

FATAL CHOICES

**WARGAMES, DECISIONS & DESTINY
IN THE 1914 BATTLES OF CORONEL AND FALKLANDS**

SETH OWEN

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DEDICATION

To Marlene

IN MEMORIUM

Dearly missed friends Patricia M. Paul & Mark J. Perry

How to use this book

One can, of course, simply read *Fatal Choices* as one would read any book. But this work is also meant to be an interactive experience, not just some fellow's opinion essay.

After you have read Chapter 2, examine See For Yourself Vignette No. 1 "Battle of Cocos: Emden" on Page 16. Make photocopies of the Form 10s for SMS Emden and HMAS Sydney that you will find in that chapter, along with the Form 4 Tactical Log sheet for each ship. Make copies of the tables in Appendix 2, or simply keep the book handy. If you have the Kickstarter edition of *Fatal Choices*, then punch out the ship counters for HMAS Sydney and SMS Emden. Otherwise make photocopies from the appendix and cut out the two ships you need. If you have ship models, you may use those. Some sources for appropriate ship models are listed on Page 195.

Read the abridged Fear God & Dread Nought rules in Appendix 2 and play the situation out. Do you agree with the chapter's conclusions? Do you see other ways the battle might have played out? Experiment, test and see for yourself.

If you have never played a wargame before or otherwise want a less intense experience, you can use the NavTac rules in Appendix 1, instead. Or try it out using some other rules such as Victory at Sea, Fletcher Pratt or SeeKrieg.

Neither a book nor a game can provide certain answers for events that never occurred, but both can provide insights into how events occurred the way they did. The synergy of history and game will enrich your experience of both as you see for yourself.

FOREWORD

Seth Owen has written an unusual book. To my knowledge, nobody's ever written a history book that included a wargame with the purpose of exploring the choices the historical commanders made.

Wargames are all about "what if." Even the most faithful wargame, with a well-researched and authentic order of battle and realistic rules, is an exercise in alternatives, because the players will make different decisions than the original commanders, and even if they tried to exactly reproduce the opening moves of the battle, random chance would rear its ugly head as soon as the first die was rolled.

"No plan survives contact with a D6."

The unknown wargamer.

But really, that's OK. We already know what happened in history, but there are always unanswered questions. Was victory inevitable? Or, "Why did he lose when everyone thought he should have won?" Some issues can be understood through study and discussion, but sometimes you just have to bang the rocks together.

And it's not just for fun. When we see the results of the commander's other choices (assuming the game is historically accurate), we deepen our own understanding of warfare, or the commander's psychology, or just how radically luck can influence a battle. And that deeper understanding is one of the big reasons people play wargames.

Seth Owen says a lot more about wargaming and the role of a commander's decisions in history and there's no reason to repeat it here. He's built a new type of history book, which could be called "interactive," except that the term's already been taken by a category of computer software. He writes about "active" study, and I like that, because as opposed to the passive process of just reading and absorbing what someone else has learned and written down, you have to take what you've read (history and rules) and do something with it. This requires more effort on the part of the reader, but the payoff is many fold.

If you're a traditionalist, you can still read this book and get a lot of good information about the Great War at sea. My message to you in this foreword is that if love history, but you're unfamiliar with wargames, this is a great way to find out about a tool that I promise will show you history in a more complete context.

And it is fun.

Larry Bond

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PROLOGUE: ON THE WARDROOM DECK

The 15-year-old admiral carefully considered his options as he paced inside the battleship's wardroom. He looked at the motley collection of unfamiliar model warships assembled on the table as he overheard his opponent openly discuss his battle plan with someone. The other player explained to his friend that he planned to keep his distance in the upcoming engagement – before he realized he was talking loudly enough to be overheard and abruptly clammed up.

The teen wasn't sure what to make of this information. He wanted to act as if he hadn't even heard the conversation, but in reality he had already been thinking along the same lines. After all, one of his four warships was a battleship with bigger guns than anything the other side had. Wouldn't keeping the range long work to his advantage anyway? But he wasn't sure. He'd never heard of this fight – Coronel.

It was 1970. The flummoxed teen admiral was this writer and the scene was the wardroom of the battleship Massachusetts, then recently installed as the official World War II memorial for the Commonwealth of Massachusetts and on this day the site of a wargame convention. The teen had only discovered the wargame hobby and naval wargaming the year before. And yet he suddenly found himself in the final round of a three-round naval wargaming tournament, much to his surprise, and the surprise of his opponents.

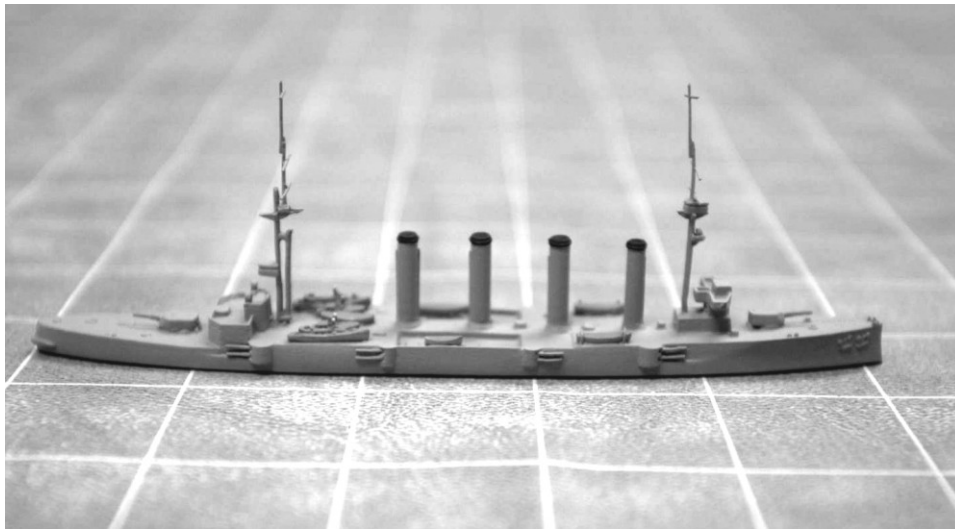


Figure 1 HMS Good Hope, model by NAVIS. This is similar to the model flagship commanded by Admiral Owen in 1970 on the wardroom deck of the Battleship Massachusetts. (Kiyora Smith/ Author's collection)

The tournament was showing off a new set of “Realistic Naval Miniature Rules” called Victory at Sea and was being run by the author of those rules, a gentleman named A.J. Morales. The tournament comprised three rounds using the scenarios in the game. Our teen admiral had won the first battle – Denmark Straits – when the Hood improbably blew up on the third turn, just as it did in the historical action, giving the teen's Bismarck and Prinz Eugen a quick victory.

The second battle, the River Plate, was a harder-fought affair, but again the historical victor emerged on top, this time the teen's three British cruisers defeating the pocket battleship Graf Spee through force of numbers. As we shall see, also not an unexpected result.

So far, so good, although the teen couldn't help but feel like he was in over his head. One battle was won by fluke, the other by numbers. At least he had heard of the Bismarck and Graf Spee. But where was Coronel and what were these strange-looking warships? Who actually won, anyway? There didn't seem to be any obvious advantage one way or the other. Each side had four ships. If anything, the teen seemed to have an edge with three large ships, including a battleship, while the other fleet, which he learned was German, only had two large ships and the other two were quite small.

The battle commenced and before long, it was evident why the experienced and older player commanding the German side planned to keep his distance. The old battleship was too slow to keep up. Every time the teen's British squadron made a move towards the German fleet, it would fade back. Dice were thrown. Hits were assessed. Points were subtracted and one by one the guns on the British ships began to fall silent. All the while the battleship struggled to close the range – unsuccessfully. The British landed an occasional hit in return, but they seemed to have little effect. Before long, the umpire ruled the game over, with the British squadron decimated, the battleship left far behind and a teen admiral wondering how he could have done better.

Now -- 44 years later -- that wardroom floor admiral, no longer a teen, still wonders if the ill-fated British squadron at Coronel could have done better. The actual commander at Coronel 1914 didn't have the battleship – he had an even more worthless 'warship,' an armed merchant cruiser. But the 1970 game seemed to suggest that having the battleship wouldn't have helped much. What was the real story of Coronel and what choices were truly available? This book poses the questions and suggests some answers. And it invites the reader to see for himself.

INTRODUCTION: HISTORY, AN ACTIVE OR PASSIVE STUDY?

While the original spark for this book was kindled when a 15-year-old pimply “admiral” tasted defeat at Coronel in the wardroom aboard the Battleship Massachusetts in 1970, my interest in that long-ago battle was rekindled by three new sources – two positive and one negative – which combined to inspire this re-examination of the historical events of a century ago.

The first positive source was an unusual 2010 book called *Death at Sea* by Drexel University history professor Eric Dorn Brose. It’s an unusual book because Brose is an accomplished academic historian and if there’s anything academic historians dislike, it’s any sort of speculation. And yet Brose wrote this book, which he called a “novelistic history” (as opposed to a historical novel, I suppose) which retold the story of the German East Asiatic Squadron under Rear Adm. Maximilian Graf von Spee in the opening months of the Great War. The book raised all sorts of intriguing questions about various “what ifs” of the campaign. But Brose is, perhaps, a little too much of the academic historian to really let himself go and truly explore those what-ifs.

As a life-long consumer of history books, although not an academic historian myself, I’m well aware of the extreme reluctance of most historians to indulge in any sort of speculation at all. What *did* happen is, more or less, knowable. What *could* have happened is, fundamentally, unknowable. This has the unfortunate effect of creating a deterministic aura around most historical accounts. The historian crafts a narrative that explains what happened and why, implying that what did happen was therefore all that could, necessarily, happen.

Philosophers and theologians have built careers and religions debating whether we have free will and to what extent human agency affects the course of events. While determinism has its attractions for historians, philosophers and theologians, it doesn’t provide much help for people faced with making decisions. Whether or not things must turn out a certain way, it never seems that way to us as we live life.

Indeed, the study of tactics and strategy are premised on the existence of choice. That our decisions have consequences and that what we choose makes a difference in events is the very foundation of the Art of War and the Science of Tactics.

But who can say what might have happened? It’s all just opinion, right?

The historian’s wariness of speculation is well-founded. All history involves selecting from among a variety of sources. Omission is unavoidable. Indeed, far more will always have to be left out than can ever be included in any historical account. The writer’s power to shape and frame are enough of a problem when considering a descriptive task of a straight historical account. How much more so when employed to make a speculative case? The power of the pen can make us believe – at least for a moment – in orcs, Qidditch or Objectivism.

My second, more negative, source of inspiration for this book illustrates the pitfalls of speculative history. In 2005 Tom Carhart wrote *Lost Triumph: Lee's Real Plan at Gettysburg – And Why It Failed*. In it, Carhart theorizes that Lee's real plan for the third day at Gettysburg involved a simultaneous attack on the rear of Meade's Army of the Potomac by Stuart's cavalry during Pickett's ill-fated charge against Cemetery Ridge. I don't mean to pick on Carhart's book. He's hardly the first or the worst to embark on this sort of speculative exercise. He is merely the one who caught my attention because I have a special interest in the Battle of Gettysburg and so I had read his book.

In Carhart's well-written book he makes an entertaining case for his theory, and even someone well-versed in the history of the battle may find it persuasive at first. And yet his narrative really relies on an improbable series of events. Yet how is one to say? One opinion is as good as another, isn't it? In fact, he has studied the battle and therefore his opinion might be worth considerably more than another.

This is where my third source of inspiration steps in: War Games – or as they are usually termed in the hobby: wargames. Even a cursory examination of Carhart's proposed scenario using a simple commercial wargame such as Avalon Hill's 1988 edition of Gettysburg uncovers time, space and force constraints that call into question its viability. In fact, it's so improbable in the game as to make it inconceivable that an experienced and talented commander such as Gen. Robert E. Lee could have had the intention Carhart alleges. Carhart's plan is not helped by turning to more intricate, detailed or realistic wargames, either, as they invariably add more friction, constraints and complications. Carl von Clausewitz famously observed: "Everything in war is simple, but the simplest thing is difficult."

A wargame is a model of reality. Like all models it is not the real thing, but carefully used it can provide insights into the real thing. And specifically, careful use of a wargame model can help provide a reality check for speculative exercises.

An author can always craft an argument to suit his purpose. And, as any honest non-fiction writer knows, careful selection of evidence can obscure gaps in knowledge, logical holes and inconvenient counter facts.

Historical writing over the last half century has benefited from the rise of wargames and the input of wargame designers, because the creator of a working model can't easily ignore relevant gaps. Facts need to be ferreted out. Where they can't be determined with certainty, reasonable estimations must be made and then tested against the historical record for accuracy. Exactly how things happened must be addressed. A writer can spice up his account with words like 'The King's Own Left Foot regiment was repulsed after enduring galling fire from the flank,' but the wargame designer modelling that same skirmish has to determine what, precisely, was "galling" about the fire, where, exactly was that 'flank,' and what, precisely, amounts to a 'repulse.'

This specificity provides an opportunity for not only accurately modelling what did happen, but also, if kept within reasonable bounds, insight into what could have happened.

So, here the three sources come together to inspire this book, where I hope to go where Brose feared to tread, while avoiding the pitfalls revealed by Carhart, and taking full advantage of the tools provided by a half century collaboration of wargame designers, historians and naval analysts.

The final reality check is provided by the reader. You can see for yourself whether the speculation makes sense and is reasonable, and explore other aspects of what might have been.

As such, this book doesn't aim to be a comprehensive historical account of Spee's voyage, the battles in the campaign or the larger events of the war. It doesn't spend a lot of time on the human elements of the story or the meaning of the events in the larger scheme of things. The bibliography points the way to a number of excellent sources for all that and more. What I have included is meant to provide sufficient background to understand the tactical choices available to Spee and his opponents and the context for those choices.

The rest is for the reader to see for himself.

CHAPTER 1

STRATEGIC CONTEXT: NO HAPPY CHOICES

Despite heightening European tensions for many years prior to 1914, the actual outbreak of the war caught the German navy by surprise. Unlike the case in 1939, the Germans were not able to position purpose-built raiders overseas before hostilities and the disposition of the German cruisers in August reflected peacetime deployment practice. In fact, the German East Asia squadron wasn't even at its home port of Tsing Tao, China, but was at Ponape in the Caroline Islands starting a summer cruise to Germany's Pacific possessions.

Likewise the German light cruisers were scattered across the globe at their peacetime show-the-flag locations.

The Germans did have contingency plans, of course, and used their extensive merchant marine to set up supporting colliers at key points and converted some suitable merchant vessels into raiders, but the situation facing the Germans under Rear Adm. Maximilian Reichsgraf von Spee was essentially a come-as-you-are war.

While the Germans could hope to do a great deal of damage as raiders, their time to do so was inherently limited because they were vastly outnumbered by the naval forces of the powers combined against them and even more grossly overmatched in support facilities. Both the British and the French had long-established globe-straddling empires with ample port facilities available in every ocean. The other major naval powers were friendly neutrals such as Japan and the United States. In contrast, the Germans were forced to rely on the largesse of minor neutral powers that had little interest in antagonizing the Allies and were therefore inclined to read the rules regarding neutral behaviour narrowly and parsimoniously.

The Germans had access to no real naval bases anywhere outside of Europe. While the nature of coal-fired steam plants meant that refuelling at sea outside of a port was technically feasible to an extent not true with oil-fired plants, coaling was still a lengthy and dirty process that required frequent repetition.

Facilities for restocking ammunition or repairing battle damage or equipment malfunction were wholly absent.

The forces available for the Germans in 1914 essentially fell into two categories. On the one hand there were the light cruisers and converted-merchant raiders. These had negligible combat power against proper warships. All were lightly armed and protected. While fast enough to chase down typical merchant vessels and having sufficient firepower to overcome an unarmed ship, none were able to guarantee either being able to escape from an enemy warship or defeat one if encountered. As it turned out, the German light ships did achieve some successes. The light cruiser Emden was able to surprise a Russian cruiser and sink it, along with a French destroyer during a raid and light cruiser Königsberg was able to defeat the old British third-class cruiser Pegasus. More typically, however, Königsberg was later trapped by two British cruisers and Emden was sunk by a larger Australian light cruiser that it could neither outfight nor outrun.

The most useful advantages these light ships had were the vastness of the sea and the holding of the initiative. To counter this threat the Allies needed quantity far more than quality. Any marginal warship was sufficient to deter a raider far from home and any advantage in numbers was enough to ensure winning if it came to a fight.

But spreading a huge number of weakly armed warships thinly provided an opportunity for mischief by the second portion of the German overseas navy -- the twin armored cruisers Scharnhorst and Gneisenau. These were powerful ships, strong enough to overwhelm any single Allied light ship. The more the Allies spread themselves out to counter the raiders, the more vulnerable they were to being picked off by Spee's armored cruisers. To the extent that they concentrated forces to ensure defeating Spee, the Allies left that much more of the ocean unguarded and vulnerable to the depredations of raiders.

This suggests that Spee might have been able to employ a synergistic effect by deploying the light cruisers to mask his intentions, confuse the Allies as to his location and induce the Allies to spread out to cover all the potential threats. But it appears that Spee was too conventional in disposition to make a good corsair and he kept a tight leash on most of the light cruisers that came his way, preferring to employ them as local scouts and dispatch vessels instead.

It was only due to the lobbying of the Emden's captain that Spee released that light cruiser to conduct its historic and lucrative career as the scourge of the Indian Ocean. Of the two light cruisers that never operated with Spee, the Königsberg took only one prize before being trapped in Africa and the Karlsruhe took 16 before being destroyed by an accidental explosion. Still, between them, these three ships took out 33 merchant ships and 3 enemy warships, for a 12-1 ratio of losses overall.

In contrast, of the three cruisers that operated with Spee's squadron, Dresden took just two prizes and Leipzig four, both before they joined up with Spee. Nürnberg, which was with Spee throughout, took no prizes at all. Spee's armored cruisers took three prizes, one of which was a sailing ship. Even considering the victory at Coronel, the balance sheet runs heavily against the Germans under Spee's command. Against eliminating nine merchant vessels and two warships from the Allied column the Germans lost five warships and five auxiliary ships altogether.

As we shall see, the combat power of Leipzig, Nürnberg and Dresden in a squadron action was negligible. While retaining one to act as a local scout and dispatch vessel was useful, it seems like Spee missed an opportunity by keeping all three instead of sending one or two off as independent raiders.

Indeed, the designer's notes for the board wargame *The Far Seas*, which depicts the world-wide raider war, suggest just this strategy for the German player: "The German player should also consider keeping the Scharnhorst and the Gneisenau together with perhaps one other cruiser. This represents a considerable force which will compel the British player to keep some of his ships in squadrons, thus reducing his searching force."

Spee was a talented tactician, demonstrated not only by his overwhelming victory at Coronel, but also by his stubborn stand against huge odds at the Falklands. But he showed less skill as a strategist. His squadron provided some headaches for the Admiralty and handed it an embarrassing defeat, but did not materially affect the outcome of the war. By the end of 1914 all the German ships were sunk or bottled up and it wouldn't be until the advent of the submarine menace that the Allied sea lanes were challenged again.

For the Allies, the problem was a familiar one, with a long-established solution. Critical troop movements were organized into convoys with heavy escorts while the British reactivated reserve ships and converted civilian vessels into armed merchant cruisers. The key need was understood and within a few weeks of the outbreak of the war the Allies started to fill the ocean with numerous, if weakly armed, vessels. The British supported this effort with energetic diplomacy that kept neutrals from providing much support to the erstwhile German raiders and started the process of recruiting active supporters as well. This paid off with the entry of Japan into the war, but even before Japan formally entered the war, its expected entry constrained Spee's movements immensely, essentially driving him out of the western Pacific – where his only base was located – and making him a nautical exile.

Numbers were far more important than combat value as far as the Allies were concerned. While losing old ships such as Pegasus, Zhemtchug, Monmouth or Good Hope was embarrassing, it had no effect on the war effort. They could be spared. Yet the Allied contingent was not without its own formidable warships – such as the town- and Chatham-class light cruisers, the armored cruiser Defence or the battlecruisers – and the Allies only needed to get lucky once. There were enough ships to find the Germans and enough good ships to sink them eventually.

The saga of the one light cruiser that Spee spared suggests that there was potential in a pirate's life, if embraced with enthusiasm. We will look at the Emden's story next.

Maximilian Reichsgraf von Spee



Figure 2 Maximilian Reichsgraf von Spee

Maximilian Reichsgraf von Spee's background was typical of the lesser nobility that formed the core of the Imperial German military establishment. Graf translates to the noble rank of "count" in English. Less typically, Spee, born in 1861, joined the German navy instead of the army, in 1878 when he was about 17. This wasn't as early as his Victorian-era Royal Navy counterparts, who were often barely into their teen years when they became midshipmen, but it still meant that he had been a seafaring man for more than three and a half decades by the time he led the German East Asia Squadron.

Spee had a considerable amount of overseas service by the time he arrived at Tsingtao in 1912, having previously seen action during the Boxer Rebellion and commanding German shore facilities in Africa. He had a reputation as a tactical and gunnery expert and by the outbreak of the war he had been in command of his squadron for more than two years.

It's difficult to provide irrefutable proof of something as subjective as tactical skill, but an interesting Dec. 28, 1914 letter from the German naval attaché to the Army and Navy Journal quoted in the United States Naval Institute Proceedings provides a way to make the case that Spee was quite skilled, indeed. The letter's author, German Navy Capt. Karl Boy-Ed, compares the combat power of the respective squadrons at Coronel and The Falklands by calculating the weight of metal thrown by their broadsides. This was a long-established and long-accepted way to measure relative firepower. For example Theodore Roosevelt used the same technique to compare opposing ships in his classic book *The Naval War of 1812*.

Obviously, such a comparison has its limits, but in the case of these two 1914 engagements where there was not a vast difference in the armour of the ships or their types, it seems a reasonable shorthand. If anything, it rather understates the case, as at Coronel the two sides were roughly equal in speed and at The Falklands Spee's squadron was at a considerable disadvantage in speed.

Boy-Ed calculated the throw weight of Rear Adm. Christopher Cradock's squadron at 1,276 kilograms and Spee's four ships engaged in the main action at 1,952 kilograms. Spee clearly had an advantage, one that he turned into a crushing victory in less than an hour's fighting.

In contrast, at The Falklands, Spee's slightly stronger squadron (all five cruisers being present) had a throw weight of 2,032 kilograms, according to Capt. Boy-Ed, while Vice Adm. Doveton Sturdee's squadron had an overwhelming 9,566 kilogram broadside. Indeed, a *single* British battlecruiser had a 3,084 kilograms broadside, making it proportionately as strong by itself as Spee's squadron was compared to Cradock's. And yet, Capt. Boy-Ed points out, it took Sturdee five hours to defeat Spee's squadron. Together the comparative outcome of the two battles suggests Spee had exceptional battle skill.

While Spee's tactical acumen seems irreproachable, his strategic sense is another story. Even Capt. Boy-Ed's analysis suggests that the German light cruisers added a negligible amount of combat power to Spee's squadron. Having no real utility in a fight, Spee just had them tag along and conform to the movements of the armored cruisers until he gave them leave to flee near the end.

Spee may have understood all too well the long odds against his success and he seems to have developed a defeatist attitude. When presented with flowers in Valparaiso as he was feted by the German community there in the wake of his victory at Coronel, he remarked that they would look very nice on his grave. While honesty is a virtue, such a grim attitude does not bode well for making the most of a difficult situation.

Still, Spee's leadership skills meant he was well-respected by his subordinates. He was approachable and encouraged candid discussion by his officers, even as he made it clear that the final decision was his, alone. He also had the moral courage to admit an error, as his last signal to his friend Maerker -- "You Were Right After All" -- demonstrates. This was a remarkable message to send amidst the carnage of a lost fight.

Despite the pummeling and severe damage inflicted on the Scharnhorst, Spee evidently survived unscathed until the ship went down. His last signal was sent just minutes before the ship sank with all hands.

CHAPTER 2

POTENTIAL REALIZED: THE EMDEN SAGA

Scharnhorst: “Emden detached”

Emden: “My dutiful thanks for the confidence placed in me. Success to the squadron and Godspeed.”

With that exchange of signals at the German colony of Pagan Island in the Pacific, Adm. Maximilian Graf von Spee’s East Asia Squadron and Capt. Karl von Mueller’s light cruiser Emden parted company on Aug. 13, 1914.

The two leaders shared destinies fated to be glorious, but demonstrated a considerable difference in opinion as to the right approach to winning that fame.

Spee’s instinct was to gather his far-flung forces to himself and operate as a unified squadron to maximize his power. Spee judged that he had to head for South America because his squadron could not maintain itself off the coal from captured ships. His judgment was undoubtedly correct, so far as it went, but it may not have gone far enough.

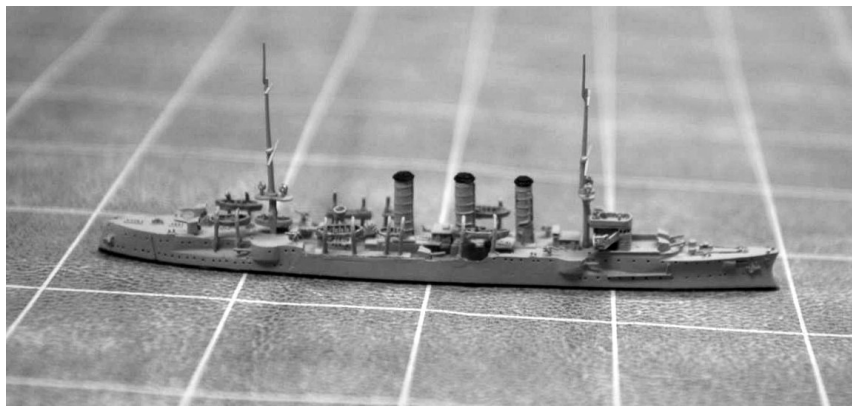


Figure 3 SMS Emden, 1:1250 model by NAVIS (Kiymora Smith/Author’s collection)

Mueller proved to have much more of the buccaneer’s spirit as the captain of Emden and his voyage over the next few weeks would show off the potential of a skilful and audacious raider. Mueller argued that a single light cruiser would be hard to find and could subsist off the coal from captured merchants. This vampire-like strategy took advantage of the fact that coal was ubiquitous in merchant shipping and relatively simple – if arduous and time-consuming – to transfer between ships at sea.

Emden was typical of German light cruiser designs. At 3,664 tons, it wasn’t a large ship, but it was substantial enough to operate independently. It wasn’t especially well-armed, with a main battery of ten 4.1-inch guns, but they were more than sufficient to overcome unarmed merchant ships. It wasn’t especially fast with a speed of 24 knots. This was enough to chase down civilian shipping, but not quite fast enough to escape from its likely hunters, British town-class light cruisers. It was a sister ship to the cruiser Dresden, which would later join Spee’s squadron, although the two ships had different propulsion systems. Emden had the older reciprocating engines while Dresden used the new technology of steam turbines as an experiment. While the turbine technology eventually proved superior, Emden’s older engine technology didn’t make a significant difference in events, as it turned out.

While Spee headed east, Emden steered a course for the Indian Ocean, passing through the Dutch East Indies and dodging Dutch warships to begin its depredations against British shipping off the coast of India on Sept. 10. In just five days Mueller captured nine steamers, beginning a legendary cruise that made him one of the war's early heroes.

Unlike the grim ruthlessness inherent in submarine warfare, commerce raiding by surface ships in 1914 had a chivalrous air to it that caught the fancy of the public. There were rules to be followed under international agreements that worked to reduce the loss of life and mitigate the inconvenience for neutrals. Typically the raider would overhaul a potential target, fire a warning shot if needed, and then send over a boarding party to inspect the vessel, its papers and cargo. If the ship was a neutral vessel not carrying any contraband it would be sent on its way. If it was an enemy-flagged vessel or carrying war supplies, the crew would be taken off, any useful supplies (usually coal and food) removed and then the vessel sunk.

Later, purpose-built raiders would have provisions made for holding prisoners, but ships like Emden had to make ad hoc arrangements. There generally wasn't much spare carrying capacity to hold very many prisoners and it was against the rules to simply maroon the passengers and crew of the sunken ship at sea. Often a suitable prize ship was used to house those captured from several other ships and then allowed to leave.

So it was that of the nine ships Emden captured in its first batch, six were sunk, two were retained as colliers and one was packed with the survivors from the other eight and sent away.



Figure 4 Emden's crew heads out to sea in an unsuccessful attempt to rejoin the ship. In the distance is the schooner Ayesha which the crew used to escape capture by sailing to Arabia. (National Library of Australia)

Emden followed the same pattern with batches of ships captured between Sept. 25th and 27th (four sunk, one collier and one released with prisoners) and between Oct. 16th and 19th (five sunk, one collier and one released with prisoners).

In between these episodes Emden also made a couple of raids against fixed targets. On Sept. 22 the light cruiser bombarded the oil storage tanks at Madras, India, destroying a couple and riling up local merchant trade and undermining British imperial rule at one stroke. On Oct. 28 it boldly raided Penang Harbor in Malaysia, surprising and sinking the old Russian protected cruiser Zhemtchug, a veteran of the Battle of Tsushima, along with a French destroyer.

If he encountered it on the open sea, Mueller probably would have simply run away from Zhemtchug. While it was not an especially strong vessel, with just a half-dozen 4.7-inch guns, Mueller would have had no reason to take the chance of fighting it, as it wasn't any faster than his ship. But what little chance the Russian cruiser might have had was lost when Emden used a dummy funnel and the laxness of the Russians to close within mere yards of the Russian ship before opening fire with guns and a torpedo. The Russian captain and first officer were ashore and much of the crew was being "entertained" by local women. The surprised Russians got off a few shots, but the fight was over before it started. The tiny French destroyer was also no match for Emden and was sunk after a gallant attack.

Emden's luck ran out when Mueller tried yet another raid on a shore facility, this time a British cable station on Direction Island in the Cocos Island Group. Wireless operators on the island had a chance to send out an SOS reporting that Emden was there before the German landing party could destroy the station and despite some radio jamming by the German ship. This might not have mattered, except that coincidentally an Australian troop convoy was just 52 miles away. Among its escorts was the town-class light cruiser HMAS Sydney, which was dispatched to check out the report.

At 0912 German lookouts spotted the approaching Allied warship. There wasn't time to recover the landing party and so Mueller raised steam and made a break to escape.

Odds were against the doughty German light cruiser, as it was seriously outmatched by the British ship in every way. Foreshadowing the fate of Spee's squadron almost a month later, Emden was slower than Sydney and outgunned as well. About Mueller's only hope would be a lucky hit that slowed down the British cruiser. Emden did manage to land some damaging early blows, but the heavier battery on the Sydney began to tell. The German ship was also undermanned because it had been unable to recover the landing party, which reduced the effectiveness of its fire.

Still, the two ships were not a hopeless mismatch and Sydney deserves credit for making the most of its edge over the German cruiser to decisively defeat it. Mueller had to beach the riddled Emden at North Keeling Island. Some difficulty in signaling his surrender caused some unfortunate additional casualties before it was all over, but in the end a much higher proportion of Mueller's crew survived than on his erstwhile squadron mates.

Meanwhile, the landing party abandoned on Direction Island was able to escape on a commandeered sailing ship and sail to Arabia! After many picturesque adventures they made their way back to Germany, hailed as heroes.

Mueller's total bag was 70,825 tons' worth of Allied shipping, two warships and the capture and conversion of a Russian merchant ship into the raider Comoran. Not bad for a smallish light cruiser. Unfortunately for the German war effort, Emden's exploits were the exception, not the norm. Of the German light cruisers at large at the start of the war, only Karlsruhe under Erich Kohler in the Atlantic was similarly productive, sinking sixteen Allied merchant ships for 72,805 tons of shipping before an accidental explosion cut short his career. The other four cruisers, between them, didn't do as much damage as either of these two alone. Three of those four operated with Spee's squadron and his conventional approach reined them in thoroughly. The fourth, the Konigsberg, was trapped by the British in the Rufiji River of East Africa after sinking one merchant ship and defeating the old British cruiser Pegasus in the Battle of Zanzibar. The Koenig's guns and crew later took part in the land campaign in German East Africa, while the disarmed cruiser was eventually sunk by British monitors.

Still, one wonders if Mueller and Kohler didn't point the way to a more cost-effective way to use the German light cruisers as raiders than Spee's more conventional use of them as scouts and dispatch vessels.

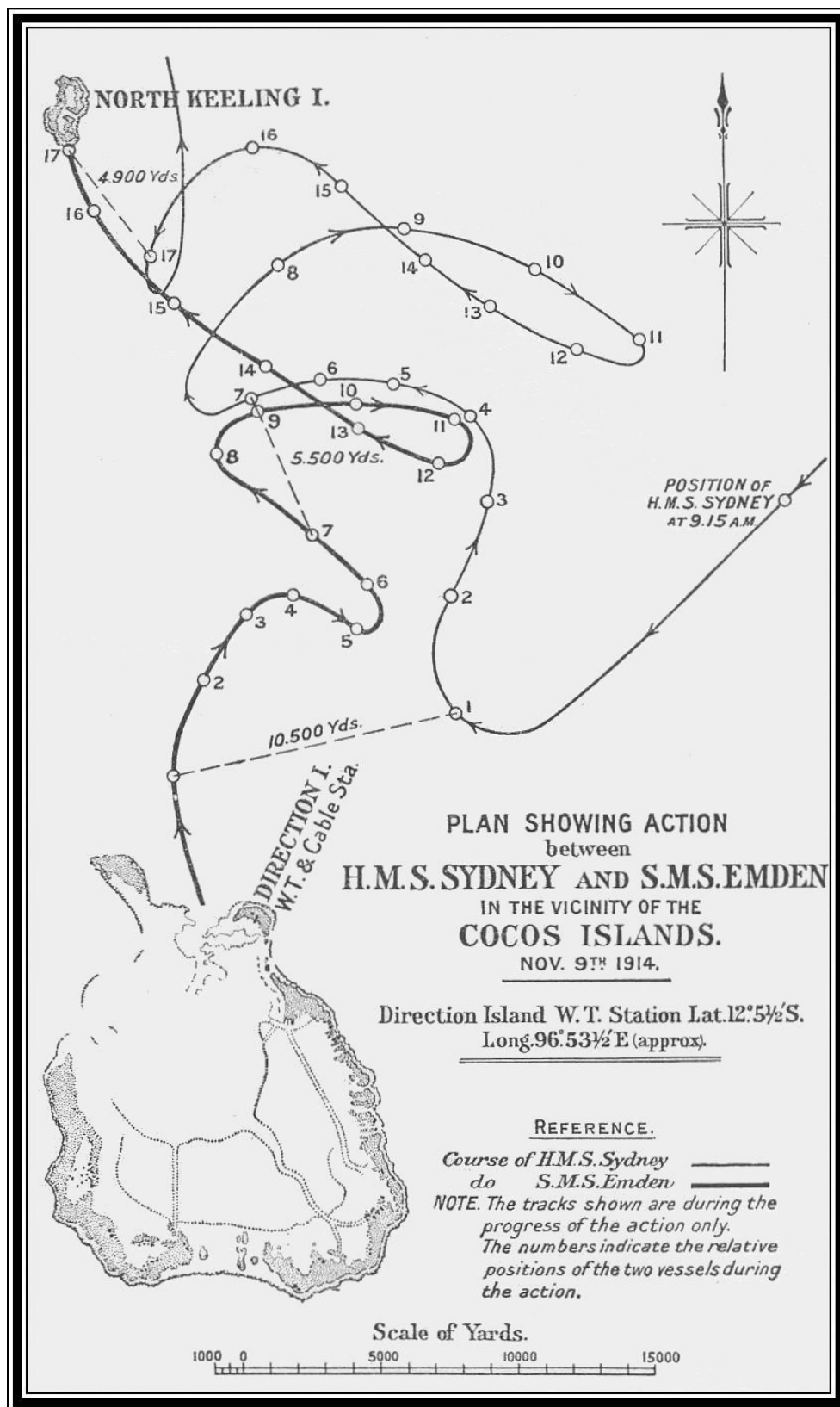


Figure 5 Chart of the Battle of the Cocos. (Corbett, 1920)

See For Yourself 1

Battle of Cocos: Emden's Example

North Keeling
Island



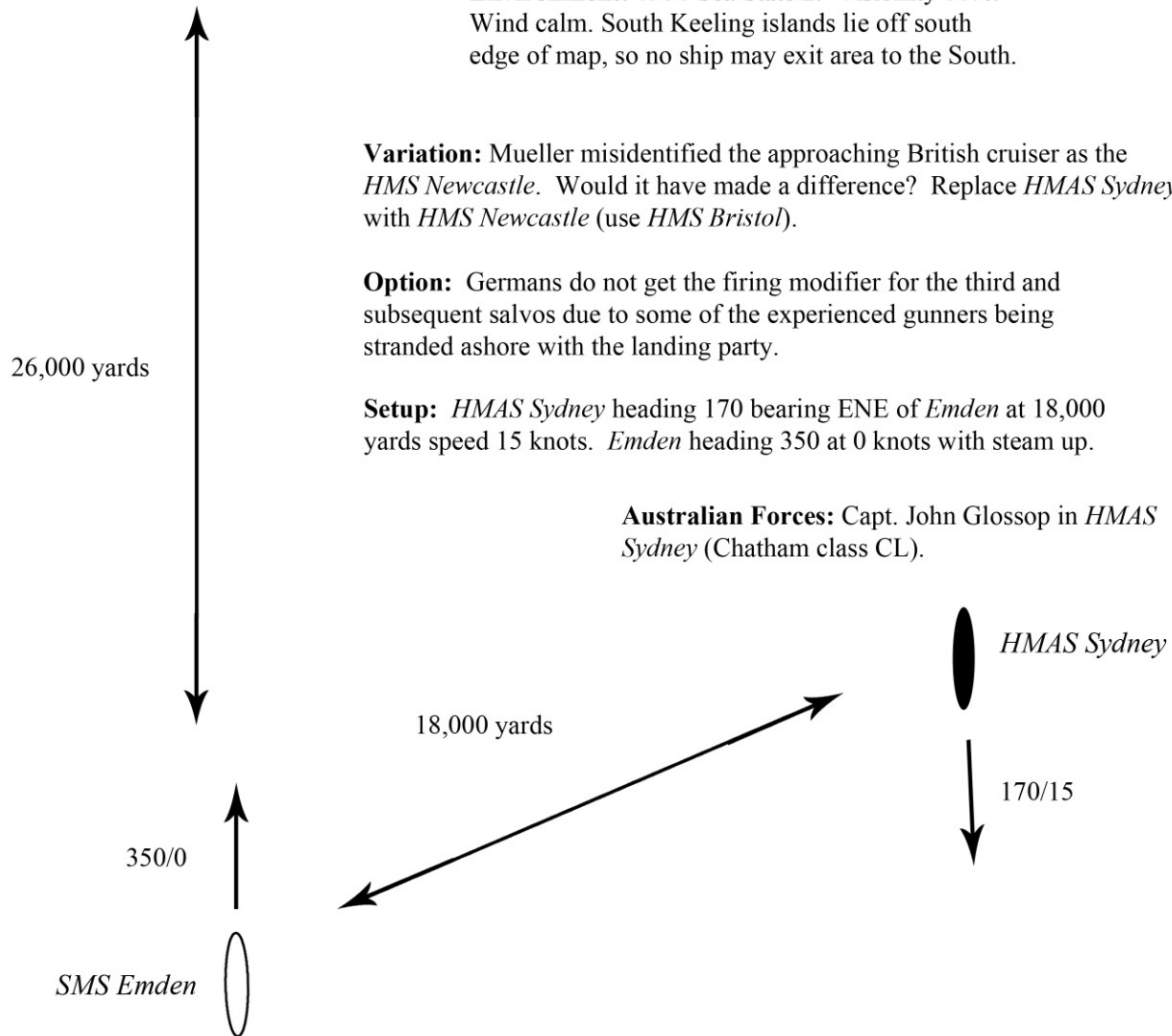
Environment: 0930 Sea State 2. Visibility 60%.
Wind calm. South Keeling islands lie off south
edge of map, so no ship may exit area to the South.

