raw materials and foodstuffs, along with industrial products exports. Lord Fisher did not mince words when he warned in 1903 that: *“In the month of May England has three days food in the country – in the month of September (on account of the in-gathering of the English harvest) there is three weeks food. Stop the incoming food for a week or two: what can the Army do? The country must capitulate!”*²⁵ Germany produced between seventy and eighty percent of needs domestically. In coal she was self-sufficient; supplemental iron ore came from Scandinavia via the Baltic. German industry was fully employed throughout the war, only restricted by a severe shortage of labour and also by shortages in certain rare raw materials. Britain’s hunger blockade created a slow strangulation that struck at the weak first, mostly the elderly and children. Several hundred thousands civilians died as a consequence of the blockade.

America protested strongly against the blockade but was unable to break its force. Industrial profits made a stronger claim. When British orders for arms and ammunition began to pour in, protest waned and died. Even inside the Admiralty there were contrasting views about the blockade. In the official history, a chapter had to be discarded and rewritten due to continuing legal scruples concerning the blockade.²⁶

U-boats

The surface force, the High Seas Fleet, held sway. Submarines were almost an afterthought until after the war had started. Even spectacular successes by submarines early on did not have the force to reallocate resources (or alter the mentality) that gave the High Seas Fleet supremacy in naval planning. The mindset scarcely changed throughout the conflict: the surface fleet was kept battle ready until the very last days of October, 1918.

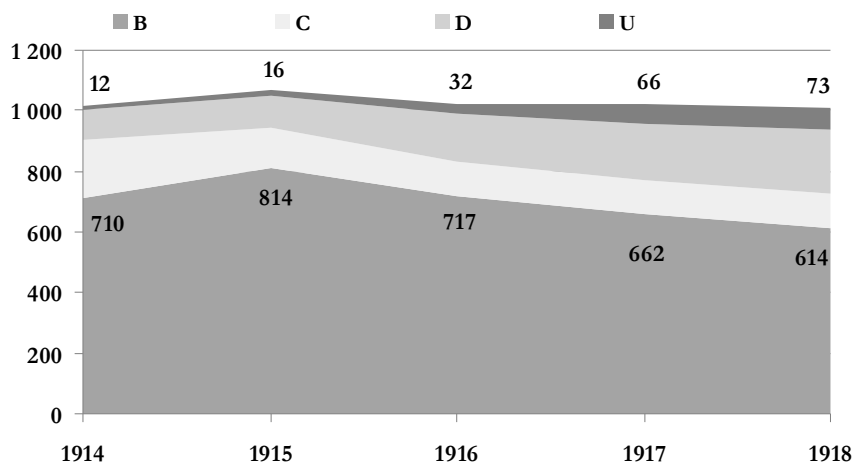
²³ Nauticus, 1914.

²⁴ Salter, Allied Shipping Control, p. 361.

²⁵ Lambert, Fisher’s Revolution, p. 88.

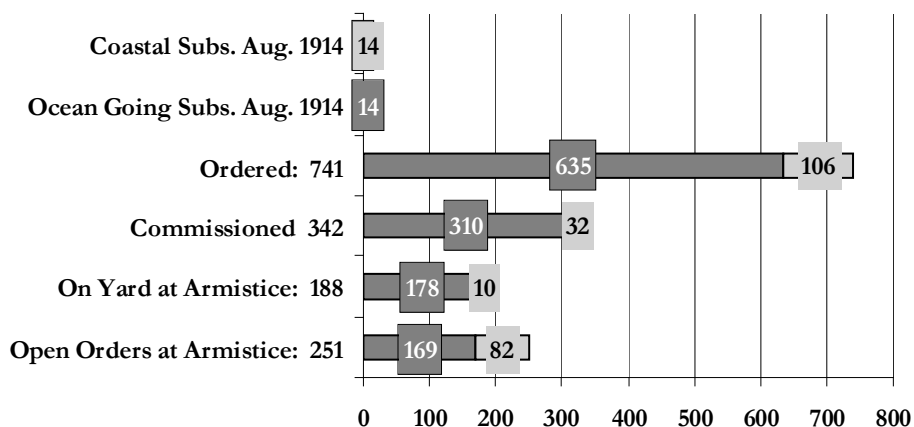
²⁶ NA, ADM 116/3424, p. 214.

Table 4: The Imperial German Navy 1914-1918 in 1,000 BRT ²⁷



Obstinacy to change may be attributed to an administrative caste system that kept naval matters in the domain of Kaiser Wilhelm, the supreme commander of the Imperial Navy. The army managed to relegate the Kaiser to a purely symbolic, honorary role. Not so the navy where His Imperial Majesty took a lively interest in and exercised power over all naval affairs from strategy to tactics.

Table 5: German Submarines 1914-1918 ²⁸



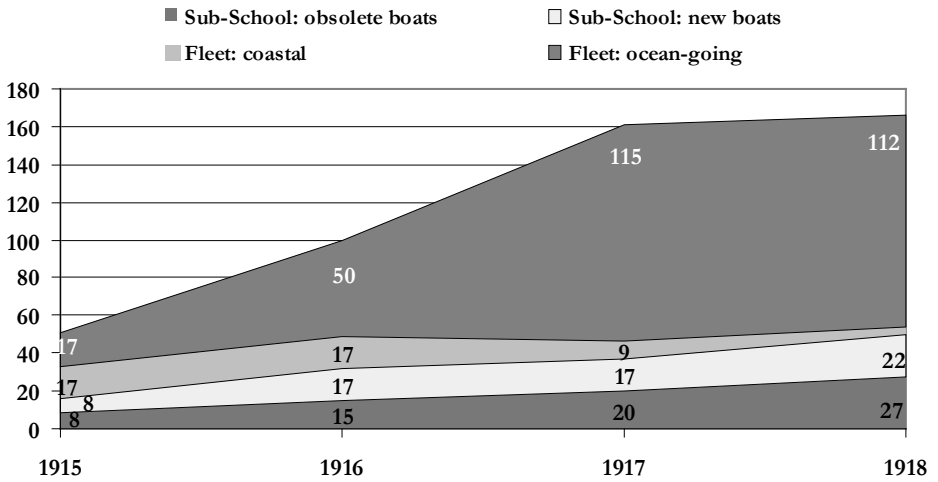
Moreover, the command structure was fragmented. The *Reichsmarineamt* (Imperial Naval Ministry) in Berlin under Tirpitz and, later, Capelle, was responsible for financing and constructing ships. The *Admiralsstab* (Admiralty Staff) under Holtzendorff in Berlin had responsibility for fleet wide strategic planning. In Kiel, the *Kommando der Hochseeflotte* (Commander, High Seas Fleet) under Scheer was

²⁷ Numbers based on: NA, HW 7/1, 2 and 3, and on: Groener, *Deutsche Kriegsschiffe*.

²⁸ Numbers based on: NA, HW 7/1, 2 and 3, and on: Groener, *Deutsche Kriegsschiffe*..

responsible for High Seas Fleet operations. Each department was independent of the others. Overall coordinating responsibility was with the Kaiser.

Table 6: German Submarines 1915-1918 ²⁹



Diesel motors became the standard means of submarine propulsion early in the 20th century. British submarines had all been diesel boats since the D-class in 1909, and in Germany all boats from *U-19* in 1913 onwards were diesel. In August, 1914 four hundred submarines were in service worldwide, mostly of the obsolete paraffin/burning type. Britain had seventy-two submarines of which seventeen were new diesel-powered ocean-going submarines. Germany had fourteen *Körting* paraffin/kerosine boats and another fourteen new diesel-powered U-boats in service.³⁰

Britain and the German submarines 1914-1918

British Naval Intelligence 1914-1918

Before the war British diplomatic naval attaches were the only sources of intelligence gathering for the Admiralty's Naval Intelligence Division (NID). In 1909, the first real Secret Services, MI5 and MI6, were created.³¹ MI5 was responsible for counter-espionage and in WWI dismantled several German espionage rings, turned around some of the spies and deceived the German Naval Intelligence with wrong messages. MI6 was responsible for espionage on the continent. And there was a remarkably effective espionage font of knowledge that

²⁹ Numbers based on: NA, HW 7/1, 2 and 3, and on: Groener, *Deutsche Kriegsschiffe*. Coastal submarines: U-4 to U-18, UB-1 to UB-17, UC-1 to UC-15.

³⁰ Blair, *Silent Victory*, pp. 33-36. Details in: Lambert, *Fisher's Revolution*.

³¹ Andrew, MI5, and Jeffery, MI6.

made sure the Royal Navy never lacked access to an up-to-the-minute information channel. MI6 had a well-placed German spy in the form of a disgruntled and avaricious *Marineingenieur*, Dr. Karl Krüger. Krüger regularly delivered a trove of accurate intelligence from the earliest days of the war. He made nearly monthly reports throughout the war with details on the prevailing situation in all German yards, in addition to the state of civil and military shipbuilding. In March 1917 he delivered his masterpiece: the exact numbers of the submarine construction program.³²

From the beginning of the war, a chain of direction finding (D/F) stations in Britain and, later, in the Mediterranean roughly determined the position of German warships whenever they used wireless transmissions (W/T). The positioning was imprecise, accurate only within a 5–50 mile radius, but that was enough to give the Royal Navy a tactical advantage.

A new period of intelligence gathering followed the capture of the cruiser *Magdeburg*'s codebooks by the Russians in the Baltic. The Admiralty received one of the codebooks³³ and was able to decipher all W/T messages from October, 1914 onwards. Hyper-secret Room 40 (established by Churchill and Admiral John Fisher) was the hub of the transcription effort. In due course, cryptographers working here mastered the art of deciphering German W/T from throughout the war area. In this way, the Admiralty pieced together a highly accurate picture about Imperial submarines:³⁴ “*As soon as a U-boat began to operate in our waters, her presence and her position were known, as a rule, first vaguely by wireless or other information, and then in some detail a day or two later when attacks were reported or when survivors from sunk ships had been landed and questioned.*”³⁵

Message traffic to U-boats from Germany (Sender Nauen transmitter) or Austrian bases (Pola transmitter) were received simultaneously by all submarines at sea and the Royal Navy. The range of normal W/T by ocean-going submarines was several hundred miles. In the Atlantic, the boats rigged a W/T mast on deck to be able to send and receive messages. Rigging antenna put the boat at risk in a diving emergency. As long as the submarine was in normal W/T range its position was sent every four hours. Returning from a cruise in the Atlantic a more fulsome report was delivered, including lists of ships sunk and other important news. Flanders-based submarines rarely employed W/T. In the Mediterranean its use was routine. D/F and systematic deciphering reached the Mediterranean in 1917.

Although submarine commanders knew that D/F could roughly identify their position they never suspected any kind of a systematic deciphering of their message

³² Jeffery, MI6, pp. 83-85. TR/16 was active from November, 1914 to the summer of 1939, when he was dismantled by the German Abwehr. The fifty-plus war-time reports are in Kew: ADM 223/637. In his masterpiece from 22.03.1917 he gave a number of 15 submarines constructed monthly. The information made its way up directly to War Cabinet level: CAB 24/8, pp. 328-329 from 24.03.1917).

³³ NA, ADM 137/4156, the original *Magdeburg*-codebook.

³⁴ Patrick Beesely, Room 40.

³⁵ NA, ADM 116/3421, p. 298.

traffic by the Royal Navy. This fact was obscured until the 1980s, when Britain made the information public.

German diplomatic traffic was also deciphered and gave insight into strategy and tactics. The most famous example is Zimmermann-telegram, in 1917. As Britain had cut the undersea telegraphic cables at the beginning of the war, Germany had to look for another way to communicate with its embassies in neutral countries. Sweden transferred classified German diplomatic traffic as its own over the Scandinavian cable network. But as London was the central hub for all European cable networks and as nearly all networks were run by British companies, this “Swedish-German line” was detected early and the messages deciphered with the aid of the captured naval codes. The same thing happened to the W/T traffic from Nauen to German embassies in Spain and the United States. Secret actions like the shipping of wolfram ore from Spain to Germany by submarines, or the landing of Sir Roger Casement in Ireland and other clandestine actions were discovered in this way.

Other intelligence sources included some eight hundred submarine officers and men who had become prisoners of war. They were a rich source of intelligence about the tactics, the state of the German fleet, the status of shipbuilding, training programs and other details affecting the Imperial Navy. Because the war played out mostly in the relatively shallow coastal waters around the British Isles, sunken submarines could be raised for close technical examination or inspected *in situ* by divers. In this way, additional codebooks and a detailed knowledge of U-boat design was obtained.

The Admiralty knew the numbers of submarines in service, their bases and tactical units, the deployment schedule, crew morale and how many new submarine orders had been placed. Unfortunately due to tortuously slow intelligence dissemination, commanders at sea got little benefit. Often, twelve or more hours elapsed before destroyers arrived at a location where a U-boat had last been spotted.³⁶ Consequently, only a handful of submarines were sunk as direct consequence of deciphered W/T or D/F.³⁷ Deciphering played a more important part in 1917/18 when it helped to redirect convoys from identified submarine positions.

Aircraft support was equally ineffective. Aircraft were slow, relatively scarce and had a limited range. Anti-submarine surface ships were equipped with an imprecise a passive noise detection device, the hydrophone. Depth charges first came into use in 1915/1916. In the first two war years, deck gunnery and ramming were the chief submarine killers. Admiral Beatty could not have been more succinct when he summed up the dilemma as “*looking for a needle in a bundle of hay, and, when you have found it, trying to strike it with another needle.*”³⁸

³⁶ Calculation example from: NA, ADM 116/3421, pp. 297- 298.

³⁷ For an example see the story of *U-154* in this book.

Lessons Learned: British intelligence

Insiders were not blind to the system's deficiencies. They were quite conscious that precious time was being lost in the process from deciphering to analysis to reaching the front, and that coordination between the army and navy never mind other intelligence branches, was severely wanting. Assigning blame reached a peak in the summer of 1916 when Room 40 deciphered German naval messages during the running Battle of Jutland a scant few minutes after they had been sent, but could not expeditiously pass them on to Admiral Jellicoe. It has been argued that the intelligence failure denied him the opportunity to annihilate the High Seas Fleet. The battle outcome was inconclusive. The Germans escaped. Reorganisation of Room 40 followed, but it was not before 1918 that the system worked to the satisfaction of its staff and the benefit of the Royal Navy.

German submarine warfare 1914-1918

Table 7: U-boat merchant war 1915-1918, North Sea and Atlantic ³⁹

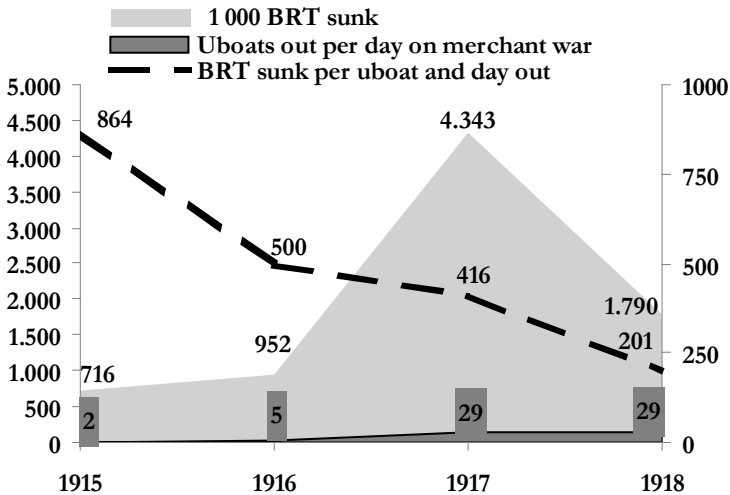


Table 7 presents somewhat of an enigma. For the North Sea and Atlantic in 1915, an average of two German ocean-going submarines per day patrolled off the British Isles with the mission to seek out and destroy merchant shipping. The “BRT sunk” numbers show that in 1915 merchant vessels amounting to 716 000 BRT were sunk by submarines in the North Sea and Atlantic. Per boat on cruise this makes a daily average of 864 BRT sunk.

³⁸ Halpern, *Naval History*, p. 367.

³⁹ Numbers based on: NA, HW 7/3; on: NA/ADM 137/3921; on: NA, ADM 137/4817; on: NA, ADM 137/4814; on: NA, ADM 1/8509/1; on: Spindler, *Handelskrieg*; on: Bendler, *UB- und UC-Boote*.

Total sinkings in the North Sea and Atlantic rose from 716,000 BRT in 1915 to 1,789,000 BRT in 1918. In 1915 an average of two boats daily deployed in the North Sea and Atlantic. In 1917 and 1918 there were twenty-nine boats out daily. The sinkings per boat fell from 864 BRT in 1915 to 201 BRT in 1918. In short, more boats resulted in less sinkings.