Variation: Mueller misidentified the approaching British cruiser as the
HMS Newcastle. Would it have made a difference? Replace *HMAS Sydney*
with *HMS Newcastle* (use *HMS Bristol*).

Option: Germans do not get the firing modifier for the third and
subsequent salvos due to some of the experienced gunners being
stranded ashore with the landing party.

Setup: *HMAS Sydney* heading 170 bearing ENE of *Emden* at 18,000
yards speed 15 knots. *Emden* heading 350 at 0 knots with steam up.

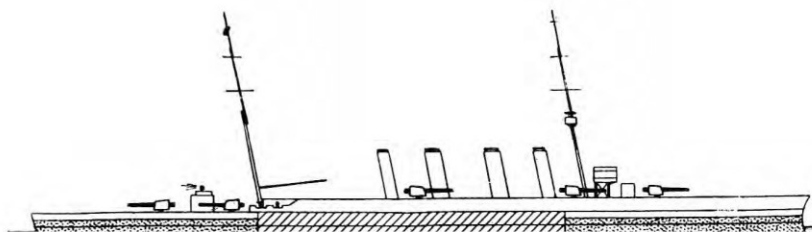
Australian Forces: Capt. John Glossop in *HMAS
Sydney* (Chatham class CL).



German Forces: Korvettenkapitan Max von Mueller in
Emden (Dresden class CL).

Victory Conditions: British - sink or disable
(over 50% damage) *Emden*. German - sink or
disable *HMAS Sydney* OR escape beyond visibility range.

Graphic by Elizabeth Owen



Sydney CL

Chatham class GB

BASIC SHIP DATA
 Size Class: C/Small In Service: 1912
 Armor: 4/3 Crew: 475
 Advance per 45° turn (Speed Loss)
 Standard Rudder: 200 yds (2)
 Hard Rudder: 100 yds (3)
 Accel/Tac Turn from 0-50% Max Speed: 8
 Accel/Tac Turn from 51-100% Max Speed: 4
 Deceleration/Tact Turn from any Speed: 10

COMMUNICATIONS

Visual Signals	# of Signals	W/T Types	Range (nm)
Flag Hoists:	2	Primary:	100 nm
Flashing Light:	3	Auxiliary:	5 nm
Total Signals:	2		

SEARCHLIGHTS:
 Fwd, Aft 3 kyds

WEAPONS

MkXI BL 6 in/50 Fwd	Port	Port	Port	Stbd	Stbd	Stbd	Aft
	Short Rng (50% Hit)		Med Rng (30% Hit)		Long Rng (10% Hit)		Extreme Rng (5% Hit)
Shell	100% vs Belt		100% vs Belt		70% vs Belt		40% vs Belt
Type	kyds	Pen	Dam	kyds	Pen	Dam	kyds Pen Dam
APC	0 -	13	16	4.4 -	8	13	8.7 - 6/1 11
CPC	4.3	10	14	8.6	6	11	11.4 4/1 10
HE	2	18		1	16		1/0 14

Port ☐ Stbd ☐ 21 in subm TT w/8 RGF 21 in MkII torp total ☐☐☐☐☐☐
 RGF 21 in MkII (1910) Range 3.8 kyds, 45 kts, 70 DP
 Range 10.9 kyds, 29 kts

Small Caliber Guns **Strength** **Range Finder** **Range** **+3 kyds** **+6 kyds**
 Anitarcraft Btry: (1)1 12 pdr/20cwt, B&S FQ2 14.5 17.5 20.5
 (1)4 MkII 3 pdr QF, (1)4 mg (7.0)
 Light Btry: (1)4 MkII 3 pdr QF (CP/HE) (0.9/1.3)

REMARKS

No main battery director. Gunnery Standard 2, local control.

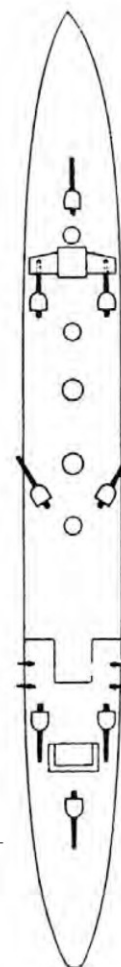
DAMAGE & SPEED BREAKDOWN

	None	25%	50%	75%	90%	100%	Critical Hits
Damage Taken	0	37	73	110	131	146	Engineering: <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> Rudder: _____
Max Speed	25	19	13	6	0	Sunk	Bridge: <input type="checkbox"/>

Fire/Flooding Severity Conditions:

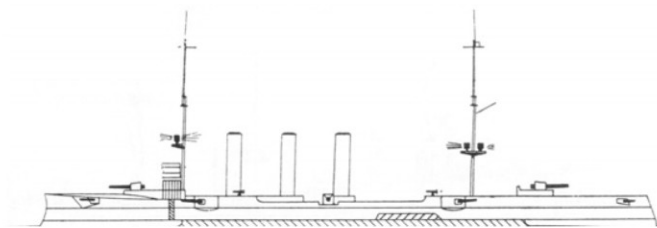
Starting DP	Dmg Rcvd	on Turn	Remaining Dmg	CH Ratio	Starting DP	Dmg Rcvd	on Turn	Remaining Dmg	CH Ratio
146	_____	_____	_____	_____	_____	_____	_____	_____	_____
_____	_____	_____	_____	_____	_____	_____	_____	_____	_____
_____	_____	_____	_____	_____	_____	_____	_____	_____	_____
_____	_____	_____	_____	_____	_____	_____	_____	_____	_____

Fire/Flooding D6+2 Fire/Flooding _____% Fire/Flooding _____% Fire/Flooding _____% Fire/Flooding _____%



Fear God & Dread Nought Form 10

This form is provided by Clash of Arms.
 It can be photocopied for use with any
 Admiralty Trilogy games.



Emden CL

Dresden class Germany

BASIC SHIP DATA

Size Class: C/Small
 Armor: 3/2
 Advance per 45° turn
 Standard Rudder: 200 yds
 Hard Rudder: 100 yds
 Accel/Tac Turn from 0-50% Max Speed: 8
 Accel/Tac Turn from 51-100% Max Speed: 4
 Deceleration/Tact Turn from any Speed: 10

In Service: 1908
 Crew: 361
 (Speed Loss)

COMMUNICATIONS

Visual Signals	# of Signals	W/T Types	Range (nm)
Flag Hoists:	2	Primary:	100 nm
Flashing Light:	3	Auxiliary:	5 nm
Total Signals:	2		

SEARCHLIGHTS:

Fwd, Aft 3 kyds

WEAPONS

10.5cm SLK/40 Port Wing ☐ Stbd Wing ☐ Port ☐ Stbd ☐ Port Aft ☐ Stbd Aft ☐

10.5cm SLK/40 Casemate Port ☐

10.5cm SLK/40 Casemate Stbd ☐

Shell	Short Rng (50% Hit)			Med Rng (30% Hit)			Long Rng (10% Hit)			Extreme Rng (5% Hit)		
	100% vs Belt			100% vs Belt			70% vs Belt			40% vs Belt		
Type	kyds	Pen	Dam	kyds	Pen	Dam	kyds	Pen	Dam	kyds	Pen	Dam
BHE	0 -	2	13	4.1 -	8	13	8.1 -	6/1	11	10.7 -	4/2	10
NHE	4.0	1	14	8.0	6	11	10.6	4/1	10	13.3	3/1	9

Port ☐ Stbd ☐ 45cm subm TT w/5 C/07 torp total ☐

C/07

Range 1.6 kyds, 36 kts, 58 DP

Range 2.2 kyds, 32 kts

Small Caliber Guns

Strength

Range Finder

Range

+3 kyds

+6 kyds

Anitarcraft Btry: (1)4 8mm mg

Light Btry: (1)8 5.2cm SKL/55

(1.8)

Zeiss Bg 3m

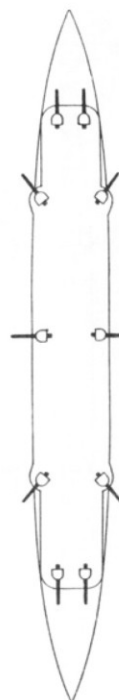
14.5

17.5

20.5

REMARKS

No director for main or secondary batteries. Gunnery Standard 2, local control.



DAMAGE & SPEED BREAKDOWN

	None	25%	50%	75%	90%	100%	Critical Hits	Engineering: <input type="checkbox"/>	Rudder: <input type="checkbox"/>
Damage Taken	0	27	54	80	96	107	Engineering: <input type="checkbox"/>		
Max Speed	24	18	12	6	0	Sunk	Bridge: <input type="checkbox"/>		

Fire/Flooding Severity Conditions:

Starting DP	Dmg Rcvd	on Turn	Remaining Dmg	CH Ratio	Starting DP	Dmg Rcvd	on Turn	Remaining Dmg	CH Ratio
107									
Fire/Flooding D6+2			Fire/Flooding ____%		Fire/Flooding ____%			Fire/Flooding ____%	

Minor (1-07%)
 Major (08-11%)
 Severe (12-13%)
 Overwhelmed (14+%)

Fire/Flooding ____%

Fear God & Dread Nought Form 10

This form is provided by Clash of Arms.
 It can be photocopied for use with any
 Admiralty Trilogy games.

CHAPTER 3

TOOLS: THE ARMORED CRUISER

The turn of the 20th century was the heyday of the armored cruiser. The first “armored cruiser” was the Russian Vladimir Monomakh in 1880 and the very last armored cruiser was the HMS Defence, completed in 1909, so the total length of time this type was in first-line service was barely three decades. They were considered capital ships and played important roles in the 1898 Spanish-American War and the 1904-1905 Russo-Japanese War, especially at the Battle of Tsushima.

But less than a decade after Tsushima changes in naval warfare had turned hard against this class of vessel. About as expensive to build as battleships and requiring similar levels of manpower to operate, armored cruisers were not as robust in battle. The Great War saw armored cruisers lost in appalling numbers. At least 21 armored cruisers were lost from all combatants during the war due to gunfire, torpedoes or mines, most with very heavy loss of life. Four were lost with all hands.

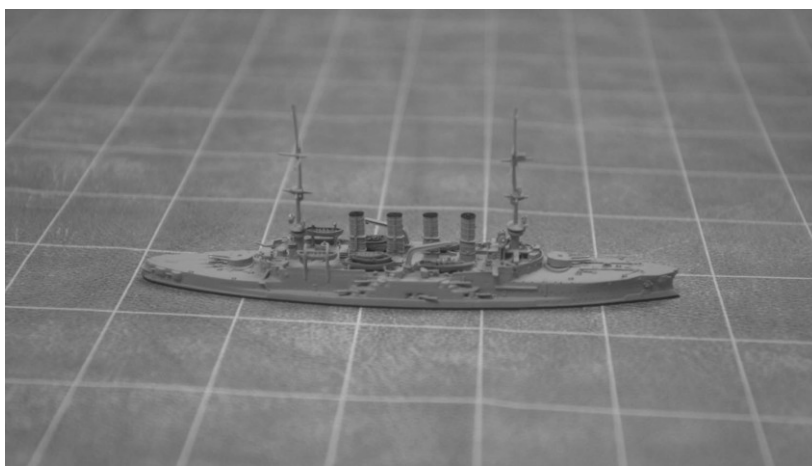


Figure 6 SMS Scharnhorst model by NAVIS. (Kiyora Smith/Author's collection)

Scharnhorst class -- SMS Scharnhorst & Gneisenau

The central players in Spee's 1914 drama were the sister ships Scharnhorst and Gneisenau. These two warships represented the heart of the military threat posed by the East Asia Squadron. The accompanying light cruisers had a role to play, but they were minor warships and could be countered by similarly minor combatants that would have negligible effects on the naval balance.

Scharnhorst and Gneisenau, in contrast, were capital ships, albeit of an obsolescent type in 1914. By 1914 the armored cruiser was no longer able to stand in the line of battle. The Dreadnought concept of an all-big gun battleship and the similar Invincible-class battle cruiser had changed the equation. Improvements in the large guns had increased their rate of fire and improvements in gunnery techniques were promising improvements in accuracy that suggested that having a uniform battery of large guns would be more effective than the mixed armament of earlier ships and that armored cruisers could no longer safely operate in the main battle line, a point later driven home at the battle of Jutland.

Still, Scharnhorst and Gneisenau were powerful ships, especially on detached stations such as the Far East, where dreadnought-type warships were still uncommon.

The two German ships were conservative designs, very well-built as was usual for German naval construction and well-armed. They were identical sister ships, and therefore worked well together as a unit. The main battery was a total of eight 8.1-inch guns. Four of the guns were mounted in twin turrets fore and aft, but the other four were mounted in casements on the side, which meant that the total broadside was only six heavy guns. Also in casements were the secondary battery guns, a total of six 5.9-inch guns, for a broadside of three.

They were well-protected with belt armor of 6 inches and a 2-inch armored deck and, like most German warships, well compartmented.

They were not especially speedy for armored cruisers, with maximum design speeds of around 24 knots. This was enough to outrun any pre-dreadnought battleship, but markedly slower than many British armored cruisers and hopelessly insufficient to outrun one of the new battle cruisers. This speed deficiency would play a major role in the outcome of the campaign and was a major consideration as Spee weighted his options. The top speed of Scharnhorst was even less due to a grounding accident that reduced its top speed to about 22 knots after repairs.

A bare recital of stats is not the sum total of a warship's effectiveness in any era, but it's especially important to note the more intangible aspects when evaluating the ships in this campaign.

The nature of the German East Asia Squadron's mission, as a detached squadron on a distant foreign station, had a major impact on its efficiency. All the crew members were long-service regular navy men, without any of the conscripts that filled out the rosters of homeland-based vessels. It was an elite posting and the two ships were widely regarded as efficient and well-led.

This manifested itself in at least two ways. First, both ships were noted for their proficiency in gunnery, being recent and multiple-year winners of the German Navy's gunnery competition. This had obvious implications in the coming engagements, as the two German ships could be counted on to be very dangerous adversaries.

Less visible, but also vital, is that the two ships were evidently very well-served by their engineering crews. In an era when large ship engineering plants were still relatively new and often temperamental, the exceptional reliability of the two ships played a key, if little noted, role in the campaign. Spee confidently set forth on a journey of extraordinary length and with little available support if something should go wrong with his systems. In the event both ships performed exceptional feats of steaming right up until their final moments.

HMS Good Hope

HMS Good Hope is a good example of the classic turn-of-the-century armored cruiser, albeit on a somewhat larger scale than typical.

With two large caliber weapons mounted fore and aft in single mounts, and a broadside battery of smaller guns, it followed the armament scheme of many similar classes in both British and foreign navies of the 1890s, although one unusual and unfortunate aspect of the design was its stacking of the broadside secondary guns in two-story casemate mountings, presumably to save weight. This arrangement left the lower guns very close to the waterline and meant that in rough seas half of the ship's 6-inch guns would be unusable. This was precisely the situation Good Hope found itself in at Coronel.

The armor protection scheme was typical for armored cruisers, with a 6-inch belt and 2-inch deck and the ship was speedy for the time, with a design speed of 25 knots. Its large size – 14,100 tons -- made it suitable for use as a flagship, and that was its role at Coronel.

By 1914, Good Hope was superseded by much more powerful designs and had just been put into the reserve fleet the year before. With the outbreak of war the ship was quickly reactivated, but instead of having the long-service crew of a regular navy ship, Good Hope found itself filled with reservists. Within days of the war's start Good Hope was sent to reinforce Cradock's South Atlantic command, where it was expected the ship might have to deal with German raiders converted from merchant ships, which Good Hope could easily do. Clearly, however, the Good Hope was inadequate to face the modern German warships without substantial reinforcement.

While given enough time, one could expect the reserve crews of a ship such as Good Hope to become nearly as proficient as the regular navy, time was the one thing Cradock's force did not have. Good Hope left Portsmouth on Aug. 2 and faced its test of battle just 91 days later. Some sense of the crew's training deficiency is suggested by the fact that Good Hope's forward gun never got off a shot, despite the fact that the German squadron had been in sight for some time. The *third* German salvo hit and destroyed the gun. Indeed, during the entire action the German ships were hit a total of just six times by 6-inch shells. As all three British cruisers were armed with that size weapon it's not possible to determine for certain which ships managed to land those hits, but one suspects several may have come from HMS Glasgow and its regular navy gunners.

Monmouth class – HMS Monmouth, HMS Kent and HMS Cornwall

The Monmouth class was conceived as a class primarily for trade protection, where they would presumably face armed merchant cruisers, raiders and light cruisers and not first-class enemy warships. Even in that role, however, they were not efficient ships. The lack of any gun larger than a 6-inch was seen as leaving them under-armed and they shared with Good Hope the two-story casemate layout for their broadside guns, which similarly rendered nearly half the battery unusable in bad weather.

Unsurprisingly, Monmouth proved to be badly outmatched when her test came at Coronel and like the flagship, Monmouth was lost with all hands.

In the Battle of the Falklands, the British squadron was strong enough that the weaker armored cruisers weren't needed for the main action, so Monmouth's sisters Kent and Cornwall were given the much more suitable duty of dealing with the German light cruisers. Cornwall, along with the light HMS Glasgow, overwhelmed the Leipzig.

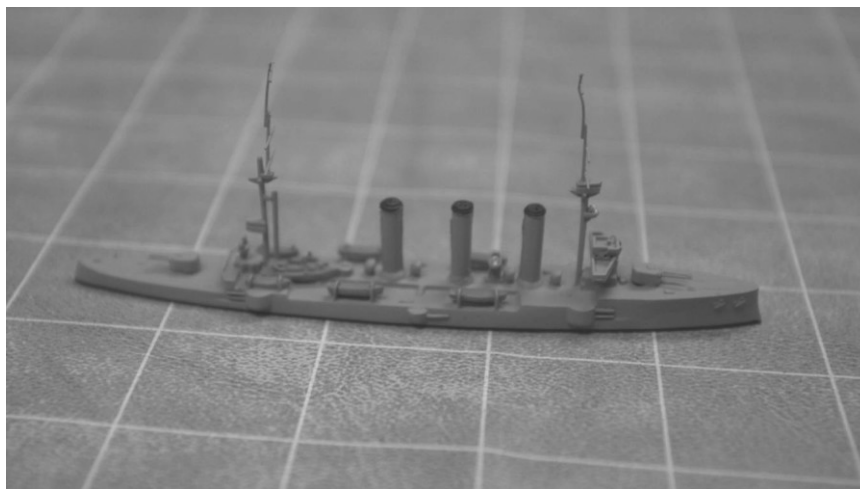


Figure 7 HMS Monmouth model by NAVIS (Kiymora Smith/Author's collection)

Meanwhile, Kent managed the extraordinary feat of running down the Nurnberg, which was technically faster on paper. As it turns out, the long cruise without a refit seems to have slowed the Nurnberg a bit and the Kent's engineers and stokers heroically exceeded her design speed, so that the British cruiser was able to close the distance. Once within 6-inch gun range, its heavier armament dominated, although there were some scary moments. Reportedly at least one 4.1-inch hit near some ammunition, threatening a dangerous fire. The German ship also knocked out Kent's wireless, so there were some anxious hours in the British fleet about the missing ship until Kent turned up.

HMS Carnarvon

An improved Monmouth design, Carnarvon and its sisters were beefed up with 7.5-inch guns fore and aft and the foremost casemate guns were replaced with 7.5-inch guns, also in single mounts and on the main deck, solving the problem of using the weapons in heavy seas.

While still not making the class fit to engage first-class armored cruisers on their own, it was powerful enough to be a backup and Carnarvon took part in the chase of the German armored cruisers, coming within range during the latter parts of the action.

HMS Defence

A member of the last class of armored cruisers built, actually coming into service *after* the first battle cruisers, HMS Defence was specifically designed to counter the Scharnhorst-class ships.

As such it was very heavily armed, with twin-mount 9.2-inch turrets fore and aft and five 7.5-inch guns, also in turrets, along each broadside. There was some concern about top weight in the design, and it was not especially fast, at 23 knots, but it certainly appeared to be more than a match for the German cruisers and would be sorely missed at Coronel.

HMS Canopus

Although classed as a battleship, HMS Canopus resembled an over-gunned armored cruiser in many ways. Its 6-inch belt armor and 2-inch deck armor were at a typical armored cruiser's scale and when designed it could make a relatively good speed for a battleship, at 18 knots. The advent of the all-big gun dreadnought battleship had rendered the pre-dreadnought battleship type obsolete in 1906, but even by the standards of pre-dreadnoughts the Canopus-class ships were not powerful. The forte for the Canopus was its main battery of 12-inch guns, mounted in double turrets fore and aft. Its secondary battery comprised a dozen 6-inch guns in casemate mounts.

By 1914 engine difficulties reduced its speed considerably. The incompetence or cowardice (accounts differ) of the chief engineer reduced that speed even further, so that at the time of Coronel the ship only made 13 knots and was therefore left behind and missed the fight altogether. Even if HMS Canopus was still capable of its design speed, however, it would have been a drag on the tactical speed of Cradock's squadron.

Its chronic engineering difficulties led to it being grounded in Stanley harbor to act as a coastal battery and it was in that role that it fired the opening salvo of the Battle of the Falklands.

CHAPTER 4

TOOLS: THE BATTLECRUISER

Admiral John Arbuthnot “Jacky” Fisher was the most ardent and effective advocate of the all-big-gun capital ship, but he neither originated the idea nor was alone in his insight. The logic of increasing gunnery ranges was inexorably leading to the idea of a uniform main battery for capital ships. Mixed batteries were too complicated to control at long range and improvements in the rate of fire of large guns was eroding the main advantage of the smaller calibers – quicker firing.

Where Fisher deserves credit is in the bold decisiveness of his move. HMS Dreadnought was not only armed with a powerful main battery, but it was speedy as well, taking advantage of the new propulsion technology of steam turbines. Fisher banked on the British skill in shipbuilding to retain naval superiority, because the Dreadnought type did make all previous capital ships obsolete. One dreadnought was clearly worth two ordinary battleships, but it concentrated the combat power in one ship. This massed the combat power of a fleet in action more efficiently.

Calculations by naval theorist Frederick W. Lanchester and others show that a small superiority in firepower has disproportionate effects. In fact, Lanchester’s formulas show that a force with twice the firepower of another will quickly annihilate the weaker force while suffering relatively small losses itself, other factors being equal.

Admirals sought through tactical maneuvers to concentrate firepower against a portion of the enemy fleet. The most basic tactic was “Crossing the T,” where the admiral contrived to form his battleline across the front of the enemy line, so that all his ships could fire against the leading elements of the enemy line. Meanwhile the enemy would be able to fire fewer ships and fewer guns in return. But an alternative way of concentrating firepower was through making each individual battleship more powerful and the sizes of battleships increased throughout the decades. Almost invariably each class built was larger than the one preceding and the numbers of guns and/or their size also increased regularly.

Fisher revolutionized the world’s battlelines with the launch of the all-big-gun HMS Dreadnought, but his real love was his battlecruisers. HMS Invincible was laid down at the same time as the Dreadnought and brought the all-big-gun concept to the armored cruiser role, and in the process relegated the armored cruiser to obsolescence. Invincible and her two sister ships, including HMS Inflexible, were not much more heavily armored than the latest armored cruisers, especially on the belt and decks and time would prove they had some dangerous vulnerabilities as far as protection went. In fact, they were originally called “large armored cruisers” until Fisher coined the “battlecruiser” nomenclature. (Fisher also coined the term “destroyer.”)

The new turbine engine technology and the weight saved by having less armor than a battleship made them very fast – much faster than any armored cruisers. And the battery of eight 12-inch guns provided both potential long range and smashing power. How long the range could be was still being worked out as the war started in 1914, but the battlecruisers opened fire on Spee's squadron at 16,000 yards. The accuracy of the battlecruisers' fire left a lot to be desired – they were not good shooters – so Sturdee risked closing the range despite the accuracy of the German gunners. While the Germans were able to land a substantial number of blows, their 8.2-inch guns were not able to do significant damage. The battlecruisers landed fewer 12-inch hits, but most of them were simply devastating. The 25-knot speed of the battlecruisers compared to Spee's 22-knot cruisers not only meant that Sturdee had complete control over the engagement range, it meant that Spee had little chance of escape, barring bad weather.

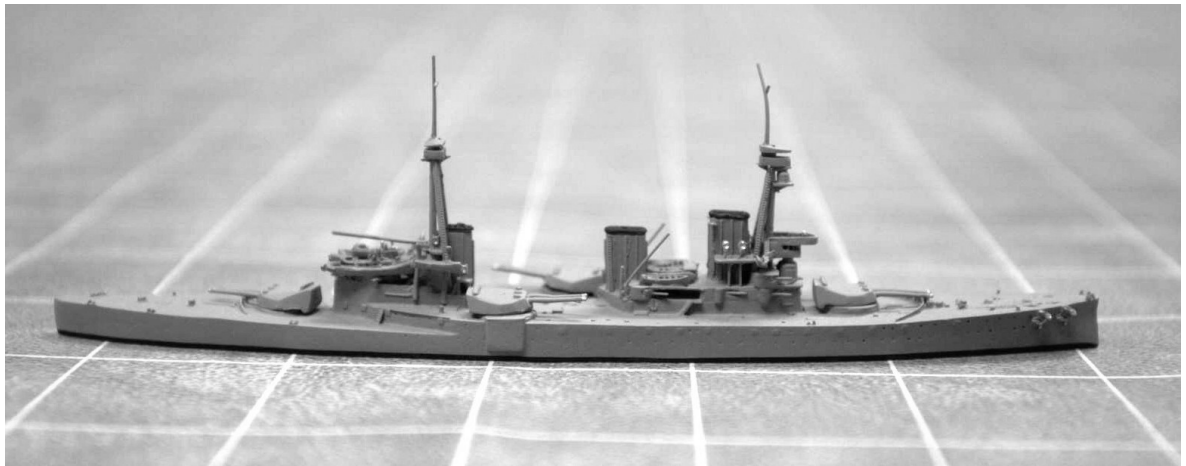


Figure 8 HMS Invincible model by NAVIS. This was the first battlecruiser. (Kiymora Smith/Author's collection)

HMAS Australia was from the second batch of three battlecruisers built by the British, basically an improved Invincible type that allowed for better cross-deck fire by the wing turrets, which increased the broadside from six guns to all eight.

While equipped with eight guns in four turrets, on the Invincibles the wing turrets had very restricted fields of fire when trained across the deck. In addition, the crew of the other turret could be concussed by its blast when it fired, so doctrine only allowed cross-deck fire if the opposite turret was out of action. The Indefatigable class was somewhat larger, which allowed more separation between the wing turrets. This increased their field of fire and reduced the blast effects, making cross-deck fire more practical.

There's no reason to think that HMAS Australia would have been a better shooting ship than the more experienced Invincible and Inflexible. Indeed, the battlecruisers didn't really improve until they started taking part in gunnery exercises a couple of years later with the Grand Fleet under Jellicoe's supervision. None of the battlecruisers had their full allotment of gunnery equipment, either, in 1914, which reduced their accuracy as well.

Against dreadnoughts, Fisher's battlecruisers had some vulnerability that would become evident later during the Battle of Jutland. HMS Invincible, herself, in fact, would be lost, as well as HMAS Australia's sister ship HMS Indefatigable and another battlecruiser.

There were no dreadnoughts in Spee's squadron, however, and Fisher's battlecruisers had adequate protection against those smaller and older ships. They had complete superiority in the two factors that were most important, firepower and speed. All had eight 12-inch guns in four turrets and a design speed of 25 knots.

They were also armed with secondary batteries of 16 4-inch guns. These were much less useful, being too small to reliably damage cruiser-sized ships and badly placed as well. Half were mounted on the turret roofs of the main battery and therefore couldn't be manned while the main battery was in action. Had Spee's squadron been equipped with numerous torpedo craft, this might have been a problem, but in the event the Germans had none. The battlecruisers also carried torpedoes like nearly all capital ships of the time, although their range was too short to be useful. These subsidiary weapons were relatively unimportant in the kind of fighting likely against Spee's squadron. It would all come down to those 12-inch rifles in the end.

The problem facing Troubridge (see Chapter 9) was wholly different because German battlecruiser concepts were the opposite of the British. While both navies stressed speed as the single most important attribute of a battlecruiser, they came to opposite conclusions about what was No. 2. Fisher believed in firepower over protection, while Tirpitz took the opposite view. While the 11-inch guns on the Goeben left it rather under-armed for a capital ship fighting other capital ships, they still overmatched the 9.2-inch and smaller rifles on the British armored cruisers.

And while the Invincible-class ships were hardly more protected than the latest British armored cruisers and therefore vulnerable, at least in theory, to the weapons of Spee's squadron, the Goeben's armor was comparable to most British battleships and only slightly inferior to the German battleships. This meant that Troubridge had little hope of penetrating the Goeben's armor at any range. The armor layout of the German ship protected all the vital fighting spaces, and therefore Troubridge had little hope that even a lucky hit would do anything to impair the German ship's fighting ability or speed. Only a blizzard of non-penetrating hits that wrecked the topside and started many fires might conceivably cause problems for the German ship.

In the event Troubridge judged that his force was too inferior to the Goeben to risk the chance.

Admiral of the Fleet Lord John Arbuthnot Fisher

Admiral John "Jacky" Fisher wasn't aboard the HMS Invincible on Dec. 8, 1914, but he still considered the Battle of the Falklands to be his victory, not Sturdee's. It was his decision to send the battlecruisers down there and the battlecruisers, themselves, wouldn't have existed at all but for his vision.

Vision is a word used by nearly everyone who tries to describe the impact of this man, twice First Sea Lord and generally credited with being the father of the modern Royal Navy. It's often attached to a discussion about the genesis of the all-big-gun dreadnought battleship, which found in Fisher an ardent champion. But that's only partly true. Fisher was not the originator of the idea and the logic of naval gunnery as inexorably pushing designs in that direction anyway. The Americans, for example, laid down their South Carolina before the Dreadnought.

But the fact that the HMS Dreadnought was launched first, despite the American head start, illustrates the true impact of Fisher. It's one thing to be a visionary, it's quite another to make those visions into reality. Fisher's fierce urgency up-ended the global naval balance because he didn't shy away from making the commitment needed. There was considerable risk. HMS Dreadnought's launch erased a comfortable British lead in battleships. Fisher was confident that the British shipbuilding industry was up to the challenge of building a whole new fleet faster than all potential enemies. He happened to be right this time.



Figure 9 Lord Fisher

Fisher's touch was less sure when it came to his "greyhounds," the battlecruisers. He was convinced that speed equaled protection – a conviction that would be refuted by the experience of two world wars. It was very difficult to sink a dreadnought battleship and very few of those ever built were successfully sunk through enemy action. The same can't be said for Fisher-style battlecruisers.

Excluding German battlecruisers of both World War eras, which embraced a decidedly different design philosophy, there were 20 Fisher-philosophy battlecruisers built altogether – 16 for Britain and four for Japan. The four Japanese ships were later supposedly upgraded to battleships, but they were still really Fisher-style battlecruisers even after rebuilding. Of those twenty ships no fewer than nine were sunk in action as surface combatants, the majority succumbing to surface gunfire and four literally blowing up. So Fisher was wrong on that point, speed did not equal protection.

Right or wrong, Fisher had enormous confidence in his views and that confidence gave him the drive to succeed despite all opposition and an unpromising start in life.

Like most Nineteenth Century British naval officers, Fisher began his career in 1854 at a shockingly early age, by 21st Century standards. He was just 13. Unlike many of his peers, Fisher didn't have extensive wealth or connections to rely upon to boost his climb through naval ranks. While not coming out of poverty, Fisher's family wasn't of high standing, either. His father was an army captain and aide to the governor of Ceylon. Fisher's unusual appearance led to life-long rumors about his true parentage that suggested that he was more than simply born in Asia. He was sent away to England at the age of six and never saw his father alive again.

Still, even without strong connections or an aristocratic lineage, it was possible for a boy of talent to earn his way through the ranks in the Royal Navy and Fisher proceeded to do that. Fisher first came under fire in the kinds of 'small war' actions that punctuated *Pax Britannica* and showed a knack for innovation and forward thinking. As a young officer on the battleship HMS Ocean he developed a system for firing the entire broadside electrically. He was later the founder and first commander of the Royal Navy's torpedo school. As commander of a battleship in another colonial incident he invented the world's first armored train using guns and men from his battleship.

It wasn't his fate to ever have the opportunity to lead a battle fleet into action himself, but he arguably had as much influence on the modern Royal navy as Nelson did. As First Sea Lord Fisher brought a reforming zeal to the Royal navy's top uniformed job at a critical time. While the advent of the all-big-gun battleship was just a matter of time, without Fisher it's probable that the world's navies would have drifted slowly into the type. It was Fisher's insistence on an entirely new fleet, driven by a new naval strategy, that stirred the pot so much that it exploded into a naval arms race like the world had never seen. It's an amazing fact that of the 250 warships that battled at Jutland in 1916, only a handful had existed just 10 years earlier.

While Fisher's tactical notions have a mixed record, he really came into his own as a strategist. He recognized that the critical front for Britain was the North Sea and concentrated almost all of Britain's first-line strength in that theater. This left secondary and tertiary priorities such as hunting down German raiders and orphaned cruiser squadrons to second- and third-rate or worse ships such as HMS Good Hope, HMS Monmouth and HMS Otranto.

And yet Fisher also had the moral courage to adjust his strategic judgments to new circumstances, and his dispatch of the battlecruisers to the Falklands clearly did as much to seal Spee's fate as anything Sturdee did.

CHAPTER 5

TOOLS: THE LIGHT CRUISER/ARMED MERCHANT CRUISER

While armored cruisers, battle cruisers and battleships were all “capital ships,” meant for main force combat against enemy fleet units, there were also many smaller vessels involved in the campaign. These smaller cruisers were designed to be expendable and economical warships to perform the numerous supporting duties of scouting, trade protection, raiding, dispatch carrying and other tasks that needed doing but didn’t need doing by expensive capital ships.

German light cruisers

The Germans were innovators in the concept of the “light” cruiser, sometimes called “scout” cruiser. Compared to its predecessor, the protected cruiser, scout cruisers tended to have lighter armament but were much speedier. In a fleet action they were intended to act as the eyes of the fleet, ranging forward to find the enemy and screen the friendly fleet from similar vessels.

For a detached squadron such as Spee’s, in addition to the scouting duties, the light cruisers were used as dispatch vessels and could operate successfully as commerce raiders. The four light cruisers associated with Spee’s squadron came from three different classes, but they were functionally identical in naval capability. Each carried ten 4.1-inch guns in single mounts with a broadside of five. In an unusual arrangement, the fore-most and aft-most pairs of guns were side-by-side allowing two guns to fire fore and aft in a chase. While less efficient than a twin-mount turret, it was simpler and less expensive in weight and money than a turret would have been.

Their weapons proved to be rather too light in practice, however. While adequate for commerce raiding and shooting up destroyers, they were too small to be a serious threat to similar-sized warships. Later in the war the Germans upgraded the battery on their light cruisers with heavier weapons, but in 1914 that measure lay in the future. Each ship also carried a pair of short-ranged 18-inch torpedoes.

Displacing under 4,000 tons, they were not large ships, but they managed a speed of 22-25 knots when new, so they generally matched foreign cruisers in that department. They were lightly armored, with just a 2-inch deck.

While not designed as commerce raiders, the light cruisers had good endurance and in the event proved to have some success in that role, when properly led.

The four light cruisers that accompanied Spee came from disparate sources. Two of them, SMS Emden and SMS Nurnberg, were part of his squadron on the China station. SMS Leipzig had been stationed off the west coast of North America, while SMS Dresden was actually in the Caribbean at the outbreak of the war. Both these ships later joined Spee’s squadron, but as he had detached Emden before those two reached him, he never had more than three present at one time.

British light cruisers

While the Germans may have invented the modern light cruiser, probably no navy loved the concept more than the Royal Navy, which had worldwide commitments that required a vast number of warships, more than it required that those warships be powerful. Still, the British recognized that among their most likely opponents were the German light cruisers and they designed theirs accordingly to overmatch those foes.



Figure 10 HMAS Sydney steams into action during the Battle of Cocos. (National Library of Australia)

The town-class light cruisers were a large class of modern ships, a total of 21 ships in five sub-classes. HMS Glasgow, which plays a ubiquitous role in the Spee saga, was a member of the first sub-class, as was its sister ship HMS Bristol. These were larger and faster than their German counterparts. While similarly armed with a large battery of 4-inch guns, which proved too light for anti-cruiser work, they also had a pair of 6-inch guns, which gave them a powerful weapon that both outranged the biggest German light cruiser weapon and had sufficient punch to do critical damage to a light cruiser hull. They were also half again larger in displacement, implying greater robustness in enduring combat damage and seaworthiness.

HMAS Sydney was a member of the third group of town-class light cruisers, and by this point the British had gone to an all 6-inch gun armament, with eight aboard.

A 6-inch gun is about the largest caliber shell that can be reliably manhandled. Larger shells are too heavy and require mechanical assistance, which meant a significantly slower rate of fire using technology existing in the World War I era.

Armed merchant cruisers:

Arming merchant vessels as warships has been pretty common over naval history, waxing and waning in popularity as wealth and technology changed. It was especially popular during the century running from about 1845 to 1945, however. This was an era of rapid technological change, filled with wars that broke out suddenly and often involved vast distances that made quantity nearly as important a factor as quality for many roles.

Typically, a large passenger vessel was militarized with some second-hand guns and some naval gunners, while often retaining most or all of the merchant crew. Passenger vessels were attractive because they tended to be relatively fast and had a lot of excess carrying capacity after being militarized. They also tended to have very good endurance compared to naval vessels, making them useful for patrolling over long distances. HMS Otranto was a fairly typical armed merchant cruiser. Built as a passenger liner, at over 14,000 tons it was about the size of an armored cruiser, although with just a fraction of the combat power.

Like many AMC, Otranto was armed with some second-hand naval guns, in its case eight 4.7-inch guns. While of adequate size to be a threat to raiders (similar to AMCs, but optimized for commerce raiding duty) or light cruisers, a number of factors conspired to make the battery much less efficient than a comparable one on proper warship.

First among these was the crew assigned. Being manned on a wartime emergency basis, the ships had ad hoc crews that were inherently unpractised. They were generally recently recalled reservists. They rarely had the opportunity to train properly before being thrown into active operations, particularly at the very beginning of hostilities, as in 1914.

Naturally these converted merchant vessels did not have the supporting infrastructure necessary for efficient gunnery. They did not have any fire control tools above the gunner's individual sights and a range finder. They normally had limited amounts of ready ammunition and no efficient way to move rounds from the magazines to the guns. The magazines were lightly protected.

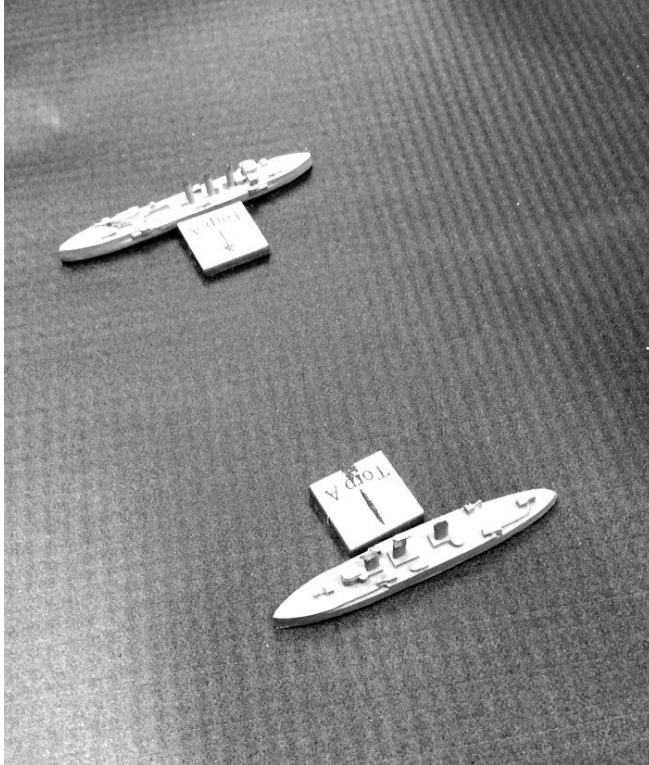
Otranto's presence at Coronel proved to be very unfortunate for Cradock, because it added a ship with minimal combat capability to his force, but placed him on the horns of a tactical dilemma because of Otranto's deficient speed. The speed of any squadron is determined by its slowest member, and Otranto's 17 knots, while respectable for an AMC, was completely outclassed by all the cruisers present on both sides.

Had Cradock *expected* to run into Spee's heavy units, he probably would have left Otranto out. The AMC was useful, however, as a scout, and it enabled him to spread out his search line, an important consideration if you are searching for a single light cruiser in the vastness of the Pacific Ocean, which is what Cradock thought he was doing.

HMS Macedonia was another armed merchant cruiser that was present at the Battle of the Falklands. It was a smaller ship than the Otranto, at about 10,000 tons and also armed with 8 4.7-inch guns. It could manage about 18 knots. Unlike Otranto, though, Macedonia was part of a large and powerful squadron and not seriously tested in the actual action. The ship would, however, have found itself in a sticky situation if Spee had decided to swoop in and attack the British while they were still inside Stanley Harbor. Macedonia was the guard ship on duty and would have been hard-pressed in such an event.

Russian, French and Japanese ships

One Russian ship features in Spee's story, the protected cruiser Zhemtchug. This sad vessel represented an older design tradition, that of the protected cruiser. Armed with eight 5-inch guns and having a 3-inch armored deck, the ship was reasonably speedy at 24 knots, but on the small side with a displacement of 3,000 tons. Nearly 14 years old when the war began, Zhemtchug was no longer a first-line unit. In the actual event, caught at anchor at close range with her captain and most of her crew ashore, the Russian ship had no chance and was destroyed.



Sunk in the same action was the small French destroyer *Mousquet*. World War I destroyers were not individually powerful warships, being meant to operate as members of flotillas and the small French craft had little chance. At 300 tons she was just a tenth of the size of Emden, which was itself not a large ship. Her battery of 2-inch guns was far too small to cause serious damage to a cruiser-sized target, leaving her only real threat a pair of 15-inch torpedoes. Closing to within effective range of these small weapons by a single firing ship against an alerted and fully mobile target was highly improbable and the French destroyer was quickly sunk, with most of her crew losing their lives.

Figure 11 SMS Emden torpedoes Zhemtchug at Penang. Models by Panzerschiffes. (Author's collection)

We won't look at the Japanese ships in detail. From the point of view of Spee, the key aspect of the Japanese navy was that it was far too large and modern for there to be any question of him remaining in the western Pacific. When World War I began, the Imperial Japanese Navy comprised two dreadnoughts, a battlecruiser, four second-class battlecruisers, 10 pre-dreadnought battleships, 8 armored cruisers and more than 75 other vessels. Spee could go in many directions, but he could not stay in Asian waters.

CHAPTER 6

TOOLS: GUNNERY AND FIRE CONTROL IN 1914

The saga of the German East Asia Squadron occurred during a seam as one era of naval gunnery transitioned to the next.

Ever since the widespread introduction of cannon on warships in the 1500s, the responsibility for aiming the gun, for “laying” it on target, had rested with the individual gun captain or gunner. The ship’s captain or a gunnery officer would select the target and suggest a range, but it was up to each gun crew to fire its weapon at the enemy.

This system sufficed so long as ranges were short. Short range meant a flat trajectory and therefore range was a lesser consideration. So long as the shot was aimed true, there was a very good chance its path would intersect with some part of the target and a hit would result. The short path also meant that the target’s position was unlikely to change in a meaningful way during the brief time of flight involved.

Among the many technological revolutions of the latter half of the Nineteenth century was an enormous increase in the effective range of cannon. In the 1870s the Royal Navy might practice firing at targets at ranges of 1,500 yards, but by the turn of the century it was not uncommon to see fire commenced at 8,000 or 10,000 yards and fire over 20,000 yards was contemplated.

This leap in range had enormous implications for effective gunnery. The ballistic trajectory of a shell in flight at these extreme ranges meant that the danger zone for a falling shot became smaller as the range increased. The flat trajectory of a short range shot could intersect the target almost anywhere along its path from muzzle to contact with the sea, but the highly curved path of a long range shot meant a large zone existed where the elevated path of the shell would pass over the target’s height and then a small zone where the plunging shell would pass through the vertical space of the target. In order for there to be a hit that vertical space would also have to match the horizontal space occupied by the target. Even a small error in the range would result in the shell failing to pass through the target’s space in a relevant dimension.

Exacerbating the problem was the natural increase in difficulty in determining what the range was as it lengthened. The limits of human perception meant that accurately determining the range more than a few thousand yards away was beyond reliable human achievement. The development of scientific range-finding devices based on either coincidence or stereoscopic techniques extended the range of human ability. A coincidence range-finder uses optics to create two images of the target that appear blurry until the operator then brings them into sharp focus. That setting provided a range. With a stereoscopic rangefinder the operator adjusts the position of a mark visible in the device until it seems to be the same distance away as the target. Once again the range can be derived from the settings at that point. Both methods work well. The coincidence rangefinder is more vulnerable to degradation due to poor visibility while the stereoscopic rangefinder requires more skill to use. The British in 1914 preferred the coincidence type while the Germans and most other navies used stereoscopic types.

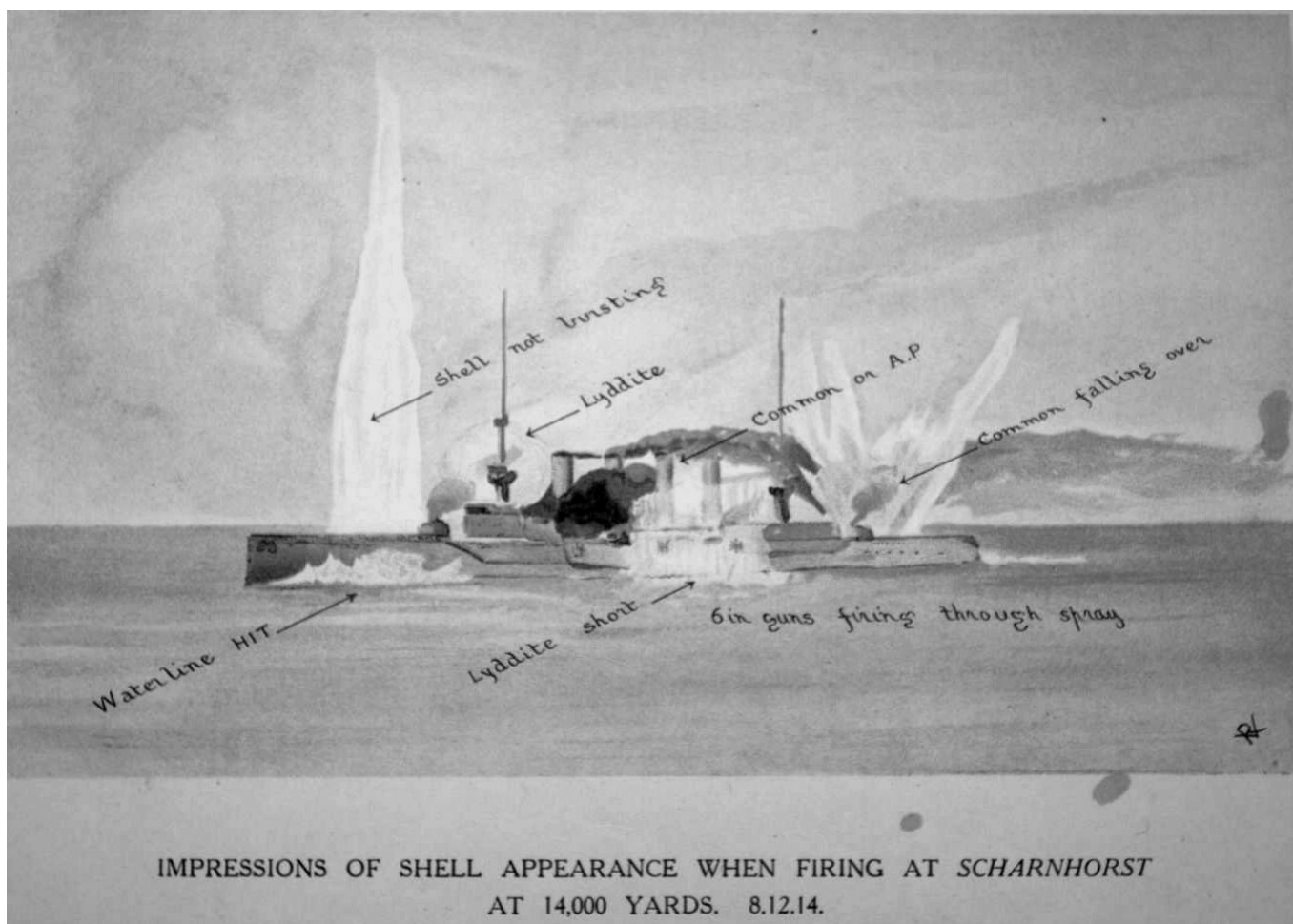


Figure 12 Painting by the gunnery officer aboard HMS *Inflexible* depicting observed effects of shells against a target. (Verner, 1920)

Accurately determining the range, however, wasn't enough to entirely solve the problem. As the range lengthened various other ballistic factors started to become important as they had more time to affect the shell while the margin for error simultaneously shrunk. And finally, as the time of flight started to stretch into the tens of seconds the movement of the target could become sufficient that an accurate shot at where the target was just meant that much more certainty of a miss because the target would not be there any longer. The gunner now had to shoot where the target was *going* to be.

The solution to this problem was the “director” system, which controlled the fire of a battery of guns centrally. A computer (in this era a mechanical device, not electronic) would be used to input the factors affecting fire and calculate what settings to use for the guns. While the British had two competing systems in use, they were only just beginning to be fitted on major warships when the war broke out in 1914. The two battlecruisers *Invincible* and *Inflexible* had the system – in their case the “Dreyer tables,” named for Charles Frederick Dreyer, although the entire system was not completely installed in time for the Battle of the Falklands. The other system was the Pollen system, named after Arthur Pollen. The Pollen system may have had some technical superiority, although the Royal Navy seemed to find the Dreyer system somewhat more practical. No ships in the campaign were fitted with the Pollen device. Because the entire director system was not yet in place, the battlecruisers and all the other ships involved used the older “spotting” technique.

While the firing was under the central control of the ship's gunnery officer, it was not assisted by computers under this system. The gunnery officer provided a range estimate, but each individual gun captain determined the settings. When ready, the gunnery officer would order the guns to fire verbally.

Simply described, "spotting" involved firing a salvo in the general direction of the enemy using a best guess for range derived from a range finder and observing where the shots appeared to land. If they were short, a second salvo was fired using a large adjustment to lengthen the range until shots were observed falling beyond the target. If the initial shot was long, then the opposite process would be followed. The difference would be split until shots were observed falling on both sides of the target. Having found the range, then the gunnery officer would order a few salvos fired rapidly before the parameters changed.

It took skill and experience to interpret the shell splashes and tell the difference between hits, near misses and complete misses. The gunnery officer on HMS Inflexible painted an illustration of how the various kinds of hits appeared. (Figure 12)

The entire community of gunners was in considerable ferment during this era as different techniques and types of equipment were developed, fielded and evaluated by navies.

Both sides used this system, although with important variations. The British system used ranging shots, normally fired using high explosive rounds for increased ease of spotting due to the larger splashes, until the range was found. In contrast, the Germans used a "ladder system" where the firing ship fired shots in a pattern with slightly different ranges for each shell in order to more quickly generate a "straddle" where splashes were seen on both sides of the target. The German system tended to produce effective straddles earlier. Indeed, at Coronel the Scharnhorst found the range and straddled the HMS Good Hope on its third salvo – which is the best that skill can give. An earlier hit is just matter of luck.

CHAPTER 7

WARGAMING: CHOICE AND DESTINY

The last half of the Nineteenth Century saw more changes in naval warfare than any comparable period in history. Fisher's first assignment as midshipman in 1854 was aboard a sailing ship of the line with muzzle-loading smoothbore cannon that would have been recognizable to Sir Francis Drake three centuries earlier. By the time Fisher retired as First Sea Lord in 1910 he had overseen the creation of a fleet of steel-clad steam-driven behemoths equipped with rifled artillery, self-propelled underwater missiles and wireless sets supported – and threatened by – submarines, sea mines and airships.

It was a fecund intellectual environment for theorists and practitioners trying to make sense of a rapidly evolving situation while having precious little evidence to go on. Naval battles are always rare, compared to land battles, but the period from 1814 to 1914 was especially sparse in fleet or squadron actions. The era before that had seen several centuries of nearly constant conflict at sea – and the decades between 1914 and 1945 would again see episodes of intense naval combat that tested theories and proved practices.

The late nineteenth century ferment in naval thought sparked many movements. A new culture of professionalism took hold, nurtured by professional journals and schools. The United States Navy founded its Naval War College in Newport, R.I., in 1884. One of the school's first faculty members was Capt. Alfred Thayer Mahan, whose lectures formed the basis for his book *Influence of Sea Power Upon History, 1660–1783*, which has informed naval thought since.

Another faculty member was Lt. (ret.) William McCarty Little, who established war gaming as a key part of the new college's curriculum, making the U.S. Naval War College an international center for wargaming.

Meanwhile, across the Atlantic, another individual's interest in naval affairs also had a lasting influence. Fred T. Jane was a British journalist, novelist and naval enthusiast who created a naval war game to better understand naval tactics and technology. One of the constraints he discovered inhibiting his development of realistic rules covering naval combat was a lack of information about the actual characteristics of ships and weapons. He had to research these on his own and the fruits of that research resulted in the founding of the book Jane's *Fighting Ships*. Auspiciously, the first edition came out in 1898, just in time for the Spanish-American War and the inauguration of what would prove to be a very active half century of naval combat.

Jane's *Fighting Ships* went on to become an essential reference on naval affairs, spawning sister publications for land and air weapons and an entire company, as well as many imitators. The book started out as what would today be called a "data annex" for Jane's "Naval War Game." In fact, if one looks at the earliest editions there are signs of the book's wargame origins. For example, the subdivisions shown on the line drawings don't represent actual structures of the ships but are abstract divisions to represent flotation hits under Jane's rules.

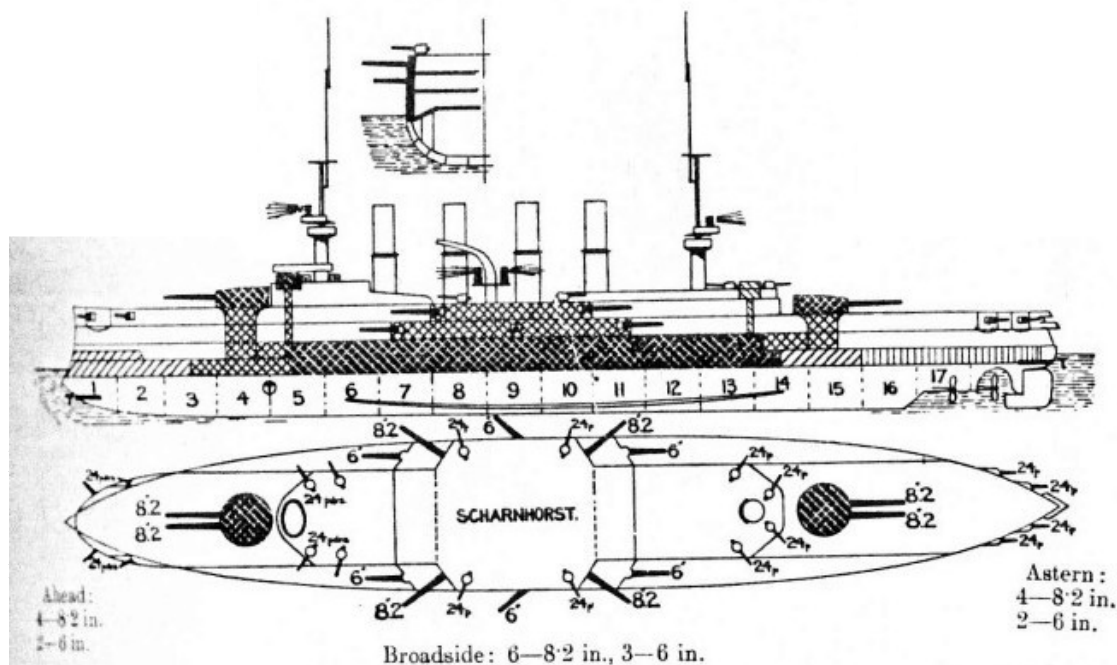


Figure 13 Illustration of Scharnhorst from Jane's Fighting Ships 1914. Note the numbered boxes in the hull. These are not actual structures on the vessel but are an abstraction of the ship's flotation for use in Fred Jane's naval wargame. This is in contrast to the treatment of armor, which reflects the actual arrangement.

Jane's rules, like many early wargames, relied on specially built apparatus and physical activity by the players instead of the more statistical and probability-based techniques of later games. Players used a stick with a pin mounted on the end to literally punch a hole in a paper depiction of the target ship. His game was forced to cope with the same problem that bedevilled actual naval officers of the era – the rapid increase in effective gunnery range. Jane's rules provide for gunnery at ranges up to 8,000 yards, with the typical engagement being between 2,000 and 6,000 yards. This was not far off the mark for 1898. Dewey's fleet at Manila devastated the Spanish from a distance of about 3,000 yards. But by the Battle of Tsushima in 1905 normal battle ranges had already jumped to 7,000 yards and more. By 1914, as we shall see, ranges far in excess of 10,000 yards were common.

By the 1920s, naval wargames used by the U.S. Naval War College and similar games such as the Royal Navy Wargame had moved to a more statistical approach to the problems of assessing gunfire and the effects of other weapons. Typically, so many shots over a given period of time at a given range were assumed to result in a hit and a certain number of hits would reduce the fighting effectiveness of a ship by specified amounts. This sort of deterministic system could be justified from a training perspective, but it held the seeds to mislead as well. Chance may be an unpredictable aspect of war, but one can predict it will always be present.

Jane didn't live to see the end of the First World War, but he was tapped as an informed naval commentator at the war's start, writing an intriguing book called *Your Navy as Fighting Machine* that was published in October, 1914, just before the battles outlined in *Fatal Choices*. His book mentions the losing fight of the HMS Pegasus against the SMS Königsberg on Sept. 20, 1914, and how the older British ship was out-ranged by the newer guns of the German.

The Great War's carnage dampened interest in things military for a while, but by the 1930s a new generation of naval wargamers were again pushing model ships across a ballroom floor. The instigator this time was another author, Fletcher Pratt, whose wide-ranging works include science fiction, straight history and even a cookbook.

Pratt's naval wargame also took a very literal approach with its key game mechanic: the physical estimation of range and deflection by the firing player which was then compared to the actual range and angle to the target using tape measures and protractors. Players normally used a "ladder" of shots to increase their chances, much like actual gunnery techniques.

Pratt had a close working relationship with the Naval War College, being allowed to witness their wargames and similarly, the Naval War College staff was aware of and sometimes used Pratt's rules. Pratt's relationship with the Navy was close enough that he got work as a war correspondent during World War II. He was even aboard one of the Escort Carriers that came under fire at the Battle off Samar!

Pratt's game relied on a complex formula for determining the number of damage points that a ship could take from various weapons. While admittedly arbitrary, it seemed to work.

The main difference between Pratt's game and the Naval War College's was how gunfire effectiveness was accounted for. In Pratt's game it was under the player's control. Players with well-calibrated eyes and a little luck would get hits while others might miss, so ships would vary in the effectiveness of their fire. In the NWC games a certain number of shots would result in a set number of hits, similar to how the Royal Navy Wargame handled it and for much the same reason. The idea was to teach proper tactics, not reward the lucky or penalize the unlucky.

While the Naval War College continued its gaming after World War II, there was a creative lull among civilian wargamers. Until the late 1960s many wargame clubs were still using dog-eared and mimeographed copies of Pratt's rules.

In the 1970s a new generation of naval wargames started appearing, generally taking a more statistical and probabilities-based approach than in Pratt's day. Gunfire effectiveness was almost universally determined through the use of tables and dice, for example. Around the same time the Naval War College began moving into computerized wargaming. In 1958 the Naval Electronic Warfare Simulator (NEWS) was installed in Sims Hall at the Naval War College, the first in a series of systems used up to the current day.

While computers can crunch a lot of data, they don't necessarily have as much instructional value as a good manual simulation, as wargame designer James Dunnigan pointed out in an issue of *Strategy & Tactics Magazine*:

"Because the board wargames were manual, you could not avoid knowing how the game worked. In effect, if you played a game a few times you could see what changes would produce slightly different results."

Dunnigan, working independently of Pratt, created his own miniatures-style naval wargame for the Avalon Hill Company in 1968 called *Jutland*. Unlike Pratt's design, Dunnigan's emphasized empirical research to test results against history and by doing so deliberately explored ways in which history could have been different.

In his book, *The Complete Wargames Handbook*, Dunnigan answers the question "Why Play the Games?"

By far the most common reason players give for playing the games is to experience history. Actually, since simulation games also include many nonhistorical subjects (fantasy and science fiction, etc.) we might as well face up to the fact that experience of any sort is one of the most important things a simulation game has to offer. This experience consists of the gamer being able to massage information in order to see what different shapes the information is capable of taking.

The essence of a simulation game is that it allows, within well-defined limits, a great deal of variety in an otherwise strictly predetermined historical event. This is the popular ‘what if?’ element in the games.

Exploring the “what-if?” element has been one of the hallmarks of the most recent designer in the Jane-Pratt tradition, Larry Bond. A novelist and naval enthusiast like Fred Jane and Fletcher Pratt, Bond has one attribute they did not and that is experience as a naval officer. Bond’s modern naval wargame Harpoon was inspired by the Navy’s NAVTAG (Naval Tactical Game) which started as a manual wargame but migrated onto computers.

Harpoon has seen some computer iterations as well, but the core of the game remains resolutely manual and it has served as the foundational element for an entire series of wargames called the Admiralty Trilogy, depicting naval warfare from 1890 to 2014 and beyond. Fear God & Dread Nought is the portion of the trilogy depicting naval warfare from about 1890 to 1920.

Like Dunnigan’s Jutland and unlike the rules of Jane and Pratt, Bond’s games rely on tables, charts and dice to handle events and combat results in a non-deterministic way that still has a basis in documented historical fact. Abstractions are minimized to the extent possible and many game functions operate with real-world measures. Ship speed is expressed in knots, turns are made in degrees and time is measured in minutes and hours. The damage algorithm is much simplified from Pratt’s approach and works off the ship’s standard displacement, modified by some simple rules.

Bond’s designs are open, with all the calculations visible and therefore able to be manipulated by players. As the introduction to FG&DN states, “We just want FG&DN players to understand they can use the game not just to bash away at each other in a structured way, but to understand what happened out on the oceans of the world.”

While any wargame can provide some insights into the problems of command and the capriciousness of fate, Fear God & Dread Nought provides the kind of intricate detail that lets players truly explore the options available to the historical commanders. If you can do it in the game, it was probably a viable course of action for the historical commanders and if you cannot do it in the game then it probably was not. Whether it was an *advisable* course of action is another matter, and sometimes one without a clear-cut answer. This is because, as the hoary maxim goes, “the enemy has a vote.”

A wargame can answer the question of whether Cradock had the opportunity to inflict damage on Spee's squadron on Nov. 1, 1914. That he failed to do so is due in part to the deficiencies of his ships, but a significant part of the reason was that Spee was a skilled tactician in his own right, and countered Cradock's tactics. This was not a foregone conclusion. Spee could easily have erred and given Cradock a fighting chance, as one can see by playing out the battle. Most of the time, under nearly any set of rules, Spee's squadron will defeat Cradock's – but Cradock didn't need to *win*. He merely needed to do *enough*. And players will see that it's not as easy as it seems to replicate the magnitude of Spee's victory. See for yourself by refighting Historical Coronel in Chapter 10.

A popular use for naval wargames is not just refighting historical battles but also examining battles that might have been as well as some that could never be. In the might-have-been category is taking a look at what might have happened if HMAS Australia had found Spee's ships in the South Pacific. The next chapter considers that possibility, using naval wargames.

Wargames for 1914 battles

The refights in this book primarily use Fear God & Dread Nought, Larry Bond's "Rules for Tactical Naval Combat 1900-1924." This is a derivative of Larry Bond's Harpoon modern naval rules, and with it, form part of the Admiralty Trilogy. The World War II era is covered by Command at Sea. Together these rules cover more than a century of naval combat. They are undoubtedly the most comprehensive and detailed simulation wargame for naval combat in the 20th and 21st Centuries that don't involve computers and that are available outside the Naval War College. There's good reason to believe that classified Pentagon wargames are not more realistic than Bond's work, based on remarks by people with knowledge of both. Fear God & Dread Nought, like all of Bond's games, is very straightforward and generally avoids using abstract procedures. This tends to make the games quite a bit of work and calculation-intense, but aids our purpose here by being very transparent about the factors at work and showing *how* and *why* things happen, not just the *what*. Bond is, of course, probably best known to the general public as an author of best-selling "techno-thrillers" such as Red Phoenix and a collaborator with Tom Clancy in The Hunt for Red October.

Our reality check rules, used to run through the battles a few additional times to highlight assumptions and prevent tunnel vision, are an eclectic mix of games, although generally not as complex or detailed as Bond's.

The first is Fletcher Pratt's Naval Wargame – probably the single most famous set of naval wargaming rules. Pratt was a well-known author of the interwar years and a war correspondent during World War II. He was aboard one the CVE's under attack during the Battle off Samar. Before World War II he published a set of naval wargame rules and formed a club to play them in a New York ballroom. Among the participants in these games were Isaac Asimov, Ron Hubbard and L. Sprague Camp. There were also serving naval officers. Pratt was familiar with the war games being conducted at the Naval War College and the College was familiar with Pratt's games as well. Experience showed that Pratt's game had good predictive power when compared to actual naval combat in the subsequent war. The edition I used was the 2011 reprint edited by John Curry, which includes the latest and most comprehensive version of Pratt's rules, with various refinements added by Pratt based on war experiences. Most of those, however, involved aircraft, submarines, and other developments that don't figure in 1914. One drawback to Pratt's game is his use of range estimation by players to conduct gunnery attacks – which creates obvious problems for this project. Fortunately, Curry wrote some optional "Solo" rules that use dice to determine gunnery effects within the overall Pratt game system. Those rules are used for both sides here.

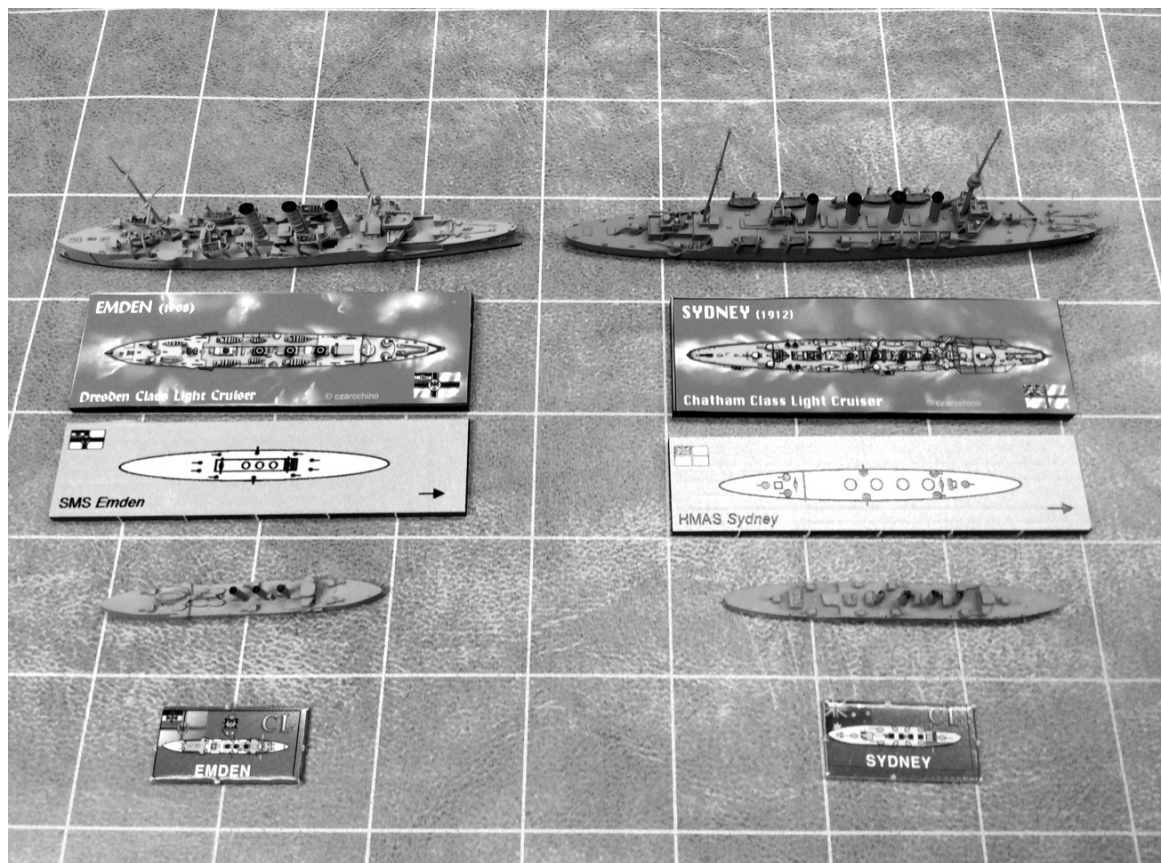


Figure 14 Players have many choices for ship models to match varying tastes and budgets. Here are the SMS Emden, left, and HMAS Sydney depicted from back to front by NAVIS 1:1250 metal models, Topside Miniatures 1:1850 flats, Fatal Choices 1:2400 counters, Panzerschiffes 1:2400 resin models and the counters included in Bond's *Fear God & Dread Nought*. (Author's collection.)