The whole submarine merchant war in more detailed numbers:

Table 8: U-boat merchant war 1915-1918 ⁴⁰

	North Sea + Atlantic				Mediterranean			
	U-boats out per day merchant war	BRT sunk total	torpedoes w/o warning	per Uboat and day out	U-boats out per day merchant war	BRT sunk total	torpedoes w/o warning	per Uboat and day out
1915	2	715 997	36 %	864	1	344 732	26 %	1,041
1916	5	951 613	19 %	500	4	886 372	39 %	648
1917	29	4 343 055	67 %	416	10	1 135 288	77 %	323
1918	29	1 789 919	85 %	201	9	703 166	96 %	247
		7 800 584				3 069 558		

Statistics for submarines in the Mediterranean are treated separately from the Atlantic because in both theatres Germany pursued different objectives: in the Mediterranean they fought a general war against the world merchant fleet without any specific focus in time or place. Most ships sunk there were Italian or French, bound for Mediterranean ports. This affected England only indirectly. In the Atlantic, however, it was tried in three phases of unrestricted submarine warfare with the object of strangling Britain by sinking all ships bound to or from there, British, Allied or Neutral.

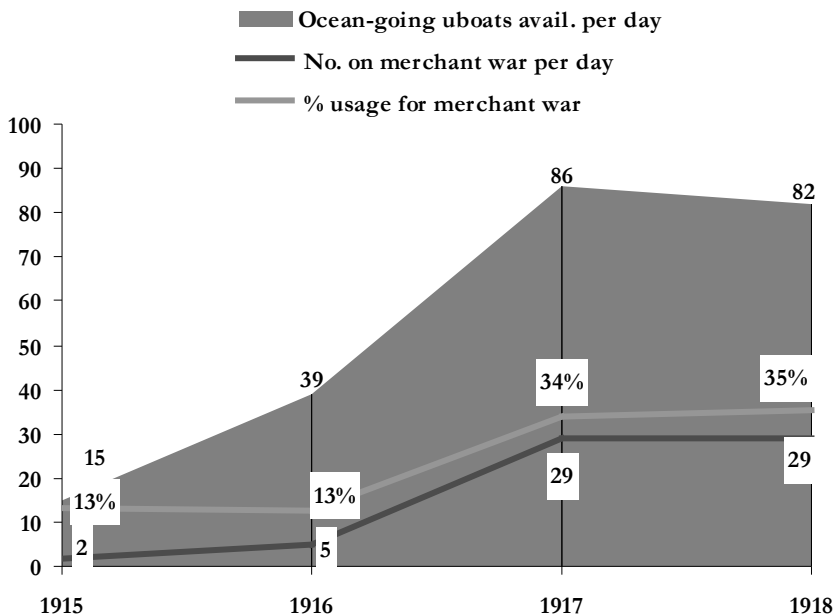
We see a general increase in the percentage of sinkings without warning. In 1917 two-thirds of the tonnage was sunk without warning, in 1918 nearly all shipping was sunk without warning. The method has significance. Unrestricted warfare applies if the vessel was attacked without warning. Restricted warfare means that the target was stopped by verbal order, signal, by warning shots or a combination of all three; neutrals were identified; ships' papers were examined and the cargo was inspected for contraband. Thus, cruiser rules for the taking of prizes were in force and destruction of the merchant vessel was done *after* all personnel were safely evacuated and their passenger and crew supplied with the means and direction for making a safe landing ashore. Only armed merchant ships were allowed to be sunk warningless.

The sinking rate decreased generally in both theatres. In fact, during the second half of the war sinkings declined from about 500 BRT per day to approximately 200 BRT. Analysts in Room 40 commented on the drop: *"The average destruction per boat at that time (second half of 1916) worked out at 17,000 tons per trip.*

⁴⁰ Numbers based on: NA, HW 7/3; on: NA/ADM 137/3921; on: NA, ADM 137/4817; on: NA, ADM 137/4814; on: NA, ADM 1/8509/1; on: Spindler, Handelskrieg; on: Bendler, UB- und UC-Boote.

During the first months of 1917, the figure was 14,000 tons, and from August onwards fell to 9,000 tons per boat per trip.”⁴¹

Table 9: Ocean-going U-boats available 1915-1918, North-Sea and Atlantic ⁴²



Tables 9 and 10 examine ocean-going submarine from *U-19*, *UB-18* and *UC-16* onwards. Coastal boats of the type *UC-I*, *UB-I*, and *U-5* to *U-18* - some forty-six units - contributed a modest 0,2M BRT to the overall total of twelve million BRT ships sunk. Their range topped at a modest 750-2,000 nautical miles, effectively restricting patrols to a few days and making them totally unsuited for the Atlantic. Further, the old petroleum boats *U-5* to *U-18* needed long, dangerous minutes of preparation time in the event of an emergency crash dive. Soon enough, all were either sunk or relegated to the submarine school. The *UB-I* class carried two torpedoes; the *UC-Is* had no torpedoes, carried mines and could man a machine gun. Carrier pigeon was the sole means of communication. With a maximum surface speed of six knots the type could overtake sailing ships caught in a weak wind or in irons. Most of their sinkings were the result of luck. Their operational area was the North Sea, the Baltic and the eastern Channel. These boats are included in the tables that address sinkings, not in tables about ocean-going boats.

In 1915, the number of ocean-going boats in service in the North Sea and Atlantic throughout the year was fifteen. In the annual average there were two

⁴¹ NA, HW 7/2, pp. 447, 448.

⁴² Numbers based on: NA, HW 7/3; on: Spindler, Handelskrieg; on: Bendler, UB- und UC-Boote.

boats out daily on merchant war cruises. The number of deployable ocean-going boats was low, reflecting their modest fifteen percent average usage in the merchant war.

In 1916, the number of available ocean-going boats in the North Sea and Atlantic had more than doubled, but relative usage in the merchant war was less than in the year prior (13%). Most available submarines were used for military purposes, like scouting enterprises against the Grand Fleet in the North Sea. Until the summer of 1917 a small number of ocean-going submarines were on patrol in the Baltic and the Black Sea, operating against the Russian Fleet. 1917 and 1918 are the pivotal years of the submarine merchant war in the North Sea and Atlantic, when a high number of ocean-going boats were made available and their percentile usage had more than doubled to 33% and 36% respectively.

Table 10: Ocean-going U-boats available 1915-1918 ⁴³

	North Sea + Atlantic				Mediterranean			
	Ocean-going U-boats avail. per day	Used on military patrols per day	Used on merchant war per day	Avail. U-boats used on merchant war	Ocean-going U-boats avail. per day	Used on military patrols per day	Used on merchant war per day	Avail. U-boats used on merchant war
1915	15	1	2	15%	2		1	37%
1916	39	6	5	13%	12	1	4	31%
1917	86	3	29	33%	30		10	32%
1918	82	1	29	36%	32	1	9	29%

The Mediterranean saw a steady upward tick of available boats along with a commensurate increase in targeting merchant traffic. From 1916 onwards more than a quarter of the German ocean-going submarine force was stationed in the Mediterranean Sea.

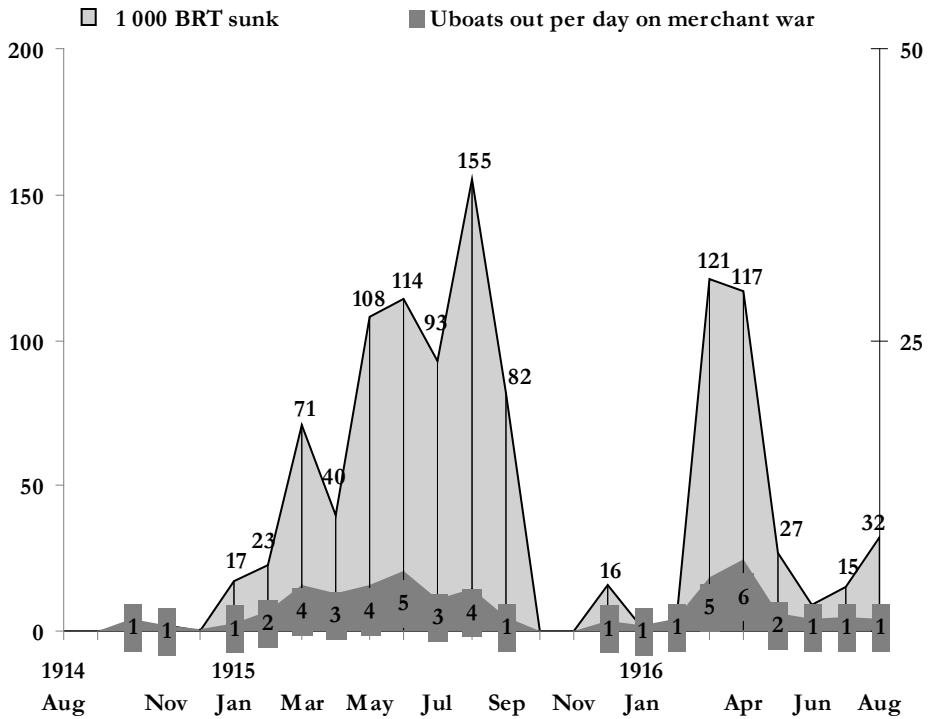
German Submarine Warfare 1915

The daily average of submarines on merchant war cruise in the North Sea and Atlantic for 1915 is a modest spread of zero to six boats. In fact, it appears that the merchant war was suspended for a period of several months. During the first unrestricted submarine warfare period in 1915, March to September, there were never more than half a dozen boats at sea at any one time. When the eight- to ten-day transit time to and from North Sea bases is taken into account, during a routine patrol of about five weeks there were never more than four boats operating in the Atlantic. The hunting was meagre. Practically the only exceptions were the sinking of the passenger liners *Lusitania* in May and *Arabic* in September. Pyrrhic victories, both. They brought Germany instant, sharp censure from President Wilson and catastrophic loss of American public support. Unrestricted warfare was suspended at once and stopped altogether in September. The sinkings had done incalculable

⁴³ Numbers based on: NA, HW 7/3; on: Spindler, Handelskrieg; on: Bendler, UB- und UC-Boote.

damage to Germany's image and, internally, many senior Imperial Navy officers had also raised serious doubts.

**Table 11: U-boat merchant war Aug. 1914 - Aug. 1916,
North Sea and Atlantic ⁴⁴**



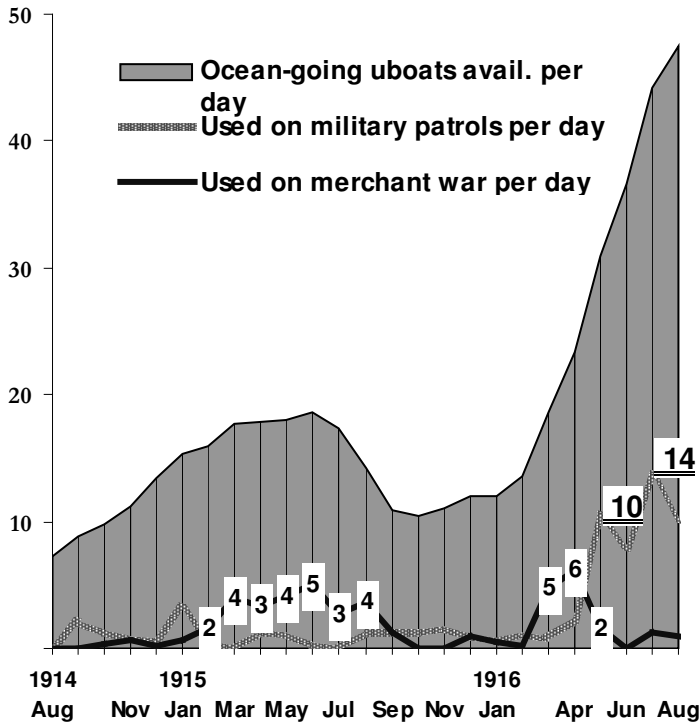
Further along in 1915, unrestrictive warfare cruises did not increase the number of sinkings. An able commander with his well-trained crew, a good boat, good weather and visibility and a bit of luck could still produce a creditable record under the old rules.⁴⁵

Between the end of September, 1915 and the beginning of the next unrestricted submarine war period in March, 1916 there was only one submarine deployed on merchant war cruise in the Atlantic, *U-24* from 16 December 1915 to 4 January 1916. Under prize rules she sank four steamers of 14,000 BRT. The score amounts to a daily average of 700 BRT. *UB-10* sank two sailing vessels in the Channel (but without warning), which completed the sinking results for December, 1915 to 15,670 BRT.

⁴⁴ Numbers based on: NA, HW 7/3; on: NA/ADM 137/3921; on: NA, ADM 137/4817; on: NA, ADM 137/4814; on: NA, ADM 1/8509/1; on: Spindler, Handelskrieg; on: Bendler, UB- und UC-Boote.

⁴⁵ Stegemann, *U-Boot-Krieg*, pp. 337-338 arrives at the same conclusion.

Table 12: Ocean-going U-boats available Aug. 1914 - Aug. 1916, North Sea and Atlantic ⁴⁶



In the Atlantic, outside the unrestricted merchant war phase, submarine usage was somewhere between zero to eleven percent of their availability. The number climbed to sixteen percent and to twenty-eight percent during the period of unrestricted submarine warfare, but lags behind submarine activity in the Mediterranean. It seems that the war against merchant ships in the Atlantic did not feature large in High Seas Fleet Command thinking. There were always a number of boats held back in reserve ready to be used as scouts against the Grand Fleet. By contrast, boats in the Mediterranean were exploited up to the limits of their availability throughout the war. The number of ocean-going boats did not increase significantly in 1915: in January there were fifteen and four more were added in December

Note: The data offered here is based on daily entries for submarines in the yards and on cruise, and ships sunk per day rounded *down* per aggregated period.⁴⁷ For example, the precise number of submarines on merchant war cruise in the Atlantic in May, 1915 is “4.74”, but is presented in this table as a rounded “4”.

⁴⁶ Numbers based on: NA, HW 7/3; on: Spindler, Handelskrieg; on: Bendler, UB- und UC-Boote.

⁴⁷ Minor differences between the tables occur because rounding results differ per period. See chapter “September 1917”, pp. 450 and 453 for other examples of detailed daily data on submarines on cruise and ships sunk, for a complete month.

On a typical day like 7 May 1915, the following ocean-going submarines were in the Atlantic on merchant war cruises:

- *U-9* off the East coast of England
- *U-20* off the Irish south coast
- *U-27* third day out somewhere in the northern North Sea
- *U-30* returning from a cruise in the Atlantic, two days before reaching base
- *U-36* between Scotland and Norway
- *U-39* off the Scottish coast

U-26 was on patrol against the Russians in the Baltic.

Merchant ships sunk:

- *Lusitania*, 30,396 BRT, passenger steamer, torpedoed without warning by *U-20*; 1,198 dead.
- *Bennington*, fishing vessel of 131 BRT, sunk by gunfire by *U-39* according to prize rules, no losses.

Such was a typical day during the first unrestricted war phase in 1915, when four submarines cruised the British Isles. U-boats were not yet viewed as a deadly menace. Their presence was virtually dismissed as a German propaganda bogymen to distraction attention away from the failure of the battleship fleet.

German Submarine Warfare 1916

Almost two years into the war, the army had become around to supporting unrestricted warfare. “[*Chief of Staff, Erich von Falkenhayn, said in Mid April, 1916*] that the recent results would let it be presumed, that unrestricted submarine warfare causes eight to ten times more sinkings, and that he feels absolutely sure England would finally be ready for peace within three months.”⁴⁸

The army actually did not depend on navy numbers.⁴⁹ In fact, the navy used published sinking numbers to gain public support for unrestricted submarine warfare by presenting the submarine as a *Wunderwaffe*. Pressure on the government grew immensely. Reasonable statesmen like Bethmann-Hollweg, opposed to unrestricted submarine war, were publicly vilified as “*English allies*.” In fact, exaggeration had obscured the truth. Out where the war was being prosecuted in 1916 there were no sinkings in October followed by a modest 226 BRT score in November and a heftier 15,000 BRT by *U-24* and *UB-10* in December. By January of the following year eight small fishing vessels by *UB-6*, *UB-16*, and *UB-17* in the North Sea; one lone steamer of 1,058 BRT by *UB-18* in the Channel chalked up a combined total of 1,447 BRT for the month. In February, 1916 three fishing

⁴⁸ Afflerbach, Falkenhayn, p. 392: Treutler to Chancellor Bethmann-Hollweg regarding a discussion with Falkenhayn on or before 14 April 1916. Translation by the editor.

⁴⁹ It has been argued that Falkenhayn hoped to use the suspension of unrestricted warfare to exonerate the army in the event the battle of Verdun did not end in his favour. Failure in the field would be attributed to the unhindered resupply of British ammunition transports for the French Army. It is an interesting rumour, only.

vessels were sunk by *UB-12*; and *UB-2* got a steamer of 672 BRT in the North Sea, making it a total of 765 BRT for February.