The second set is Victory at Sea, a privately published set of rules from 1971. During the rediscovery of naval wargaming in the 1960s the most common rules used were Pratt's, but further research and changes in player preferences induced some to design new rules to fix perceived flaws in Pratt's game. Among those that appeared over the next couple of decades were Seapower, Seekreig and General Quarters. Victory at Sea, by Anthony J. Morales, was different from most of those by attempting to remain a fairly simple and quick-playing game system, more comparable to Fletcher Pratt than some of the others. It's included here partly for the sake of nostalgia, because it was my first naval miniatures wargame experience and its Battle of Coronel scenario is the ultimate inspiration for this entire book. Compared to Pratt's game – or Bond for that matter – Morales eschews using any complex formula for determining the robustness of the warships, simply using the standard displacement to represent the amount of damage the ship can sustain. Like Bond, Morales uses dice to determine the success of gunnery, although he uses an unusual "chances per 36" system instead of the straight percentages of Bond. This attests to how ancient Morales' game is – existing in the pre-history before polyhedral dice.

The simpler set of rules included in Appendix 1 of this book is an extract of NavTac, which is based on Morales' and Pratt's games. Published by Minden Games, NavTac provides a faster and simpler way to explore the scenarios, although at some cost in detailed accuracy.

The final set is also called Victory at Sea, but this 2009 game (Full title Age of Dreadnoughts: Victory at Sea), bears no relation to the 1971 Morales game. It's included not only because it's another relatively quick-playing set of rules, but because it proceeds from an entirely different premise from the preceding three sets – emphasizing crew quality and armor protection over detailed formulas and statistics. In Age of Dreadnoughts the men are just as important as the machines in the outcome, which makes it considerably different from the more hardware-oriented rules by Bond, Pratt and Morales.

Also consulted, although not directly used, was The Fred Jane Naval Wargame (1906) and Royal Navy's Wargaming Rules (1921) as edited by John Curry. While not directly suitable for this specific project, they also provided some insight into how naval officers of 1914 may have viewed their options and are valuable for injecting a contemporary mindset into things less contaminated by hindsight.

Also consulted were the James F. Dunnigan-designed board wargame *Jutland* and two clever strategic games: *The Far Seas* from Strategy & Tactics magazine No. 125, 1989 and *Goeben 1914* from Strategy & Tactics magazine No. 287, July-August 2014.

CHAPTER 8

SPEE'S NIGHTMARE: THE BATTLE OF SAMOA

Remaining in the Western Pacific was out of the question for Spee's squadron once it became evident Japan's entry into the war was imminent. In capital ships alone the Japanese navy was overwhelming, with more than a dozen battleships and battlecruisers and 8 armored cruisers available. This didn't even take into account the considerable British, French and Russian naval forces in the region.

On the other hand, most of the eastern Pacific naval powers were neutral. The one hostile navy had just one capital ship -- although it was a powerful one, the battlecruiser HMAS Australia. While Spee strove to avoid facing long odds, he showed no reluctance to fight if offered anything resembling a fair fight.

On Sept. 7, while at Christmas Island, Spee learned that Australian forces, including HMAS Australia, had seized German Samoa nine days earlier. Hoping to catch the Allies by surprise and at anchor, Spee swooped down on Samoa on Sept. 14th. As it turned out, the Allied naval forces had already departed and Spee saw little point in expending resources trying to molest the few enemy troops ashore, so he left, but it's an interesting window into Spee's mindset that he was willing to face an enemy battlecruiser, possibly supported by other ships, if he could catch it by surprise.

Spee was not the only aggressive admiral to find his efforts frustrated. Australian Rear Adm. George Patey had been agitating to be released from his duties escorting expeditions like Samoa in order to go out and seek Spee's squadron. He was overruled. By the time he was finally given the freedom to chase Spee, the German squadron was out of reach.

If Patey had been detached earlier an interesting confrontation might have occurred. While two battlecruisers clearly overmatched two armored cruisers, it's less obvious that a single battlecruiser did. If encountered on the open sea, Spee's ships didn't have the speed to escape HMAS Australia anyway, but it's quite likely a feisty Spee would have been willing to take his chances against a valuable target like a first-line battlecruiser.

This provides an interesting scenario to consider, because it's probably one of the fairest fights that could have reasonably occurred during this campaign. Spee's chance at catching HMAS Australia napping at Apia, Samoa, was a real long shot. His news was more than a week old and it took several more days to get to Samoa. There's little reason to think Patey would have been so indolent to have just sat there for two weeks. He was no Sturdee. But he might have been encountered on the way, if given his desired leeway to seek Spee out. We increase the chances of the two forces encountering each other if we assume a clear, fine day.

So what might have happened if Spee and Patey had encountered each other? We can speculate, but that speculation can be informed if we play out the possibility using naval wargames. Let's consider how such an engagement might have progressed, using several alternative rules sets. We will start with Fear God & Dread Nought, the rules for which are found in Appendix 2

Fear God & Dread Nought

It's a fine South Pacific day, with a light breeze from the southwest and 100 percent visibility, when shortly before 10 a.m. lookouts on the light cruiser HMAS Melbourne spot the smudge of stack smoke on the horizon and steer north to investigate, followed by HMAS Australia about 4 miles behind. Around the same time the lookouts on SMS Nurnberg see the same indications to the South and head in that direction, followed by SMS Scharnhorst and SMS Gneisenau, also trailing by about four miles. Both squadrons are cruising at 12 knots.

At 1012 a lookout on Melbourne sends word down to the captain that there's a German light cruiser under one of the smoke columns. Around the same time a Nurnberg lookout reports a similar sighting to his skipper – "British light cruiser bearing due South!" The higher lookout post on the Australia allows her to also spot the German cruiser around the same time.

Even as the light cruisers begin to raise their speed, hoist signal flags announcing their sightings and refine their initial spotting reports, lookouts on both sides start to see the larger ships become distinct in the distance. At 1015 Nurnberg identifies the second Allied ship as being the battlecruiser Australia. Even as she hoists signals and begins a turn to reverse course, the German flagship spots the bad news itself and orders the squadron to reverse course and flee north at best speed. By 1030 both groups are heading north at their best speeds.

It's a race that the Germans can't win, as both Australian ships are faster. Nurnberg slowly overtakes the two German armored cruisers, but the Australian squadron closes in on all. Melbourne is ordered to fall in behind the battlecruiser.

Just before noon Australia closes within 16,000 yards and begins firing ranging shots at the Gneisenau. As the German 8-inch guns are also in range, the rear turret of the German ship begins return fire in hopes of disturbing Australia's aim, if nothing else.

At 1203 a 12-inch shell lands smack on Gneisenau. Spee recognizes that the jig is up and orders a turn to bring broadsides to bear. His only hope now is to inflict some speed-killing damage on Australia before she fatally damages his ships. Nurnberg, previously ordered to save herself, continues her flight north.

At 1209, after turning to unmask its broadside, Australia scores another hit on the Gneisenau, as both German ships continue to return fire. Gneisenau manages to hit back, one of its 8.2-inch casemate guns landing a non-penetrating hit on the deck of Australia. This illustrates the grim math facing Spee – every 12-inch shell hit is a devastating blow to an armored cruiser, while the lighter 8.2-inch shells do minimal damage in return.

By 1230 Gneisenau has been hit three more times by 12-inch shells and had a couple of 4-inch hits as well, reducing her speed, while Australia has been hit by four more 8.2-inch shells and a couple of 5.9-inch from both German armored cruisers, to little effect. Meanwhile, Melbourne has joined in and also drawn some fire as well, although no hits had been scored as yet.

With Gneisenau slowly falling behind, the two armored cruisers begin to separate as the range between the two squadrons slowly closes and they start a wide circle around each other. Meanwhile Nurnberg has succeeded in passing beyond visible range on her way to escape.

As Gneisenau continues to stagger under more hits by 12-inch and 4-inch shells, the Scharnhorst switches fire to Melbourne to at least drive off part of the Allied force. An 8.2-inch hit on Melbourne quickly follows.

Both sides score a number of hits over the next nine minutes with every ship scoring and being scored upon, but the 12-inch shells being enormously more destructive. A hard blow on Gneisenau at 1239 jams her rudder in a starboard turn. With Gneisenau obviously badly hurt, Australia switches fire to Scharnhorst and signals Melbourne to break off and finish off the Gneisenau. At 1245 a 12-inch shell slams into the bridge of Scharnhorst, killing or wounding everyone present, including Spee. Melbourne starts landing hits on Gneisenau as the range closes, while taking a few in return from the 5.9-inchers on both armored cruisers.



Figure 15 HMAS Australia steams between the two German armored cruisers in a replay of a potential encounter between the ships using the counters and rules from Fear God & Dread Nought. (Author's collection.)

Australia's course begins to carry it between the two German armored cruisers, which have turned in opposite directions and the 4-inch batteries on both sides of the ship bark. The German cruisers are both on fire by this point as all the ships close into short range, with hits all around.

At 1257 Gneisenau regains rudder control, and not a moment too soon as Melbourne launches a torpedo as she passes. Gneisenau is able to turn hard starboard and dodge the underwater missile, but can't dodge the shells pouring in from both sides. Scharnhorst is also hit and loses speed as Australia decides to start lengthening the range again using its 10-knot edge in speed to dictate the range.

By 1309 Melbourne has come around again for another torpedo run, but it's unnecessary as multiple hits from Melbourne knock out most of Gneisenau's guns and set several fires. One shell penetrates the boiler room and causes a massive explosion that robs the armored cruiser of all power. It's soon clear the armored cruiser is sinking and Melbourne heaves to so it can lower boats for rescue work.

Meanwhile Australia and Scharnhorst continue their unequal duel. Scharnhorst's bridge is re-manned, but is unable to maneuver quickly and Australia is able to maintain a sweet spot in the range at about 10,000 yards. Accuracy for both sides falls off, as gun crews tire. Between 1312 and 1330 neither ship manages to land a hit, but at 1330 another 12-inch shell finally slams into Scharnhorst, penetrating the belt and damaging the engine, cutting her speed further, and setting her afire again.

The end comes quickly with another 12-inch shell hit at 1336, setting off the ready ammunition in the casemate. The resulting explosion clears out the bridge again, as well as fanning more raging fires. The ship coasts to a stop. Another 12-inch shell hits the listing ship, but then Australia ceases fire. Scharnhorst turns turtle and sinks at 1346, taking Spee with her. Meanwhile Gneisenau settles in the water a few miles away and doesn't go under until 1439, so most of her crew is rescued.

Both German armored cruisers are sunk, although Nurnberg is able to escape. The Australia knows she's been in a scrape, with 24 percent damage, but little diminution of fighting ability. Melbourne likewise is only moderately damaged, at 13 percent.

Other opinions:

Fletcher Pratt Modified.

Playing with the Fletcher Pratt rules, with modifications suggested by the Donald Featherstone variant and John Curry's solo play rules, the engagement between the Australian force and the German squadron proved to be both more sedate and yet end more violently than the other versions.

The Pratt system, with its lack of critical hits and its incremental damage system, is much more attritional than most other naval wargame rules. As such the first hour of game time involved a very slow pounding away at each other as the ranges slowly closed.

In this play-through Spee decided to send Nurnberg off from the get-go, judging the ship's likely contribution as being minimal. The two armored cruisers doubled back and closed on the Australia and her consort, Melbourne, varying the approach a few times to help throw off the Allied aim.

Australia kept Melbourne in company as an additional bit of firepower and to draw off some fire from the Germans, which Melbourne succeeded in doing at some cost to itself. As in every other replay, Australia found it impossible to maintain its range advantage for long under the conditions of closing speeds approaching 50 knots.

Scharnhorst mostly fired on Melbourne for the first three quarters of an hour, while Gneisenau and Australia dueled. Unsurprisingly the Gneisenau was coming out the worse, but so slowly that Patey felt the need to close to point-blank range to increase his chances of hitting enough to finish off the German ship. This incautiously brought Australia within torpedo range of the Scharnhorst – at least torpedo range as defined by Pratt's rules, which appear very generous compared to actual capabilities of the time. And then this was compounded by exceptional luck for the Germans as BOTH torpedoes hit, which left Australia in pitiable condition. It took a few more turns to finish Australia off, but almost exactly an hour after the action began, the Australia was sunk. Meanwhile, Melbourne also succeeded in torpedoing the Gneisenau, although in this case the task was made easier by Gneisenau's slow speed. Melbourne then limped off the field – Spee not following as there seems little reason for him to take even the small risk of jeopardizing his victory for the small benefit of finishing off a light cruiser.

At the end of the action, then, HMAS Australia is sunk and the Melbourne left 71% damaged. Nurnberg, of course, escaped unscathed, while Scharnhorst was only lightly damaged at 11%. Gneisenau was sunk, probably with heavy loss of life as the other German ships were not nearby for rescue operations and the amidships hit on an already badly damaged ship may have sent her down fast. Scharnhorst's ability to continue her cruise, however, is still in question. While Pratt's system does not account for ammunition, in the historical battle of Coronel the Scharnhorst fired off half her main gun ammo supply in a half hour of fighting. In this battle the two sides traded fire for an hour, which suggests that the magazines on Scharnhorst were likely nearly empty. Once again, internment in a neutral port seems to be Spee's only real choice, although he could probably delay doing so until after he rendezvoused with all his light cruisers. Emden's experience showed that it would be useful to beef up the crews of the light cruisers so they had the additional manpower needed for prize crews. If he was going to be interned, there was no need to do so with his entire crew.

Under Pratt's rules Spee was therefore able to win a shocking victory.

Victory at Sea 1971

These rules do consider visibility, and so there's an initial period of maneuvering outside of gunnery range. The light cruisers spot each other at a range of 17 miles, and shortly thereafter the heavier ships are also seen.

As before, the light cruisers drop back into line behind the heavier ships, but in this case I supposed that Spee would at least make an attempt to run, hoping, perhaps, that some bad weather might intervene or that the Australia might suffer an engineering glitch that would slow her down enough for Spee to escape.

It was not to be, however, and the 3-knot speed advantage of Australia and Melbourne over the German cruisers inexorably closed the range. After about three hours a ranging shot from Australia lands near Nurnberg. Spee turns his line broadside to face his pursuers and the action, proper, begins.

Australia opens up the action with two hits at 17,500 yards on Scharnhorst, knocking out the fore turret and cutting her speed down to 17 knots.

As the range closes to 15,000 yards Australia continues to pummel Scharnhorst, blasting her down to half speed and destroying half of her remaining guns. Gneisenau manages to exact some revenge, hitting Australia in return.

The light cruisers continue to close the range while both sides continue to blast away, scoring heavily. Australia switches fire to Gneisenau and begins to devastate her in turn, but the German ships are managing to land some blows in return.

Still, there's really no contest and Nurnberg turns to flee while the German armored cruisers gamely fight on. They do manage to land a couple of hits on Melbourne, which gives Nurnberg the speed advantage it needs to make its escape, but the battle is over within half an hour. Scharnhorst is sunk and Gneisenau forced to scuttle after taking 83 percent damage. Nurnberg escapes. Melbourne has 34 percent damage while Australia has just 16 percent.

Victory at Sea 2009

In the first play through using these rules, the very first shot from Scharnhorst hit Australia, penetrated its armor for a critical hit that exploded the magazine and sunk the ship! Shades of the Denmark Straits! This low probability (well under 1% chance) event highlights the role of pure chance in war. Such a shocking result would have undoubtedly spurred the British to hunt down Spee's squadron long before it had the chance to reach Coronel. It might also have spared the British their battlecruiser losses at Jutland two years later by prompting reforms earlier.

Resetting the game -- because one *can* in wargames -- the skilled (lucky?) Spee consistently won the initiative in the early going, which prevented Australia from taking full advantage of its edge in range under these rules. Instead the two German cruisers were able to get close enough to use their turret-mounted guns every turn and often got in a shot or two from the casemate guns. The two light cruisers mostly tried to stay out of the way, although Melbourne's 6-inch guns did make a contribution to the damage on Scharnhorst.

The pounding match went fairly evenly, as the heavier hitting power of the 12-inch guns was offset by the superior quantity and good marksmanship of the German gunners. Eventually the Australia was damaged by more than 50% and I judged that Patey would have broken off the action rather than risking losing his country's sole capital ship.

So Spee's squadron was able to drive off a single battlecruiser -- although it had the odor of a pyrrhic victory. Both German armored cruisers were substantially damaged -- 65% for the Scharnhorst and 35% for Gneisenau. Their immediate fighting ability was little degraded in game terms -- amounting to some disabled secondary and tertiary guns -- but such a high level of structural damage calls into question the seaworthiness and habitability of the vessels for extended operations. They were, still, many thousands of miles from home and didn't have access to friendly ports for repairs.

Uniquely, Victory at Sea 2009 also tracks crew casualties, and both German ships suffered heavily, with more than 400 dead and wounded between them. Such heavy casualties would also call into question the squadron's ability to sustain operations and presents the problem of what to do with a few hundred wounded sailors.

It's quite possible that Spee might have decided the cruise could not continue and he might have sought internment -- perhaps in Hawaii or in Chile, after detaching Nurnberg as a raider. In this case Leipzig and Dresden would never have joined his squadron and would also have conducted careers as independent raiders.

Assessment

The consensus of the rules sets seems to be that one battlecruiser was, indeed, more powerful than two armored cruisers, but not by so much that an upset wasn't a distinct possibility. This tends to vindicate Fisher's later insistence on sending *two* battlecruisers with Sturdee. What is certain, however, is that, win or lose, after tangling with even a single battlecruiser, Spee's cruise as a squadron was at an end. The light cruisers could be dispatched as raiders, but the armored cruisers, even if they survived, would almost surely have had to head to Hawaii or Chile for internment, as the only other alternative would be surrender or destruction by the next British warship they met.

The light cruisers would prove to be little more than interested observers in this Samoan encounter, their main utility being in the scouting beforehand. The German ship, especially, is simply too lightly armed to be useful, but even Melbourne's usefulness was close to negligible in a firefight between capital ships.

The German ships fared the best with the least detailed rules, and the addition of complexity and the better accounting of relevant factors tended to work against Spee's chances.

Readers can see for themselves in SFY No. 2 if different tactics might bring Spee a victory. Perhaps a bold charge at the battlecruiser would increase Spee's chances of landing some critical blows, although it would also ease the task for Patey's gunners.

See For Yourself 2

Patey's Possibility: Battle of Samoa

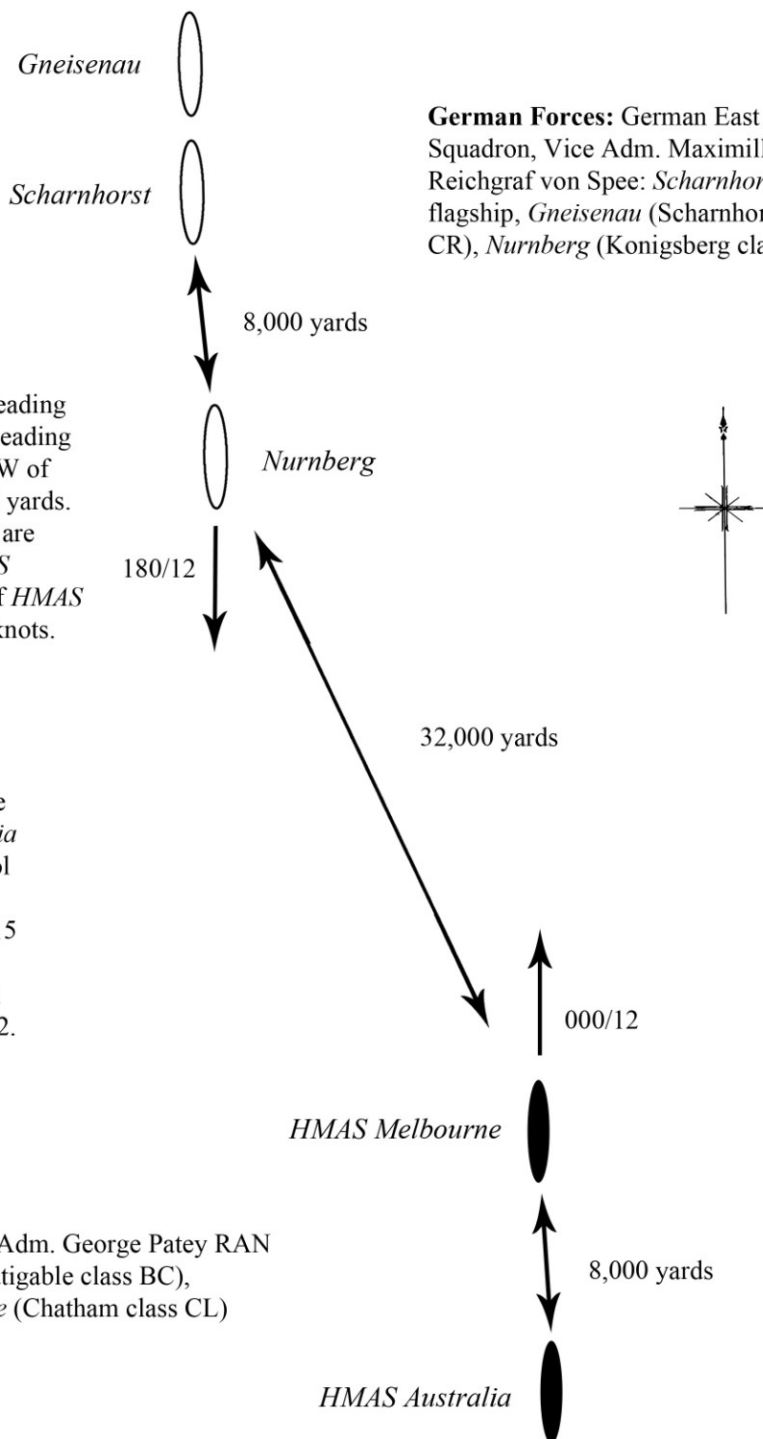
Environment: 1000
Sea State 1. Visibility
100%. Wind from SW.

Setup: *HMAS Melbourne* heading
000 at 12 knots. *Nurnberg* heading
180 at 12 knots bearing NNW of
HMAS Melbourne at 32,000 yards.
Scharnhorst and *Gneisenau* are
8,000 N of *Nurnberg*. *HMAS*
Australia is 8,000 yards S of *HMAS*
Melbourne. All ships at 12 knots.

Option: According to some
sources, the *HMAS Australia*
did not receive a fire control
director system until
sometime between mid-1915
and May 1916. Treat as
having no director for main
battery, Gunnery Standard 2.
Local control.

Australian Forces: Rear Adm. George Patey RAN
in *HMAS Australia* (Indefatigable class BC),
flagship, *HMAS Melbourne* (Chatham class CL)

German Forces: German East Asia
Squadron, Vice Adm. Maximillian
Reichgraf von Spee: *Scharnhorst*
flagship, *Gneisenau* (Scharnhorst class
CR), *Nurnberg* (Konigsberg class CL)



Graphic by Elizabeth Owen

CHAPTER 9

CRADOCK'S BANE: THE TROUBRIDGE AFFAIR

"I will take care I do not suffer the fate of poor Troubridge" -- statement of Rear Adm. Cradock reported by Adm. Hedworth Meux.

The fate of Rear Admiral Ernest Troubridge weighed heavily on Cradock, so it's worth looking at that incident to help understand the squadron commander's state of mind as he faced Spee.

In the opening days of the war the German battlecruiser Goeben and its accompanying light cruiser Breslau were caught in the Mediterranean, surrounded by powerful enemies, including not only the majority of the French Navy, but a large collection of British ships, including several battlecruisers.

Through a series of mishaps, missed communications, strokes of luck and some unexpected moves by the Germans, Goeben and Breslau managed to elude nearly all of their pursuers. It eventually came down to Troubridge with his squadron of four armored cruisers to be the last chance for the Allies to intercept the Germans before they found refuge in Turkey.

Troubridge's situation was complicated by his instructions from the Admiralty to avoid engaging a "superior force." First Lord of the Admiralty Winston Churchill, while incontestably a literary talent of the first order, had demonstrated the sad quality of being a poor writer of orders. Leaving aside the dubious strategic wisdom of the concept behind the orders (the Royal Navy had a very long and successful tradition of seeking engagement with superior forces), Churchill provided no guidance as to what might constitute a "superior" force. It appears that Churchill meant the Austro-Hungarian navy, not the German squadron, but that was left unsaid.

This was the dilemma Troubridge faced.

While a single battlecruiser was undoubtedly superior to a single armored cruiser, or maybe even a pair of them, it was less clear whether four armored cruisers might be enough to overwhelm it. We can discount the presence of Breslau. While stronger than the typical German light cruiser, it was still a minor combatant in the context of a brawl involving capital ships. The limitations of German fire control meant that no more than two of the armored cruisers could be brought under fire at a time, at best, leaving at least two undisturbed to maneuver against or fire at the German ship.

Troubridge's squadron comprised HMS Defence, which we have already discussed in Chapter 4, and three other late-model British armored cruisers. These three, the sister ships HMS Duke of Edinburgh and HMS Black Prince, and the similar HMS Warrior, had a somewhat less efficient arrangement of their main battery than Defense, but the end result was the same broadside of four 9.2-inch guns. The main difference between the four ships was in the size and arrangement of their secondary batteries, which would have been of less importance in a scrap with Goeben. All of them had more than enough firepower to prevent Breslau from even considering a close approach.

It was to be an ill-fated group, with three of the four ships being lost at Jutland two years later. Only Duke of Edinburgh survived.

Their opponent, Goeben, was a formidable one, made more so by the different German approach to the battlecruiser concept. Fisher believed that firepower was the most important attribute of a battlecruiser, and gladly sacrificed protection in order to maximize speed and hitting power. In contrast, his counterpart in the German Navy, Grand Admiral Alfred von Tirpitz, believed that the most important characteristic of a warship was staying afloat. German capital ships, as consequence, emphasized survivability and were very well-built and well-protected. They sacrificed firepower in order to maximize protection and speed. This meant that many German capital ships – including Goeben – carried just 11-inch guns, smaller than anything mounted on first-line British ships. While this would prove to be problematical in a general fleet engagement such as Jutland, in a fight with armored cruisers an 11-inch gun was more than sufficient. Every hit by the 11-inchers could be expected to be devastating, with no hope of the armored cruiser's armor keeping it out. In contrast, unlike British battlecruisers, the Goeben had thick, battleship-scale armor that would be proof against the cruisers' 9.2-inch guns at any battle range. The lighter British guns would be relying on causing enough damage to unarmored areas of the German ship to disable it.

It is beyond the scope of this work to examine in detail the likely outcome of a battle between Goeben and Troubridge's squadron, but some sense of the relative power of the two forces can be illustrated by looking at the Avalon Hill game *Jutland*, which includes the ships or sister vessels.

The numbers shown on the playing pieces represent the combat characteristics of the ships in the three main areas of firepower, protection and speed. The four British armored cruisers are represented, while the Goeben's sister ship Moltke, stands in for that ship.

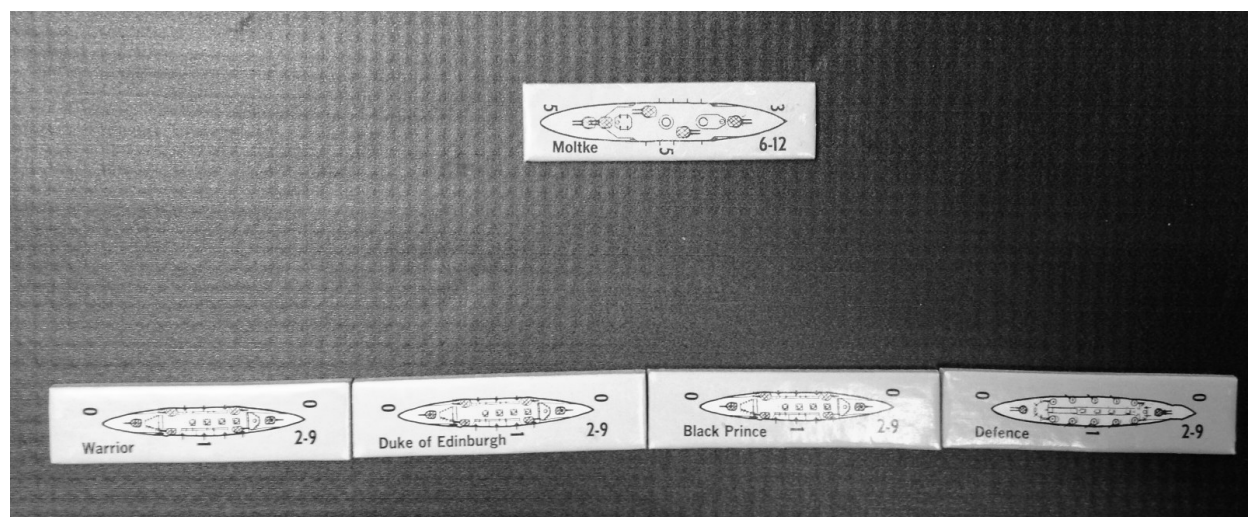


Figure 16 Ship counters from the Avalon Hill game *Jutland*, illustrating the disparity in combat power between Goeben and the British squadron under Troubridge. (Author's collection)

The numbers at the bow and stern of the ship represent its firepower when firing in those directions, while the larger number beside the ship amidships represents its broadside. The differences between the ships are stark, with all the armored cruisers having a broadside value of just “1” compared to the German ship’s “5.” The British ships are also hopelessly overmatched in protection as well, with the German ship’s value three times higher than theirs. But perhaps the most critical difference is the final number, which represents their speed – with the German ship’s “12” leaving the cruisers’ “9” far behind.

This is the crux of the matter. The British armored cruisers could not force the German ship to fight. So long as conditions allowed, the German ship could fight as long as it liked at the range it preferred and break off as desired. Troubridge recognized the realities of the matchup and tried to arrange the encounter so that he’d fight in reduced visibility to maximize his chances of getting close enough to force a battle. When he found that he wasn’t going to be able to do that, he called off the chase, judging that Goeben was, indeed, clearly a “superior” force.

His conclusion seems reasonable, as we can see in the comfortable hindsight of a century later, but he immediately came in for widespread and harsh criticism in the fleet. Eventually there was a court martial, which acquitted him, but it didn’t really *vindicate* him. But even that lay far in the future, and in the fall of 1914 Troubridge’s failure to even try to fight Goeben was a chicken bone that stuck sideways in the throat of most British naval officers. Indeed, it had such far-reaching influence in the Royal Navy that a generation later, the current First Sea Lord saw fit to refer to it in his remarks to the commander of another South Atlantic squadron who faced a similar choice. See the Epilogue for more on that.

There was also the contemporary example of William Kelly, commanding the light cruiser HMS Gloucester (yet another town-class vessel), which repeatedly nipped at Goeben and Breslau, attempting to provoke them into abandoning their flight to rid themselves of the nuisance. The Germans refused to take the bait, but Kelly was awarded the Companionship of the Bath for his action. He *tried*.

Given the general opinions of the service, which he undoubtedly held himself, the one thing we can be certain of is that Cradock would fight Spee if encountered. Withdrawal was not an option and we can therefore discount any scenario involving a breaking off of contact, once gained.

First Lord of the Admiralty Winston Churchill

No man probably had more influence on the catastrophe at Coronel than a man who was 8,000 miles away – First Lord of the Admiralty Winston Churchill.

The Twentieth Century was chock full of larger-than-life figures, but even among that company Winston Spencer Churchill was remarkable. Best known today for his epic World War II leadership, the Churchill of 1914 was still many years away from being the Churchill of “Blood, Toil, Tears and Sweat” fame.

Still, Churchill had already cut a notable swath through history and was the sort of person who could – and did – rate an entire chapter in a book titled *Real Soldiers of Fortune*. Churchill's exploits in Cuba, South Africa and the Sudan were recounted with awe. That book's author could presciently write, "He is the kind of man who in any walk of life makes his own fortune, who when he sees it coming, leaps to meet it, and turns it to his own advantage."

The writer went on to say that other "than Winston Spencer Churchill to-day there are few young men – and he is a very young man – who have met more varying fortune, and none who has more frequently bent them to his own advancement. To him it has been indifferent whether, at the moment, the fortune seemed good or evil, in the end always it was good."



This was written in 1906, well before Churchill started his first stint as First Lord of the Admiralty in 1911 (He'd again serve in the post in 1939 before becoming prime minister). Churchill played a critical role in carrying on Fisher's reforms of the Royal Navy that readied the service for the challenge of the First World War. Brilliant, mercurial and eloquent, Churchill had energy that overwhelmed most opposition. As an administrator he generally had a positive influence on Allied fortunes, even if his strategic acumen was more doubtful.

Figure 17 A postcard from early 1915 showing Churchill as First Lord of the Admiralty.

As an operational leader, however, Churchill left a lot to be desired. While an eloquent and profligate writer, it turned out he had some difficulty clearly communicating his thoughts as orders, with a number of unfortunate incidents in the opening part of the war – nowhere worse than in the affair of Cradock's squadron.

In the wake of the disaster at Coronel, no clear line of blame could be assigned to Churchill, but it appears he was at least aware of, if not the author of, several decisions that worked against Cradock. It was Churchill's ill-defined warning about engaging "superior forces" that caused Troubridge such grief and someone in the Admiralty delayed the dispatch of the HMS Defense without bothering to inform Cradock in a timely way.

Churchill's difficulty in making himself clearly understood to the admirals may have stemmed from a lack of intimacy with how they thought. Churchill didn't seem to think much of admirals, as a group. While he had seen much fierce action, it was always with the army. He was, in essence, an amateur. Brilliant, perhaps, but he was still an amateur in naval matters. Nowhere is this more evident than in his characterization of the HMS Canopus as a "citadel" that Cradock could use for protection. It's hard to conceive of a more un-nautical concept than a citadel at sea.

Churchill was too skilled a wordsmith to chalk this up to a careless turn of phrase. No, it seems to betray a fundamental misunderstanding of sea fighting. Churchill expected Cradock to fight under the battleship's protection, but Cradock could clearly see that if he had the battleship with him, there would be no fight at all -- Spee would simply steam away.

CHAPTER 10

DOOMED VALOR: HISTORICAL CORONEL

Much about the Battle of Coronel is explained by the fact that neither admiral had expected to fight it. Each was under the impression he was concentrating an overwhelming force against a detached element of the enemy and it was only after the battle became unavoidable that the truth became known.

Spee's mistake was the more understandable of the two. While the laxness of early war security and a prolific neutral press gave Spee a pretty good idea of the composition of his opponent's potential force, he had unusually specific information that gave him a mistaken impression of the situation on Nov. 1.

HMS Glasgow's arrival under Capt. John Luce in Valparaiso gave Spee the best possible intelligence – a confirmed sighting by trained observers. Luce's circumspection here paid dividends, however, as apparently no hint of Cradock's presence nearby leaked out. Luce's prudent decision to keep Glasgow's visit very short also stymied Spee's plan to catch her as she left harbor, but Spee had a reasonable expectation that the British light cruiser was still close enough to find.

Cradock's error was less understandable, as it arose as much from an assumption as from known facts. The known fact was that wireless intercepts had shown the presence of a German transmitter using the call sign of SMS Leipzig. Cradock can be forgiven for thinking that only the Leipzig was transmitting. This was the infancy of wireless and many common precautions of later eras had yet to be implemented, so Cradock was unaware that Spee had instructed *all* of his ships to use Leipzig's call sign, relying on message content to identify the actual ships affected by the transmission. This may very well have been the first-ever use of that particular ruse. Still, Spee's ships were known to be operating in concert, and it's hard to see why Cradock would not have assumed that Spee's squadron was all together anyway and that where the Leipzig was, the rest would be as well.

In any case, Cradock thought he was searching for Leipzig alone, and therefore had to deploy as wide a net as possible. Here the HMS Otranto was useful, as it extended his search line by another 20 miles.

So it was ironic that the first ships sighted were Glasgow and Leipzig, confirming each admiral's preconceptions and inducing each to close immediately with the intent to do battle.

Considering the course of the actual battle from the perspective of the Fear God & Dread Nought rules, the first consideration is this question of spotting and identification.

Cradock's scouting line was set up with each ship about 20 miles from its neighbor and still able to see it.

From Otranto's log, we know that the seas were "rough" but the weather was otherwise "fine and clear" that afternoon. Under the FG&DN rules this implies visibility was about 100%, allowing ships a good chance to keep visual contact at roughly 40,000 yards.

As it turned out, Glasgow, on the extreme right flank of the scouting line, made contact with Leipzig at 1620 before the line was even fully deployed. The British squadron concentrated on Glasgow. Unfortunately for Cradock, his flagship was on the far left side and therefore had the farthest to travel and so he was the last on the scene.

Meanwhile, Spee also concentrated his force, calling in his outlying light cruisers to rendezvous with the main body, which had closed up on Leipzig.

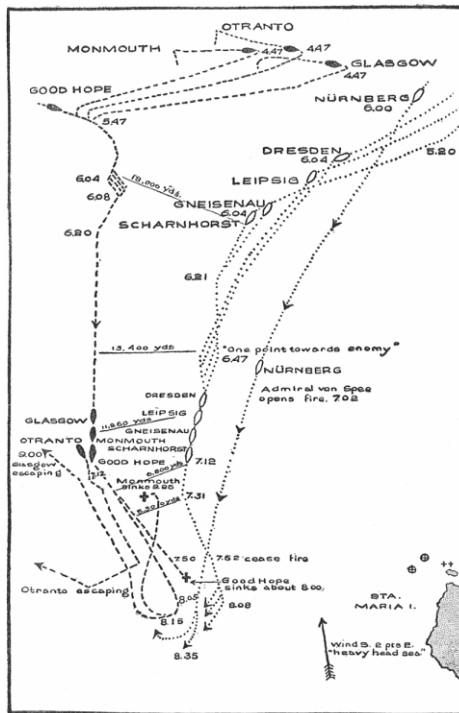


Figure 18 Map of Coronel (Corbett, 1920)

Visibility far exceeded the range of all the available weapons, so both commanders had ample time to identify the opposing ships and assess the tactical situation before the shooting started. At 1800 both squadrons were in line, heading generally south in battle formation, but outside of gunnery range. Cradock led his column in HMS Good Hope, with HMS Monmouth, Glasgow and Otranto following in turn.

Spee's deployment was equally orthodox, with the flagship SMS Scharnhorst leading SMS Gneisenau and Leipzig. SMS Dresden was closing from the rear, but SMS Nurnberg was still many miles away and would not figure in the early stages of the coming battle.

By 1800 the opposing battle lines were about 20,000 yards apart, having been in contact for about 90 minutes.

Spee did not have unlimited sea room. The Chilean coast was about 20 miles to his east and the headlands of Boca Chica and Santa Maria Island would compel him to head southwesterly eventually. And the setting sun behind Cradock's ship's provided the British admiral with a momentary advantage, as the setting sun would be shining in the eyes of Spee's gun layers while Spee's ships in turn would be fully illuminated. In the FG&DN rules this provides about a 10% penalty against the gunners trying to fire into the sun, which largely counterbalanced the skill advantage Spee's gunners held over their British counterparts.

It's probable that Cradock realized that he was operating at a disadvantage in gunnery, but doubtful that he realized how great the disparity actually was.

He was undoubtedly aware that the hastily manned and inadequately trained gun crews on his two armored cruisers were below the usual Royal Navy standard, but at this early stage of the war he would have had little chance to realize how appalling that standard was. In fact, the Royal Navy's gunnery was in crisis, and the Battle of Coronel was among a series of actions in the early part of the war, along with Heligoland Bight and the Battle of the Falklands, that would reveal that the overall level of British gunnery was shockingly bad. It was Cradock's misfortune that he was in one of the very first battles where this deficiency manifested itself.

Peacetime gunnery exercises, by nature, tend to obscure the real state of gunnery under wartime conditions. In an effort to be fair, gunnery competitions normally try to strip out factors that unfairly impact on skill but are common enough in actual operations. At Coronel, Cradock's decisions imply he thought his gunners had a reasonable chance to inflict significant damage.

And it's worth noting that Cradock did not have to "win" his fight with Spee, he merely had to do enough damage that Spee's ships would be unable to continue their cruise and would have to surrender or be interned at a neutral port.

What Cradock probably did not know was that his opponent's gunners were as far above standard as his own gunners were below standard. The long-service regular naval crews of the East Asia Squadron would have had an advantage in any case, but it appears that they were exceptionally good. The German Navy ran annual gunnery contests, as most navies did, and between them the Scharnhorst and the Gneisenau regularly won the "Kaiser's Cup," as it was called. Their performance at Coronel and later at The Falklands would show that this was no fluke and the honor was richly deserved. Indeed, it appears that the gunners on the two German armored cruisers achieved or exceeded the standards expected of director-assisted fire even though they had no formal gunnery director system.

Exacerbating the British admiral's problem was rough seas. The crashing waves required keeping the lower row of casemate-mounted secondary guns on both armored cruisers closed and unavailable, cutting each ship's available firepower almost in half. This was the naval equivalent of going into a fight with one hand tied behind your back. Deciding to engage Spee under these conditions is the first questionable tactical decision Cradock made that afternoon.

As it turns out, we know from Otranto's logs that the rough seas persisted throughout the following day, but Cradock could not know that the weather would not improve, and one wonders why he apparently gave no thought to trying to delay the action until he could use more guns.

In FG&DN at extreme range, neither side's gunners stand any chance to hit under these conditions. Unsurprisingly, neither side opened fire at the theoretical maximum ranges of their guns. Instead, Spee waited until he closed to about 12,000 yards before he opened fire, with Cradock immediately replying. In FG&DN terms this is "Long" range for the guns involved.

Cradock's main battery guns start with 10% base chance to hit in FG&DN. Sundry negative modifiers for sea state, first salvo, ship speed and target speed mean that there's no chance for a hit at first. Only after a third salvo, and assuming that Spee's ships remain broadside, does the chance for Cradock's gunners climb into positive territory at around a 4% chance to hit for the 9.2-inch guns. The 6-inch batteries fare a little better because of more barrels firing, reaching 6% for Good Hope's secondary batteries and 10% for Monmouth's battery of 6-inch guns.

With the sun in his gunners' eyes, Spee's chances were about the same, even giving his men a "Kaiser's Cup" bonus, with the 8.2-inch guns having about a 12% chance of hitting. Spee wasn't interested in these even odds, however, and when Cradock ordered a turn of 4 points towards the enemy at 1804 to close the range, Spee countered with his own turn to port to keep the range open for the moment.

Here's where Cradock made his second questionable call. He was unable to dictate the battle range, at least in part, because of Otranto, which slowed his squadron's maximum speed to 17 knots. Given the negligible combat value of Otranto, Cradock missed an opportunity to rid himself of it at this point. Part of the reason why Cradock apparently accepted battle at all was because he knew that pulling away would mean leaving Otranto behind and he was unwilling to do that.

But ordering Otranto to flee and take advantage of Spee's reticence during the 1800 hour would have been a win either way for Cradock. Either Spee would stay and fight in order to prevent the Otranto from getting away and therefore force a battle at as even odds as Cradock was ever likely to see, or Spee would continue to fade away and Otranto would get a good clean head start on pulling out of danger. An hour's head start would put Otranto well out of sight of Spee's ships.

Stymied by Spee's fade away, Cradock's line resumed its southerly course, slowly closing the distance as the sun sank below the horizon. At 1900 Spee was ready.

When the battle began in earnest at 1900, conditions had changed considerably, and not to the British advantage. Now instead of dazzling the eyes of the German gunners, the fully set sun silhouetted the British ships starkly against the horizon. Meanwhile the German ships were lost in the twilight gloom to the east, further hidden by the backdrop of the Chilean island of Santa Maria, 20 miles distant. British accounts say their gunners were reduced to firing at muzzle flashes.

Some idea of the scale of the turn-around can be gained by considering how the changed state of affairs would be reflected in FG&DN.

Cradock's gunners would start off with a base chance of 10% for long range, but face negative modifiers for firing at muzzle flashes, sea state, ship speed and target speed. Together these mean there is no chance at all for a hit under the rules. Indeed, even after three salvos and giving the British ships the benefit of firing at the German ship's broadside and accounting for the number of barrels firing, the game gives the British ships no chance of a hit at all at long range. In fact, the British would manage a handful of hits in the actual battle and I think a case can be made in FG&DN that there should always be a minimum chance of 1% for a hit so long as a gun is within long range.

In contrast, Spee's gunners, starting at the same 10% base chance, have only negative modifiers for sea state, first salvo, ship speed and target speed to contend with, and these are mitigated by the twilight sun, Kaiser's Cup bonus and broadside aspect to give the Germans a 4% chance initially, climbing to 10% by the third salvo. In the actual event, the third German salvo landed a hit on Good Hope, destroying the fore 9.2-inch gun and starting the disaster.

Things went rapidly downhill from this point for the British ships and by 1945 both armored cruisers were wrecks. Otranto had fled and Glasgow was dancing round, torn by Luce's conflicting desires to support the stricken heavy ships and yet not share their fate.

As both British armored cruisers were lost with no survivors, we can only surmise the extent of their damage, but we know that the British fire landed just six hits on the two German armored cruisers. All were 6-inch hits. As all three British cruisers used that caliber ammunition it's not possible to assign credit, but the fact that Gneisenau was hit four times while Scharnhorst was hit just twice suggests that the Glasgow's regular navy gunners – who also fired on Gneisenau – may have been far more effective than the reserve gunners of the other ships even though they were firing far fewer guns.

In any case, no matter who deserves credit, the reality was that none of those hits did much damage, and looking at the situation using Fear God & Dread Nought we can see why not. It turns out that at the ranges where the battle was fought the 6-inch shell could not penetrate the German armor. The game would credit each non-penetrating hit with doing about 5 points of damage so the Scharnhorst took about 10 points of damage and the Gneisenau about 20. This amounts to about 4% and 8% damage respectively, far below the level that would have any effect on the ship in game terms.

Accounts indicate that the Monmouth was hit at least 20 times, probably all 8.2-inch shells. In contrast to the British shells, at the ranges fought, many of the 8.2-inch shells would penetrate the British ship's armor. If half were penetrating hits they would do about 90 points of damage, while 10 non-penetrating hits would do about another 50 points. This adds up to about 140 points of damage, which amounts to more than 60 percent of what the ship can take. At this damage level we can expect to start seeing multiple critical hits and the historical accounts report evidence of both fires and flooding occurring. Under the rules both of these critical hits add more points of damage, which in turn creates more opportunities for even more critical hits.

We have less information about what happened to Good Hope, but that ship seems to have been hit at least as often as Monmouth, if not more, and suffered similar critical hits as well as others such as the destruction of the forward main battery turret. Both ships seem to have suffered enough damage to completely silence their guns, which the game judges as happening at 75 percent damage.

In fact, if the fires and flooding were not brought under control – a difficult task for the reserve crews – then 75 percent damage is sufficient to create the conditions for the crews to be “overwhelmed” in game terms with capsizing and explosions inevitable. In the actual event it appears that the Good Hope exploded and the Monmouth capsized.

Most accounts suggest that Nurnberg, which happened upon the stricken Monmouth, may have played a role in her sinking, but it's likely the British ship was doomed in any case. Nurnberg reported firing some “devastating” close-range broadsides at Monmouth but, as we have seen, the German ship was armed with just 4.1-inch guns, which were unable to penetrate the armor of Monmouth at any range. Even a dozen or so hits (very generous given the darkness and rough seas) would probably add no more than another 10-20 points of damage or 4%-8% damage. This would probably not be enough to make a difference -- given the amount of damage already inflicted -- and change the result.

What the arrival of Nurnberg did do is increase the tragic loss of life. Because of the approach of Nurnberg and the nearby presence of the rest of the German squadron, Luce withdrew Glasgow from the area after having stood by Monmouth to render aid. Nurnberg was also not in a position to stop and help, with its boats stowed for action and Glasgow still unaccounted for. So Monmouth was left to founder alone and her entire crew was lost. It's likely that Luce and his regular navy crew would have been able to save at least some survivors of Monmouth despite the rough seas and darkness if left unmolested.

It's hard to assess blame, as each captain acted in the best interests of his own ship, but the end result was a tragedy of the first order as both British capital ships were lost with all hands.

Readers can assess for themselves whether Cradock could do better with SFY No. 3.

Lost with all hands

“Lost with all hands” is a chilling and rare phrase -- and yet one that applied three times to major warships involved in Spee's saga.

Naval combat is often especially sanguinary. While it's typical in ground combat for there to be three or four men wounded for every fatality, it's not uncommon for casualty lists aboard damaged warships to see those killed outnumber the wounded. The effects of high explosive blast and fire in confined spaces aboard ship are frightful and an unlucky hit can easily snuff out a hundred or more lives in an instant. Further exacerbating the death toll is the grim fate awaiting the wounded if their ship sinks. There is danger for even the strong and hale swimmer if the water is cold.

Still, it's difficult to kill every single individual in the company of a large warship. Even the catastrophic loss of a warship like the battlecruiser HMS Hood in World War II or HMS Invincible in World War I usually left at least a handful of survivors. In earlier eras the combat loss of an entire ship's company in battle was nearly unheard of. During the age of sail a storm might sink a ship with no one left to tell the tale, but the buoyancy of wooden warships meant that even the blasted remnants of a ship would support some survivors even in the most vicious sea fight. When the French battleship L'Orient exploded at the Battle of the Nile in one of the most spectacular demises of a sailing warship ever, there were still around 100 survivors from the 1,000-man crew.

During the intense naval combat of the first half of the 20th Century there were a number of instances of major warships being lost with *all* hands, not even counting some instances where the survivors were only numbered in the single digits. The Russian battleship Imperator Aleksandr III was sunk at Tsushima with the loss of all 867 aboard. The German pre-dreadnought battleship Pommern went down with all 839 of its crew at Jutland. There were no survivors after the battle known for the Japanese battleships Fuso and Yamashiro from the Battle of Surigao Strait, but at least some men reportedly survived the actual sinking of the ships only to die later, so they probably should not be counted. All 648 aboard the French battleship Suffren died when it was torpedoed by a submarine. The cruiser HMAS Sydney was sunk by the German raider Komoran with the loss of all 645 aboard. At the Battle of Jutland the British armored cruisers Defence with 903 and Black Prince with 857 were lost with all hands as well.

Although much smaller battles than Jutland or Surigao Strait, the engagements at Coronel and the Falklands also saw multiple ships lost with all hands, with the armored cruisers Good Hope, Monmouth and Scharnhorst all sunk with no survivors. Losses were heavy on most of the other German ships as well, prompting Churchill to note that the 8 out of every 10 men engaged at Coronel would be dead before the end of the year, either lost directly at Coronel in the case of the British or in the wake of the Falklands in the case of Spee's crews.

Christopher Cradock

Rear Admiral Christopher Cradock neither survived the Battle of Coronel nor succeeded in leaving an explanation for his decisions to posterity despite having taken the precaution of leaving a letter with his friend Adm. Meux. We know from comments by Meux and others that Cradock didn't expect to survive his encounter with Spee but we're not left with a clear explanation for why he accepted a fight he knew he could not win because the letter has not survived. All we have to go on are references to not being a scapegoat like Troubridge and various official dispatches back and forth that point to Cradock's unhappiness and confusion.



Figure 19 Rear Adm. Christopher Cradock

While one cannot fault Cradock's physical courage, his moral courage is another matter. Given that he was directly responsible for a couple thousand lives and a substantial investment in fighting machines, his reluctance to force things with the Admiralty was a disservice to the British war effort. While gallant, his sacrifice at Coronel did not bring a commensurate gain and it's pretty clear it would have been better to have declined the fight that day. That he would rather die than have his reputation colored by charges of cowardice may be understandable, but one can't help but wonder about the 1,600 men and their families who paid the price.

Cradock was born in 1862 and like most Royal Navy officers, first donned the uniform when barely a teenager, in 1875. He had the typical Victorian-era naval career of serial postings at schools and aboard ships, combat service ashore during colonial affairs and a steady progression through the ranks. Along the way he commanded a naval brigade and the battleship HMS Swiftsure. When the Great War began he was the senior admiral in American waters as commander of the 4th Cruiser Squadron. His initial flagship was the cruiser HMS Suffolk, but through various reassignments and reallocations of force he ended up commanding an assortment of vessels and found his area of responsibility shifted into the southern hemisphere to deal with Spee.

Cradock never married and left no descendants. He does have a memorial at York Minster in England.

See For Yourself 3

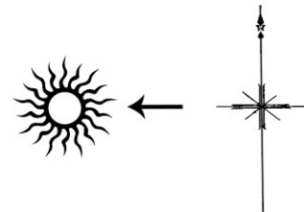
Cradock's Charge: Historical Coronel

Environment: 1900 Sea State 4. Visibility for Germans 75% (the British are silhouetted against the afterglow of sunset). British have Twilight visibility (50%). Twilight lasts until 1945 when visibility drops to 25% for all. Sun direction is 270 degrees.

Option: The *Nurnberg* arrives at maximum visibility range due north of the northernmost ship in play at 2100.

Setup: HMS Good Hope leads the British squadron heading 170 at 18 knots with 500 yards between ships, Otranto offset to starboard. Scharnhorst leads the German column heading 175 at 18 knots with 500 yards between ships. There are 12,300 yards between the formation flagships, bearing 110 degrees.

Victory Conditions: British -- sink or disable (over 50% damage) one German CR.
German -- avoid more than 25% on either German CR while sinking or disabling all British ships OR escaping beyond visibility range.

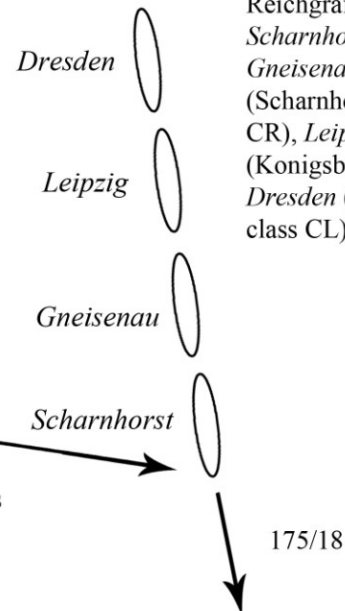


Variation: Add *HMS Canopus* to the British line and delete the *HMS Otranto* to see how having the battleship would have affected each side's options.

British Forces:
Rear Adm. Christopher Cradock in *HMS Good Hope* (Drake class CR) flagship, *HMS Monmouth* (Monmouth class CR), *HMS Glasgow* (Bristol class CL), *HMS Otranto* (AMC)



German Forces:
German East Asia Squadron, Vice Adm. Maximillian Reichgraf von Spee: *Scharnhorst*, flagship, *Gneisenau* (Scharnhorst class CR), *Leipzig* (Konigsberg CL), *Dresden* (Dresden class CL)



Graphic by Elizabeth Owen

CHAPTER 11

CHURCHILL'S CITADEL: CANOPUS FACES SPEE ALONE

"The Canopus, moreover, must be warned. She was coming up from the south to sure destruction." – A. Neville Hilditch, Coronel and the Falkland Islands.

Most accounts of Coronel imply that the escape of HMS Glasgow probably saved HMS Canopus from joining the Good Hope and Monmouth at the bottom of the sea.

While Canopus would have been hard-pressed to *win* a fight with Spee's squadron, it's also hard to see what would be in it for Spee to consent to the fight in the first place.

Spee had already indicated that he intended to avoid action with any 12-inch-gun armed ships he might meet – and this was before he expended half his ammunition dispatching Cradock's ships. Even a victorious fight with Canopus would almost certainly use up a substantial amount of his dwindling supply of 8.2-inch shells and leave him essentially disarmed should he encounter any more British ships. Even a Kent or Carnarvon would be dangerous to a Scharnhorst and Gneisenau with empty 8.2-inch magazines.

So we can assume that in any scenario where Spee spots the Canopus at such a distance that he can safely disengage, he will, regardless of his chances of overpowering the battleship. Ridding the Royal Navy of an obsolete old battleship would not be worth any risk. If, however, the battleship runs into Spee in darkness or poor visibility, there's a chance a lucky shot may pin Spee in place long enough for the Canopus to do significant damage.

So our scenario assumes Spee continued south during the night at about 16 knots and ran into the northbound Canopus, proceeding at 12-13 knots, about 7-8 hours after the end of the fighting with Cradock, or just about dawn on Nov. 2. Glasgow's attempts to warn Canopus are assumed to have failed to get through, either because of German jamming or simply due to the unreliability of wireless transmissions during that era. Visibility is assumed to be about 25 percent of the maximum due to darkness and morning haze.

Fear God & Dread Nought

Lookouts on the Canopus spot some indistinct shapes emerging from the haze to the NNE, two large ships. Within a few minutes they identify them as German armored cruisers – there can be no doubt it is Spee's squadron. For Spee's lookouts things are less distinct – a single large ship to the south. After the British ship's 12-inch guns open up, however, the Germans quickly return fire. They may not be certain who the enemy is – but it's clearly an enemy.

The poor visibility plays havoc for the accuracy of gunners on both sides, even as each side turns to port to unmask their broadsides. Finally, about 12 minutes into the fight the German ships begin landing 8.2-inch hits on Canopus and a few minutes later Spee identifies his opponent. Realizing that he can easily outrun the old British battleship, he continues his course and disappears into the gloom after scoring a few more parting hits. The Canopus turns to pursue, but it's quite hopeless, as the doughty British warship is even slower than Spee suspects and the entire action is over within 30 minutes.

The Canopus failed to land a single hit, while the four German large-caliber hits she suffered left her lightly damaged – about 13 percent. Canopus was saved more by her worthlessness than her spunk.

Other opinions

Fletcher Pratt modified

The low-hit percentage Pratt rules see a similar dynamic play out, as the two German ships are able to escape into the gloom 21 minutes after being first spotted. These rules don't make any allowance for poor visibility affecting fire, but the generally low chance of hitting using the solitaire rules had a similar effect as the FG&DN set. In this case both sides managed to land hits. The Germans again hit Canopus four times with 8.2-inch shells, doing 5 percent damage, but this time Canopus also scored, landing a couple of 12-inch shell hits that did 15 percent damage to Scharnhorst. This reduced her speed to 19 knots, which was still more than enough to guarantee an escape from the 13-knot battleship. Gneisenau, meanwhile, took a single 6-inch hit from the Canopus secondary, which left her fighting ability unaffected.

This encounter illustrates the high-risk, low-gain nature of the battle from Spee's standpoint. Even if he sinks the Canopus, it can hardly be worth it to him to risk significant damage or expenditure of ammunition.

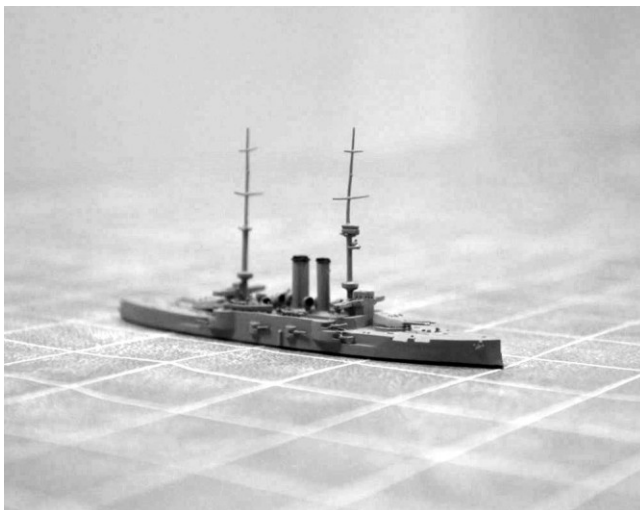


Figure 20 HMS Canopus, 1:1250 model by Navis. (Kiyomora Smith/Author's collection)

Victory at Sea 1971

These more-decisive rules bring the encounter to a resolution in just 12 minutes, so neither side is able to draw back out of visibility range before the close-range fight results in damaging hits on both sides.

By the end of the firefight Canopus is left dead in the water and helpless after multiple hits, more than 87 percent damaged, while the Gneisenau is 20 percent damaged. Both German ships are down another four turns of ammunition. Under the Victory at Sea rules this suggests that they may have as little as just 30 minutes' more firing left in them, a grim spot if they run into any more ships while thousands of miles from home.

Victory at Sea 2009

These rules are kindest to the Germans. A mere nine minutes of close combat are enough to cripple the Canopus while leaving the Gneisenau unscathed and the Scharnhorst just 8 percent damaged – although down one 5.9-inch gun. These rules don't credit the 12-inch guns with more hitting power than the 8.2-inch guns, therefore favoring the more numerous lighter guns.

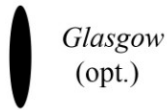
Assessment

Even under the best case scenario, Spee gains little from risking an encounter with the Canopus and his best move is to break off contact as quickly as visibility allows – and if he spots the battleship outside of gun range the British ship is helpless to force an action. While it's true that the odds would be against Canopus in a straight-up fight, all of Spee's incentives run strongly against engaging in one. While Cradock had enough speed that Spee was *forced* to deal with him, the Canopus is easily evaded.

Readers may examine the chances of Canopus in SFY No. 4.

See For Yourself 4

Churchill's Citadel: Canopus Alone



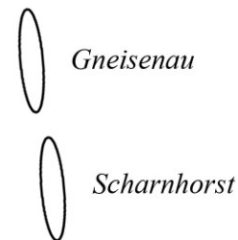
Glasgow
(opt.)

Environment: 0600 Sea State 4. Visibility 25% Rising to 75% at 0630. South America lies off the east edge of the map so no ship may exit the map area to the East.

German Forces: German East Asia Squadron, Vice Adm. Maximilian Reichgraf von Spee: Scharnhorst (flagship), Gneisenau (Scharnhorst class CR).

Variation: The HMS Glasgow might have succeeded in a rendezvous with Canopus. Starting at 0600, roll a D6 during each Detection Phase. On a DR of 6 place the Glasgow at the current maximum visibility range NW of most northwesterly German ship. If Glasgow does not arrive, roll again on the next tactical turn, with a +1 to the DR for every previous missed roll. The Glasgow automatically arrives at 0618 if it has not already arrived.

Victory Conditions: British -- sink or disable (over 50% damage) one German CR. German -- Avoid more than 25% on either German CR. Also sink or disable all British ships OR escape beyond visibility range.



Gneisenau

Scharnhorst

175/18

9,000 yards

0/13



Canopus



British Forces: Capt. Heathcote S. Grant in HMS Canopus (Canopus class OBB)

Graphic by Elizabeth Owen

CHAPTER 12

CHURCHILL'S FOLLY: IN DEFENCE OF CRADOCK

Among the many Admiralty errors that contributed to Cradock's catastrophe, one of the least defensible was the decision to delay fulfilling his request for the modern armored cruiser HMS Defence. Instead it was retained in the Mediterranean Sea for several weeks. That the ship could be spared from that theater there's no doubt about. It *was* spared, just a few weeks later, far too late to do Cradock any good, but soon enough to hint at the possibilities.

Adding Defence to Cradock's battle line would more than augment the strength of his squadron – it would transform it. By itself Defence was more powerful than the rest of Cradock's force put together and more than a fair match for either of Spee's capital ships. This was by design, as Defence and her two sisters were explicitly designed to counter the Scharnhorst-class German cruisers and were the epitome of the armored cruiser design concept. They were, in fact, the very last armored cruisers ever built and were actually completed *after* the first of the battle cruisers that made the Defence's type obsolete.

Still, while the battlecruiser overmatched the armored cruiser, Defence was still, on balance, a more powerful ship than either of Spee's twins alone, although not both combined. While Good Hope and Monmouth might not add a lot of offensive power to the British battle line, they would, at least, draw off some fire. While wargamers can experiment with the potentialities of concentrating fire against the most dangerous enemy ship, actual doctrinal practice at the time was to allocate fire among all the ships of the enemy battle line. This reduced the chances of ships confounding each other's shell splashes while making sure that the enemy gunners were not unmolested. It's much harder to concentrate on shooting well when someone is shooting back at you.

So there can be little doubt that Defence would have been dueling with Spee's flagship while Gneisenau dealt with the other two armored cruisers. It almost certainly would have been flagship versus flagship, too, as Cradock would probably have transferred his flag to the newer, more spacious and powerful ship as soon as it joined his squadron.

And Defence was an especially powerful ship. It had four 9.2-inch guns double-mounted in the fore and aft turrets, which gave it twice the firepower of the Good Hope in that heavy gun caliber. Additionally Defence had a broadside of five 7.5-inch guns, which were much closer in firepower to Spee's 8.2-inch weapons than the 6-inch guns that made up the secondary on Good Hope. Defence also had a much more effective and modern layout for those secondary weapons, with all guns mounted in turrets on the main deck instead of the ill-designed stacked casemates of Good Hope and Monmouth. This would have meant that all Defence's guns were still useful in the rough sea conditions of Coronel.

Finally, Defence was fast. Leading the British battle line in Defence, Cradock would have had the speed to control the battle. While he might have still used HMS Otranto to extend his scouting line, there would have been no need to stick that nearly worthless ship in the battle line. Once he discovered Spee's squadron, Cradock likely would have just sent the armed merchant cruiser off. Without Otranto, Cradock's squadron speed was faster than Spee's and the German admiral would have found it more difficult to avoid Cradock's move to close the range from up sun.

If Defence had been sent to Cradock when first requested, he would have been able to keep to his historical schedule, so our scenario assumes that the Battle of Coronel happens at the same time and place as the historical action and opens in the same manner. HMS Otranto has been sent off to await the outcome of the battle. It's probable that HMS Canopus would still be on the South Atlantic side of the continent, there being no reason to bring it along.

Spee's options are limited. He cannot hope to run away from the British squadron. He might try to delay the fight long enough to gather up the light cruisers, but we can assume that he would accept battle. Spee's cruise is over, but he can hope to take some British ships down with him. This is probably one of the "fairest" fights we will look at in this book.

Fear God & Dread Nought

Our scenario starts at 1803 hours, just before the moment when Cradock historically decides to make his move and close the range while the sun is setting in the eyes of the German gunners. His squadron is formed up with HMS Defence in the lead, followed by HMS Good Hope, HMS Monmouth and HMS Glasgow. Spee has also formed a line of battle with four ships, SMS Scharnhorst leading. Following are SMS Gneisenau, SMS Leipzig and SMS Dresden. SMS Nurnberg is just visible at 24,000 yards behind, steaming hard to catch up.

Cradock orders a change of course to port to close the range while attempting to keep the sun in the eyes of the German gunners to mask his approach. Spee observes the changed course and likewise steers to port to keep the range long and lengthen Cradock's approach. Cradock is constrained from making too direct a path towards the Germans because otherwise his T will be crossed and he will move out of line with the sun. This means that he can't quickly close the range on the German squadron, having an edge in speed of just 3 knots. By 1818 hours Cradock has clawed into range and fires some ranging shots from Defence at Leipzig. Leipzig returns fire to throw off the aim of the British gunners. By the time the sun sets at 1900 hours Cradock has not been able to get close enough to have a statistical chance of hitting under the FG&DN rules when firing at the light cruisers, although shortly before sunset he'd have maybe ten minutes of firing at the armored cruisers with some small chance of hitting.

Cradock's speed advantage isn't enough to make full use the favorable lighting conditions. However, the tables rapidly turn by the 1857 turn. Glasgow's dispatch from the actual battle could just as easily have come from our "what if": *By this time sun was setting immediately behind us from enemy position, and while it remained above horizon we had advantage in light, but range too great. 6.55 p.m., sun set, and visibility conditions altered, our ships are silhouetted against afterglow, and failing light made enemy difficult to see.*

Spee turns his squadron to employ full broadsides against the approaching British force, which is still trying to prevent his escape. Visibility for the British gunners falls to 40% in the gathering gloom while the Germans can still easily see their targets. Cradock's hit chances drop precipitously while Spee's jump. Spee's gunners are soon rewarded with some hits on the British ships, although the armor on the armored cruisers is enough to mitigate much of this early damage.

As the range continues to close hits start to occur on both sides. A 7.5-inch hit from the Defence starts a fire aboard the Scharnhorst, providing a convenient aim point despite the murky visibility.

By 7:15 the fire is out but by then Cradock has been able to pull into searchlight range and match course and speed with Spee's squadron. Now it's a slugging match.

Before long Scharnhorst has taken enough damage to slow the squadron speed to 17 knots, while Leipzig had to haul out of line due to severe damage from Glasgow's fire. Glasgow turns to follow the stricken German light cruiser, which takes more heavy blows.

At 7:27 Cradock has pulled enough ahead of Spee's course that he's no longer silhouetted against the setting sun and he starts turning to port to cut off Spee. Around this time the fore turret on the Scharnhorst is knocked out.

At 7:30 the wounded Scharnhorst hauls out of line to starboard while the Gneisenau and Dresden steer to port to avoid the flagship. This momentarily confuses the aim of the British ships. Defence continues firing on Scharnhorst but Good Hope switches to the nearer target, leaving the Gneisenau unmolested for the moment. Monmouth continues punishing Dresden, which begins to slow from the damage.

Glasgow's duel with the Leipzig is cut short at 7:30 as a 6-inch shell hits the torpedo magazine of the light cruiser and it explodes, sinking immediately. This occurs just as the Nurnberg gets close enough to send a few shots at the Glasgow, which is silhouetted by its burning victim. Glasgow also replies, but no hits happen as yet.

Three minutes later the two battle lines begin to sort themselves out as most ships switch to new, closer targets. Defence and Gneisenau start to trade hits while the Dresden gets clobbered by point-blank fire from Good Hope. Critical hits start multiple fires, cause major flooding, wipe out the bridge staff and destroy the engineering plant leaving the ship coasting to a stop while turning to port. Dresden manages to hit back, causing minor damage.

Monmouth and Scharnhorst now find themselves dueling as the stricken German flagship staggers away from the fight while Monmouth takes up the rear of the British line. No hits are scored, but it doesn't matter as the German flagship's flooding damage overwhelms it and it suddenly capsizes.

Glasgow begins to turn around to chase the Nurnberg while the German light cruiser starts to make smoke and head west to escape into the night. A few parting shots disappear into the murk but nothing close to a hit is possible.

Gneisenau finds itself alone against the British fleet. Scharnhorst and Leipzig have both sunk. Dresden is drifting to a stop as the crew abandons ship while Nurnberg makes its escape. (Coincidentally this bears a remarkable resemblance to the final stages of the historical battle of the Falklands. See chapters 14 and 15).

Gneisenau turns toward the British line in a death ride and launches a torpedo from 1,000 yards away at Good Hope. Defence's surprised gunners miss, but Gneisenau is hit several times by Good Hope and Monmouth.

Cradock turns away slightly as Gneisenau continues to turn in and heads for the Good Hope to ram. Good Hope manages to dodge Gneisenau by mere yards. The torpedo launched at Defence also misses.

The violent turn throws off everyone's gunners and no hits are scored at 1939 hours,

As Cradock begins a turn to starboard to keep the Gneisenau under fire, the German ship turns to port to set up another ramming run. Everyone's gunnery is still off after the close encounter, except for Monmouth, which manages to get a hit.

As the two lines settle back down into parallel courses the British ships find the range again and Gneisenau starts to undergo her final pummeling. Despite the close range her gunners are unable to reply effectively and damage slows the German ship to 12 knots.

A few more hits and the guns of the Gneisenau fall silent, the engines fail and the order to abandon ship is given while the seacocks are opened. Cradock ceases fire.

Cradock has his victory, although he definitely knows he has been in a fight. All three British armored cruisers have been damaged, with the fighting capability of Defence being degraded. The damage under FG&DN amounts to 36 percent for Defence, 12 percent for Good Hope and 3 percent for Monmouth.

The battle's outcome is a good illustration of the insights from the equations of Frederick W. Lanchester that, ironically, were first published in 1914. These demonstrated that under 'modern' conditions of aimed fire, as summarized by Capt. Wayne P. Hughes Jr., in *Fleet Tactics*, "When both sides can aim their fire, there is an expanding, cumulative advantage to the larger force."

Hughes points out that Lanchester's calculations suggest another factor that seems relevant to this alternative Coronel scenario. "He showed that for aimed fire, number of firing units are more valuable than fighting quality. A commander is better off with twice as many units of force than with units with twice the rate of effective firepower."

Lanchester's equations don't provide hard and fast rules. They hold for very specific and controlled conditions where, *all else being equal*, certain things are true. It's the entire point of tactics to make things unequal, of course. Still, our hypothetical Cradock's apparent superiority on paper was not overwhelming. Leaving aside the light cruisers, which we should, his three armored cruisers did not represent, on average, notably superior firepower over Spee's pair. The British trio had broadsides of eleven heavy guns and another eleven medium guns against the German pair's twelve heavy guns and six medium weapons. Given the fact that the German gunners were more skilled and generally had more favorable lighting conditions the gap is even smaller.

Redressing the balance partially, the British 6-inch guns had a useful anti-armor capability lacking in the German 5.9-inch secondary battery, which only had high explosive shells that were appropriate for the anti-torpedo boat work they were designed for, but were inadequate for fighting armored ships.

The outcome of this hypothetical Coronel suggests that Cradock's tactical instincts were correct, but without HMS Defence he didn't have the proper means to carry it out. Cradock's aim was to close to point-blank range with the German line where the difference in gunnery skill and lighting conditions would matter less. With HMS Defence leading his line he would have had a ship robust enough to "take it" from the Germans during the approach phase and powerful enough to "dish it out" once he arrived "alongside the enemy." Cradock's plan followed the Nelson tradition, but without the necessary tools.