These were the modest results of coastal patrols by Flanders based UB-boats within five months (except for *U-24*). The only High Seas Fleet submarines out in the first two months of 1916 were *U-44*, *U-32*, *U-70* and *U-22*, all on military patrol against the Grand Fleet in the North Sea.

For five whole months there was no concerted merchant war at all in the Atlantic. The sinking of some small fishing vessels and coastal steamers seemed to have been the basis for Falkenhayn's calculations, and perhaps also stirred the German public to support the notion "*that unrestricted submarine warfare causes eight to ten times more sinkings.*"

Holtzendorff, Chief of the Admiralty Staff, joined the chorus when he declared that by 1 March, 1916 "*enough U-boats would be available for a submarine campaign against Great Britain which, if conducted without restrictions, would induce the British to make peace within four months.*"⁵⁰

In light of the twenty-six ocean-going boats available in March, 1916 with an average of six or seven on cruise per day the pronouncement was, at best, wishful thinking. Less than thirty percent of available boats were on Atlantic merchant war cruises, and the Mediterranean suffered from insufficient dockyard capabilities for repair and maintenance. In April a passenger liner, *Sussex*, was torpedoed without warning. Among the casualties were American citizens. Again, American protests made it clear that resumption of unrestricted submarine warfare threatened a very high price, likely even war with the United States.

The Submarines of the High Seas Fleet, May to October 1916

The merchant campaign stopped at the end of April at the directed of Admiral Scheer, the new Commander of the High Seas Fleet, despite resistance from the Admiralty. However, ocean-going submarines based in the North Sea were now dedicated exclusively for military patrols, scouting the North Sea for the British Grand Fleet. Only Mediterranean boats continued to prosecute restricted submarine warfare.

What was behind Scheer's 'merchant war strike'? Consider his situation: costly dreadnoughts of the High Seas Fleet were not quite a match for British Grand Fleet supremacy. The navy was challenged by the army to do more to support the war effort. Indeed, soldiers mocked the fleet with, "*Lieb Vaterland magst ruhig sein, die Flotte schlaeft im Hafen ein.*" ("Dear Fatherland rest calmly the fleet sleeps safely in port.") If the war ended with a German Army victory, naval budgets on the pre-war scale were unlikely to be approved by the Reichstag. In such a grim environment it was perhaps better to risk a great battle than financial asphyxiation at some later date. Tactics were developed to give the Imperial Navy an edge

⁵⁰ Birnbaum, *Peace Moves and U-boat Warfare*, p. 56, memo Holtzendorff to chancellor Bethmann-Hollweg, 4 Jan. 1916.

against its Grand Fleet foe. Planners projected that the Royal Navy's battlecruisers would sortie hours in advance of the Grand Fleet. U-boats would scout naval bases to report cruiser departures and possibly make some kills of their own.

Battlecruisers were not heavy cruisers. In fact, they were a variant of the dreadnought but with less armour and fewer guns and more speed. Size and construction cost were the same as for a dreadnought battleship. In the High Seas Fleet and Grand Fleet battlecruisers served as an advance guard of the battle fleet and were integral to the line of battle. Churchill called battlecruisers the "*strategic cavalry of the Royal Navy*".⁵¹ Freiherr von Spiegel, U-32, reported on the morning of May 31, 1916 the day of the Battle of Jutland:

*"At the time I was lying off May Island, and reported to the German Fleet the departure of the British Light Cruiser Squadrons. Another German submarine sighted the Battle Squadron coming down from Scapa Flow; this was also reported to the German Fleet. The German Admiral worked the distance both fleets had travelled, and calculated that he would be able to engage the Light Cruiser Squadron four hours before the Battle Fleet arrived."*⁵²

"The British light cruiser squadrons" were Beatty's battlecruisers running out from the Firth of Forth, passing U-32. Beatty made contact with the German battlecruisers in the afternoon, and then with the rest of the High Seas Fleet. In the ensuing engagement, Scheer sank three battlecruisers. She had made the most of his limited options but decided to withdraw his forces and proceeded to Wilhelmshaven on the morning of June 1, leaving the Royal Navy in control of the blockade of Germany. Despite alarming casualties, especially on the British side, the battle had not altered the strategic stalemate one whit. An American reporter wryly commented '*The German Fleet has assaulted its jailor but it is still in jail.*'⁵³

In a subsequent memorandum to the Kaiser, Scheer confessed the inferiority of the High Seas Fleet and requested priority for the submarine merchant war as the only means of beating the English at sea. Response came in the fullness of time. It took months and another sortie of the High Seas Fleet in August – again, supported by U-boats - before the submarine merchant war in the North would be taken up gain.

In summary, Scheer stopped the submarine merchant war in the Atlantic from May to mid-September, 1916 for the very great gamble of a victorious High Seas Fleet. It is tempting to speculate that instead of siphoning away his assets in pursuit of a grand scheme, the deployment of all available U-boats in the North Sea would have cost the Allies at least one million BRT in lost assets⁵⁴ which might have been enough to topple Britain in the spring of 1917, either on terms favourable to German or as an outright victory.

⁵¹ Churchill, *World Crisis*, p. 57.

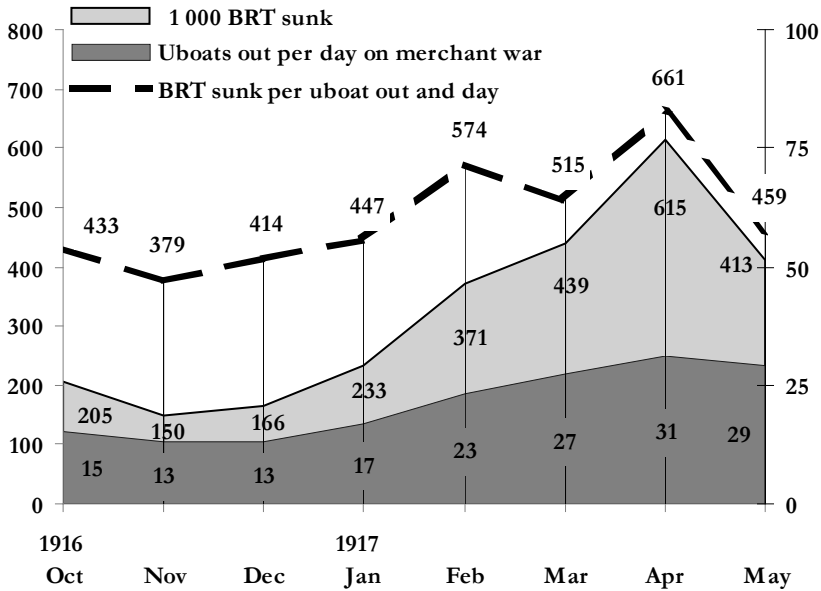
⁵² NA, ADM 137/3872, Prisoner of War Freiherr von Spiegel, here printed on page 382.

⁵³ Kennedy, *Rise and Fall of British Naval Mastery*, p. 246.

⁵⁴ The number here is based on 25% cruise activity and 600 BRT sunk per boat and day at sea. Halpern, p. 309 gives 1.6 million BRT possible sinkings for this period.

Restricted and Unrestricted Submarine Warfare 1916 and 1917

Table 13: U-boat merchant war Sep. 1916 – Sep. 1917,
North Sea and Atlantic ⁵⁵



In this table we compare two aspects of the submarine merchant war: the restricted phase lasting from October, 1916 to January, 1917 and the third unrestricted submarine war beginning in February, 1917 in the North Sea and Atlantic.

Total tonnage sunk in the unrestricted merchant campaign was significantly higher because:

- The total number of deployed submarines was higher (around thirty daily);
- There were more targets in the unrestricted merchant war. All neutral shipping in the war zone could now be sunk, whether or not there was contraband aboard. Neutral shipping made up around 20-30% of the traffic around the British Isles. In restricted warfare all neutral ships without contraband on board were permitted to pass unmolested.

⁵⁵ Numbers based on: NA, HW 7/3; NA/ADM 137/3921; NA, ADM 137/4817; NA, ADM 137/4814; NA, ADM 1/8509/1; Spindler, Handelskrieg; Bendler, UB- und UC-Boote.

Table 14: U-boat merchant war Sep. 1916 to Sep. 1917 ⁵⁶

	North Sea+Atlantic				Mediterranean			
	U-boats out on merch. war per day	BRT sunk			U-boats out on merch. war per day	BRT sunk		
		Total	torpe- doed w/o warning	per U- boat and day out		Total	torpe- doed w/o warning	per U- boat and day out
1916 Sep	5	110 194	2 %	672	3	90 315	30 %	951
Oct	15	205 142	10 %	433	6	105 473	68 %	583
Nov	13	149 403	7 %	379	8	89 944	59 %	358
Dec	13	166 093	9 %	414	8	108 400	83 %	437
1917 Jan	17	232 642	13 %	447	4	58 720	81 %	485
Feb	23	371 065	47 %	574	8	98 606	68 %	463
Mar	27	438 426	64 %	515	8	53 288	84 %	212
Apr	31	615 338	60 %	661	11	193 869	72 %	602
May	29	412 513	61 %	459	11	125 994	64 %	358
Jun	34	507 925	74 %	493	12	109 768	56 %	311
Jul	31	424 878	76 %	443	8	62 750	82 %	254
Aug	30	390 689	81 %	417	10	54 977	73 %	186
Sep	35	257 083	72 %	245	12	63 919	83 %	183

*Grey=Unrestricted Submarine Warfare

The percentage of tonnage sunk without warning grew immensely from around 10% in the restricted to 60-80% in the unrestricted phase. In the four months of restricted warfare, October, 1916 – January, 1917, the average sinking rate in North Sea and Atlantic was around 418 BRT per boat and day. In the first four months of the restricted phase the daily tonnage sunk increased by 25% to 552 BRT.

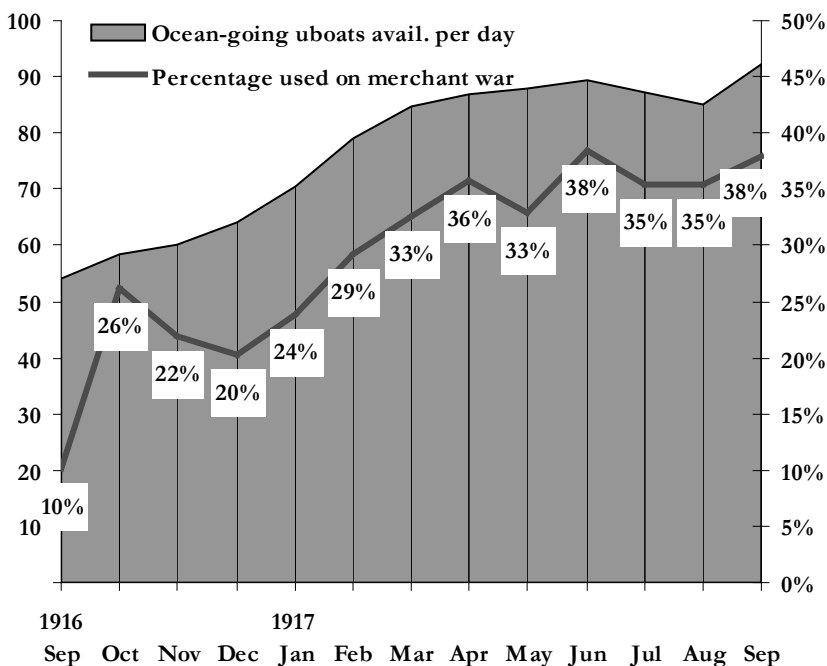
Likewise, in the Mediterranean there was no correlation between the amount of tonnage sunk per day and the manner of sinking, *i.e.* with or without warning. The numbers vary wildly depending on the submarine commander, his crews, the boat, weather and fortune.⁵⁷ To illustrate, we need only compare September, 1916 with the same month a year later.

With the increase of deployed boats and targets from February 1917 on, there is no jump in the tonnage sunk in the Atlantic.

⁵⁶ Numbers based on: NA, HW 7/3; NA/ADM 137/3921; NA, ADM 137/4817; NA, ADM 137/4814; NA, ADM 1/8509/1; Spindler, Handelskrieg; Bendler, UB- und UC-Boote.

⁵⁷ See also for this: Schröder, *Uboote des Kaisers*, pages 325-329.

Table 15: Ocean-Going U-boats available Sep. 1916 - Sep. 1917, North Sea and Atlantic ⁵⁸



The number of boats in service grew from fifty-eight in October, 1916 to ninety-two in September, 1917. On an average daily basis, around fifteen U-boats operated in the restricted period and thirty boats were in the unrestricted war. No boats were held in reserve to support the High Seas Fleet in 1917 when the unrestricted campaign commenced. In 1916, around 25% of the available boats were on cruise, in 1917 used boats jumped to more than 35%.

Why restricted submarine war in October 1916?

High Seas Fleet commanders opposed restricted submarine measures in the summer of 1916. By early autumn, Captain Karl Bartenbach, chief of the Flanders based submarine flotillas, pressed for its resumption. From the middle of September the Flanders and High Seas Fleet submarine force resumed the commercial war in accordance with the rules of cruiser warfare.⁵⁹ This worked well for the next four and a half months. There were no new, distracting diplomatic problems and the tempo of merchant vessel sinkings around the British Isles was high. This was proof that restricted submarine warfare was tactically and strategically successful.

⁵⁸ Numbers based on: NA, HW 7/3; Spindler, Handelskrieg; and Bendler, UB- und UC-Boote.

⁵⁹ Birnbaum, *Peace Moves and U-boat Warfare*, pp. 201+202.

Why unrestricted submarine war in February, 1917?

But why risk a break with America by unrestricted submarine warfare, why not continue with restricted war?

Historian Karl Birnbaum characterized the brief period of decision-making in Germany between December, 1916 and January, 1917 as a “*a race between peace and unrestricted warfare.*”⁶⁰ At the end of 1916, President Woodrow Wilson tried to mediate a peace between the Allies and Germany. The U.S.’s diplomatic negotiations with Germany were intense. Germany’s Ambassador in Washington, Count Johann Heinrich von Bernstorff, was hopeful that Wilson would commence mediation efforts within a matter of weeks.

In Germany, socialist workers and the liberal minority of the middle-class supported an end to the war via negotiations (*Verständigungsfrieden*). They wanted something on the lines of a *status quo ante bellum*. Ultra-conservative reaction among in the army and the senior bureaucracy, Pan-German naval officers, industrialists and the predominantly right of center middle-class, sought an end to the war through military victory and a German-directed peace (*Siegfrieden*). The key to their ambitions lay with U-boats loosed to pursue unrestricted submarine warfare. Better to play *va banque*, all or nothing, in a single decisive action. The U-boat would win the war.

*“In his letter [of 22 Dec. 1916 to Hindenburg and Ludendorff, Admiral Holtzendorff] maintained that by means of unrestricted U-boat warfare Great Britain could be compelled to sue for peace within five months [...].”*⁶¹

It was reckoned that five or six months was all that was needed to decisively swing the balance in Germany’s favour.

Moreover, some well-respected military authorities like Admiral von Capelle - Tirpitz’s successor – voiced almost delusional points of view. Von Capelle told the Reichstag on February 1, 1917: “*From a military point of view I rate the effect of America coming on the side of our enemies as nil.*”⁶² Not to be outdone in bluster, Admiral Holtzendorff swore that no American soldier would ever set foot on the European continent.⁶³

Besides decimating the enemy the Navy considered unrestricted submarine warfare to be a deterrent to neutral shipping (Norway, Sweden, Denmark, Holland et al), further strangling Britain’s sea-borne lifelines by as much as 30% percent.⁶⁴ Victory was anticipated within months. Opponents of unrestricted war (Bethmann-Hollweg and even the Kaiser had serious misgivings), were simply swept away in a tsunami of hope and numbers.⁶⁵

⁶⁰ Ibid. p. VIII.

⁶¹ Birnbaum, *Peace Moves and U-boat Warfare*, p. 277.

⁶² Schröder, *Uboote des Kaisers*, p. 208

⁶³ Ibid. p. 307.

⁶⁴ Birnbaum, *Peace Moves and U-boat Warfare*, p. 278.

⁶⁵ Ibid. p. 286.

Imperial Navy optimism was not entirely ill-founded.