As for the light cruisers, once again we see how tactically negligible they are in a serious fight. About all that can be said for the German light cruisers was that they managed to draw some fire away from Spee's capital ships in the early stages of the battle. "Able to draw fire" is not something that one wants to put into a job description, however. The inadequacy of the 4.1-inch gun armed German light cruisers is on full display in this fight, with both of the engaged German light ships destroyed while HMS Glasgow escaped unscathed. Nurnberg's flight was an appropriate response to its tactical prospects.

Readers who “see for themselves” how the battles unfold can explore if there’s any useful role for the light cruisers. It might be interesting to see if a layout similar to the Glasgow -- replacing the fire and aft pair of 4.1-inch guns with single 5.9-inch guns -- might have made for a more useful combatant. Starting with the Pillau class in 1914, new German light cruisers started carrying the heavier gun.

See For Yourself 5 looks at Cradock’s chances with HMS Defence added to his order of battle.

Admiral Solo

The most authentic playing experience is had when each player controls a single ship, but often wargamers find themselves in the opposite situation, when a single player controls all the ships – on both sides.

Solitaire play of wargames is common. James Dunnigan goes so far as to say that Strategy & Tactics magazine surveys show that most board wargames are played solitaire, rather than with opponents. “Every time we asked whether people play the games with opponents or solitaire, we consistently found that more than 50 percent of the games played are played solitaire,” Dunnigan noted. The proportion is probably lower in the more social environment of naval miniatures wargaming, but it still occurs.

It can be especially hard to recruit a guinea pig to play out one of the more one-sided battles. Most battles are not fair to one side. Indeed, the entire point of good generalship (or admiralship) is to generate battles that are unfair to the enemy. A “fair” fight implies somebody screwed up.

So if you can’t find someone to be Capt. Mueller’s Emden to face Sydney you can still explore the what-ifs of the battle by yourself. The trick is to try to play the role of the disinterested observer as much as possible and not favor one side over the other.

The easiest way to accomplish this is to draw up a battle plan for each side and then see if it can be achieved. An even more illuminating exercise is to draw up several viable courses of action for each side ahead of time and then randomly select between them.

For example, one can refight the Battle of the Cocos depicted in See For Yourself 1 even if you don’t have an opponent.

SMS Emden’s courses of action might be A) Flee north to Keeling Island and try to use the island as a screen. B) Charge Sydney while steering evasively to launch a torpedo attack, or C) Steer evasively and then engage in a gunnery duel when within short range.

HMAS Sydney’s COA might be A) Stay at long range. B) Close to short range, or C) Allow Emden to choose the range and concentrate on maximum gunnery.

The solo admiral can assign different weights to the strategies so that the more likely ones have a greater chance of happening, but it's good to allow some chance for events to unfold in unexpected directions.

Another way to introduce some authenticity to the affair is to have some chance for ships to disobey orders or have errors in command. The chance should be kept low, under 10%, in order to avoid an unrealistic degree of chaos. All the officers involved were well-trained professionals and were not in the habit of running off half-cocked. But poor visibility, misread signals and the general confusion of battle often resulted in mistakes.

One thing to be careful about is watching the workload on the player. FG&DN is sufficiently detailed that running a single ship is pretty demanding for a player. Running several can be overwhelming and trying to do the whole Battle of the Falklands by yourself with its 14 ships is a very big project, probably better done using the NavTac rules instead. Don't bite off so much that it becomes a chore instead of fun.

See For Yourself 5

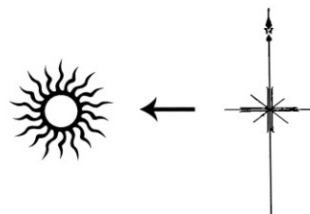
Churchill's Folly: In Defence of Cradock

Environment: 1900 Sea State 4.
Visibility for Germans 75% (the British are silhouetted against the afterglow of sunset). British have Twilight visibility (50%). Twilight lasts until 1945 when visibility drops to 25% for all. Sun direction is 270 degrees.

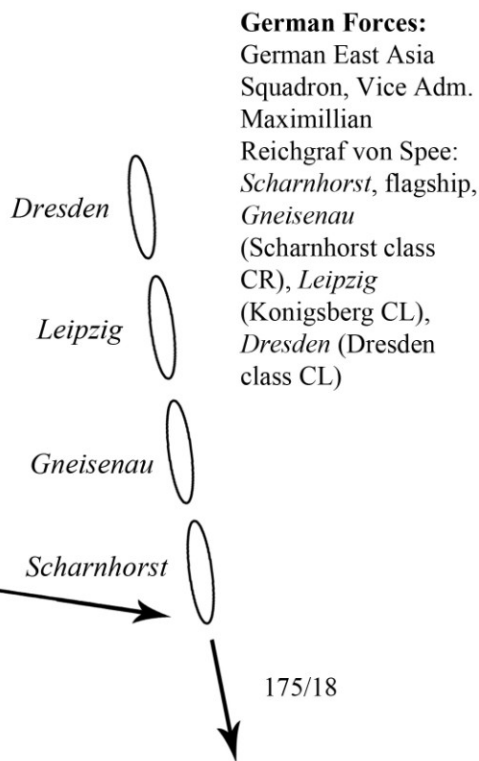
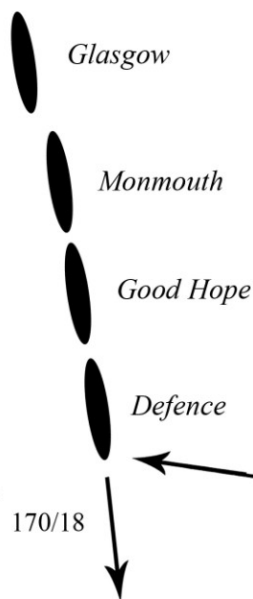
Option: The *Nurnberg* arrives at maximum visibility range due north of the northernmost ship in play at 2100.

Setup: HMS Defence leads the British squaddron heading 170 at 18 knots with 500 yards between ships, Glasgow offset to starboard. Scharnhorst leads the German column heading 175 at 18 knots with 500 yards between ships. There are 12,300 yards between the fromation flagships, bearing 110 degrees.

Victory Conditions: British -- sink or disable (over 50% damage) one German CR.
German -- avoid more than 25% on either German CR while sinking or disabling all British ships OR escaping beyond visibility range.



British Forces:
Rear Adm. Christopher Cradock in *HMS Defence* (Defence class CR) flagship, *HMS Good Hope* (Drake class CR), *HMS Monmouth* (Monmouth class CR) *HMS Glasgow* (Bristol class CL)



Graphic by Elizabeth Owen

CHAPTER 13

LOST WEEKS: TARDY STURDEE, LETHARGIC SPEE

After his smashing victory at Coronel, Spee did something for the next month that has perplexed historians ever since – nothing.

What strategic benefit the German squadron might have derived from eliminating Cradock's force was squandered as Spee puttered around the Chilean coast for the balance of November. After the battle he visited Valparaiso long enough to be feted by the extensive German community there, but half of the next four weeks was spent at the Mas Afuera Islands. Occasionally a light cruiser was sent to Valparaiso to send and receive cables to Germany, but Spee seemed to be in no hurry to leave, finally starting to meander toward the Straits of Magellan, passing around Cape Horn on Dec. 1 -- a full month after Coronel.

Spee didn't survive and never really explained his reasoning. Coal seemed to be a concern, but there was no battle damage to repair and Spee's most critical shortage, ammunition, was not going to be remedied by waiting around off the Chilean coast. Spee's armored cruisers had fired off about half of his main battery ammunition in the process of wiping out Cradock's force. Win or lose, Spee's squadron had just one more fight left in it.

It's hard to justify Spee's lackadaisical approach. While a skillful tactician and aggressive in battle, Spee seemed to lack strategic vision. Most historians seem to chalk up Spee's passivity to a certain fatalistic acceptance of his fate while facing overwhelming odds, but does this excuse him? An admiral holds the lives of thousands in his hands and the responsibility for a significant portion of his nation's treasure in the form of expensive warships. He has a responsibility to try to rise above his emotions and make the best of the situation he is dealt.

In Spee's case, his decisions feel like a self-fulfilling prophecy. Slim as his chances of reaching Germany were, surely they were not improved by delay. As it was, Spee came within just hours of beating the British to the Falklands. A speedier entry to the South Atlantic may very well have avoided Sturdee's battlecruisers altogether. The ocean is vast, and the British ability to find him in 1914 was limited if Spee made an effort not to be found.

This is not a recent criticism. The French publication *Journal de la Marine* noted in 1920 that "in spite of everything, it may be stated with certainty that Von Spee did not make the most of the advantages offered by time and opportunity. He did not remember the remark of Nelson that 'time is everything in war and five minutes makes the difference between victory and defeat.' "

Also questionable is Spee's insistence on keeping all three light cruisers with him instead of releasing one or two of them to raid shipping. As we have seen in every scenario so far, and shall see again, they added very little combat capability to his squadron. Aside from keeping one for local scouting and dispatch duties, Spee could have sent off Emden's sister Dresden and one of the other light cruisers to operate independently. This would have reduced the demand on his own squadron's coal supplies and provided a chance to dissipate British naval strength. It may also have complicated British attempts to ferret out Spee's intentions. Sightings of light cruisers heading towards Panama or back toward Australia might have confused the British about Spee's plans. As it was, the British detached the battlecruiser HMS Princess Royal to watch the Panama Canal and kept HMAS Australia in the Pacific in case Spee doubled back. Additional sightings of German light cruisers may have prompted additional British reaction.

If Spee was a dawdler, the British reaction to the news at Coronel was swift, decisive and, ultimately, effective.

Fisher had been named First Sea Lord on Oct. 31 and even before he heard the awful news about Coronel he had started to undo some of Churchill's meddling. For example, he sent a cable to Cradock explicitly telling him to wait for HMS Defence before fighting Spee. Sadly, Cradock was already quite dead. Once word of the Coronel catastrophe arrived, Fisher took the bold step of sending battlecruisers to deal with Spee.

Indeed, the alacrity with which Fisher acted belied his age and imbued the deployment with an atmosphere of extreme urgency. When the dockyards claimed it would take until Nov. 13th for the battlecruisers to be ready for sea, Fisher took advantage of Churchill's artful prose to send this splendid example of an action-spurring memo:

"Invincible and Inflexible are needed for War Service and are to sail Wednesday, November 11. Dockyard arrangements must be made to conform. You are held responsible for the speedy dispatch of these ships in a thoroughly efficient condition. If necessary dockyard men should be sent away in the ships, to return as opportunity offers."

The ships sailed on time – and Invincible *did* have dockyard men aboard.

In contrast to the urgency with which the ships were dispatched, the commander of the squadron, Vice Adm. Sir Frederick Doveton Sturdee, struck a more relaxed, perhaps even dilatory, pace. While coal consumption forced a fuel-conserving 10-knot speed on the squadron, Sturdee showed a surprising lack of urgency when he arrived at Abrolhos Rocks to rendezvous with Rear Adm. A.P. Stoddart's armored cruisers. Amazingly, despite the 26-day trip and various security leaks, word that the battlecruisers had been sent never reached Spee. Still, when Sturdee announced that the squadron would sail on the Falklands on Nov. 29th, Capt. Luce of Glasgow felt compelled to lobby Sturdee for an earlier departure.

According to Luce, the exchange went like this: "I hope you don't mind me coming over, sir. And please don't imagine I am questioning your orders, but thinking it over, I do feel we should sail as soon as possible."

Sturdee replied "But, dammit, Luce. We're sailing the day after tomorrow. Isn't that good enough for you?"

Apparently it was not, for Luce persisted and Sturdee finally said "Very well, Luce. We'll sail tomorrow."

And thus by the narrowest of margins was Spee's fate affected. Had Sturdee sailed when he originally planned then he would have arrived at least a day later – after Spee had already attempted to raid Port Stanley.

This doesn't mean that Port Stanley would have been devastated. It was already as good as saved when Canopus was left as a guard ship. As soon as Canopus opened fire, Spee probably would have pulled away. There was nothing at Port Stanley worth risking his ships for and in the face of serious opposition – and especially 12-inch guns – there's no reason to think Spee would have persisted in the attack. He only attacked Port Stanley in the first place because he had erroneous intelligence that there were *no* British warships present, let alone a battleship. Remember that Spee only had the ammunition for one more fight, no matter what. Spending it on Canopus or Port Stanley was out of the question.

But Spee probably would have continued on towards Germany in such a case. He had already been ordered by the German high command to return, preserving the benefit of his victory at Coronel. And Sturdee, arriving a few hours later, would have missed him. And worse, Sturdee would have been behind Spee and in need of coaling. Undoubtedly there would have been a search and a chase. It is possible good fortune would have brought Sturdee in contact with Spee's squadron anyway, but the Germans would have had many chances to escape.

Of course, Spee might have avoided even this small chance if he had skipped raiding the Falklands at all, which most of his captains opposed. It wasn't much of a prize. The German penchant for using raiders to attack relatively minor shore facilities deserves criticism. The single biggest advantage a raider had was the difficulty of finding a single ship in the expanse of the sea under 1914 conditions. Every time they raided a fixed point they simplified British searches and exposed themselves to ill fortune. It's telling that both Emden and Spee's squadron came to grief while conducting such a raid.

Spee delegated the planning of the operation to Capt. Maerker, commander of Gneisenau, who decided the actual raid was going to be carried out by the light cruiser Nurnberg and Gneisenau. While these two ships took care of the wireless station and burned coal supplies using landing parties the rest of the squadron would wait over the horizon.

While a workable plan, it didn't make maximum use of the heretofore underused light cruisers and unnecessarily exposed the armored cruisers as well. One might have thought that two of the light cruisers would have been more than adequate for the task while leaving the other ships to act as distant cover, on watch in case other British warships appeared.

CHAPTER 14

CRADOCK AVENGED: HISTORICAL FALKLANDS

In accordance with Maerker's plan, Gneisenau and Nurnberg approached Port Stanley shortly before 9 a.m. on Dec. 8, 1914.

The eruption of huge splashes at 9:20 a.m. caused by large caliber shells hitting the water a few hundred yards away from Maerker's ship were definitely unwelcome and not part of the plan. The shooting was unnervingly accurate, with one shell reportedly landing close enough to ricochet through the funnel of Gneisenau.

Maerker hauled away immediately.

The approach of the German fleet to Port Stanley had been closely watched for some time, ever since a civilian coast watcher on Sapper Hill first spotted them at 7:30 a.m. By 7:45 a.m. word had reached HMS Canopus and the battleship hoisted the signal "enemy in sight." While an intervening hill hid that message from Sturdee on HMS Invincible, HMS Glasgow could read the signals and hoisted the same message. When Sturdee's flagship failed to react, the ever-energetic Capt. Luce of Glasgow ordered a saluting gun fired to get its attention.

Sturdee was shaving when a staff officer brought word of the sighting. Sturdee was a man noted for his equanimity and he calmly ordered the men to have breakfast and steam to be raised while he finished getting dressed.

Sturdee may have exuded an aura of calm, but the reality was that the British squadron had been surprised and was in a potentially dangerous spot. Coal-fired steam warships cannot simply leap into action and the time-consuming process of raising steam meant that most of Sturdee's squadron was immobile. In fact, at least one ship, HMS Bristol, had dismantled its engines for repair. Only the armed merchant cruiser HMS Macedonia, on guard outside the harbor, and HMS Kent – a sister ship of the ill-fated HMS Monmouth – which was ready to relieve Macedonia, had steam up and were ready to fight.

This is one of the great "what-ifs" of the campaign that we will look at in greater detail later. Could Spee have taken advantage of Sturdee's discomfiture to score another stunning victory as he went out in a blaze of glory?

Perhaps, if Spee had realized his opportunity, he would have taken it, but here an error by a subordinate intervened. Spotters on Gneisenau saw the tripod masts of the battlecruisers in the harbor, although the low hills prevented them from seeing the ships themselves. Gneisenau's gunnery officer suspected that the masts belonged to battlecruisers and reported as much to Maerker. At the bridge level, Maerker couldn't see for himself, but he discounted the gunnery officer's report. He simply couldn't believe that battlecruisers could have been sent without word getting out. No, he decided that the tripod masts must belong to some pre-dreadnought battleships, which were known to be in the South Atlantic and that is what he reported to Spee.

Spee made the obvious and correct decision based on that information and ordered his fleet to steam away. Even with steam up, pre-dreadnought battleships stood no chance of catching up to him and they certainly weren't worth a fight.

This decision, eminently defensible based on the knowledge he had, was also directly responsible for the disaster that unfolded. Sturdee was able to fire up his boilers, issue detailed instructions to the ships of his squadron, feed the men breakfast and leave Stanley Harbor in an orderly fashion. At 9:45 a.m. Glasgow was out, and by 10:30 a.m. the last of the British squadron was passing Cape Pembroke lighthouse.

Spee still had a significant head start, but the weather was unusually clear for the latitude and before long the grim truth dawned on the German observers as it became clear that they were being pursued by battlecruisers, after all.

Even a few knots of speed advantage can be decisive in a naval battle and Spee's options were limited. While on paper the battlecruisers were not much faster than the German ships, the Germans had been at sea for a considerable time without the kind of maintenance required to keep an early 20th-century steam plant at peak efficiency. Undoubtedly there had been a build-up of marine growth on the hulls as well, and there was the question of the Scharnhorst's permanent reduction in top speed after a 1909 grounding incident. In theory the German ships could make 22 to 24 knots, but the evidence suggests that they were doing closer to 20 knots this day. Meanwhile most of the British ships, and especially the battlecruisers, seem to have been operating at close to maximum ability and may have even exceeded their design speed of 25 knots at times. They had done so during trials when new.

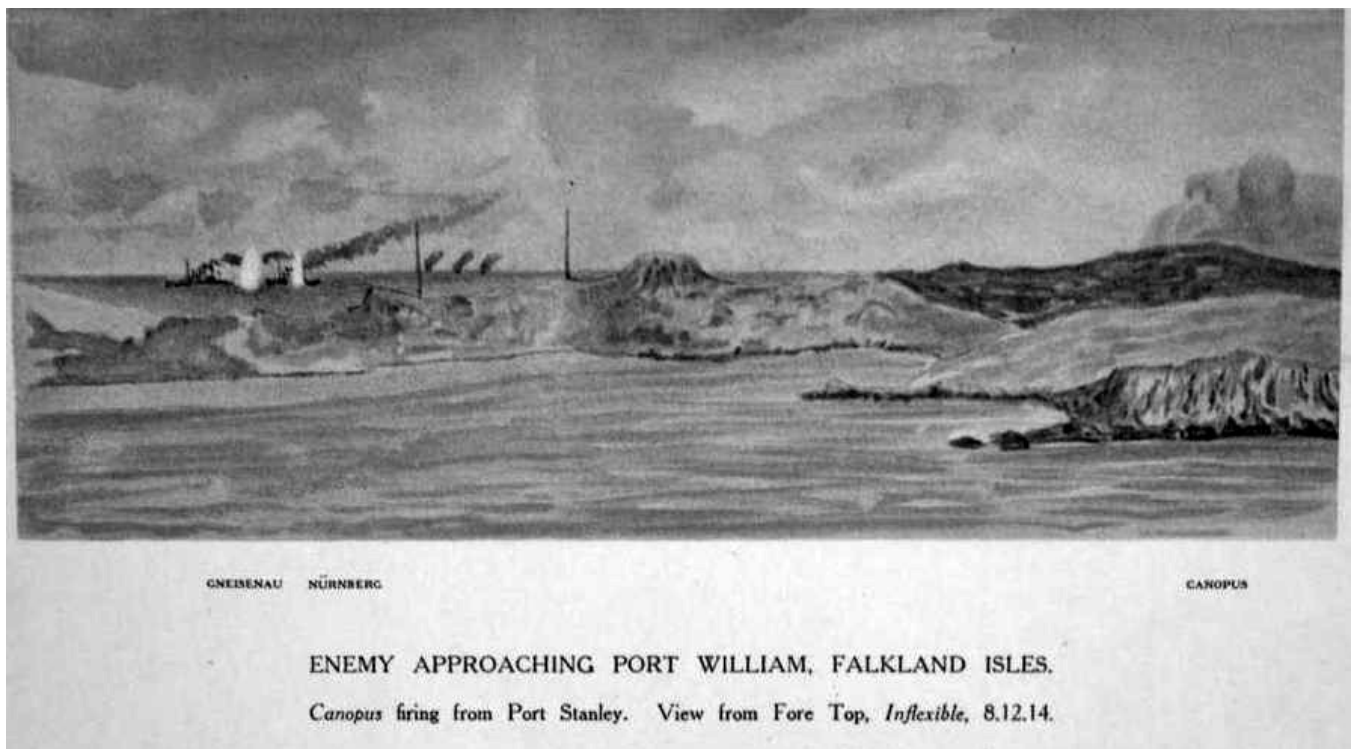


Figure 21 Rudolf Verner's painting of the opening shots at the approaching German ships. (Verner, 1920)

So even after spotting the Germans a two-hour head start, Sturdee's battlecruisers were soon seen to be obviously closing the range. At 11:32 a.m. Sturdee signaled the squadron that the men should take lunch. For a time he reduced speed as well, in an attempt to let the slower armored cruisers such as HMS Carnarvon and HMS Kent keep up, but shortly after noon he decided to let the battlecruisers take full advantage of their speed to force the action. The other ships would catch up as best they could.

At 12:55 p.m., with the range 16,500 yards, HMS Inflexible opened fire on the rearmost of the fleeing German ships, the light cruiser Leipzig. A few minutes later HMS Invincible followed. At first the shots fell short, but within a quarter hour Leipzig was straddled and Spee knew the jig was up.

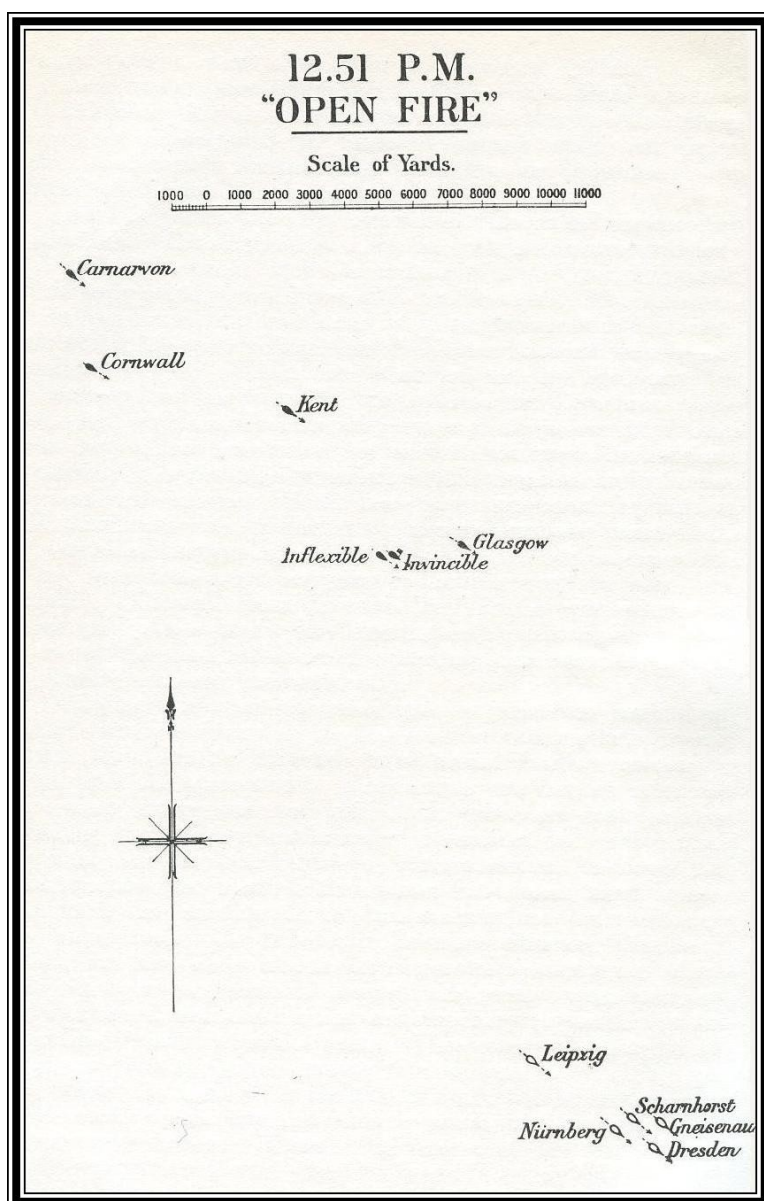


Figure 22 Opening shots. (Corbett, 1920)

At 1:20 p.m. Spee ordered the light cruisers to try to escape and he turned the heavier ships to face their pursuers. We'll take up the story of the light cruisers in the next chapter, but here we'll note that Sturdee had anticipated this move before the battle and had already told his cruiser captains in written instructions to chase the light cruisers, so HMS Kent, HMS Cornwall and HMS Glasgow turned away to pursue the three German light cruisers. HMS Carnarvon, unable to steam at any speed better than 18 knots, and therefore worthless for pursuing light cruisers, ploughed on after the battlecruisers.

Meanwhile, coast watchers had spotted the three German auxiliaries around 11 a.m. The guard ship HMS Macedonia and HMS Bristol, which had finally reassembled its engines, were dispatched to deal with them. They rounded up two of the German auxiliaries. One escaped to be interned later in Argentina.

For now it was a two versus two duel, the battlecruisers HMS Invincible and HMS Inflexible against the two German armored cruisers. While the battlecruisers had a clear edge in size and power, the disparity was not necessarily insurmountable.

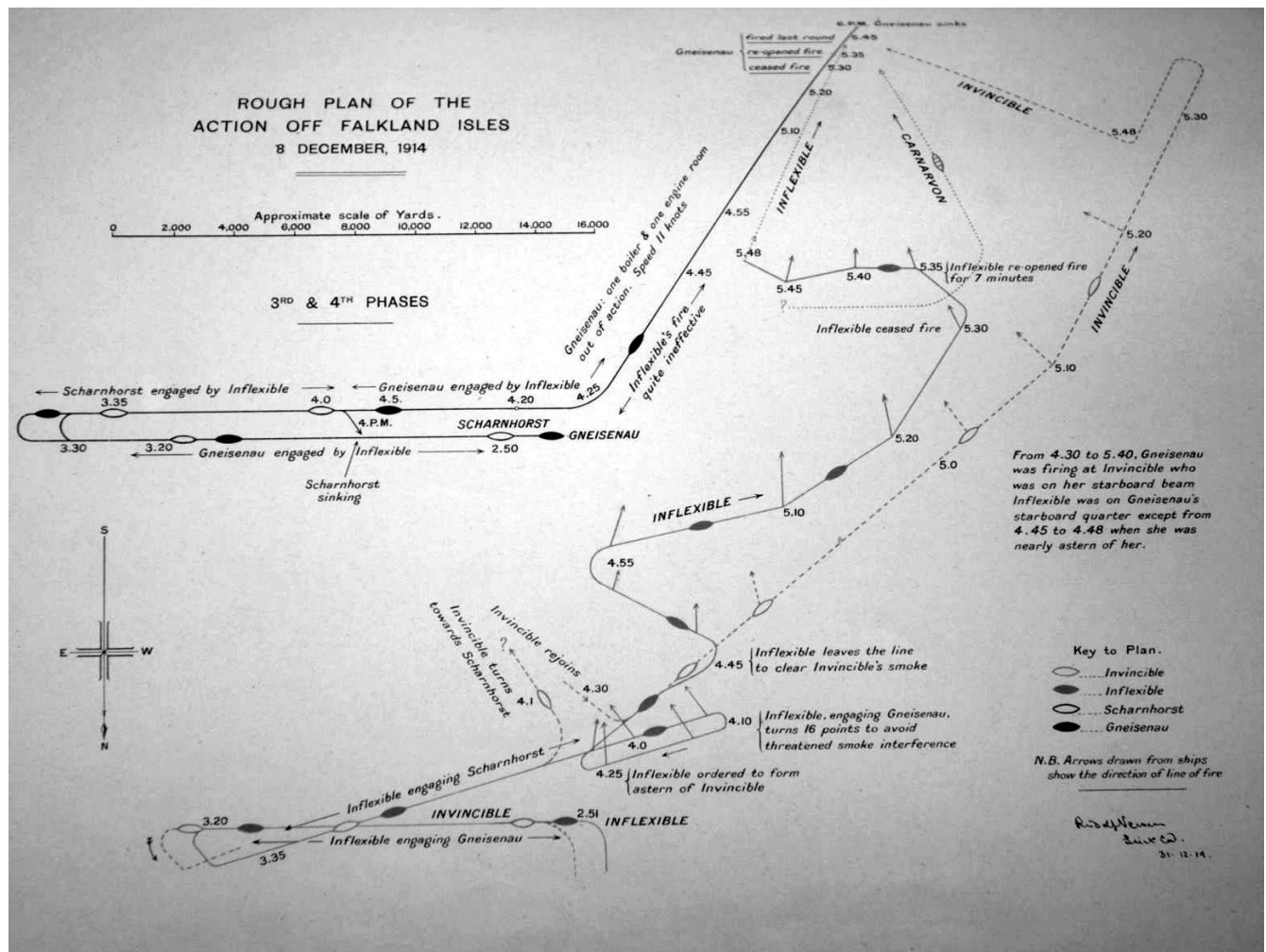


Figure 23 Verner's sketch of the main action from his perspective. (Verner, 1920)

For example, although the battlecruisers carried much heavier guns than the armored cruisers, those guns did not have an advantage in effective range over the German main battery. They did have an advantage in hitting power and armored penetration, however, but this advantage would not come into play unless they could score some hits.

As we have already seen, the German gun crews had proven their proficiency in both gunnery drills and in action at Coronel. They could expect to land some hits and here's where Fisher's tradeoff of speed for protection revealed some vulnerability. While battleship-sized, the battlecruisers were just marginally more heavily armored than an armored cruiser. The armor at all points was not necessarily heavy enough to keep out the 8.2-inch shell.

In contrast, the effectiveness of long-range British gunnery was very much in question, not helped by the fact the wind was blowing the thick funnel smoke downwind towards the Germans. The battlecruisers would come to earn a poor-shooting reputation and later actions at Dogger Bank and Jutland would come in for considerable criticism for poor gunnery.

If Spee's ships could land some damaging early hits then they *might* stand a chance. Similarly, Sturdee could not afford to get careless or complacent. While it was extremely unlikely Spee could sink Sturdee's ships, disabling them so he could escape would be a catastrophic defeat for the Royal Navy. Fisher didn't send *two* valuable battlecruisers so that Sturdee could defeat Spee. He sent two battlecruisers so that Sturdee would *annihilate* Spee.

And so Sturdee treated his skillful opponent with the respect he deserved and the duel between the two pairs of combatants resembled a carefully choreographed, if deadly, ballet.



Figure 24 *Verner's depiction of the last moments of Scharnhorst. (Verner, 1920)*

During the initial portion of the fight, gunnery from the British side was hampered by the funnel smoke, while the two German cruisers demonstrated their customary excellence. After about 30 minutes Sturdee lengthened the range to reassess. The British had fired 210 rounds of 12-inch ammunition while only scoring three or four hits. At this rate he might empty his magazine before sinking Spee's ships. Still, any hit from a 12-inch shell is a serious affair for an armored cruiser while the hits from the 8.2-inch guns were not doing the same kind of damage in return.

Spee made an attempt around 2 p.m. to take advantage of the smoke to break off to the south, but Sturdee soon spotted the move and resumed the pursuit. By 2:45 p.m. the battlecruisers were close enough to make a turn to expose full broadsides at 15,000 yards and Spee gave up his attempt to flee and turned to face his tormenters again.

This time the four ships went at it intensely, trading blows as the range closed to 10,000 yards where the German ships' 5.9-inch secondary batteries could start to play a role.

This was a dangerous range for the battlecruisers as they were hit repeatedly by both 8.2-inch and 5.9-inch shells. While the hits were numerous, British luck held and none of them hit any vital unarmored space or were defeated by the armor.

The same was not true for the two German ships in return. They had no hope of keeping out the 12-inch shells at any range and now that the range had closed the British gunners were able to start landing hits. As the large caliber shells blasted the German armored cruisers their combat efficiency began to wane. A 5.9-inch gun on the Scharnhorst was blown into the sea and an engine room in the Gneisenau was flooded.

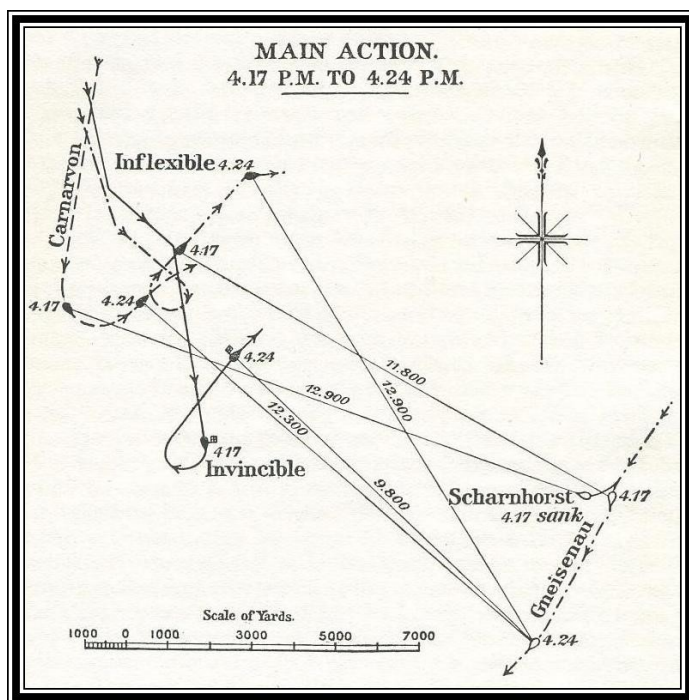


Figure 25 Main action (Corbett, 1920)

When fire resumed the situation was starting to look grim for Spee's two ships. While both were still firing, the truth was that each had been badly hit and about quarter past 4 p.m. Spee signaled Gneisenau to "Endeavor to escape if your engines are still intact." As a late-arriving Carnarvon finally arrived on scene to drop a few shells into the carcass, the Scharnhorst capsized and sank, going down at 4:17 p.m. There were no survivors.

Gneisenau lasted for nearly 90 more minutes under the concentrated fire of *both* British battlecruisers, which is a testament to the inherent toughness that German capital ships showed throughout the war and foreshadowed the stubbornness that would save several badly damaged German ships at Jutland in two years' time.

Sturdee was finally able to outmaneuver Spee at around 3:30 p.m. and steer a course that brought his ships clear of the funnel smoke and gave them an unobstructed view of their opponents. Spee countered with a turn himself to unmask the undamaged starboard batteries on his ships, as several guns on the port side had been knocked out. Around this time Gneisenau's speed was reduced to around 16 knots, which would occur in the Fear God & Dread Nought rules when the ship reached 25% damage.

An odd interlude then occurred at this point when the full-rigged sailing ship Fairport suddenly appeared on the scene, serenely sailing between the two forces and causing a temporary cessation of fire.

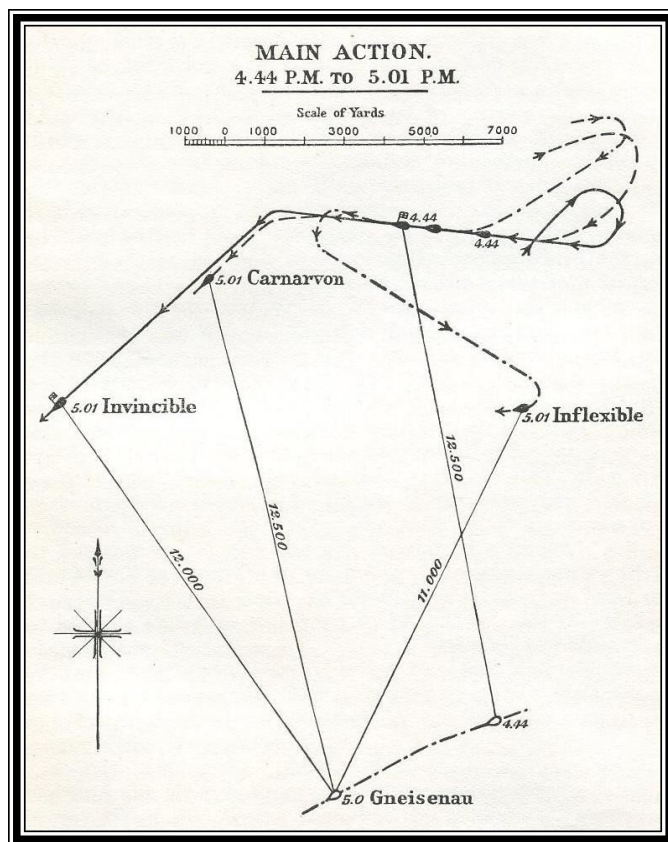


Figure 26 Finale (Corbett, 1920)

Still, this phase of the battle was very one-sided despite some occasional hits from the embattled German gunners. At 5:15 p.m Sturdee finally ordered a “Cease Fire,” but a solitary return shot from the Gneisenau prompted the British to resume, not ceasing fire again until 5:50 p.m.