Initial success in Spring 1917

Recognition of submarine effectiveness could also be found in Britain. In October, 1916 when restricted submarine warfare resumed, Jellicoe wrote to the Admiralty that there was “*a serious danger that our losses in merchant ships, combined with the losses in neutral merchant ships, may by the early summer of 1917, have such a serious effect upon the import of food and other necessaries into the allied countries, as to force us into accepting peace terms which the military position on the Continent would not justify, and which would fall far short of our desires.*”⁶⁶ In November, 1916 the Admiralty informed His Majesty’s government of the U-boat menace that “*No conclusive answer has as yet been found to this form of warfare; perhaps no conclusive answer ever will be found. We must for the present be content with palliation.*”⁶⁷ The alarm heightened in April, 1917: “*In a single fortnight in April, 122 ocean-going vessels were lost. The rate of British loss in ocean-going tonnage during this fortnight was equivalent to an average round-voyage loss of 25% percent – one out of every four ships leaving the United Kingdom for an overseas voyage was lost before its return. The continuance [at] this rate . . . would have brought disaster upon all Allied campaigns, and might well have involved an unconditional surrender.*”⁶⁸ Admiral Lord Fisher was prompted to ask “*Can the Army win the war before the Navy loses it?*”⁶⁹

Churchill recorded a conversation between American Admiral Sims and Admiral Jellicoe:

Sims: “*It looks as though the Germans [are] winning*”

Jellicoe: “*They will win, unless we can stop these losses – and stop them soon.*”⁷⁰

The threat extended to the Grand Fleet: “*By the outbreak of the war in 1914, 45% percent of the British fleet burned oil, including nearly all the destroyers. The British Navy’s monthly oil requirement jumped from 80,500 tons in January, 1915 to 190,000 two years later. . . Tanker losses to U-boats further lowered the oil supply. ‘As demands went up, tankers went down.’ Fuel oil stores were so low in February, 1917 that Lord Curzon admitted, ‘the Fleet had to restrict its exercises.’ In June, the Commander-in-Chief, Grand Fleet, was informed that the oil situation was ‘most critical’, that all oil-burning vessels ‘except in great emergency were to be limited to three-fifths power.’ In July, British foreign secretary Lord Arthur Balfour cabled . . . that unless three hundred thousands tons of fuel oil could reach Britain, immobilization of the British Fleet was threatened.*”⁷¹

U-boats, indeed, were bringing Britain to ruin.

⁶⁶ NA, ADM 116/3421, p. 280.

⁶⁷ NA, ADM 116/3421, p. 281.

⁶⁸ Salter, *Allied Shipping Control*, p. 122.

⁶⁹ Churchill, *World Crisis*, p. 719.

⁷⁰ Still, *Crisis*, pp. 16-17.

⁷¹ *Ibid.* pp. 177-178.

Mishaps

Attacks were not as relentless as they seemed. The exceptions were often in Britain's favour. Britain succeeded through diplomatic channels in persuading the neutrals to continue their merchant trade.

Ships of the Belgian Relief Commission were spared because they supported populations with food in the German-occupied areas of Belgium and France, relieving Germany of the burden. Special agreements between Germany and European neutrals allowed a certain amount of commerce with Britain in exchange for trade with Germany outside the declared war zone. Passenger liners, unarmed allied vessels in the Mediterranean and a few neutrals like Spain were treated in accordance with diplomatic arrangements.⁷²

The only important neutral power with which German had no agreements, and whose ships were sunk recklessly, was the United States. When America and other neutrals declared war, over two million tons of interned German ships were seized. This bounty was a welcome reinforcement for the Allied merchant fleet and helped to mitigate the effects of the first months of Germany's merchant war.

Turnaround in Autumn 1917

Just as Bethmann-Hollweg had feared, American personnel and epic industrial capabilities overcame any advantage gained by unrestricted submarine warfare. The convoy system also vastly improved merchant ship safety. When war came, America did not have a serious army but organizational capability and an enormous and enthusiastic, fresh manpower pool quickly overcame any deficiencies. America also had the world's third largest navy. On May 3, 1917 the first six destroyers arrived at Queenstown to reinforce the British Navy. Seventy other destroyers followed. By the end of the war, nearly four hundred American war ships from dreadnoughts to armed yachts and 70,000 men from the U.S. Navy served in Europe.⁷³

The convoy system (imposed on a reluctant Admiralty by Prime Minister Lloyd George) proved to be an immediate success. The monthly rate of sinking of all ships fell from over ten percent to under one percent. A German submarine commander agreed that convoys were effective. He said, “. . . the present system of convoy does not favour submarines; the old order of patrols allowed [submarines] greater freedom of action as they could easily avoid the patrol craft by diving, and the submarine commander then felt there was nothing more to fear for a while. Now, every target met with has an attendant defender.”⁷⁴

Atlantic shipping was organised in convoys by the end of 1917, coastal shipping around the British Isles and in the Mediterranean quickly followed suit in the New Year.

⁷² Schröder, *Uboote des Kaisers*, p. 345-355.

⁷³ Still, *Crisis*, pp. 63, 393.

⁷⁴ NA, ADM 137/3060, *Kp111*. Launburg, May, 1918. Printed in chapter *UB-52*.

Meanwhile, the number of patrol and convoy guard vessels increased exponentially. Dreadnought construction ceased in Britain in favour of smaller, more manoeuvrable vessels. Pre-dreadnought battleships were de-commissioned; their crews transferred to new warships.

The last year of the unrestricted submarine war

From October, 1917 submarine numbers and availability in Germany decreased. New construction did not replace losses. Relative sinkings per boat decreased. Still, what U-boats could be brought into service prosecuted the war until near the end of hostilities. Their élan and determination can not be doubted.

Submarine Sinkings – Claims and Reality

Table 16: Mio BRT World Tonnage sunk 1914-1918 by different sources

	Published	By Submarines	By Mines	Total
German Admiralty⁷⁵	1914-1918	15.0	3.7	18.7*
British Admiralty⁷⁶	1919	11.1	1.1	12.2
Spindler⁷⁷	1966	11.0	1.2	12.2

* 9,506 BRT missing in sum, see footnote for Michelsen

Each month the naval staff in Berlin published a record of U-boat successes by tonnage. These numbers were 50% higher than British figures for the same period. Chalking up successes and failures in wartime should always be read with tongue firmly planted in cheek. Each side has to balance political considerations as well as public reaction. However, in Germany the Imperial Navy senior staff's fanciful concoctions stretched credibility beyond the breaking point

Later in 1917, the Imperial Navy's inflated numbers climbed to 153% of actual tonnage destroyed, and in 1918 to an astounding 193% of the truth. The army and government used the fictional count as a basis for their political, industrial and strategic calculations. Inside the Navy the real numbers were known as the "captured German sinking lists" (see Chapter V) and were circulated among U-boat-commanders and the High Seas Fleet. These numbers correspond quite exactly with the numbers of the British Admiralty.

⁷⁵ Following Michelsen, U-Bootskrieg, pp. 196-197. Michelsen published the 'official numbers', announced by the German Admiralty Staff 1914-1918. There is a addition error in the sum for submarines and mines of 9,506 BRT in Michelsen.

Galster, 1925, p. 145, also uses the 'official numbers' of the Admiralty Staff: For Feb. 1917 – Dec 1917 he claims 8,916,500 BRT sunk, for Jan. 1918 5,198,000.

Spindler, Vol. V, p. 345, gives the 'official numbers 1914-1918' as 17,223,096 BRT.

⁷⁶ NA/ADM 137/3921. The same numbers for the British Admiralty also in: Salter, Allied Shipping Control, pp. 355-359.

⁷⁷ Spindler, Handelskrieg, Vol V, pp. 368-371. Also a 50,000 BRT mistake in the summation.

Table 17: Mio BRT World Tonnage sunk 1914-1918, per phase

	British Admiralty ⁷⁸	German Admiralty ⁷⁹	% Diff German Adm.
1914 Aug - 1917 Jan	3.9	4.9	+ 25 %
1917 Feb - 1917 Dec	5.7	8.7	+ 53 %
1918 Jan - 1918 Oct	2.6	5.1	+ 96 %
Total	12.2	18.7	+ 53 %

As far as the public, the Government and the Army was concerned, the Navy was happily sinking Allied ships *en masse*. England was being bled white. Little wonder, then, at Ludendorff's consternation in the summer of 1918 when he saw that France had become a virtual American military camp. About 200,000 "Doughboys" a month were being safely transported to Europe in spite of U-boats.

The Treaty of Versailles required Germany to replace "ton for ton" Allied ships that had been sunk, so why did the Navy insist on 18 million BRT instead of the actual 12 million? ⁸⁰ Perhaps it was pride, alone. In a clearly defensive mood Admiral von Capelle declared after the war that ". . . submarines did not fail. They did more than was required of them. The fault lay in an underestimation of the enemy's staying-power."⁸¹

Results

The U-5 to U-18 gasoline class, the "smoky Körting boats", was outdated at the beginning of war. Their diving time was several minutes. More than half of them were lost in the first 6 months of the war, mostly rammed by enemy warships. Internally they were named "suicide boats". The rest was decommissioned in summer 1915 and further used as training boats.

The UB I and UC I class was developed and built in expectation of a short war, to protect the Flanders bases and to operate under the south-east English coast. The UC I mine boats were only armed with a machine gun, and the UB I boats had 2 torpedoes and used carrier pigeons to communicate with their base.⁸² But these boats were the workhorses of the Navy; they went out every week for 2 or 3 days with the regularity of a bus service, patrolling the Flemish coast. They played an immense role in the first years of the war for the training of new

⁷⁸ NA/ADM 137/3921.

⁷⁹ Michelsen, U-Bootskrieg, pp. 196-197, also Galster, p. 145 for Feb. 1917 – Sep 1918. Stegemann, U-Boot-Krieg, p. 342, remarks that in the first half year of 1918 the German Admiralty numbers were 100% over the British Admiralty numbers, means double to those.

⁸⁰ Spindler, Volume V, p. 344ff.: *Die Marineleitung im Reichswehrministerium*, October 6, 1922, corrected the sinkings to around 12 million BRT.

⁸¹ NA, HW 7/2, analysis of Room 40, page 220 in this book.

⁸² NA, ADM 137/3899, p. 10. A "deserted" carrier pigeon from UB-6 was found in Calais 26 Nov. 1915. The message: "23.11.1915. Pos. 51.31N, 2.46E. Please open the locks today at 2.30 a.m."

submarine officers and men – Tirpitz had closed the Submarine School in September 1914 and it was not re-opened before autumn 1915. They suffered heavy losses and practically vanished in 1917

Table 18: The different U-boat types, Aug. 1914 – Sep. 1918 ⁸³

	U-boats in Service	Service Days	Cruise Days	Percent Cruise activity	BRT Sunk		U-boats Lost (Sunk or de-com.)	Lost per 1.000 Cruise Days
					Total	per Cruise Day		
Early Coastal	46	19,012	3,889	20 %	197,589	51	42	11
U-5 to U-18	14	3,359	505	15 %	66,271	131	14	28
UB I	17	8,820	2,166	25 %	101,513	47	14	6
UC I	15	6,833	1,218	18 %	29,805	24	14	11
Ocean-Going I	90	44,807	14,076	31 %	5,925,987	421	49	3
U-19 to U-70	51	35,946	10,330	29 %	4,769,583	462	31	3
Mittel U*	39	8,861	3,746	42 %	1,156,404	309	18	5
Ocean Going II	174	45,575	16,920	37 %	4,150,583	245	101	6
UB II	27	12,559	4,397	35 %	1,022,524	233	23	5
UC II	63	22,683	8,215	36 %	2,079,362	253	44	5
UB III	84	10,333	4,308	42 %	1,048,697	243	34	8
Minelayer**	14	6,196	1,521	25 %	157,007	103	4	3
U-Cruiser	10	2,302	1,384	60 %	332,695	240	2	1
U-151 to U-157	7	2,131	1,240	58 %	302,690	244	2	2
U-139 to U-141	3	171	144	84 %	30,005	208	0	0
Overall Result	334	117,892	37,790	32 %	10,763,861	285	198	5

*U-81 upwards

**U-71 to U-80, UF-boats

The U-19 to U-70 classes were pre-war designs of modern diesel boats. They were produced in batches of 4 or 8 boats, small sub-classes, like U-66 to U-70: “They were about the best boats Germany ever had.”⁸⁴ The Mittel-U class from U-80 on was a standardisation of this class.

The UB II and UC II classes were developed in 1915 to speed up construction times. They suffered under a decisive construction error: there was no hatch between conning tower and pressure hull, so that the exposed conning tower became the weakest part of the pressure hull.

⁸³ Numbers based on: NA, HW 7/3; on: NA/ADM 137/3921; on: NA, ADM 137/4817; on: NA, ADM 137/4814; on: NA, ADM 1/8509/1; on: Spindler, Handelskrieg; on: Bendler, UB- und UC-Boote.

⁸⁴ HW 7/3, analysis of Room 40, here printed on pages 2 and 166.

The UB III was a synthesis of UC II and UB II, de-facto a ‘Mittel-U light’. They were built in high numbers, were quite successful and appreciated by the submarine commanders. Their high losses resulted from their operations in the second half of the war, when anti-submarine defences had increased.

The long range U-cruisers came late in 1917 and in small numbers. The British had expected them already for 1916 and judged about their strategic long range potential:

“[...they] might possibly have entailed a complete revision of many of the means of defence which were proving effective against the smaller submarines [...]”⁸⁵

German naval construction 1914-1918

Dreadnought priority until 1916

Imperial Navy fleet construction authorization (*Flottengesetz*) for 1912 approved three new dreadnought keels to be laid down in 1915. Six submarines were scheduled annually but Tirpitz favoured dreadnought construction. With war, the focus shifted slightly with a dozen each of ocean-going and coastal submarines added to the construction list.

The three dreadnoughts previewed in the budget were laid down in 1915. Five additional super-dreadnoughts were ordered as replacements for sunken old cruisers and three of these were laid down between November 1915 and July 1916.

Table 19: German dreadnoughts laid down 1915-1916 ⁸⁶

Ship	Type	BRT	Costs (Mio. RM)
Prinz Eitel Friedrich	battle-cruiser	35,300	66
Mackensen	battle-cruiser	35,300	66
Württemberg	battleship	32,200	50
Yorck	battle-cruiser	38,000	75
Blücher	battle-cruiser	35,000	66
Friedr. Carl	battle-cruiser	35,000	66

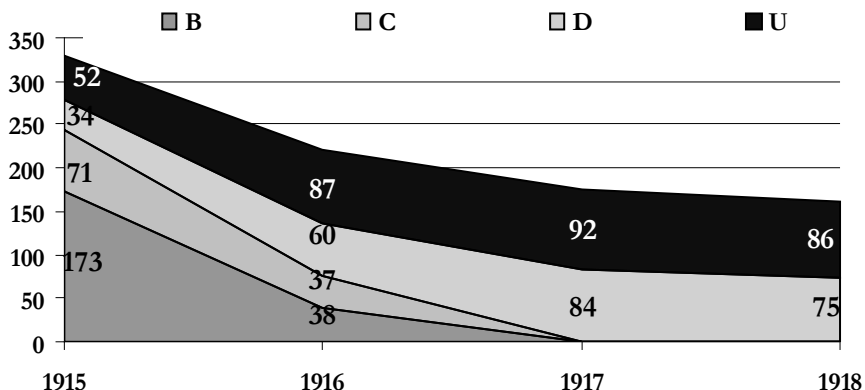
Ocean-going submarines of the *U-19* type displaced 650 BRT and cost 3.3 million Reichsmarks. Battleship construction required at least three years; a submarine 12-18 months. A single dreadnought cost the equivalent of twenty ocean-going U-boats.⁸⁷

⁸⁵ HW 7/2, analysis of Room 40, here printed on page 240.

⁸⁶ Numbers based on: Groener, *Deutsche Kriegsschiffe*; and on: Forstmeier, *Grosskampfschiffe*.

⁸⁷ Lambert, *Fisher's Revolution*, cites examples of the same kind of calculations for the British side.

Table 20: German warships laid 1915-1918 in 1,000 BRT ⁸⁸



Until the summer of 1917 there were on average always seven to eight new dreadnoughts under construction in the yards, along with a dozen light cruisers and some 60-80 destroyers, compared with roughly 100 submarines. For the wartime orders of heavy surface ships in 1915 and 1916 (eight dreadnoughts plus fifteen light cruisers) 200 additional submarines could have been funded. The Navy could have easily doubled submarine construction in 1915-1916.

German Submarine Orders 1914-1918

The submarine arm (*Uboots-Inspektorat, UI*) of the High Seas Fleet had calculated in May, 1914 the need for a total of 222 U-boats for a merchant blockade of the British Isles. Tirpitz simply ignored what he may have thought were fantastic numbers, but the first successes of submarines against British Warships in 1914 and 1915 put him under pressure to reconsider the situation:⁸⁹ In April, 1915 the Kaiser received a memorandum from his naval staff requesting an order of 200 additional submarines. In January, 1916 Navy leadership called for another 350 submarines to mount a comprehensive blockade of Britain stretching from the Atlantic, the North Sea and the English Channel, as well as re-enforce Mediterranean operations.

In all, the hulls ordered amounted to a total of 170 available submarines a year by January 1917.⁹⁰

Arguments in opposition were not slow in coming. In November, 1916 Admiral von Capelle complained about excessive ordering of submarines. He believed that the war would end soon and an excess of submarines would have a negative impact on the post-war naval budget for dreadnought construction.⁹¹ The

⁸⁸ Numbers based on: Groener, *Deutsche Kriegsschiffe*.

⁸⁹ Weir, *Kaiser's Navy*, p. 172.

⁹⁰ Rössler, *Ubootbau*, pp. 96-99.

⁹¹ *Ibid.* p. 107.

Navy Staff concurred. By January, 1917 it was projected that the war would be won within six months. Additional submarines were unnecessary.⁹² By June, 1917 it was clear that unrestricted submarine war had failed. Victory was distant. Ninety-five new submarines were ordered and all shipyard work on new capital ships ceased.

German Submarine Construction 1914-1918

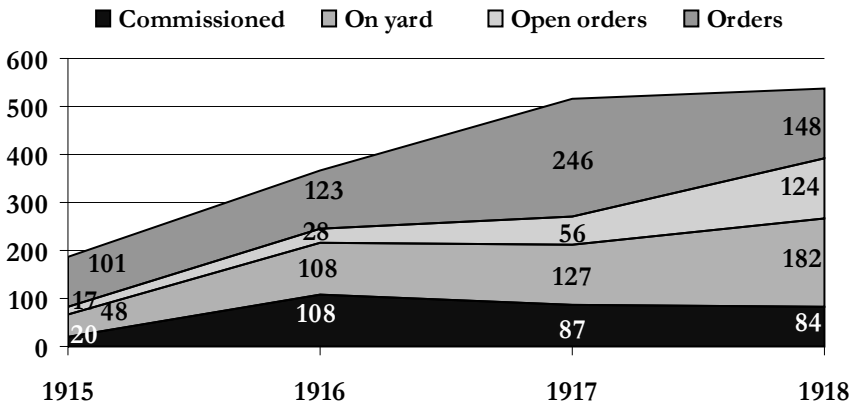
Orders for ocean-going submarines rose steadily and exponentially but shipyard capacity could not keep up with demand.

“Thus metal prices doubled and tripled, while the labour force dwindled with each battle.”⁹³

“The basic problem of the shortage, distribution, and fluctuation of the labor force plagued the entire [shipyard] industry.”⁹⁴

“In 1917 the labor shortage reached epidemic proportions.”⁹⁵

Table 21: Ocean-going submarines 1915–1918 ⁹⁶



The result was a bottleneck in submarine construction due to insufficient yard capacity and a skilled shipyard labour force that was too small to meet the demand.

Adding to the problems were priority allocations for High Seas Fleet repair in the aftermath of the Battle of Jutland, organisational disruption caused by the “Hindenburg program,” and the hard winter of 1916/1917 when unusually wretched weather caused a breakdown of transport systems. Laced throughout was loss of efficiency and flagging morale among under-nourished workers, growing domestic social tensions and increased strikes. The social fabric was coming undone.

⁹² Granier, *Seekriegsleitung*, p. 203.

⁹³ Weir, *Kaiser's Navy*, p. 205.

⁹⁴ Weir, *Kaiser's Navy*, p. 161.

⁹⁵ Weir, *Kaiser's Navy*, p. 180.

⁹⁶ Numbers based on: Groener, *Deutsche Kriegsschiffe*; and on: Roessler, *Ubootbau*.

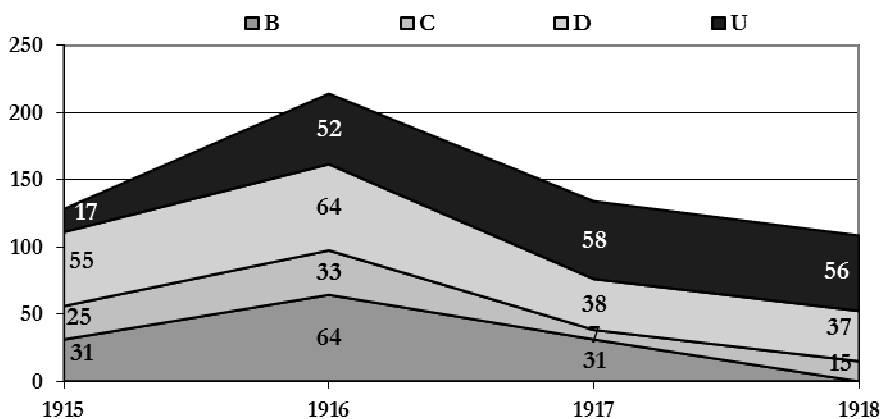
Boats of the *U-19* to *U-70* pre-war classes were built with increasing rapidity during the first half of the war; construction time dropped from twenty-nine months to twenty months and less by 1916. For the thirty-five boats of the *U-81* type (and following types) as well as the UB III class (seventy-four boats), construction time went up by 50%. Ironically, the two classes were originally planned to reduce construction time but the general production slowdown in the second half of the war defeated the aim. The slowing trend was compounded by policy issues and lack of standardization.

The 310 ocean-going boats commissioned up to October 31, 1918 had all been ordered by June, 1917. No ocean-going submarine ordered after June 1917 ever saw service. In any case, boats ordered after June, 1917 would not have seen service before early 1919; Scheer's ambitious wish-list of August, 1918 could not have been put into commission before 1920.

Yard capacities

1914 Germany had built merchant vessels amounting to approximately 380,000 BRT. Her warship tonnage in this year amounted to 192,000 BRT. Shipyard production declined sharply thereafter due to the wholesale induction of draft-age men. In the period 1915-1918 some 600,000 BRT in merchant vessels and 585,000 BRT in warships was launched. The average annual output of the German shipyard industry was roughly 300,000 BRT. 332 submarines with 184,000 BRT tonnages were commissioned in this time.

Table 22: German warships commissioned 1915-1918, 1,000 BRT ⁹⁷



⁹⁷ Numbers based on: Groener, *Deutsche Kriegsschiffe*; and on: Roessler, *Ubootbau*.

Table 23: German warships commissioned 1915-1918, numbers ⁹⁸

	Ships Commissioned					1,000 BRT
	B	C	D	U*	Total	
1915	1	4	80	52	137	128
1916	2	5	86	108	201	214
1917	1	1	69	87	158	134
1918		2	59	85	146	109
Total	4	12	294	332	642	585

* all classes

Private merchant submarines ⁹⁹

The quasi-commercial undertaking of long-range U-Commerce submarines presaged their use in war. Two of these merchant boats were ordered from Krupp-owned Germania Yard, Kiel, in October, 1915. The *U-Deutschland* and *U-Bremen* (1510 BRT each), were commissioned in May, 1916. The former made two commercially successful cruises to the United States, generating profits that exceeded its two million *Reichsmark* construction costs on the first trip. Six follow-on boats were ordered immediately. *U-Bremen* disappeared without trace, likely the victim of a sea mine. Following American's declaration of war in April, 1917 the boats were armed and taken into Imperial Navy service.

The Scheer-Program from August 1918

When Scheer became Chief of a centralised Imperial Navy he sought to initiate an immense submarine building program of 450 new boats. Production would double from sixteen hulls monthly to thirty-two hulls by December, 1919.¹⁰⁰ Moreover, he wanted to standardize boat types. Manufacture of parts would be done inland for later assembly in shipyards.¹⁰¹ It was modern, innovative and too late. Scheer was informed that industrial and shipyard production capabilities were sufficient to meet his plan but that available labour was insufficient. In 1918, 70,000 workers worked in submarine construction. An additional 40,000–50,000 would be needed immediately.¹⁰² Scheer demanded 50,000 workers from the Army for a 25% increase in production and another 70,000 workers for a 70% increase in 1919. The Army conditionally conceded 40,000 men, “if the situation at the Western front would allow it.” It was not to be.¹⁰³

⁹⁸ Numbers based on: Groener, *Deutsche Kriegsschiffe*; and on: Roessler, *Ubootbau*.

⁹⁹ Roessler, *U-Bootbau*, pp. 100-103.

¹⁰⁰ Weir, *Kaiser's Navy*, p. 169.

¹⁰¹ Rössler, *Ubootbau*, p. 122.

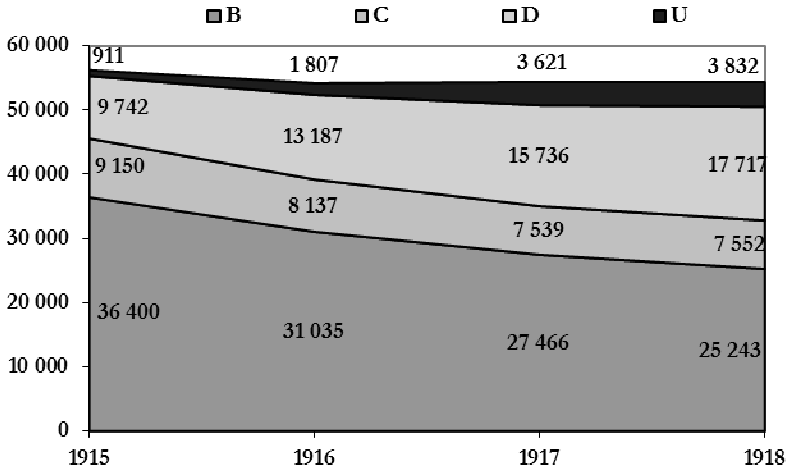
¹⁰² Granier, *Seekriegsleitung*, p. 155.

¹⁰³ Rössler, *Ubootbau*, p. 122.

German submarines 1915-1918: Personnel

The dreadnoughts of the High Seas Fleet were battle-ready until the last month of the war. The ships were fully equipped, ready to go out at any moment. Their last sortie was in August, 1918 when they undertook a trip to the south coast of Norway. Eleven obsolete pre-dreadnought battleships had been demobilised in summer 1916 to release seamen for submarines duty, and another four – the last pre-dreadnoughts – in October 1917. But nobody wanted to go further. Dreadnoughts were taboo. In February, 1918 the High Seas Fleet Command denied a further demand to decommission battleships or cruisers.¹⁰⁴

Table 24: Officer & men in the German Navy 1915-1918 ¹⁰⁵



¹⁰⁴ Forstmeier, Grosskampfschiffe, p. 48.

¹⁰⁵ Numbers based on: Groener, Deutsche Kriegsschiffe.

Technical Aspects of this Publication

Footnotes

I numbered my own footnotes in Arabic numbers. I preserved as much of the original footnotes as possible.

Omissions

In the preface I marked omissions in citations with '[...]'. In the book itself I marked no omissions. The original documents contain some 2,500 pages, condensed here to some 700 pages. Some thousand omissions would have made the text unreadable. So I decided for readability and against scientific form.

The Editor

Hans Joachim Koerver, born 1960 in Germany. From 1980 to 1986 studied history at the University of Aachen, Germany, and since 1989 working as IT Consultant.

Second Edition, March 2012

In the second edition I overworked the preface and added some more documents:

Deserted carrier pigeon from UB-6 (Chapter IV)

S.S. BRUSSELS and Captain Fryatt (Chapter V)

The Zimmermann-Telegram (Chapter V)

Wolfram-Ore (Chapter VII)

Cruises of U-DEUTSCHLAND to America (Chapter IX)

British decyphering of German naval and diplomatic messages (Appendix D)

British Intelligence on U-boat construction (Appendix E)

Thanks

My grateful thanks to Birgit Haermeyer for her ideas in the design of the front cover.

Unvaluable thanks I owe to Dr. Eric Dietrich-Berryman for his editing help with the second edition.

My grateful thanks to the National Archives in Kew, UK, which generously granted me the copyright to publish these sources. The kindness of the team there is overwhelming, and the organisation of the National Archives is perfect. It is really great to work there.

Hans Joachim Koerver, May 2012

Abbreviations, Synonyms, Measures

German Rank	British Equivalent
Bootsmannsmaat	Petty Officer 2nd Class
F. T. Gast	Telegraphist
Heizer	Stoker
Ingenieur	Engineer Sub-Lieutenant
Kapitänleutnant	Lieutenant-Commander
Korvettenkapitän	Commander
Leutnant	Sub-Lieutenant
Marine Ingenieur	Engineer
Marine Ober-Ingenieur	Engineer Lieutenant
Maschinist	Engine-Room Warrant Officer
Maschinen-Anwärter	Engine Room Probationer
Maschinenmaat	Engine Room Petty Officer 2nd Class
Matrose	Able Seaman
Ober F. T. Gast	Leading Telegraphist
Oberbootsmannsmaat	Petty Officer 1st Class
Oberheizer	Leading Stoker
Oberleutnant	Lieutenant
Obermaschinist	Chief Artificer Engineer
Obermaschinenmaat	Engine Room Petty Officer 1st Class
Obermatrose	Leading Seaman
Obersteuermann	Chief Navigating Warrant Officer
Steuermann	Navigating Warrant Officer
Steuermannsmaat	Navigating Petty Officer 2nd Class
Vizesteuermann	Acting Warrant Officer

1 inch = 2.54 cm

1 foot = 12 inches = 30.48 cm

1 yard = 91.44 cm

1 fathom = 1.83 m

1 cable = 185.32 m

1 Nautical Mile = 10 cables = 1.85 km

1 knot = 1.852 km per hour

1 BRT = 100 cubic feet = 2.83 cubic meter

Northabout = sailing from/to North Sea/Baltic via Scotland

By the Belts/Sound = sailing from/to Baltic via North of Denmark

Relief Commission = American Commission for Relief in Belgium.

Ships

F.V. = Fishing Vessel

S.V. = Sailing Vessel

S.S. = Steam Ship

H.M.S. = Her Majesty's Ship, British warship

S.M.S. = Seiner Majestaet Schiff, German warship

U.S.S. = United States Ship, US-American warship

T.B.D. = Torpedo boat destroyer

Guns

5.9 inch gun = 15 cm Geschütz

4 pdr. gun = 5 cm Geschütz

22 pdr. gun = 8.8 cm Geschütz

4.1 inch gun = 10.5 cm Geschütz

CHAPTER I

GERMAN SUBMARINES, THEIR FLOTILLAS, AND THEIR SCHOOL

The Submarines ¹

Types

German submarines were of the three main types: U-boats, UB-boats, and UC-boats. The U-boats were large double hull ocean-going boats. The UBs were small boats built originally for coastal work; the UC-boats were minelayers. A fourth class named UF-boats were under construction at the time of the Armistice and were said to be of a small improved coastal type, but none of these were completed during the war.

U-boats

The U-boats constitute the principal type. At the outbreak of war Germany possessed 28 submarines, all of the U-class. Of these the first 18 were fitted with Körting paraffin engines but all submarines from U-19 upwards were driven by heavy oil Diesel engines. The submarines were built in series which at first consisted of three to five boats, but later when greater standardization was introduced for the sake of accelerating output, the U-boat series sometimes contained as many as ten boats, while UB- and UC-type series were far larger. Each series, with a few exceptions, showed a slight increase in size over the preceding one.

U-1, which was launched in 1906, was 138 feet long with a surface displacement of 235 tons and a submerged of 280 tons. In the series U-19 to U-22, which were the first boats to undertake long-distance trips, the displacement had risen to 640/825 tons.

From this series to that of U-105 to U-114 the boats show generally a steady increase in size, the last named boats having a displacement of 820/1,015 tons.

The average large U-boat was 210-225 feet long, 20-22 feet in breadth and in surface trim drew 12 to 13.25 feet. A few series may be selected as containing noteworthy points.

U-71 to U-80. These boats were fitted as minelayers carrying 34-36 mines. They only had a single hull and were very slow, cruising generally at about 6 knots. They were not successful as a class and were liable at all times to develop engine defects.

¹ NA, HW 7/3, chapter V, pp. 127 passim.