By this point the German cruiser was completely wrecked topside, but it still needed a positive scuttling order from Maerker to ensure the ship went down. Several hundred survivors from the ship’s crew of 800 made it into the water alive and the warships closed in for rescue, as depicted on the cover of this book. Cold water-induced hypothermia and battle wounds meant that not all could be saved and the final number saved was 188 from the Gneisenau. The senior surviving officer was Commander Hans Pochhammer, the second-in-command. Maerker went down with his ship.

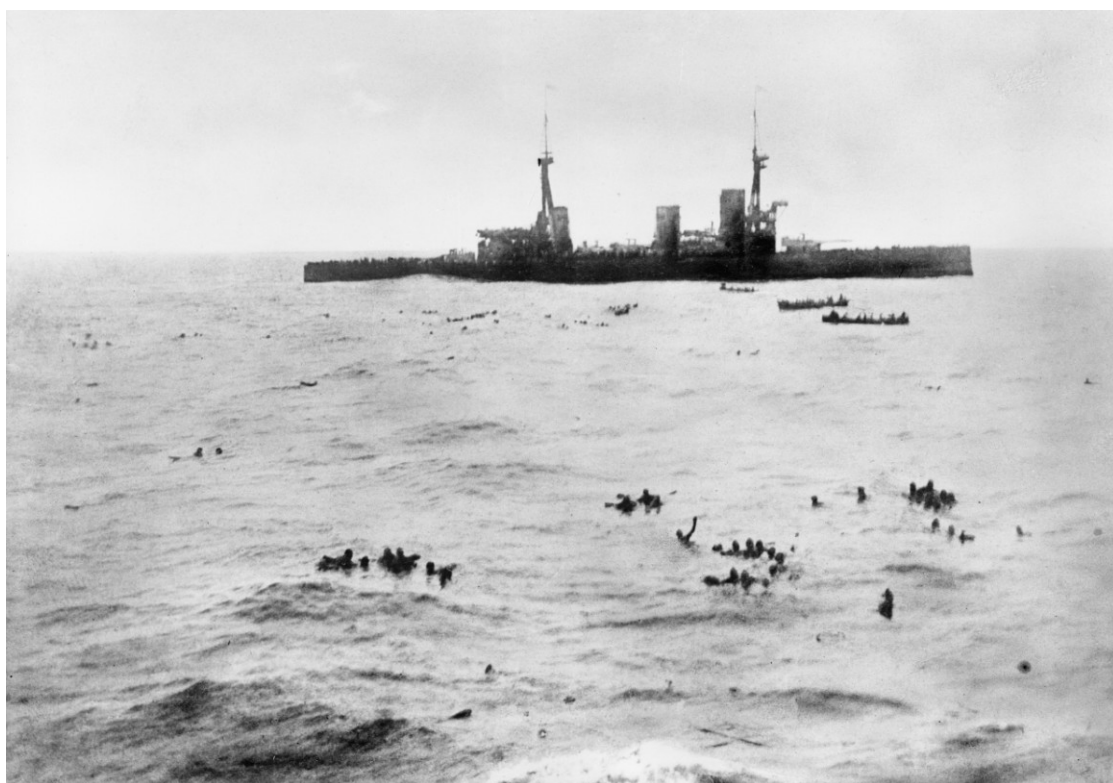


Figure 27 Fatal consequences. The British battlecruisers stand by to rescue the survivors of Gneisenau. (Imperial War Museum)

Spee family tragedy

Several thousand families had reason to grieve in the aftermath of the battles of Coronel and the Falklands, but fate handed Margarete von Spee a triple helping of sorrow.

Not only did she lose her husband, Maximilian, who was commander of the squadron, but both of her sons, who were serving naval officers aboard other ships.

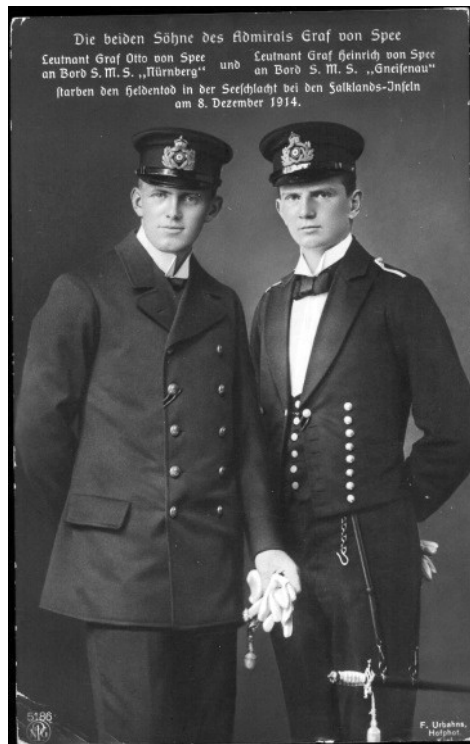


Figure 28 Otto and Heinrich von Spee are shown in a wartime German postcard commemorating the tragedy.

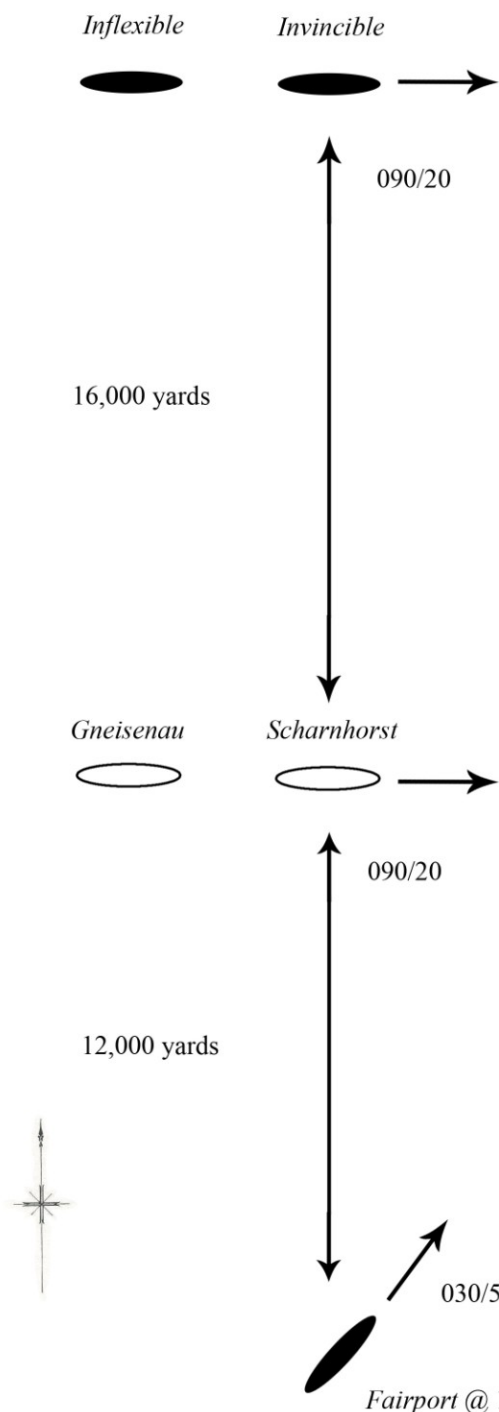
Spee was able to arrange to have both of his sons assigned to his command. Otto, the elder, was aboard the light cruiser Nürnberg, while Heinrich, the younger, was on the Gneisenau. Tragedies such as the loss of the five Sullivan Brothers and other appalling family decimations that dot history have tended to make military authorities reluctant to assign members of families together, although this prudence is often resented and resisted.

Still, the Spees did not seem exceptionally vulnerable to a mass tragedy. While all three men were serving in the same squadron, they were aboard three different ships and it would require awful luck to lose all three vessels at once and to lose them with heavy loss of life – and yet that is precisely what happened.

Spee the father was among the all hands lost when the Scharnhorst went down. Only 170 survived the sinking of the Gneisenau – Heinrich von Spee not among them. The loss of life on the light cruiser Nürnberg was likewise very heavy, with only 12 being pulled from the sea – and again none were named Spee.

See For Yourself 6

Cradock Avenged: Duel Between Admirals



Environment: 1400 Sea State 1. Visibility 100%. Wind from North.

British Forces: Vice Adm. Doveton Sturdee in *HMS Invincible* (Invincible class BC) *HMS Inflexible* (Invincible class BC)

German Forces: German East Asia Squadron, Vice Adm. Maximilian Reichgraf von Spee: *Scharnhorst* (flagship), *Gneisenau* (Scharnhorst class CR)

Variation: The HMS *Carnarvon* arrives at 1500 20,000 yards due West of westernmost ship in play.

Pro-Spee Variant: HMS *Invincible*'s propeller had been fouled by a cable while towing a gunnery target. Historically it was cleared before the battle, but it's possible there could have been residual damage that reduced its speed. Reduce HMS *Invincible*'s top speed to 18 knots and have it arrive with HMS *Carnarvon*.

Victory Conditions: British - sink both German CR. German - sink or disable (50% damage) one British ship OR have at least one CR escape beyond visibility range.

Setup: HMS *Invincible* heading 090 at 20 knots, followed by HMS *Inflexible* 500 yards behind. *Scharnhorst* heading 090 at 20 knots, followed by *Gneisenau* 500 yards behind. Flagships are 16,000 yards apart with Germans due South of British.

Special Event: At 1430 the German player places the sailing ship *Fairport* no closer than 12,000 yards from any ship at the south edge of the playing area. It sails at 5 knots on course 030 until it exits visibility range. It blocks the line of fire of any ship firing within 10 degrees of the ship.

Graphic by Elizabeth Owen

CHAPTER 15

LUCE'S REVENGE: FOXES AND HOUNDS

Once he saw HMS Invincible's shells landing at Leipzig's range, Spee recognized complete escape was no longer an option and he ordered the three light cruisers to make a run for it while he turned the two armored cruisers to cover their flight.

SMS Dresden was the newest and fastest of the three and had the biggest head start. It was able to make its escape to the southwest, with Luce on HMS Glasgow, the senior officer among the chasing group, judging there was little chance of successfully catching up. The Dresden's eventual fate will be detailed later, but it did manage to escape this day.

Glasgow instead concentrated on SMS Leipzig, attempting to slow it down enough that the armored cruiser HMS Cornwall, a sister ship to Coronel's Monmouth, could catch up. Leipzig essentially headed due south in its escape attempt.

Meanwhile, HMS Kent, another Monmouth sister, took off after Nurnberg, which was headed in a generally southeasterly direction.

There were two other British ships available, the armed merchant cruiser Macedonia and the light cruiser Bristol, which had finally managed to reassemble its engine and leave harbor. Neither was able to join in the cruiser chase, but each was saved from irrelevance by the sighting of Spee's auxiliaries approaching Port Stanley. It's unclear why Spee didn't send a wireless message warning them off as he fled, but they were spotted and the two British ships had something to do after all. They eventually caught two of the ships as they scattered, but one managed to escape.

As for Leipzig, this unfortunate ship had the least chance of all. The oldest and slowest of Spee's light cruisers, it was truly hopelessly outgunned. HMS Glasgow alone was more than a match for the German ship. While both ships had similar suites of light guns, ten 4-inch or 4.1-inch weapons, the British cruiser also had a pair of six-inch guns. It was also significantly larger, implying greater damage resistance. In FG&DN terms the British ship had 133 damage points while the German ship had just 97.

HMS Cornwall added another 14 6-inch guns and 235 damage points to the equation, although too slow to catch the Leipzig in a straight race. While both Leipzig and Cornwall were rated at 23 knots on paper, it appears neither was up to making that kind of speed anymore, but the Leipzig's had deteriorated somewhat less.

So Luce's objective was to nip at the Leipzig enough to force it to slow down and deal with him while not getting so close that he risked too much damage in return. Glasgow's armor was quite thin, so even the 4.1-inch guns on the Leipzig had some chance of getting through if he got too close. Luce was able to get close enough that the threat of his 6-inch guns forced Leipzig to turn and fight. The two ships dueled for a while, as Luce endeavored to keep Leipzig occupied while not risking dangerous damage in return.

Eventually Cornwall was able to come up and the two British ships were able to overwhelm Leipzig, but it was a very long chase and Leipzig was actually the last of the German ships to be sunk on Dec. 8, not going under until 2035. Leipzig again demonstrated the amazing sturdiness of German warship design by refusing to sink on its own despite being devastated from stem to stern by British shells and set ablaze. While the surviving crew assembled on deck, the German captain ordered the sea-cocks opened and emptied the torpedo tubes. Sadly he failed to order the colors struck and it appeared to the British that the torpedo firing was sign of renewed resistance and so they opened fire again, killing about 100 of the crewmen massed on deck.

Finally the Germans fired a green flare, which Luce recognized as a sign of surrender and seven officers and 11 crewmen were saved from the Leipzig shortly after it went down.

Glasgow had emptied its 6-inch magazine during the long chase but there was little damage to the two British ships. Leipzig scored a couple hits on Glasgow and 18 on Cornwall, killing one man on the light cruiser and wounding four while causing no casualties at all on the armored cruiser. Neither British ship's fighting effectiveness was affected.

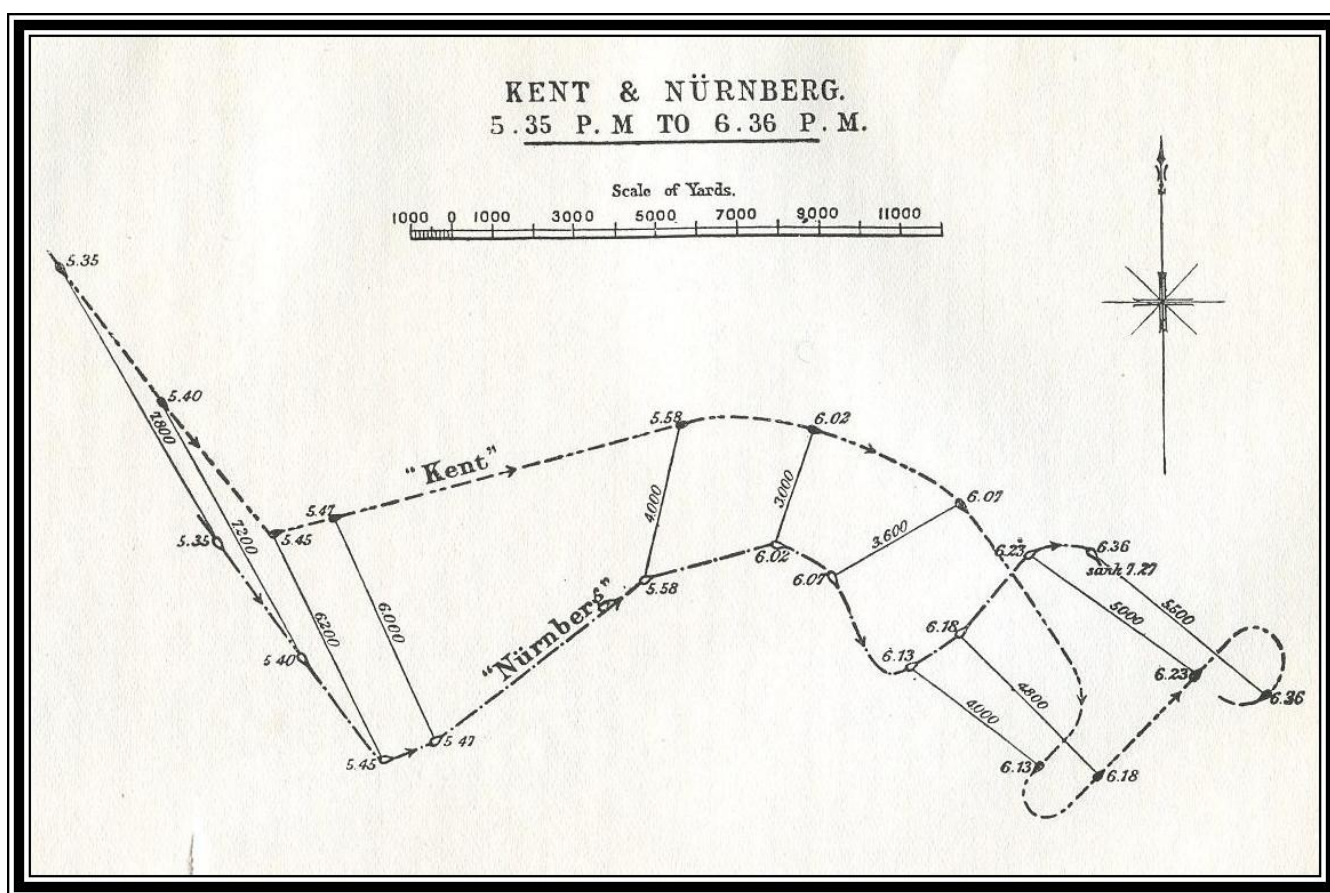


Figure 29 Kent duels with Nurnberg. (Corbett, 1920)

If the Dresden and Leipzig affairs were one-sided, albeit favoring different sides, the chase of SMS Nurnberg by HMS Kent was high drama and a near-run thing.

On paper Nurnberg should have been able to make its escape, much as Dresden did. The Form 10s in Appendix 2 Annex C credit both ships with speeds of 23 knots, which should have meant that the British armored cruiser would never make up the 10-mile head start of the German light cruiser.

Here is a cautionary tale about paper capabilities and real-world eventualities. Nurnberg had been on the Asia station since 1910. Early 20th Century nautical power plants don't seem to have retained peak performance for very long. It's also possible that the ship had accumulated marine growth on its hull. Whatever the cause, it appears that Nurnberg on Dec. 8 was at least a knot or two off its best speed.

In contrast HMS Kent, although even older – 1903 compared to 1907 – seems to have achieved a miraculous turn of speed out of her old, although recently repaired, power plant. The ship was also running light, having not had a chance to restock its coal bunkers since it arrived at the Falklands. And the captain, chief engineer and crew, by all accounts, exerted strenuous efforts to coax every last knot of speed out of the old ship – going so far as to send the officer's wardroom furniture into the furnace. The result was that Kent made up to 24 knots, therefore gaining a 2-3 knot speed advantage over its quarry.

While this might not seem like much, it meant that Kent was closing the distance at a rate of 2-3 miles per hour. By 5 p.m. Kent had closed the gap to about 11,000 yards and the two ships began firing at each other. This long-range fire by just a pair of guns on either side went on for about half an hour with no apparent effect. Under the FG&DN rules the base chance for each ship is 10% for long range. By the third salvo they would have a +1 for ranging, but this would be more than counterbalanced by -2 for local control, -1 for firer's speed over 15 knots, -2 for target speed of 20 knots and -1 or -2 for a narrow target aspect. In fact, neither ship had a statistical chance for a hit under FG&DN rules. It seemed likely that darkness would fall before Kent could close the range enough to have a shot.

And here another real-world eventuality intervened, as Nurnberg suffered two burst boilers, knocking its speed down to just 19 knots. This is the kind of event that is difficult to account for in a wargame -- or in naval planning, for that matter. But it has to be kept in mind whenever analyzing a historical battle. Some allowance must be made for chance events.

Now operating at a speed deficit of 5 knots, Nurnberg had no choice but to turn and fight, although there was little hope of prevailing. Kent quickly closed in, knowing that its armor would be able to keep out Nurnberg's 4.1-inch shells while the British cruiser's 6-inchers would easily punch through the light cruiser's sides. Under the FG&DN rules the British ship would be inflicting 15-18 points of damage per hit, depending on the shell selected, while the best the non-penetrating shells from Nurnberg could expect to do is 3-4 points.

Here again, the amazing toughness of the German warship was evident, as despite being pummeled for more than an hour, the Nurnberg was still afloat when it hauled down its colors at 6:57 p.m. Visibility was falling and the sea was rising as the survivors among the German crew tried to escape drowning but there were no usable boats left. At 7:27 p.m. the light cruiser turned on its side and sank, throwing the few survivors into the frigid water. Only a dozen were plucked from the water alive by Kent and five of those soon died. Over 300 were dead.

Kent was not unscathed. While the armor protected the ship from the 37 hits achieved by the plucky Nurnberg, one unlucky shot did burst at a gun position, killing four and wounding 12 men. This shot also set some powder on fire, and some accounts suggest that there was some danger of an uncontrolled fire and even a magazine explosion! This seems unlikely, but it is another example of the role of fate in battle. Another shot took out the Kent's wireless transmitter, which created some anxious hours for Sturdee as the cruiser failed to answer radio calls. The Kent was also very short on coal, as one may recall, and therefore had to creep slowly back to Stanley at an economical speed. It wasn't until the afternoon of Dec. 9 that Kent made it back and Sturdee could rest easy.

Looking at the fate of the light cruisers in Spee's squadron, it's hard to see what good they did, really. Sure, it was useful to have one for scouting and dispatch duties, but it's clear that they added nothing in any kind of serious fight. The 4.1-inch gun was wholly inadequate for anti-cruiser work. Later German light cruiser designs started mounting the Germans' excellent 5.9-inch weapon, and it's interesting to consider how the battles might have turned out had the German cruisers carried, say eight 5.9-inch guns like the Pillau class. Certainly the Emden might have stood a chance against the Sydney in that case and Leipzig and Nurnberg a chance of deterring close pursuit as well.

A more realistic question to raise, however, given that upgraded armament was beyond Spee's control, was whether he made the best use of the light cruisers that he had. On Dec. 8 it would have been a more prudent tactic to scout out Stanley harbor with one of the light cruisers first. If the harbor was empty, there was plenty of time to bring up the rest of the squadron. If there was serious opposition, then only one expendable ship would have been risked.

Similarly, Spee delayed too long letting the light cruisers go. It wasn't necessary to wait until the cruisers came within 12-inch gun range to make the decision to cut them loose. Once the battlecruisers were identified, the likely outcome was clear to all present. Splitting off the light cruisers sequentially might have tempted the British to make an error. For example, it's likely that some ship would have pursued Dresden if it had split off first, although there's an excellent chance it would still have gotten away. Luce was tempted as it was. If he had gone after Dresden in Glasgow then that would have materially aided the chances for Leipzig and Nurnberg later.

Another alternative would have been to use the light cruisers as a screen and even a torpedo attack threat. As we have seen, hitting a small, evasively steering target at long range was a tall order for 1914 gunners. Over 10,000 yards the battlecruisers would have found it challenging to land a hit on a light cruiser that was doing its best to be a difficult target. Some fancy footwork by the light cruisers might have given Spee the break he needed to escape into the darkness. As it was, Sturdee needed just about every bit of daylight to sink Spee's fleet. What might another hour or two of delay have won? Readers are invited to experiment and see for themselves.

Luce the Ubiquitous

John Luce and HMS Glasgow were the Alpha and Omega of the Spee saga. Luce and his doughty light cruiser seemed to have had an uncanny nose for always being where the action was. Glasgow saw the first of Spee's squadron at Coronel on Nov. 1, 1914, and saw off the last of it at Mas a Tierra on March 14, 1915.

In between those dates, Luce played a critical role, as we saw, at prodding Sturdee to head for Port Stanley with alacrity.

Interestingly, while Luce's command was just a light cruiser, he was actually a fairly senior officer who had already commanded a battleship, HMS Hibernia, before the war. As such he was often the senior officer afloat in various circumstances such as during the pursuit of Spee's three light cruisers at the Battle of the Falklands in December and later again during the search for the Dresden when he was in tactical command of the HMS Kent as well as his own HMS Glasgow. This might strike some wargamers as unusual, as they would expect the larger ship to have the more senior officer.

Unlike the various old British armored cruisers and their ad hoc, reservist crews, HMS Glasgow was an experienced regular navy crew manning a new ship. HMS Glasgow was commissioned in September, 1910 and was therefore less than four years old when the war broke out. Luce had taken command in 1912, and had been in command for nearly two years, more than enough time to make it his ship. He was the second captain in the ship's career.

Luce continued as captain of the Glasgow until 1917 when he was reassigned to head up the Royal Navy's aviation training establishment. After the war he held a variety of posts, including commanding the battleship HMS Ramillies for a time, retiring as a rear admiral. He died in 1932. Meanwhile, Glasgow served the rest of the war mostly in the Mediterranean and was sold for scrap in 1927.

Coincidentally, Glasgow's namesake, a Type 42 Destroyer, would fight in the 1982 Falklands War, and was damaged by a bomb dropped by an Argentinean A-4 Skyhawk.

CHAPTER 16

CHURCHILL'S NIGHTMARE: SPEE ATTACKS

Word of the battle arrived at the Admiralty at 5 p.m., London time: “‘Admiral Spee arrived at daylight this morning with all his ships and is now in action with Admiral Sturdee’s fleet which was coaling.’ These last three words sent shivers up my spine,” said Churchill. “‘Had we been taken by surprise and, in spite of our superiority, mauled, unready, at anchor?’”

Had Sturdee’s apparent complacency given Spee a chance, after all? Many historians of the campaign think so. Halpern suggests, “Spee neglected the opportunity to inflict serious damage while the British were still unprepared.”

McNally goes further and claims that “A bold stroke by the German admiral would have subjected the confines of the harbor to a storm of fire from both his primary and secondary armament which would certainly have wreaked havoc among the British vessels as they raised steam and tried to make their way to sea.”

Even Massie thinks Spee “might boldly approach Port Stanley Harbor with his entire squadron and unleash a storm of 8.2-inch shells into the crowd of ships at anchor.”

As for Brose, he states, “Graf Spee, with a probability bordering on certainty, would have maximized his chances in disadvantageous circumstances and attacked with his entire squadron. He had risked it in Samoa, why not now?” Brose goes on to say that “Sturdee was truly ‘Copenhagened.’ With no chance to utilize his superior speed, and with little room to maneuver in the crowded roadstead, the likely fate of the British flotilla would have justified the chill that went up Churchill’s spine about two hours later.”

Fear God & Dread Nought

So let’s revisit the scene at 9:20 a.m. using Fear God & Dread Nought. Capt. Maerker has been told by his gunnery officer that there appear to be two battlecruisers in the harbor. While initially inclined to dismiss the report, moments later two huge splashes off the port side a thousand yards away announce the presence of large-caliber guns.

Maerker knows that his ship can neither outrun nor outfight a battlecruiser, but perhaps fate has provided a sliver of a chance. Nelson might be a British naval hero, but German sailors also admired the Nelson touch. Hadn’t bold attacks at Copenhagen and the Nile against anchored foes made Nelson a hero?

Maerker orders full steam ahead and signals Nurnberg to follow, while sending a signal to Spee that he was attacking!

Canopus’s cannon roared again, but its shells still failed to strike home as Gneisenau started to lengthen the range to starboard. Maerker could see a Monmouth-class armored cruiser and an armed liner emerging from behind Cape Pembroke. Obviously these would have to be dealt with before he could penetrate the harbor.

HMS Kent and HMS Macedonia poured on steam and sallied forth to buy time for their colleagues in the harbor, who would still need close to an hour to raise steam and get underway. Kent was already within range as it pulled around Cape Pembroke and began exchanging fire with Gneisenau, which returned with both its main and secondary batteries. The old 4.7-inch guns of Macedonia and the newer 4.1-inch guns on the Nurnberg were both out of effective range as of yet.

So initially the action was a straight duel between armored cruisers, although for a short while the Canopus was able to lob a few shells at the German armored cruiser as it pulled away. The old battleship actually drew first blood, as a 12-inch shell slammed into Gneisenau at maximum range, causing damage but leaving the ship's fighting ability unimpaired.

For the next half hour the two armored cruisers blast away at each other. Maerker risks closing to the range because he needs to quickly overwhelm Kent and get to the business of wreaking havoc in the harbor. Kent, for its part, is not so obliging as its sister ship at Coronel as to allow itself to be quickly silenced. Visibility is excellent and the sea is smooth, so the British ship can use its entire battery of casemate guns and her reserve gunners don't have the distractions of heaving seas to throw off their aim. Gneisenau's superior gunnery and weight of metal mean it still gets the better of the exchange, but Kent is able to land some damaging blows as well, while nudging Gneisenau eastward and away from the harbor.

The duel between Macedonia and Nurnberg is much more one-sided. Macedonia's unpracticed gunners find the nimble German cruiser a very difficult target, while the large liner imitates the broad side of a barn in return. The 4.1-inch shells devastate the unarmored civilian ship. Within 20 minutes the Macedonia is on fire in multiple places, flooding from holes fore and aft and her guns all silenced – and unable to land a single hit on the German ship.

Macedonia's sacrifice was not in vain, however, as it has bought time for Luce and his ubiquitous HMS Glasgow to pick its way through the harbor shipping and emerge into the roadstead just as Nurnberg turns in to try to make a potential torpedo run.

Now the tables are turned, and it's the German cruiser that is overmatched. Despite evasive maneuvers and blazing away at Glasgow, the larger British ship and its heavier firepower quickly gain an edge over the lighter ship. Shortly it has taken enough damage to lose too much speed for effective salvo chasing and the fatal spiral of damage reduces the German gunnery so that it causes only slight damage to Glasgow. The Nurnberg's suffering ends in spectacular fashion as a 12-inch shell from HMS Invincible blows it apart. Time has run out.

The battlecruisers are underway and with that goes Spee's chances of wreaking havoc. Kent, crippled, turns away, but Gneisenau has been battered as well and is too far away to interfere with the British squadron's sortie. Spee and his other three ships are also only now coming into range of the harbor and Glasgow is already starting to pop away at them.

Glumly, Spee orders Gneisenau to attempt to save itself by fleeing east while he turns south with the other ships. Maybe there is still a chance for bad weather – if he has time. HMS Macedonia is a blazing wreck that will soon sink, and HMS Kent is crippled, but they have bought time for HMS Invincible and HMS Inflexible to sortie, supported by HMS Glasgow and HMS Carnarvon. The likely outcome from this point will resemble the historical course, albeit with less of a head start for the German ships. In this alternative history Spee has already done more damage than the historical admiral, but it's hardly of any consequence as neither Macedonia nor Kent will be particularly missed by the admiralty.

Sturdee's equanimity in the face of his being surprised is often noted, but it may be that the stolid British admiral's poise was due to a very rational assessment of the odds. Sturdee always maintained that his biggest concern had been tracking Spee down in the vast ocean and that the Germans did him a favor by being so obliging as to show up where he was.

Some have questioned whether Sturdee was caught napping, but it seems that the experienced British had taken more than sufficient precautions to guard against disaster. First among those precautions was the emplacement of Canopus as a shore battery. Capt. Heathcote had made good use of his time to prepare Canopus. By cutting down the masts, and placing his spotters ashore on the high ground he made Canopus virtually invisible while putting it in position to cover the harbor entrance completely.

Sturdee's posting of Kent and Macedonia was further insurance that Spee would find it impossible to simply steam into the harbor and blast away. Deficient as they were as warships, Kent and Macedonia still could not be ignored.

And steaming into a harbor on a clear fine morning in broad daylight was hardly likely to recreate Copenhagen or Aboukir Bay. Perhaps if weather conditions had been more typical of the South Atlantic and Spee had been able to get closer to the harbor before being spotted things might have been different. But in the actual event, Spee's ships were spotted more than an hour's steaming away and most of the British fleet was in very little danger of being caught at anchor.

Here we can see that Maerker's plan was actually not very good.

A more prudent course of action would have been to send one or two of the light cruisers ahead to take a peek into the harbor first. As we have seen, Spee had a long-standing habit of underutilizing the light cruisers he had gathered. While of marginal use in a fight, they were perfectly suitable as scouts. In fact, it was their primary design role. Why Maerker scouted with one of his armored cruisers is inexplicable.

If the German light cruisers had spotted the British squadron, then they could have warned Spee off before he even came into range. Sturdee would have had little idea where Spee had gone and wouldn't have been in a position to chase after him. It was one thing to skip coaling and go after Spee when he was in plain sight, but it would have been quite another to abandon the coaling and engage in a long and uncertain chase over the horizon.

An alternative would have been for Spee to swoop down with his whole squadron at once and try to really 'Copenhagen' Sturdee. To have a chance of this Spee would have needed to show up in the roadstead unspotted and in full force. He might have accomplished this by timing his arrival just before dawn. Brose is right, that Spee had shown at Samoa that he would consider that kind of bold action, but Brose misses key differences in the context that prompted it. Spee had intelligence that the Australian squadron had been at Samoa and consequently could make plans accordingly. In contrast, Spee's intelligence suggested the Falklands were unoccupied and that what British naval forces were in the area were hundreds of miles away at the River Plate. And, of course, he had no clue at all that the British battlecruisers had been dispatched. He didn't even know Canopus had been there for weeks.

If Spee had had any idea that Canopus or Stoddart's cruisers, let alone Sturdee, were present, there's no question he would have avoided the Falklands altogether as not being worth the risk. The same preconditions required to give him a chance to replay Copenhagen would have guaranteed that the battle would not have even been attempted.

Instead Maerker's plan was an unhappy compromise. It exposed too much of Spee's squadron to be considered expendable but too little to have any realistic chance of overwhelming the British security arrangements before the battlecruisers became fully functional.

NavTac

Examining the battle using the NacTac rules comes out much the same. These rules tend to reflect more decisive gunnery results than the FG&DN set.

At 0920 the Gneisenau closes in on the harbor while Canopus fires another salvo, which misses. Meanwhile Gneisenau's forward 8.2-inch turret lands damaging blows on the Kent, which is still out of range with its 6-inch guns. The other British ships are still masked by the headlands. While the gunnery officer on Inflexible's foretop can see the German ships the rangefinders and gun layers in the turrets cannot and so they cannot open an effective fire as of yet.

At 0925 the Germans continue to close, with Spee increasing speed to support Gneisenau. Gneisenau continues to pound Kent, doing significant damage. Kent's return fire starts to score some return hits while Canopus misses. The other ships are still out of range or masked by the headlands.

By 930 Canopus finds the range and lands a 12-inch salvo on Gneisenau, knocking her speed down and taking out one 5.9-inch and one 8.2-inch gun. Kent misses but Macedonia's small guns also find the range and inflict some damage as well. Gneisenau's shots at Kent continue to do heavy damage, wiping out the last of her starboard guns. Nurnberg starts to get hits on Macedonia as well.

At 0935 the Germans continue to close while Kent maneuvers to unmask its port guns. Canopus lands another damaging salvo on Gneisenau, including a critical hit that takes out the fore turret and staggers the armored cruiser. Gneisenau has some measure of revenge, however, as it lands multiple hits on Kent, devastating the ship, leaving it dead in the water with all guns knocked out. Nurnberg for its part continues to get hits on Macedonia as well, knocking out one 4.7-inch gun.

At 0945, the stricken Gneisenau begins to turn away, covered by Nurnberg. Canopus switches targets to the light cruiser, without initial success, but the gunners on Macedonia start landing hits on the light cruiser, knocking out one gun, while it returns the favor. In the harbor HMS Glasgow is the first British ship to start making its way towards the harbor exit, although it also has the farthest to go. Canopus ceases fire as the German ships have moved out of range. The duel between Macedonia and Nurnberg starts to go badly against the armed merchant cruiser, as its ill-trained gunners have trouble hitting the light cruiser. But it's a crushing salvo from the surviving 8.2-inch turret on the Gneisenau that knocks out the remaining guns on the starboard side plus the ship's fire control.

At 0950 Spee's opportunity is clearly beginning to slip away as most of the British ships start to get underway. Gneisenau and Nurnberg are able to finish off Macedonia, but the guard ships have done their duty and thwarted any chance to embarrass Sturdee in harbor. Spee turns away and begins to head southeast in a desperate effort to save at least some of his ships.

The good weather and proximity of shore probably would have mitigated the loss of life on the British side aboard the two ships, so there would have been no Coronel-style disaster.

Assessment

A writer can conjure almost any scenario and make it appear plausible with well-crafted prose. Questions of time and space, correlations of forces and environmental conditions can be passed over or minimized at will.

But when subjected to the rigors of a wargame model with reasonable fidelity to historical fact, all those considerations have to be squarely faced and it becomes clear that Spee's supposed opportunity was illusory and Sturdee's equanimity well justified. There was very little chance of Churchill's nightmare coming to pass, barring a very heavy intervention by Fate.

See for yourself.

Vice Adm. Frederick Charles Doveton Sturdee

Vice Adm. Frederick Charles Doveton Sturdee became a baronet and a national hero because his new boss hated him with a white-hot passion. Sturdee got the plum job of leading the battlecruiser task force sent to destroy Spee because First Lord of the Admiralty Winston Churchill knew that Sturdee could not possibly continue to serve as Chief of Staff under the new First Sea Lord, Adm. Jacky Fisher.