SHIP'S INDEX

- A15, 564
ABBAS, 533
ABOUKIR, 165, 238, 239, 240
ACHERON, 20, 22, 26, 29, 248, 249, 357, 370
ACTION, 467
ADAMA, 635
ADMIRAL FOURICHA, 251
ADORNA, 453
ADRIA, 16, 581
ADVENTURE, 351
AGEMENDON, 327
AGNES, 386, 640
AGNES HALLALD, 640
AILLY, 549, 550, 702
ALEXANDRA, 334
ALFRE JANNE, 301
ALGERIA, 636
ALLO, 626, 627, 628
ALLOS, 627, 637
ALYSSUM, 472
AMALFI, 225
AMAZON, 484, 485, 486, 487
AMAZONE, 679
AMIRAL DE KERSAINT, 577, 580
AMIRAL GANTEAUME, 165
AMPHITRITE, 582
ANCHISES, 234
ANCONA, 217
ANDALUSIAN, 253, 254, 255
ANE, 187, 326
ANGLIA, 282
ANGLO-COLUMBIAN, 299, 304
ANN, 434
ANN J. TRAINER, 434
ANNA MARIA, 350, 351
ANNE PERRY, 636
ANSALDO, 636
ANSWALD, 357
ANTARES, 578
APHRODITE, 418
AQUITANIA, 530
ARABIA, 279
ARABIC, 174, 175, 284, 285, 286, 287, 288, 289, 297
ARAL, 619
ARCHBOLD, 350
ARCHIMEDES, 520, 522
ARCONA, 329
ARDEOLA, 289
ARGYLL, 277, 319
ARIADNE, 451, 456
ARIANE, 225
ARIEL, 248, 249, 697, 698
ASCOT, 211
ASIA, 349
ASK, 178
ASTURIAS, 169, 204
ATLANTIQUE, 554, 556, 557, 562
ATTACK, 248, 249
ATTENTIVE, 244
ATWOOD, 640
AUGUST, 338
AUGUSTE CONSEIL, 251
AUGUSTE FRAISSENET, 554
AUGVALD, 626
AUSONIA, 577
AVENTURIER, 435
AYESHA, 589
AYSGARTH, 229
B2, 100
BADEN, 211, 680, 681
BAILEY, 701
BAIRD, 620
BAL TIC, 248
BAL TO, 326, 329
BAL TRO, 187
BANDOENG, 531
BARALONG, 175, 290, 294, 296, 297, 298, 302, 305, 308, 371, 697, 698
BARBARA, 326

BASILISK, 702
BATAVIER II, 193
BATAVIER VI, 193
BATTENHALL, 365
BAUME, 282
BAYANO, 290
BAYERN, 407, 674
BEGONIA, 369
BELGIAN PRINCE, 215, 404
BELVOIR CASTLE, 402
BENGUELA, 229, 648
BERBERA, 577
BERGSDALEN, 636
BERLIN, 596
BIANCA, 636
BILLITON, 326
BIRCHERAWE, 355
BIRMINGHAM, 165, 237, 697
BK9983, 703
BLACKWOOD, 172
BLANCHE, 256
BLUECHER, 559
BOBBY, 348
BOGOTA, 328
BOMBALA, 230
BONAVENTURE, 335
BONCOURT, 681
BONETTA, 336
BORBODALE, 364, 368, 369
BORGA, 334
BRAENEIL, 377, 701
BRAGI, 187, 326
BRANDENBURG, 13
BRANKSOME HALL, 452
BRAUNSCHWEIG, 477, 673, 674, 679
BREMEN, 396, 617, 677, 680, 681
BREMSE, 680, 681
BRESLAU, 216, 218
BRET LAND, 362
BRIERLEY HILL, 298
BRITISH MAJOR, 627
BRITISH PRINCESS, 484
BRITISH TRANSPORT, 418, 700
BROWN, 621
BRUMMER, 680
BRUSSELS, 176, 318, 319, 320, 321, 323
BUCK, 637
BYGDONES, 644
BYLANDS, 234
C15, 452, 455, 700
C24, 274, 275, 697
C27, 697
C34, 472
C7, 699
CAESAR, 540
CALVIA, 703
CAMERONIA, 257
CAMPANULA, 224, 701
CANDIDATE, 258, 259
CANOPUS, 528
CARLO, 327, 328
CARMA, 326
CAROLINA, 232, 520, 615, 620
CAROLUS, 452
CASTLE EDEN, 484
CASTOR, 338
CASWELL, 326
CATALUNA, 536, 538, 539
CAYO ROMANO, 258
CEANOTHUS, 558
CENTURION, 258
CERTO, 390
CHANCELLOR, 299, 304
CHARLOTTE, 506
CHATEAU RENAULT, 222
CHELMER, 529
CHICAGO, 461
CHILIER, 626
CHUMLEIGH, 577
CIRCE, 222, 699
CITO, 363
CITY OF BELFAST, 541
CITY OF CADIZ, 675, 680, 682

CITY OF CAIRO, 326
 CITY OF DORTMUND, 279
 CLAN BUCHANAN, 327
 CLEANER OF THE SEA, 698
 CLEOPATRA, 550, 571, 581
 CLOUGHTON, 251
 COLE, 619
 COLEUS, 521
 COLUMBIAN, 187, 326, 329
 COLUMBUS, 681
 COMEDIAN, 364, 365, 368, 376
 COMMANDER NASMITH, 703
 CONFIDE, 338
 CONSTANZA, 547
 CONTENT, 33
 COREOPSIS, 499, 500, 702
 CORMORAN, 580
 CORNWALLIS, 708
 CORSO, 575
 COTTINGHAM, 192, 697
 CRADOSIN, 555
 CRESSY, 165, 238, 239, 240
 CROMER, 345
 CROWN OF LEON, 338
 CROWN POINT, 351
 CURACOA, 705
 CURIE, 591
 CUSHING, 418
 CYCLAMEN, 224, 701

D10, 523
 D4, 702
 D7, 313, 349, 422, 423, 579, 700
 DADRUGADA, 628
 DAGNE, 338
 DALKEITH, 222
 DANAE, 283
 DANAI, 363
 DANE II, 291
 DANIA, 186
 DANIEL HOWARD, 230
 DANMARK, 327

DANTON, 575, 576
 DANZIG, 20, 673, 674, 675
 DEIPARA, 545, 549
 DELPHIN, 28
 DERBYSHIRE, 279, 630
 DERFFLINGER, 679, 680
 DEUTSCHLAND, 673, 675, 679
 DIANA, 350, 363, 368
 DICTO, 187, 327
 DIGBY, 250
 DIOMED, 232, 635
 DOCTOR LEE, 555
 DOLLY VARDEN, 463
 DORIE, 383, 384, 385
 DORNFONTEIM, 628
 DOROTHY BARRETT, 628, 629, 632
 DOROTHY GRAY, 242, 697
 DOVER CASTLE, 205
 DREADNOUGHT, 172, 250, 256, 697
 DRESDEN, 708
 DRONT, 410
 DRYPOOL, 301
 DUKE OF CLARENCE, 229, 649
 DUNSLEY, 284, 286, 288, 289
 DUNSTAN, 435
 DURBAN, 331
 DURWARD, 169
 DWINSK, 232, 622, 623, 645

E16, 698
 E20, 224
 E3, 409
 E34, 702
 E35, 231, 702
 E42, 526
 E45, 700
 E48, 229, 649
 E52, 700
 E54, 384, 385, 698, 699
 EARL OF LATHOM, 258, 259
 EARNEST, 393
 EASTPOINT, 467

ECHO, 349
 EDDA, 357
 EDNA, 615, 618, 619, 623
 EDWARD, 619, 620
 EEMLAND, 531
 EIDSVOLD, 621
 EIKA, 337
 ELBING, 181, 568, 605, 679, 682
 ELIZABETH, 378, 379
 ELSIE PORTER, 636
 EMDEN, 589, 679, 681
 ENDURANCE, 311
 EOGOTA, 327
 EPTALOFOS, 576
 ERFURT, 681
 ERIC, 635, 686
 ERICA, 484, 486
 ERNE, 242
 ERRI BERRO, 229, 447
 ERSATZ EMDEN, 681
 ERSATZ KAISER FRIEDRICH III, 672,
 676, 679, 680
 ERSATZ KOELN, 681
 ERSATZ LEIPZIG, 681
 ERSATZ VICTORIA LUISE, 682
 EXCELLENCE PLEAKE, 251
 EXCELLENT, 709

 FAGERTUN, 337
 FAIRY, 702
 FALABA, 173, 174
 FALCON, 178, 244, 245
 FALMOUTH, 182, 183
 FAMIGLIA, 188
 FANNING, 462, 464, 700
 FARADAY, 541
 FARNBOROUGH, 698
 FAWN, 244
 FERT, 577
 FEUERSPEIER, 16, 550, 551, 581
 FIREDRAKE, 700
 FISCUS, 578
 FLACOL, 554
 FLAHERTY, 635
 FLANDERIA, 363
 FLAWYL, 555, 562
 FLORA, 355
 FOLDIN, 362
 FORDALEN, 326
 FORMIDABLE, 166, 284
 FORT GEORGE, 701
 FOXGLOVE, 561
 FRAM, 363, 368, 376
 FRANCES, 634, 635
 FRANKFURT, 213, 679, 703
 FRANZ WILKE, 362
 FRAUENLOB, 574
 FREDERICK, 628, 629, 632
 FREYA, 395, 523, 575
 FUERST BISMARCK, 20, 24, 28, 421, 679

 G13, 699
 G2, 704
 G34, 278
 GAELIC, 400, 403
 GALLIA, 219
 GAMO, 637
 GARDE, 635
 GARRY, 167, 168, 242, 502, 503, 504, 703
 GASTERLAND, 531
 GAZELLE, 507
 GERA, 681
 GHURKA, 244, 245, 697
 GISLA, 577
 GLADIATOR, 291
 GLADYS FREHALEIT, 640
 GLASGOW, 345
 GLEN, 699
 GLENESK, 379, 380
 GLENLEE, 626
 GLENNART CASTLE, 205
 GLITRA, 165, 243
 GLOAMING, 635
 GLOUCESTER CASTLE, 205
 GLYNN, 416

GOEBEN, 216, 218, 220
 GOLDEN GAIN, 703
 GOTHENBURG, 298
 GRATANGEN, 577
 GREEN ISLAND, 702
 GRENADIER, 279
 GRODNO, 175
 GROSSER KURFUERST, 682
 GULDBERG, 333
 GUSTAV, 345

 H4, 224, 558, 559, 561, 563, 702
 H5, 698
 HAAKON, 368, 376
 HAINAULT, 250
 HALCYON, 699
 HAMBURG, 5
 HAMPSHIRE, 179
 HANNA LARSEN, 345, 346, 347
 HANNOVER, 213, 331, 617
 HANSA, 370, 506, 523
 HARFAT CASTLE, 326
 HARMARTRIS, 178
 HAROLD, 362
 HARPETHIAN, 621, 623
 HARRISBURG, 627, 628
 HARVEY, 621
 HASKELL, 619
 HATSUSE, 328
 HATTIE DUNN, 615, 617, 618, 623, 624
 HAUPPAUGE, 615, 617, 618, 623
 HAWK, 697
 HAWKE, 165, 241
 HEADLANDS, 253, 254, 255
 HECTOR, 240, 241
 HEIMDALL, 9, 10
 HEKLA, 279
 HELENA, 356
 HELGE, 520, 522
 HELGOLAND, 506, 705
 HENRIK LUND, 622
 HERBERT L. PRATT, 620

 HERMAN WINTER, 628
 HERMES, 290, 362
 HERMIONE, 282
 HERTA, 559
 HERTHA, 278, 314
 HERTOG HENDRICK, 483
 HESIONE, 299, 300, 301
 HESSEN, 6, 673, 674
 HILARY, 413
 HINDENBURG, 407, 673, 675, 676, 681, 682
 HISPANIA, 327
 HMS CHELMER, 529
 HOGUE, 165, 238, 239, 240, 241
 HOHENZOLLERN, 617
 HOLMBLAD, 350, 355
 HOLME, 529
 HONORIA, 282
 HORSA, 364, 366, 368, 376
 HUGO, 298
 HUMBER, 349
 HUNTINGTON, 637
 HUNTRESS, 231

 IBO, 229
 ICHBADOR, 369, 376
 IDA, 346, 347
 IDAHO, 327
 IGOTZ MENDI, 526
 IKBAL, 364, 366, 368, 369, 376
 IMMACULATA, 577
 INDIA, 175
 INDIAN CITY, 252, 253, 254, 255
 INDUSTRY, 416
 INGA, 363
 INGEBORG, 483
 INVERLYON, 697
 IOANNIS, 328
 IOLO, 186
 IRENE, 6, 332
 IRON DUKE, 167
 ISABEL, 619, 623
 ISABEL WILEY, 623

IVY, 491
 J1, 461
 JACARTA, 531
 JACINTH, 700
 JACOB HASKELL, 619
 JACOB JONAS, 607
 JAN, 337
 JENNINGS, 232, 627, 629
 JERVAULX ABBEY, 290
 JESSAMINE, 702
 JOHAN MJELDE, 229
 JOHN GILLMAN, 703
 JOLANDE, 503
 JOSE DE LARRINAGA, 380
 JOSEPH CUDAHY, 627
 JUSTICIA, 209, 511, 514, 515, 516

 KAI, 338, 349, 363
 KAISER, 477, 493, 523, 680
 KAISER FRIEDRICH III, 493
 KAISER WILHELM, 477, 523
 KAISER WILHELM DER GROSSE, 477
 KAISERIN, 16, 20, 28, 550, 581, 680
 KAISERIN AUGUSTA, 20, 28
 KANDY, 569, 570, 571, 572
 KANGAROO, 244
 KANSAS, 520
 KARIN, 363
 KBU, 337, 520
 KELLOGG, 628, 629, 632
 KERMANSHAW, 232, 627
 KESSINGLAND, 703
 KHURI, 250
 KIMBERLEY, 698
 KING ALFRED, 402
 KING EDWARD, 251
 KING GEORGE, 675
 KINGFISHER, 638
 KINGSTONIAN, 222
 KIRKHAM ABBEY, 279, 290
 KLI, 433

 KNUT HILDE, 186
 KOENIG, 676, 679, 681
 KOENIGSBERG, 677, 680, 681, 706
 KONIGIN REGENTES, 193
 KRINGSJAA, 615, 622
 KRONPRINZ, 421, 580
 KRONPRINZ WILHELM, 580
 KYOTO, 326

 L12, 703
 L33, 335
 L59, 553
 LACKAWANNA, 628
 LADY, 251, 327, 349
 LADY CARRINGTON, 327
 LADY MARTIN, 349
 LAKE ERIE, 626
 LAKE FOREST, 626
 LAKEBRIDGE, 626, 627
 LANFRANC, 204
 LANSQUENET, 701
 LAPWING, 337
 LAURA, 483
 LAURENTA, 363
 LEDA, 327
 LEGION, 239
 LEIPZIG, 29
 LEIXOES, 637
 LELA, 328
 LEMBERG, 595
 LENNOX, 239
 LEONORA, 362
 LEOPOLD II, 250
 LEVEN, 244, 701
 LEWBY HALL, 637
 LIBAU, 335
 LIBERTY, 699
 LIONS, 182
 LLANDOVERY CASTLE, 205
 LLEWELLYN, 698
 LOCH RYAN, 574
 LOIS, 255

LOKKEN, 327
LOOKOUT, 239
LORD SEFTON, 637
LORELEY, 16
LORNA, 702
LOTHRINGEN, 516
LOUISIANE, 178
LOWESTOFT, 238, 239
LOYAL, 701
LUCIA WOERMANN, 706
LUCIFER, 239, 240
LUCILLE, 635
LUCY ANDERSON, 338
LUETZOW, 673
LUND, 615, 622
LUSITANIA, 174, 178, 218, 250, 257, 258,
259, 260, 261, 262, 263, 264, 266, 267, 268,
269, 270, 271, 272, 404, 413
LYCHNIS, 570, 571, 572, 573, 702
LYDONIA, 702

M31, 507
MACKENSEN, 673, 674, 675
MADRUGADA, 629, 632
MAGDA, 291
MAIDSTONE, 705
MAJESTIC, 171, 217, 527, 528, 529, 530
MALACHITE, 166
MAMELUKE, 439, 701
MANIN, 234
MANITOU, 570, 572
MANSEMOND, 637
MANX KING, 628, 629
MAORI, 244, 245
MARGUERITE, 533
MARIA THERESIA, 16, 550, 551, 564, 581
MARKGRAF, 671, 682
MARLBOROUGH, 172, 180, 250
MARMORA, 644
MARNE, 209, 515, 703
MAROSA, 628
MARS, 20, 28
MARTIN, 225, 588

MARY, 363, 402, 640
MARY BELL, 402
MASCOTTE, 290
MATARAZZO, 575
MATE, 492
MATTEN GRANGE, 301
MAURETANIA, 263
MAY, 362
MAYFLY, 334
MECKLENBURG, 13, 473
MEDEA, 699
MEDIA, 365, 555, 557, 562
MEDUSA, 225
MELAMPUS, 700
MELITA, 627
MELVILLE, 465
MENADO, 531
MENDEL, 620
MENTOR, 20
MERAK, 627
METEOR, 337, 338, 370, 507
MICHAEL, 485, 486, 701
MILNE, 391, 699
MIMOSA, 533
MIRLO, 628, 629, 632
ML155, 603
ML263, 502, 503, 505
ML373, 603
ML413, 702
ML49, 503
MOEWE, 187, 617, 625
MOHAWK, 182, 244, 245
MOLESLEY, 476, 478
MOLTKE, 421, 682
MONADA, 521
MONARCH, 476, 552
MONMOUTH, 637
MONTAUK POINT, 682
MORAMAN, 327
MORAVIA, 439
MORAZAN, 328
MORESBY, 485, 486

MOSEL, 416
MURJEK, 298
MYNA, 476

NANNY WIGALL, 484
NARRAGANSETT, 258
NARVIK, 298
NAUNBURG, 681
NEW JERSEY, 520
NEWBY HALL, 637, 638
NICATOR, 180
NICOSIAN, 175, 293, 294, 295, 296, 297
NIDAROS, 350, 355
NIDELVENY, 290
NIGER, 166, 248
NOOMOONA, 589
NOOR-EL-BAHR, 533
NORDERDIJK, 531
NORDHAV, 628, 632, 633, 636
NORDLAND, 298
NORDPOL, 290
NORTH SEA, 452
NOTIS, 356
NOTRE DAME, 635
NOTTINGHAM, 182, 183
NUBIAN, 244, 245
NUTTALIA, 400
NYLAND, 299
NYTAAR, 345

OCEAN, 607, 629
ODIN, 6
OKHARA, 634
OLDENBURG, 314
OLDER, 188, 325, 328, 329
OLIVE BRANCH, 411, 412
OLYMPIC, 533, 702
OMRAH, 250, 555, 562
ONSLow, 701
OOPACK, 594, 595, 597
OPHELIA, 703
OPOSSUM, 703

ORACLE, 699
ORIOLE, 169
OSTFRIESLAND, 357, 477
OTWAY, 328
OUSE, 703

P32, 476, 479
P51, 702
P56, 701
P57, 700
P60, 699
P61, 427, 428, 700
P62, 701
PALPNEER, 279
PANTHER, 507
PARCUST, 699
PARTHENON, 364, 366, 369, 376
PARTHIAN, 229, 644
PARTRIDGE, 250, 570, 572
PASTOR, 627
PASTORES, 635
PATHFINDER, 165, 527
PATRIOT, 699
PAX, 545
PAXTON, 467, 473
PELICAN, 182
PELIKAN, 596
PENA CASTILLO, 292
PENNISTONE, 628, 629
PERSIA, 217
PERTH, 233, 234, 235, 628, 629
PERTH AMBOY, 628, 629
PETER MAERSK, 362
PETREL, 331, 334
PFEIL, 493, 523, 679
PHILIPP, 279
PIATT ANDREW, 634, 635
PILLAU, 681
PILOT ME, 702
PINAR DEL RIO, 615, 621
PLIEADES, 635
POLLO, 355

POMMERN, 314
 POMONA, 292
 PONTET CANET, 520, 522
 POPPY, 381
 PORENA, 337
 PORJUS, 298
 PORPOISE, 183
 PORTO, 627
 PORTUGAL, 588
 POTENTATE, 636
 PRATT, 231, 620
 PRESIDENT BUENGE, 250
 PREUSSEN, 9, 674
 PRIMO, 166
 PRIMULA, 560
 PRINCE CHARLES, 280, 283, 697
 PRINCESS, 486, 637
 PRINS WILLEM, 337
 PRINZREGENT LUTTPOLD, 182
 PRIVET, 603, 704
 PRIZE, 367, 369, 370
 PROVENCE, 536
 PYRRHUS, 628

 Q5, 352, 353, 354, 699
 Q7, 472, 698, 699
 Q10, 366
 Q13, 196
 Q16, 378
 Q19, 699
 QUARRY KNOWE, 698
 QUEEN ALEXANDRA, 702
 QUEEN ELIZABETH, 513, 706

 R29, 703
 RASHAR, 326
 REGENSBURG, 671
 RENEN, 345
 RETRIEVER, 701
 REWA, 205
 RIO CLARO, 251
 ROBERT AND RICHARD, 628

 ROCHAMBEAU, 461
 ROMA, 534, 535, 536, 538, 539, 540, 542
 RONNIZ, 281
 ROON, 506
 ROSLIN, 283
 ROSTOCK, 313
 ROUMANIAN, 367
 ROXBURGH, 701
 RUGIA, 9, 10, 337, 593, 602
 RUSH, 635, 636

 S100, 579
 S106, 579
 S122, 6
 SALMON, 698
 SAMOA, 615, 622
 SAMUEL, 620
 SAN DIEGO, 232, 628
 SAN GIOVANNI, 328
 SAN ZEFERIONO, 427
 SANJOSE, 632
 SANTONELLE, 545
 SARAH REDCLIFFE, 327
 SARPFOS, 362
 SATURNIA, 528
 SAUNDERS, 635
 SAXONIA, 395
 SCANIA, 521
 SCHARNHORST, 506, 559
 SCHELDRAKE, 592
 SCHIEDIJK, 426
 SCHLESSEN, 314
 SCHLESWIG-HOLSTEIN, 11, 23, 401
 SCHNARE, 635
 SCOTTISH HERO, 229
 SEAFLOWER, 491
 SEAKING, 699
 SEAMAN, 627
 SEARANGER, 698
 SEATONIA, 326
 SEATTLE, 520
 SEEDLER, 187

SEINE, 554, 562
SENNETT, 640
SERPOLET, 546
SERULA, 345, 349
SEVERINI, 338
SEYDLITZ, 313, 507
SHAKESPEARE, 705
SHIPMATES, 491
SIBONEY, 623
SIEGFRIED, 20, 28, 477
SIERRA VENTANA, 705
SILIUS, 178
SILVIA VESTA, 349
SIZERGH CASTLE, 292
SKAGERRAK, 410
SKANDIA, 299, 362
SKJALD, 338
SNAPDRAGON, 575, 599, 703
SNOWDEN, 560
SOLINGEN, 701
SOMMERSTAD, 628, 629, 632
SOPHIE, 7, 396
SOUCHON, 186
SPEEDWELL, 298, 331, 334
SPRUCOL, 502, 503, 504
STA, 363
STANDARD ARROW, 635
STANLEY, 258, 352, 627
STANLEY WEYMAN, 352
STETTIN, 20, 559, 682
STIRLING, 334
STRALSUND, 673, 676
STRASSBURG, 673
STRATHMORS, 283
STRAUSS, 349
STURGEON, 701
STYLIANI BEBIS, 328
SUFFREN, 188
SUNDET, 299
SUSETTE FRAISSINET, 557
SUSSEX, 178, 179, 186, 188, 192, 218, 405
SVENT ISTVAN, 225
SVEVA, 646
SWINTE, 363
SYANJE, 363
SYDLAND, 633
SYDNEY, 640
SYLVANIA, 634, 635
SYLVIA, 439, 700
SYOLAND, 298
SYREN, 244
T100, 9, 579
T101, 10
T106, 579
T109, 6
T112, 467, 468
T131, 9
T137, 9, 512
T153, 506
T161, 579
T38, 6
T99, 7
TABERTNESS, 484
TALAWA, 601
TARA, 533, 560
TARANAKI, 274, 275, 276, 278
TASMANIA, 617, 624
TAX, 549
TB109, 476
TB95, 541
TENNO, 327
TERENCE, 381
TERESE, 327
TEXEL, 231, 619
THAMES, 483
THESPIS, 636
THETIS, 681
THISTHEARD, 363
THISTLE, 334
THOROLD, 376
THRASHER, 699
THRUSTER, 701
THUNDERSTONE, 291

TINTO, 290
 TIRADE, 439
 TITAN, 240
 TOGO, 545, 546, 549
 TOKIO, 242
 TOKUYNA MARU, 627
 TOMSK, 483
 TRASHER, 347
 TRIPEL, 575
 TRITON, 240
 TRIUMPH, 171, 217, 232, 527, 528, 529,
 530, 634, 635, 649
 TROLDFOSS, 363, 368
 TROMBE, 311, 698
 TUBANTIA, 178
 TULA, 461
 TURQUOISE, 224
 TUSCANIA, 209, 231, 257

 U-1, 1, 25, 33, 100, 164, 500, 506, 523
 U-2, 20, 25
 U-3, 25, 44, 45, 305, 314, 507, 706, 707
 U-4, 25, 44, 45, 507
 U-5, 6, 166, 173, 697
 U-6, 6, 698
 U-7, 6, 173, 697
 U-8, 6, 173, 241, 244, 245, 246, 247, 278, 697
 U-9, 6, 12, 25, 44, 45, 165, 212, 238, 241, 244,
 507
 U-10, 6, 12, 305, 698
 U-11, 7, 8, 166, 173, 697
 U-12, 7, 8, 166, 248, 249, 697
 U-13, 165, 697
 U-14, 6, 7, 8, 173, 697
 U-15, 7, 8, 165, 179, 237, 697
 U-16, 6, 7, 8, 25, 44, 45, 147, 167, 168, 171,
 304
 U-17, 6, 7, 8, 12, 25, 44, 45, 165
 U-18, 3, 7, 8, 33, 100, 163, 167, 168, 242, 697
 U-19, 1, 3, 9, 12, 33, 44, 45, 63, 68, 71, 75, 76,
 79, 83, 92, 163, 164, 165, 169, 179, 181, 312,
 398, 440, 443, 444, 471, 568
 U-20, 9, 169, 174, 251, 257, 258, 259, 266,
 267, 273, 413, 506, 698
 U-21, 9, 18, 44, 45, 164, 165, 166, 169, 171,
 204, 217, 218, 226, 278, 350, 360, 398, 527,
 528, 530, 531
 U-22, 1, 9, 44, 45, 164, 175, 181, 186, 213,
 519, 520, 568, 697, 707, 708
 U-23, 10, 11, 12, 75, 173, 282, 378, 697
 U-24, 9, 25, 44, 45, 75, 147, 166, 174, 175,
 180, 187, 284, 289, 349, 378, 398
 U-25, 9, 10, 11, 12, 25, 44, 45, 147
 U-26, 9, 10, 11, 12, 79, 697
 U-27, 9, 10, 75, 175, 250, 290, 297, 697
 U-28, 9, 10, 11, 75, 164, 173, 175, 398, 409,
 410, 412, 442, 443, 700
 U-29, 10, 166, 172, 179, 238, 250, 251, 252,
 255, 256, 295, 404, 697
 U-30, 10, 25, 42, 43, 75, 138, 171, 250, 362,
 398, 488, 671
 U-31, 10, 75, 671, 697
 U-32, 10, 17, 42, 43, 45, 146, 180, 371, 373,
 441, 445, 446, 702, 708
 U-33, 10, 18, 42, 43, 175, 176, 217, 544, 588,
 648
 U-34, 8, 17, 42, 43, 145, 175, 217, 226, 544,
 601, 602, 683, 704
 U-35, 8, 17, 42, 43, 145, 146, 172, 175, 203,
 217, 218, 224, 229, 233, 471, 533, 534, 535,
 536, 538, 539, 540, 541, 542, 551, 560, 561,
 644
 U-36, 8, 279, 281, 282, 283, 697
 U-37, 8, 697
 U-38, 8, 17, 42, 43, 144, 145, 175, 188, 217,
 224, 226
 U-39, 8, 17, 42, 43, 92, 175, 203, 217, 224,
 226, 248, 441, 446, 702
 U-40, 8, 173, 274, 275, 276, 277, 697
 U-41, 8, 75, 144, 145, 298, 304, 305, 306, 307,
 308, 594, 698
 U-43, 9, 42, 43, 64, 65, 70, 71, 72, 73, 75, 76,
 77, 78, 80, 81, 82, 85, 89, 92, 95, 96, 180, 186,
 188, 360, 398, 414, 440, 467, 515
 U-44, 9, 180, 181, 215, 337, 360, 398, 559,
 699
 U-45, 9, 181, 325, 360, 398, 420, 421, 422,
 423, 442, 700
 U-46, 9, 42, 43, 180, 185, 186, 289, 398, 441,
 467, 471, 472, 473, 483, 519
 U-47, 9, 17, 42, 43, 180, 188, 519, 703

U-48, 9, 24, 75, 79, 84, 181, 186, 213, 337, 360, 398, 441, 443, 444, 467, 468, 469, 470, 471, 472, 473, 474, 700
U-49, 9, 181, 183, 187, 266, 325, 326, 327, 328, 329, 330, 355, 360, 398, 415, 416, 441, 444, 461, 700
U-50, 3, 9, 64, 65, 70, 71, 72, 73, 76, 77, 78, 80, 81, 82, 85, 89, 92, 95, 96, 187, 266, 325, 326, 327, 328, 329, 330, 360, 398, 440, 700
U-51, 8, 92, 143, 180, 698
U-52, 8, 17, 42, 43, 180, 181, 183, 188, 289, 343, 398, 441, 443, 444, 472
U-53, 8, 42, 43, 144, 181, 182, 185, 209, 234, 360, 398, 413, 605, 606, 607, 707
U-54, 8, 42, 43, 143, 181, 186, 209, 360, 398, 413, 422, 423, 440, 445, 446, 512, 515
U-55, 8, 42, 43, 181, 208, 360, 398, 442, 512
U-56, 8, 75, 92, 143, 181, 186, 698
U-57, 8, 42, 43, 66, 67, 74, 75, 76, 77, 80, 82, 84, 85, 92, 152, 337, 360, 398, 442
U-58, 8, 360, 398, 440, 461, 462, 463, 464, 465, 700
U-59, 8, 398, 699
U-60, 8, 42, 43, 356, 360, 398, 414, 441, 445, 446
U-61, 8, 42, 43, 360, 398, 442, 446, 702
U-62, 8, 42, 43, 66, 67, 74, 76, 77, 80, 82, 84, 85, 92, 152, 231, 360, 398, 442, 554, 643
U-63, 11, 17, 42, 43, 70, 71, 80, 180, 181, 183, 440, 443, 444, 445, 446, 469, 574
U-64, 11, 17, 42, 43, 92, 181, 440, 444, 471, 568, 570, 571, 572, 573, 574, 575, 576, 577, 578, 579, 580, 581, 583, 584, 702
U-65, 11, 17, 42, 43, 70, 71, 80, 92, 181, 183, 470, 574, 703
U-66, 2, 10, 11, 76, 78, 81, 84, 85, 89, 92, 151, 164, 180, 181, 182, 187, 289, 360, 398, 440, 470, 488, 700
U-67, 11, 40, 41, 180, 181, 209, 356, 360, 398, 440, 470
U-68, 11, 698
U-69, 11, 181, 289, 363, 398, 699
U-70, 2, 10, 11, 40, 41, 76, 78, 81, 84, 85, 89, 92, 151, 164, 180, 193, 228, 330, 360, 386, 398, 442, 470, 495
U-71, 1, 3, 6, 33, 40, 41, 63, 83, 89, 92, 97, 179, 211, 332, 360, 442
U-72, 6, 17, 40, 41, 179, 221, 590, 704

U-73, 17, 40, 41, 179, 221, 441, 446, 547, 568, 590, 704
U-74, 6, 179, 698
U-75, 6, 179, 186, 206, 398, 442, 701
U-76, 7, 186, 332, 333, 337, 338, 414, 699
U-77, 6, 698
U-78, 6, 40, 41, 211, 257, 360, 398, 704
U-79, 7, 40, 41, 337, 398, 441
U-80, 1, 3, 7, 33, 40, 41, 63, 83, 89, 92, 97, 179, 211, 317, 332, 399, 442, 461
U-81, 11, 66, 75, 77, 79, 84, 92, 187, 289, 349, 360, 378, 385, 399, 699
U-82, 11, 40, 41, 214, 399, 440, 445
U-83, 11, 187, 289, 349, 350, 351, 353, 354, 360, 378, 699
U-84, 11, 360, 399, 442, 472, 701
U-85, 11, 399, 699
U-86, 11, 40, 41, 66, 75, 77, 92, 399, 442, 495, 503
U-87, 10, 70, 71, 73, 75, 77, 80, 81, 85, 89, 92, 284, 399, 442, 472, 701
U-88, 10, 174, 257, 399, 413, 442, 700
U-89, 10, 40, 41, 442, 467, 701
U-90, 10, 40, 41, 441, 446, 602, 708
U-91, 10, 40, 41, 214, 483, 495, 643
U-92, 10, 40, 41, 70, 71, 73, 75, 77, 80, 81, 85, 89, 92, 503, 513, 516, 526, 703
U-93, 11, 70, 71, 75, 80, 92, 362, 363, 367, 368, 369, 371, 373, 376, 377, 386, 399, 442, 686, 701
U-94, 10, 11, 40, 41, 209, 386, 399, 441
U-95, 11, 440, 443, 471, 701
U-96, 11, 40, 41, 209, 442, 483, 701
U-97, 11, 40, 41, 441, 706
U-98, 11, 40, 41, 70, 71, 80, 92, 442
U-99, 8, 91, 92, 386, 699
U-100, 8, 38, 39, 442, 495
U-101, 8, 38, 39, 209, 214, 441, 446
U-102, 8, 38, 39, 214, 442, 495, 703
U-103, 8, 143, 440, 444, 601, 702
U-104, 8, 75, 91, 92, 702
U-105, 1, 11, 70, 71, 75, 76, 80, 85, 92, 209, 442
U-106, 11, 440, 700
U-107, 11, 38, 39

U-108, 11, 38, 39, 502, 602
 U-109, 701
 U-110, 11, 142, 483, 486, 487, 488, 489, 701
 U-111, 11, 38, 39, 214
 U-113, 11, 38, 39
 U-114, 1, 11, 38, 39, 70, 71, 75, 76, 79, 80, 85, 92
 U-117, 2, 3, 6, 7, 38, 39, 209, 232, 519, 632, 633, 636, 643
 U-118, 6, 7, 38, 39
 U-119, 7, 38, 39, 637
 U-120, 2, 38, 39
 U-121, 2, 38, 39
 U-122, 13, 38, 39
 U-124, 38, 39, 707
 U-126, 2, 13, 38, 39
 U-135, 2, 38, 39, 235, 709
 U-136, 38, 39
 U-138, 2, 33, 38, 39, 63, 235
 U-139, 2, 13, 33, 36, 37, 60, 61, 174, 211, 219, 226, 228, 231, 233, 235, 563, 643, 709
 U-140, 2, 13, 36, 37, 209, 228, 231, 232, 235, 519, 560, 636, 643, 644
 U-141, 2, 36, 37
 U-142, 2, 13, 33, 36, 37, 60, 61, 231, 235
 U-143, 33, 36, 37, 60, 62, 235, 563
 U-150, 2, 13, 33, 36, 37, 60, 62, 235, 519
 U-151, 2, 13, 33, 36, 37, 56, 58, 59, 184, 209, 218, 229, 231, 232, 440, 445, 560, 614, 615, 616, 617, 618, 623, 624, 626, 643, 644, 645, 646, 647, 649
 U-152, 13, 36, 37, 233, 235, 643, 645, 646, 647, 648
 U-153, 13, 36, 37, 230, 507, 554, 643, 647
 U-154, 13, 36, 37, 58, 59, 230, 507, 643, 702
 U-155, 13, 36, 37, 56, 58, 59, 184, 203, 228, 230, 233, 234, 235, 442, 637, 638, 643, 644, 645, 646, 647, 648, 710
 U-156, 13, 36, 37, 59, 209, 229, 232, 233, 234, 235, 448, 449, 450, 636, 643, 644, 646, 648, 649, 703
 U-157, 2, 13, 33, 36, 37, 56, 59, 141, 184, 226, 229, 234, 235, 448, 449, 450, 519, 520, 643, 645, 647, 648
 U-160, 4, 11, 214, 235
 U-161, 11, 214, 233
 U-162, 11
 U-164, 4
 UB-1, 2, 17, 33, 100, 115, 149, 697
 UB-2, 12, 25, 50, 51
 UB-3, 17, 698
 UB-4, 192, 697
 UB-5, 12, 25, 50, 51, 312, 313
 UB-6, 50, 51, 193, 196, 309, 699
 UB-7, 18, 115, 698
 UB-8, 8, 17, 18, 48, 49, 50, 51, 115, 149, 221, 703
 UB-9, 25, 46, 47, 50, 51, 530
 UB-10, 50, 51, 314, 395, 441, 443, 704
 UB-11, 25, 50, 51, 357, 395
 UB-12, 4, 14, 50, 51, 314, 442, 703
 UB-13, 698
 UB-132, 2, 193
 UB-14, 18, 50, 51, 115, 224
 UB-140, 33, 100
 UB-143, 707
 UB-148, 707
 UB-15, 17, 18, 225, 698
 UB-16, 50, 51, 442, 702
 UB-17, 2, 33, 50, 51, 100, 115, 441, 493, 701
 UB-18, 2, 3, 14, 33, 100, 101, 107, 119, 125, 155, 178, 192, 193, 387, 441, 445, 451, 454, 456, 477, 700
 UB-19, 14, 698
 UB-20, 12, 15, 196, 699
 UB-21, 6, 7, 8, 12, 50, 51, 180, 207, 360, 393, 394, 395, 396, 397, 399, 442
 UB-22, 6, 8, 12, 180, 360, 395, 399, 440, 701
 UB-23, 14, 50, 51, 196, 699
 UB-24, 12, 50, 51
 UB-25, 25, 50, 51
 UB-26, 14, 108, 110, 113, 311, 312, 313, 314, 315, 698
 UB-27, 6, 8, 13, 15, 180, 360, 399, 699
 UB-28, 25, 50, 51
 UB-29, 2, 14, 107, 178, 192, 698
 UB-30, 2, 12, 15, 50, 51, 107, 148, 441, 443, 446, 703
 UB-31, 12, 15, 50, 51, 387, 441, 444, 702

UB-32, 12, 15, 441, 453, 700
 UB-33, 12, 13, 15, 50, 51, 702
 UB-34, 7, 8, 12, 16, 50, 51, 181, 360, 399, 441, 444, 446
 UB-35, 8, 13, 181, 332, 333, 360, 399, 414, 440, 443, 444, 446, 701
 UB-36, 12, 15, 702
 UB-37, 14, 699
 UB-38, 14, 441, 444, 445, 701
 UB-39, 14, 192, 506, 699
 UB-40, 14, 50, 51, 197, 198, 441, 445, 446, 704
 UB-41, 8, 12, 360, 399, 441, 444, 700
 UB-42, 18, 50, 51, 107, 221
 UB-43, 17, 107, 221, 591
 UB-44, 17, 50, 51, 698
 UB-45, 18, 50, 51, 698
 UB-46, 18, 50, 51, 698
 UB-47, 2, 3, 17, 33, 100, 101, 107, 119, 125, 155, 221, 591
 UB-48, 2, 18, 33, 48, 49, 100, 193, 222, 544, 545, 704
 UB-49, 18, 48, 49, 148, 442, 443, 545, 569
 UB-50, 18, 48, 49, 440, 444, 445, 446, 568
 UB-51, 18, 48, 49, 441, 446, 544
 UB-52, 18, 48, 49, 224, 554, 559, 560, 561, 562, 563, 564, 566, 567, 581, 702
 UB-53, 18, 48, 49, 225, 544, 586, 587, 588, 589, 590, 591, 703
 UB-54, 15, 701
 UB-55, 15, 103, 491, 493, 494, 702
 UB-56, 15, 701
 UB-57, 15, 48, 49, 193, 195, 214, 451, 703
 UB-58, 15, 506, 701
 UB-59, 15, 48, 49, 477, 704
 UB-60, 25, 48, 49
 UB-61, 12, 206, 442, 701
 UB-62, 8, 12, 48, 49, 101, 440, 445
 UB-63, 12, 440, 444, 701
 UB-64, 9, 12, 48, 49, 209, 331, 442
 UB-65, 9, 48, 49, 426, 703
 UB-66, 18, 224, 701
 UB-67, 12, 25, 48, 49, 211
 UB-68, 18, 48, 49, 593, 595, 596, 597, 598, 599, 703
 UB-69, 18, 224, 701
 UB-70, 18, 48, 49, 702
 UB-71, 18, 48, 49, 224, 544, 702
 UB-72, 12, 25, 702
 UB-73, 7, 12, 48, 49, 199, 438, 502
 UB-74, 12, 15, 48, 49, 702
 UB-75, 12, 701
 UB-76, 48, 49, 507
 UB-77, 7, 12, 48, 49, 209, 231, 505, 512
 UB-78, 13, 15, 48, 49, 702
 UB-80, 15, 48, 49
 UB-81, 15, 476, 477, 478, 479, 480, 482, 701
 UB-82, 12, 48, 49, 483, 702
 UB-83, 10, 12, 48, 49, 512, 515, 703
 UB-84, 48, 49, 701
 UB-85, 13, 214, 495, 499, 500, 501, 702
 UB-86, 10, 13, 48, 49, 602
 UB-87, 10, 13, 48, 49, 214
 UB-88, 16, 48, 49
 UB-89, 8, 48, 49, 703
 UB-90, 9, 46, 47, 512, 515, 703
 UB-91, 9, 46, 47
 UB-92, 9, 46, 47
 UB-93, 9, 46, 47
 UB-94, 9, 46, 47
 UB-95, 9, 46, 47
 UB-96, 9, 46, 47, 602
 UB-97, 9, 46, 47
 UB-103, 16, 46, 47, 195, 520, 703
 UB-104, 16, 46, 47, 703
 UB-105, 18, 46, 47, 147, 148, 544
 UB-106, 46, 47, 701
 UB-107, 16, 46, 47, 703
 UB-108, 16, 46, 47, 702
 UB-109, 16, 46, 47, 193, 195, 519, 520, 521, 522, 523, 524, 525, 643, 703
 UB-110, 16, 46, 47, 194, 413, 502, 504, 505, 506, 507, 508, 509, 703
 UB-111, 16, 46, 47
 UB-112, 16, 46, 47, 195
 UB-113, 16, 46, 47, 703

UB-114, 46, 47, 702
 UB-115, 46, 47, 703
 UB-116, 16, 46, 47, 198, 704
 UB-117, 16, 46, 47, 195
 UB-118, 10, 46, 47
 UB-119, 10, 46, 47, 702
 UB-120, 10, 46, 47
 UB-121, 10, 46, 47, 602
 UB-122, 10, 46, 47
 UB-123, 10, 46, 47, 703
 UB-124, 10, 46, 47, 209, 511, 512, 513, 514,
 515, 516, 517, 530, 703
 UB-125, 10, 46, 47
 UB-126, 10, 46, 47, 515
 UB-127, 46, 47, 393, 703
 UB-128, 18, 46, 47, 519
 UB-129, 18, 594, 704

 UC-1, 2, 33, 116, 128, 149, 196, 390, 699
 UC-2, 192, 697
 UC-3, 698
 UC-4, 7, 14, 16, 52, 53, 54, 55, 128, 196, 399,
 441, 442, 703, 704
 UC-5, 7, 13, 52, 53, 192, 196, 441, 602, 698
 UC-6, 17, 52, 53, 437, 442, 594, 700
 UC-7, 7, 337, 361, 399, 698, 699, 707
 UC-8, 14, 698
 UC-9, 14, 698
 UC-10, 14, 128, 149, 698
 UC-11, 54, 55, 128, 157, 441, 702
 UC-12, 17, 128, 221, 698
 UC-13, 17, 698
 UC-14, 15, 17, 441, 700
 UC-15, 2, 18, 33, 115, 116, 128, 157, 698
 UC-16, 2, 4, 14, 33, 97, 100, 115, 116, 156,
 158, 159, 160, 441, 443, 444, 700
 UC-17, 14, 54, 55, 440, 444, 491, 493
 UC-18, 14, 699
 UC-19, 14, 698
 UC-20, 17, 54, 55, 185, 188, 221, 228, 550,
 589, 594
 UC-21, 14, 434, 440, 445, 700
 UC-22, 17, 54, 55
 UC-23, 18, 54, 55
 UC-24, 7, 17, 222, 361, 399, 699
 UC-25, 12, 17, 54, 55, 117, 125, 550, 704
 UC-26, 14, 193, 386, 387, 389, 390, 391, 392,
 699
 UC-27, 12, 17, 54, 55, 442, 444, 445, 446
 UC-28, 25, 54, 55
 UC-29, 7, 361, 399, 699
 UC-30, 7, 361, 363, 399, 699
 UC-31, 7, 16, 54, 55, 331, 333, 334, 335, 361,
 399, 442, 445
 UC-32, 7, 333, 355, 356, 357, 358, 361, 399,
 699
 UC-33, 7, 125, 356, 361, 399, 426, 442, 700
 UC-34, 17, 54, 55, 118, 121, 123, 125, 588,
 704
 UC-35, 17, 54, 55, 221, 543, 545, 547, 548,
 549, 550, 551, 552, 553, 702
 UC-36, 15, 699
 UC-37, 17, 54, 55, 208, 561
 UC-38, 17, 222, 701
 UC-39, 15, 118, 119, 121, 123, 125, 197, 345,
 347, 348, 699
 UC-40, 7, 16, 52, 53, 125, 361, 399, 441, 444,
 451, 477, 495
 UC-41, 7, 361, 399, 700
 UC-42, 7, 361, 399, 414, 442, 443, 700
 UC-43, 7, 337, 361, 699
 UC-44, 7, 266, 361, 399, 400, 401, 402, 403,
 404, 405, 699
 UC-45, 7, 125, 399, 424, 442, 700
 UC-46, 15, 117, 699
 UC-47, 15, 442, 446, 700
 UC-48, 15, 52, 53, 150, 441, 445, 523, 701
 UC-49, 7, 16, 52, 53, 399, 441, 703
 UC-50, 7, 15, 331, 399, 441, 443, 701
 UC-51, 15, 399, 441, 444, 700
 UC-52, 17, 52, 53, 149, 441, 444, 568, 569
 UC-53, 17, 52, 53, 440, 445, 446, 569, 572,
 704
 UC-54, 18, 52, 53, 593, 704
 UC-55, 7, 361, 399, 438, 439, 442, 700
 UC-56, 13, 15, 52, 53, 702
 UC-57, 13, 441, 700

UC-58, 7, 13, 52, 53, 441, 602
 UC-59, 7, 13, 52, 53, 495
 UC-60, 13, 25, 52, 53, 507
 UC-61, 15, 21, 23, 31, 196, 699
 UC-62, 15, 442, 700
 UC-63, 15, 193, 441, 445, 446, 700
 UC-64, 15, 52, 53, 442, 445, 702
 UC-65, 15, 193, 441, 443, 446, 451, 452, 453,
 454, 455, 457, 459, 460, 700
 UC-66, 15, 699
 UC-67, 17, 52, 53, 594
 UC-68, 15, 699
 UC-69, 15, 441, 443, 446, 701
 UC-70, 15, 52, 53, 505, 506, 703
 UC-71, 15, 52, 53, 441, 443, 444, 445, 446,
 508
 UC-72, 15, 425, 442, 700
 UC-73, 17, 52, 53, 221, 550, 589
 UC-74, 17, 52, 53, 210, 226, 441, 443, 544
 UC-75, 7, 15, 52, 53, 197, 361, 399, 442, 702
 UC-76, 7, 337, 361, 399, 699, 707
 UC-77, 15, 52, 53, 399, 441, 703
 UC-78, 13, 15, 52, 53, 441, 702
 UC-79, 2, 4, 13, 15, 33, 97, 100, 115, 116,
 156, 158, 159, 160, 441, 700
 UC-80, 2, 33, 115, 194
 UC-89, 2
 UC-90, 2, 707
 UC-91, 703
 UC-120, 33, 115

 UA, 25, 33, 100
 U-BREMEN, 56, 184, 610, 611, 612, 679,
 681, 683
 U-DEUTSCHLAND, 5, 56, 183, 184, 185,
 203, 228, 330, 609, 610, 611, 612, 613, 615,
 637, 647, 648, 679, 683, 710
 U-OLDENBURG, 37, 648

 UDA, 635
 UL263, 703
 ULLA, 362
 ULRIKEN, 337
 ULYSSES, 255

 UMI, 350
 UNION, 337
 UNTSMOOR, 368
 URANUS, 30
 URBINO, 299, 301, 302, 303, 304, 306, 307
 URE, 244, 245
 USCHO, 337
 USSA, 391

 V100, 454
 V105, 23
 V108, 23
 V153, 11, 506
 V159, 6, 10
 V161, 7, 579
 V164, 10
 V441, 528
 V69, 349
 VALERIA, 416, 699
 VALIANT, 295
 VANDUARA, 169
 VANESSA, 703
 VARING, 187, 326, 327, 328
 VATERLAND, 209, 514, 674
 VERNA, 635
 VESTA, 339
 VETDETER, 363
 VICTORIA LUISE, 515
 VIENNA, 417
 VIKING, 244
 VILLA DE SOLLER, 545, 546, 549, 550
 VINDEGGEN, 232, 615, 621, 622
 VINETA, 20, 22, 27, 28, 30, 370
 VINLAND, 621
 VIRGO, 675, 682
 VITOL, 484, 486
 VOLLRADTHARN, 290
 VON KLUCK, 675
 VULKAN, 20, 26, 27, 87, 401, 507

 WAALBICK, 415
 WALDECK ROUSSEAU, 219

WALDTRAUTE, 20, 26
WALLFLOWER, 702
WALTER PRIORY, 703
WANLOCK, 514
WAR QUEEN, 599
WAR RANEE, 635, 636
WARSPITE, 180
WAVERLEY, 578
WEST HAVEN, 635
WEST LOTHIAN, 363, 368, 376
WESTFALEN, 183
WETTIN, 516, 679
WIEN, 16, 550, 581
WIESBADEN, 371
WIGDIS, 355
WILEY, 615, 619
WILLIAM OSWALDT, 675
WILLONYX, 452
WILLY, 502
WILMORE, 577
WINNECONNE, 615, 619
WITTE ZEE, 483
WITTELSBACH, 559
WOERTH, 579
WOLF, 187, 289, 349, 378, 526

YORCK, 559
YOUNG FRED, 702

ZAANDIJK, 531
ZAEHRINGEN, 679
ZENA, 298
ZINAL, 521
ZUBIAN, 701