Sturdee and Fisher had long been enemies, dating back to Fisher's first turn as First Sea Lord when they were in opposite factions of a major inter-service feud between Fisher and a certain Admiral Lord Charles Beresford. Today Fisher is widely hailed as a visionary genius whose reforms were largely responsible for forging the Royal Navy that won the Great War. Meanwhile, it's probable that not even one person in most large cities has ever even heard of Beresford. But at the time their respective merits were, perhaps, less clear and Sturdee had thrown his lot with Beresford. Fisher, who considered Sturdee a "pedantic ass," said he had to go.

Churchill may not have always been a brilliant strategist, but he was always a clever political operator and so he "promoted" Sturdee out of the chief of staff job and into operational command.

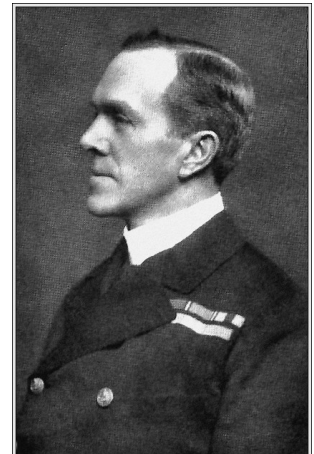


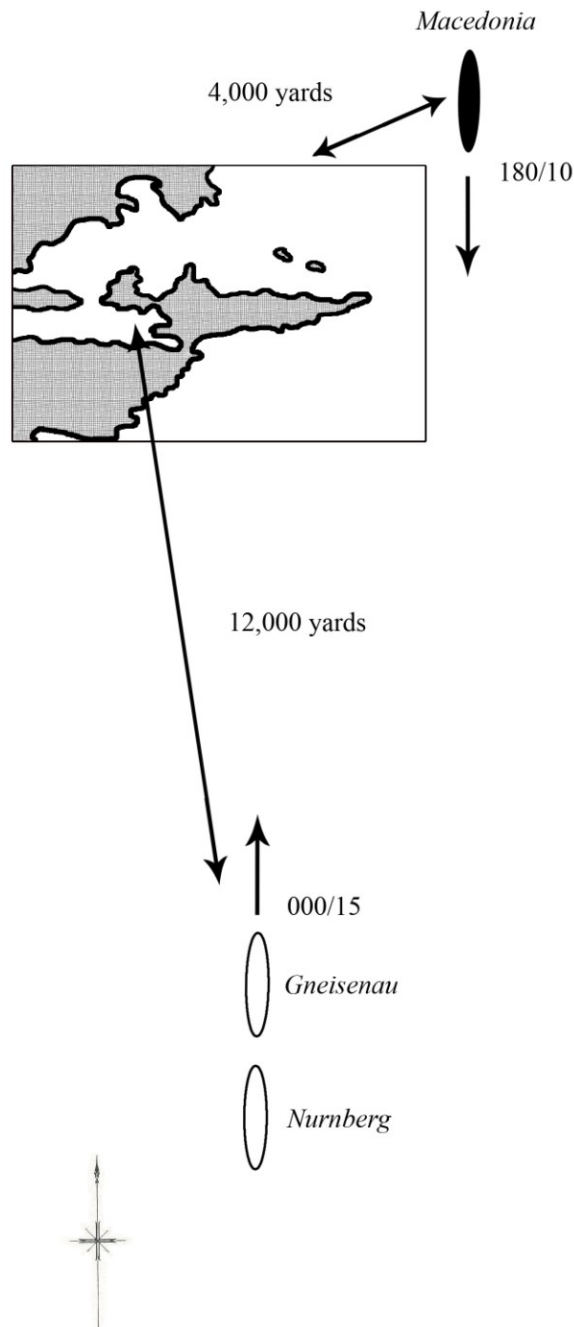
Figure 30 Vice Adm. F.C.D. Sturdee

Sturdee, 55, had been in the navy since he was 12 and was considered a rather prickly person to deal with, although he did have a reputation as an expert in gunnery and tactics. He had only been at the Admiralty since May and had already managed to alienate many colleagues, but not Churchill, which was his good fortune. Lady luck seemed to have a special fondness for Sturdee, not only delivering him from his bureaucratic enemies in London but saving him from a number of potential pratfalls in the coming campaign. He was lucky to have a self-confident subordinate such as Luce to prod him into leaving early for the Falklands, lucky again that the Germans turned away after Canopus' salvo and lucky for a third time that Dec. 8, 1914 would be a fine, clear and luxurious day for battle – so unlike the typical South Atlantic. And, of course, lucky most of all that no German shell managed to tease out the weakness in the HMS Invincible that would be revealed so catastrophically less than two years later at Jutland.

At Jutland Sturdee was aboard the HMS Benbow, commanding the eight dreadnoughts of the 4th battle Squadron.

See For Yourself 7

Churchill's Nightmare: Spee Attacks



Environment: 0915 Sea State 0. Visibility 100%. Wind calm. The Falkland Islands lie to the North and West so no ships may exit the playing area in those directions.

British Forces: Vice Adm. Doveton Sturdee in *HMS Invincible* (Invincible class BC) *HMS Inflexible* (Invincible class BC), *HMS Carnarvon* (Carnarvon class CR), *HMS Kent* (Monmouth class CL), *HMS Cornwall* (Monmouth class CL), *HMS Glasgow* (Bristol class CL), *HMS Bristol* (Bristol class CL), *HMS Macedonia* (AMC), *HMS Canopus* (Canopus class OBB)

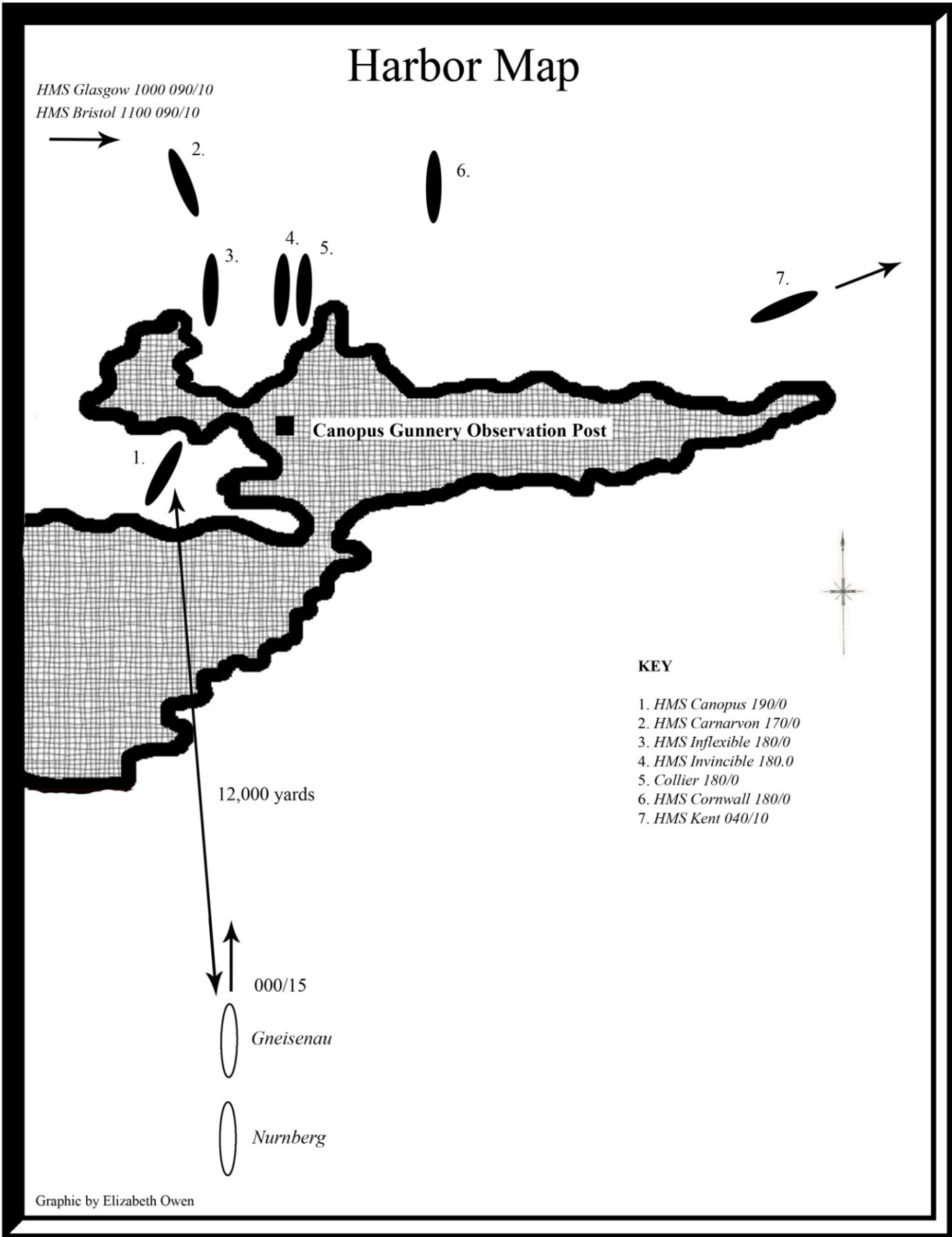
German Forces: German East Asia Squadron, Vice Adm. Maximilian Reichsgraf von Spee: *Scharnhorst* (flagship), *Gneisenau* (Scharnhorst class CR), *Leipzig* (Bremen class CL), *Dresden* (Dresden class CL), *Nurnberg* (Konigsberg class CL)

Caught Coaling: The British ships were surprised at anchor and were coaling after a long voyage. Only HMS Kent and HMS Macedonia have steam up and can move normally. All other British ships have to raise steam before they can move. It takes 4D6x10 minutes for BC and CR to raise steam. HMS Glasgow and HMS Bristol appear as shown on harbor map. Finally, HMS Canopus is grounded with its fire control personnel posted ashore. It cannot move.

Victory Conditions: British - sink or disable (over 50% damage) both German CR while not having one BC or two CR sunk or disabled.
German - sink or disable at least one BC or two CR and have at least one CL escape beyond visibility range.

Setup: Macedonia, Gneisenau, and Nurnberg as shown. Other British, see Harbor Map. Other Germans are 30,000 yards due South of Gneisenau.

Graphic by Elizabeth Owen



CHAPTER 17

LOOSE ENDS: THE DEMISE OF DRESDEN

Spee sacrificed his armored cruisers to allow the light cruisers to escape, but it ended up being in vain. Of the three light cruisers, only Dresden evaded its pursuers, but it didn't accomplish much during its 3-month reprieve.

Despite captaining a sister ship to the famous Emden, Kapitän zur See Fritz Lueddecke of Dresden lacked either the luck or aptitude -- or both -- of von Mueller. Dresden had the lengthiest voyage and longest career of any of the German raiding cruisers and yet it had a very modest haul. Before joining Spee's squadron it took just two prizes and after the Battle of the Falklands the Dresden only managed to bag a couple of British sailing vessels, although the steamer RMS Ortega staged a dramatic escape on Sept. 18 after encountering Dresden near the Straits of Magellan.

Dresden was a sister ship to Emden, but was different in one respect. While Emden had the older technology of triple-expansion engines, Dresden was the first German cruiser equipped with the new steam turbine technology. This proved to be a success and later German cruisers also used them. Aside from the power plant, however, Dresden was identical to its very successful sister ship and posed a viable threat to British shipping. The difference in the power plants had no effect during the campaign, as both performed adequately.

In any case, the British considered their victory at the Falklands incomplete so long as any ship of the German squadron was at large. Sturdee ordered an immediate pursuit and search for the missing ship, heading west towards Tierra del Fuego with the battlecruisers and HMS Bristol until bad weather and low coal prompted him to abandon the search on Dec. 10.

Invincible had taken the most damage and was sent back to England for repairs, but Inflexible had only been hit three times for minor damage and therefore led the searching force, which also comprised the light cruisers Bristol and Glasgow, that was sent to Punta Arenas after a Dec. 14 sighting of Dresden in that port. Naturally the German cruiser was long gone, however, and a continuation of the pursuit into the Pacific was fruitless.

Dresden took advantage of the extremely rugged and complex coastal waters of neutral Chile to hide out, but while this strategy helped the ship survive, it also neutralized it as a raider.

Eventually Inflexible and most of the other British warships were recalled for duty elsewhere and the search for the Dresden was left to who else but Luce aboard the Glasgow, aided by its sister ship Bristol and the armored cruiser Kent.

The surgeon on HMS Kent left a description of the fjord-like coast where Dresden hid out: "The channel varies from a mile or two in place to a few hundred yards only. Tiny islands, tree covered, fill the large channels. Huge bare granite, and lava and limestone mountains rise from the water's edge where a thick undergrowth covers them, up through a scraggy forest to bare glacier-worn rock. In places, for instance near the Kirk Narrows, entrance to Last Hope, several huge glaciers come almost down to sea level. Every now and then distant peeps of snowfields, glaciers and huge peaks. It's a land of mist and rain and dreaminess: only when the sun shines it makes a wonderful picture."

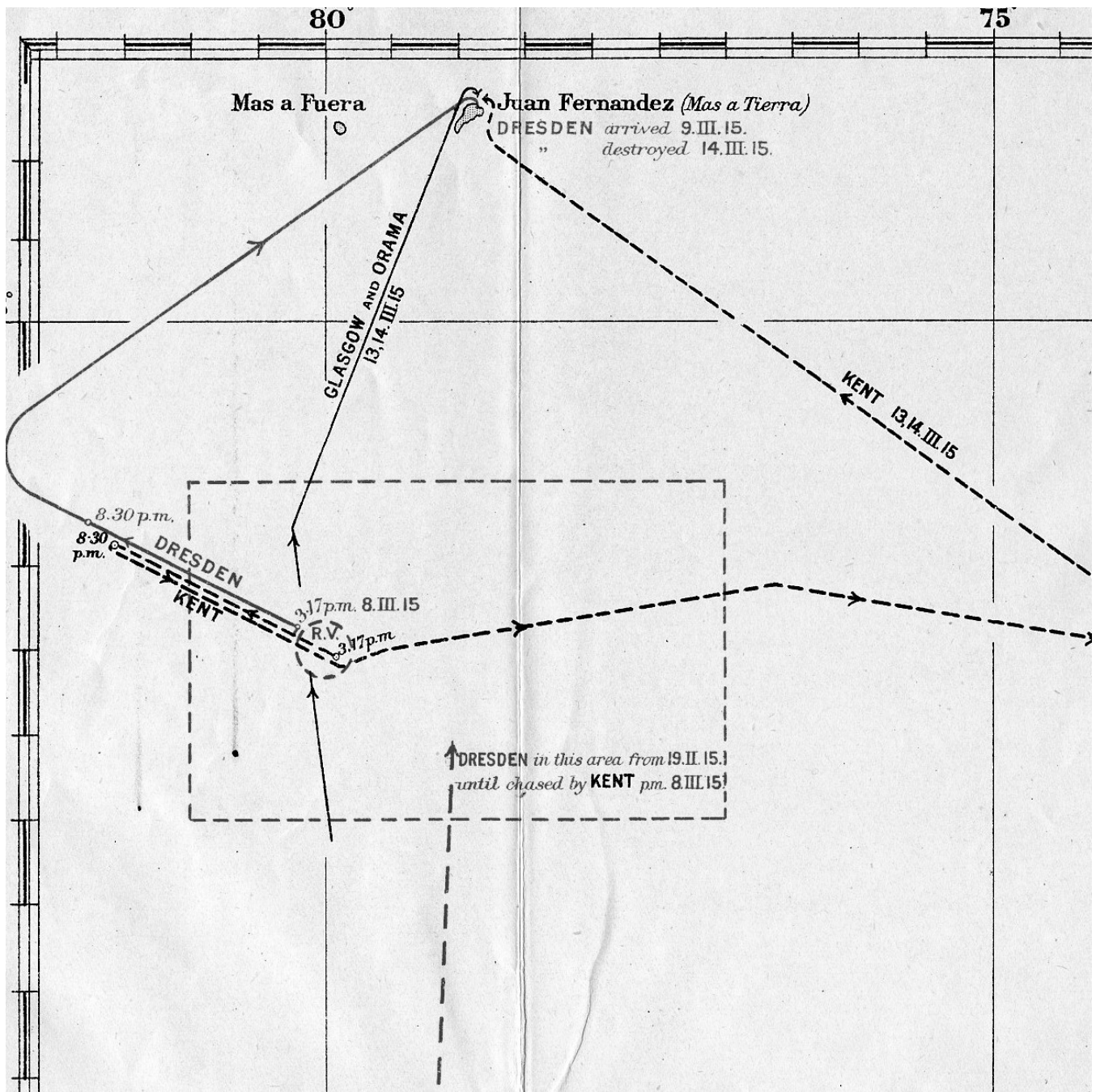


Figure 31 Detail showing the final stages of the search the search for Dresden. (Corbett, 1920)

Eventually HMS Bristol also had to head home to repair a broken rudder and the searchers were reduced to HMS Kent and HMS Glasgow.

Dresden's luck was starting to run out. On March 8 a dissipating fog left Dresden exposed within sighting range of HMS Kent. The old armored cruiser wasn't able to repeat its heroic performance against Nurnberg, however, and after a strenuous chase Dresden was able to pull away. Still, the encounter had its payoff, because the Kent was close enough to intercept a wireless message from Dresden to one of its colliers setting up a rendezvous at Mas a Tierra in the Juan Fernandez Islands.

Down to just 40 tons of coal, the Dresden was well and truly stuck until a collier showed up. The captain rebuffed a claim by Chilean authorities that the ship was interned when it didn't leave after 24 hours.

On March 14 Kent, joined by Glasgow, appeared outside the harbor.

While the Dresden attempted to raise steam, it had no coal to go anywhere and no chance to resist. A couple of salvos from Kent and Glasgow were fired and after taking a few damaging hits the German captain bowed to the inevitable and hoisted the white flag.

While engaging in some falderal about diplomatic protests and claims of neutrality the German ship's crew quietly arranged to scuttle the ship and before long it was resting on the bottom.

Nine German sailors had been killed and another 15 wounded. Luce settled a few claims for property damage from Chileans with a bag of gold sovereigns and on-the-spot settlements for things like a lobster shack and a scared cow.

With the end of Dresden, the saga of Spee's expedition came to a close.

Aside from a couple of armed merchant cruisers, which soon interned themselves at US ports, this was the end of the German naval presence overseas until the submarine war and a new set of surface raiders put to sea later in the war.

CHAPTER 18

FATAL CHOICES: DECISIONS AND DESTINY

It's easy for the reader, sitting comfortably on the couch with hot cocoa and a slice of apple pie, to second-guess a long-dead man standing on a cold-steel deck peering through the gloom of dusk and the fog of war as he weighs choices that will inevitably lead to the death of hundreds.

So it's appropriate that we approach the question of assessing those choices with humility and fairness. But if History is to be anything more than mere entertaining storytelling, we can't avoid looking for lessons; the vicarious wisdom derived from others' hard-earned experience and some guidance for those inescapable moments when we're faced with making hard choices amidst confusion and fear.

The three admirals who made those choices understood that the buck stopped with them. Being an admiral gives one immense power with few counterparts in civilian experience. That power comes with great responsibility. Admirals Cradock, Sturdee and Spee were well aware that their decisions would be judged by their peers, their subordinates, their political overseers, their countrymen and by History.

Starting with "poor Cradock," our reader who has tried to see for himself Cradock's options and the what-ifs surrounding the events of Nov. 1 may find Cradock's choices cast in a more positive light than is usually the fate for defeated admirals. It's clear that Cradock had long odds against him no matter what he did that fading November afternoon and the choices he made, if not flawless, were sound tactics and had some reasonable chance of success.

While we know, with the benefit of hindsight, that the odds were perhaps worse than Cradock could know, they were probably not as bad as events made them appear. Cradock undoubtedly suspected that his reservist crews were at a disadvantage compared to the East Asia Squadron's long-service experienced regular navy crews. There's no indication that Cradock knew that Spee's gunners were the crack winners of the Kaiser's Cup, but that detail would hardly have been surprising to him and he was already doing his best to mitigate that by endeavoring to close the range as quickly as possible. At point blank range even poor gunners can expect to get some hits.

While it's tempting to suggest that Cradock could have shown more prudence about whether to engage at all and should have considered merely observing Spee while he waited for HMS Canopus to come up, as we have seen that would have been unlikely to do much good and was quite unthinkable given the traditions and culture of the Royal Navy.

This is a naval tradition where one admiral was shot for, essentially, obeying orders and its most honored admiral was admired for "turning a blind eye" to orders. Cradock would have been intimately familiar with the stories of Byng and Nelson and imbued with the lessons they conveyed.

Adm. John Byng was a fairly ordinary British admiral of the mid-Eighteenth Century, but he earned undying infamy when he was shot in 1757 for "not doing his utmost" to save Minorca from capture. The questionable justice of his court martial and the validity of his excuses notwithstanding, the final result was death by firing squad on the quarterdeck. An element of Byng's failure was his refusal to depart from the fighting instructions and break his line in order to more closely engage the enemy fleet, which therefore escaped.

Almost half a century later Adm. Horatio Nelson famously held a telescope up to his blind eye so he could not see the signals ordering him to withdraw during the Battle of Copenhagen. Instead he pushed the fight and the Danish fleet was destroyed.

Of course the real stories in both Byng's and Nelson's cases were not quite so neat and a detailed look will reveal nuances and mitigations, but as with many such stories the perception matters as much as the truth. The lesson imparted to Royal Navy officers was that a spirit of aggressiveness was expected to be thoroughly marinated in their bones. And this spirit of aggressiveness paid off for the Royal Navy for more than two centuries. As noted by Nicholas Rodger, "More and more in the course of the century, and for long afterwards, British officers encountered opponents who expected to be attacked, and more than half expected to be beaten, so that [the latter] went into action with an invisible disadvantage which no amount of personal courage or numerical strength could entirely make up for."

Throughout the Age of Sail British commanders rarely hesitated to engage clearly stronger opponents and much more often than not, managed to win. The same spirit animated the Royal Navy in 1940 -- a generation after Cradock's death -- when the armed merchant cruiser HMS Jervis Bay faced the pocket battleship Admiral Scheer and the destroyer HMS Glowworm attacked the heavy cruiser Admiral Hipper.

Here's where the pernicious influence of Churchill on the Admiralty reveals itself both directly and indirectly. While the Admiralty had a small professional naval staff and the naval officers in it and the First Sea Lord share some responsibility for the shoddy nature of the directives issued, the dominant personality was clearly First Lord of the Admiralty Winston Churchill. It was not in Churchill's nature to avoid meddling, and although it can be hard to pick out who, exactly, did what, Churchill's influence seeps through. Directly, because Churchill's delay in dispatching the HMS Defence robbed Cradock of the resources needed to do the task expected of him with a reasonable likelihood of success. As we saw, with HMS Defence in his line Cradock would probably have brought Spee's voyage to an end right there. Cradock was likely to win a clear victory, but he was almost certain to suffer no more than a Pyrrhic defeat, one that would have left Spee's squadron just as much out of the war.

The indirect effect of Churchill was from the fallout of the Troubridge affair. Regardless of the reasonableness of Troubridge's judgment that he was facing a "superior force" and therefore justified in avoiding combat under his admiralty instructions, the nature of those instructions was fatally flawed. Engaging superior forces was *expected* of Royal Navy officers. Churchill's admonition was a very un-Royal Navy-like one and it stuck in the craw of the professionals ever after. It's doubtful that Troubridge could have successfully engaged the Goeben, but the crime was in not trying. Cradock would try.

And try he did. One is left feeling that fate was particularly unkind to Cradock that day, because, in truth, he did have a chance. Perhaps not as great as he thought, but not so grim as events would make seem, either, as readers who fight through the Historical Coronel scenario will discover. While it's likely the British squadron will be beaten, it's also unlikely that the German squadron will emerge unscathed. While the accuracy of the German gunners was amazing, the third salvo hits achieved on HMS Good Hope and HMS Monmouth were the absolute best case that skill could give. Hits on a first or second salvo were purely by chance, but even a third salvo hit was fortuitous. And Cradock's luck was exceptionally bad, because those first hits were critical, taking out portions of the main battery instantly and starting fires. Cradock's embattled ships never really recovered from that initial setback. Yet it's easy to see how a few more minutes might have made all the difference for the British squadron and given it a chance to close the range and start landing hits of its own. That's what will happen often enough when the battle is refought, even with FG&DN. Under the more bloody systems of other rules it's even more likely. The lesson is that just because you were defeated it doesn't mean you were doing the wrong thing. Sometimes fate intervenes.

The Battle of Denmark Strait on May 24, 1941 may be the most simulated naval battle of history. It's a scenario in just about every naval wargame ever published. Therefore experienced naval wargamers have seen the battle between the Bismarck and the HMS Hood and HMS Prince of Wales play out over and over again. The fact is that most of the time the Bismarck loses. It's notoriously hard to get that battle to turn out with the historical result, largely because until 0600 the British plan was working perfectly. The Bismarck and Prinz Eugen had failed to break out into the Atlantic undetected. Two British cruisers had been successfully shadowing the German task force for half a day and the British had vectored a superior force to intercept.

And the Hood and Price of Wales were, undoubtedly, a *superior* force. While individually slightly weaker than the Bismarck, together they clearly overmatched the German ship in firepower. Far from home, any significant battle damage meant doom for the German warships and the two British ships were more than capable of doing significant damage. And the British task force commander, Adm. Lancelot Holland, handled his ships appropriately, closing the range at the optimum rate and taking the enemy under fire. Aware of the vulnerability of the Hood to plunging fire, Holland was within a few minutes – a few thousand yards – of closing that window of danger when disaster hit. The Hood blew up. Half the guns on the newly built Price of Wales then malfunctioned and that was it. Even in that disaster the Bismarck didn't escape scot-free. A couple of seemingly minor hits by the Prince of Wales laid the foundation for the series of events that led to the Bismarck's sinking three days later.

So, while details of Cradock's deployment might be criticized – for example allowing the useless Otranto to slow him down – the soundness of his overall approach and the tactical handling of his squadron seem vindicated by the insights provided by wargaming it out a few times.

While Cradock couldn't seem to catch a break, it appears Sturdee was born under a lucky star indeed. If Cradock suffered an undeserved defeat, a case can be made that Sturdee achieved an undeserved victory.

We can start with Sturdee's good fortune in having a self-confident and assertive subordinate such as Capt. John Luce of HMS Glasgow who lit a fire under Sturdee's ass to get him to leave a day early for Port Stanley.

We can add to that good luck by noting his good fortune that Maerker was incredulous at the reported presence of battlecruisers because that spared him the embarrassment of being attacked at anchor. As we saw, Sturdee's force was so powerful that Spee stood little chance of winning – but it might have been an embarrassingly pyrrhic victory for the British squadron if it had lost a few more ships under such inglorious circumstances. The annihilating historical victory was a cathartic avenging of Coronel – a bloody survival after being ambushed in harbor would have been another psychological defeat.

Finally we can note Sturdee's good fortune that the weather was so fine – in an area where fine clear days are rare. Most days Spee would have had conveniently bad weather in which to make his escape and Sturdee would have been faced with an arduous search for an elusive enemy. Sturdee would have had to split up his forces in order to find the Germans. Readers can experiment with various interesting combinations of British cruisers and battlecruisers that might have faced Spee instead.

Sturdee was competent enough with his tactical handling of his ships once engaged. He managed to avoid throwing away his advantages and making the most of his good fortune. He correctly anticipated that the Germans would detach their light cruisers and he exploited the superiority of the battlecruisers. Players who explore Sturdee's options should have little difficulty doing as well. Sturdee did well enough. But his victory over Spee was as much Fisher's as his.

Spee represents the hardest case to evaluate. There's little to fault in his tactical acumen. He won a smashing victory at Coronel and he made Sturdee work exceedingly hard for his win at the Falklands. Despite the long odds, HMS Invincible and HMS Inflexible didn't have an easy time with SMS Scharnhorst and SMS Gneisenau. If the German ships didn't have the firepower to seriously threaten the British battlecruisers, Spee's handling made the German armored cruisers very hard to kill. Sturdee had a very long summer's day to defeat Spee's squadron and he had to use all of it to do so.

Where Spee can be faulted is in his lack of strategic vision. As we have seen, the under-armed German light cruisers added negligible combat power to his squadron. Aside from drawing some fire, they had no utility in any fight involving armored ships. Mueller's Emden showed the potential of a well-handled light cruiser. It's easy to see that loosening his hold on the light cruisers he had with him could have complicated the British problem of trade protection and also made it harder for the British to find Spee.

Similarly, Spee's decision to raid the Falklands is questionable -- and not just in hindsight. Most of his captains thought it unwise and it's hard to see how even a successful raid would have been worth it. Once Canopus was beached at Port Stanley there was no chance of a successful raid (Curious players can modify See For Yourself 7 by eliminating all but the HMS Canopus) because any damage at all to the German squadron would be fatal. But even if Spee's intelligence was correct and the Falklands were vacant, the damage to the facilities would have been counterbalanced by the British learning where Spee was.

And, of course, most inexplicable of all was Spee's dawdling off the coast of Chile after Coronel. Getting back any one of those wasted days from that month would have allowed Spee to have a chance of slipping past his pursuers.

All these questionable decisions are related to the overriding problem with Spee's leadership of the East Asia Squadron – he didn't seem to have an idea what to do. While it's true that he didn't get a lot of guidance from the German high command, Spee certainly had plenty of time to think about what to do and how he could do the most to further the German war effort. One detects a fundamental indecision underlying Spee's voyage throughout. He was too conventional to play the pirate and unleash his light cruisers to wreak havoc while using the armored cruisers to menace the trade protectors. And he was too pessimistic about his chances of breaking through back to Germany to make the bold moves that might have given him a chance to pull that off.

Spee didn't make it to within 8,000 miles of Germany, so there's insufficient information to generate plausible what-ifs for what might have happened if Spee's squadron evaded Sturdee and ended up somewhere in the North Atlantic in January. Coal would have been an issue, as always. Weather would have been a consideration. Undoubtedly Fisher and Churchill would have pulled out *all* the stops to redeploy ships to find him, so it's impossible to even speculate what the order of battle might have looked like. It was a long shot – but making the attempt would have, at least, created some difficult moments for the Admiralty. And it could hardly have turned out worse than the actual event, after all.

One area of criticism can be dismissed, however, and that is the notion that Spee threw away a golden chance to salvage some sort of victory by immediately attacking Sturdee's squadron in the harbor while it was coaling. As we saw, there really wasn't an opportunity for Spee to do that under the conditions he faced that morning. The British squadron was too strong, the visibility was too good and the warning was too extensive. The British security arrangements with Kent, Macedonia and especially, Canopus, were more than adequate for the task.

Spee ended up a dead hero and got a ship named after him. Spee's memorializing namesake ironically wrote a sequel to the story a quarter century later in nearly the same place (See the Epilogue). No warships have been named after the unfortunate Cradock. Sturdee was feted as a hero, yet never really believed he got his due. Fisher considered Sturdee's victory his own. Churchill survived politically for the moment, only to run into difficulty months later over Gallipoli. Even that disaster couldn't keep that Real Soldier of Fortune down for good, of course, and he would go on to even grander roles on the world stage.

It's very easy when reading about historical events to be lulled into believing that the way things *were* was the way they *had* to be. But that's not how it was experienced by those living through those moments. They had to make choices and we can't really understand what happened if we don't understand the choices open to them as they saw them. Some choices lead to success, life and victory. Others ended up being fatal choices.

EPILOGUE

UNDER SOUTHERN SKIES: SPEE 1939

A quarter century, almost to the day, after Maximilian Graf von Spee died, another Graf Spee met its demise in the same South Atlantic waters. The December, 1939, Battle of the River Plate echoed the lessons of Spee's adventure for both sides.

Twenty-five years after the beginning of World War I, Great Britain and Germany were again at war as World War II gave lie to the Great War promise to be the "War to End All Wars." While the combatants were the same, much had changed in the meantime and both sides had drawn lessons from their World War I experience.

While Germany no longer had overseas colonies to defend, it did have warships scattered across the globe once more. While the sudden outbreak of World War I had caught the German navy by surprise, Hitler had complete control over the timing of the renewed war's start and so Germany's naval planners were able to place surface and subsurface raiders at sea and make provisions for their support, ready to unleash economic warfare on the British from the first days of the conflict.

Unlike its World War I predecessor, the 1939 German navy had no illusions of challenging the Royal Navy for sea control. Instead German naval forces were set out to bring England to its knees through blockade and economic disruption.

Optimized for raiding were the three German ships of the Deutschland class. Restricted by treaty to warships displacing less than 10,000 tons, the Germans used a combination of new technologies, innovative doctrine and a bit of cheating to create warships that were powerful enough to cause considerable anxiety to British planners while still ostensibly following the rules.

Armed with 11-inch guns, the Graf Spee and its two sister ships could outshoot a cruiser while its speed of 26 knots was sufficient to outrun contemporary battleships. Only the World War I-era battlecruisers still posed a threat, but Britain had just three of those ships, making the odds of one being in the right position slim.

Styled "Armored Ships" or Panzerschiffe by the Germans, and called "pocket battleships" by Western journalists, the Graf Spee and its sisters were the closest thing remaining to a lineal descendant of the armored cruiser concept of the pre-dreadnought era. The World War II "heavy" cruiser was an outgrowth of the scout cruisers of the Great War era and among the major navies there was often little to choose from in combat power and size between light and heavy cruisers. In fact, some classes came in both light and heavy cruiser versions and other classes switched from one to the other merely by changing armament. This was all an artifact of the Washington Naval Treaties, which defined "heavy" cruisers by gun size, the maximum allowed being 8-inch. Light cruisers were generally armed with 6-inch guns. The 6-inch gun has the advantage of being about the largest size shell that can reliably be manhandled, so all things being equal it had a higher rate of fire than an 8-inch shell, which required power equipment. This meant that 6-inch guns and 8-inch guns could throw out about the same weight of metal, which was sufficient for most cruiser work which involves battling other cruisers and lighter ships.

Where an 8-inch shell does have an advantage over a 6-inch shell is in armor penetration, which is a factor when fighting armored ships. While the “pocket battleship” Graf Spee didn’t have true battleship-scale armored protection, it did have heavy armor for a cruiser-sized vessel.

The Graf Spee also had other features that made it a more potent raider compared to the German ships of a quarter century earlier. Foremost among these was range, due to its use of diesel engines. This new technology gave the Graf Spee an enormous range compared to the coal-fired ships of Admiral Spee’s squadron. While coal supplies were a constant concern for Spee and severely restricted his options, the Graf Spee’s diesel engines were both fuel-efficient and much easier to refuel from supporting ships.

The Graf Spee’s effectiveness as a raider was also enhanced by the aircraft it carried, which gave it a much wider search area to find prey.

The 11-inch guns and heavy armor of the Graf Spee meant that it was more than a match for a single cruiser.

The British, too, had learned important lessons from their Great War experience. Among the most important was the overriding importance of quantity.

While the British were the impetus behind the definition of the “heavy” cruisers under the Washington naval treaties, they actually made a relatively modest investment in that type. Instead they pioneered making the most of the light cruiser concept, believing that quantity was the most important characteristic of a cruiser, so long as it had adequate quality.

The British solution to the individual quality of Graf Spee was to overwhelm it with quantity. The British judged that three ordinary cruisers would be sufficient. A raider, far from home and shipyards, was very vulnerable to any sort of battle damage, so it wasn’t necessary for the three cruisers to sink the raider – they just had to do enough damage to abort its cruise.

The three cruisers that actually faced Graf Spee were not especially powerful ships, even for their type. But they were enough.

The one “heavy” cruiser was HMS Exeter. This was the smallest practical size for a heavy cruiser, with just six 8-inch guns, designed as part of an intended program that privileged quantity over quality. The idea of the program was that three Exeter-sized heavy cruisers could be built for the same price as two slightly larger County-class ships. Of course, tight budgets due to the Depression meant that the planned great quantity was never built and the British just ended up with two rather small heavy cruisers in the class – Exeter and its sister, HMS York.

The other two cruisers in the fight were sister ships of the Leander class, HMS Ajax and HMNZS Achilles. At 7,000 tons and just eight 6-inch guns these were also not especially powerful for light cruisers – later British classes would have up to a dozen 6-inch guns.

Still, under Commodore Henry Harwood it would be enough. Harwood drilled his task force – known as Force G – in his battle plan, which involved splitting his force into two groups to divide the fire of Graf Spee and give his ships a chance to close the range.

And so it worked out in practice. While Exeter was eventually forced to retire with heavy damage and the two light cruisers also took some significant hits, Graf Spee was also battered enough that its commander, Capt. Hans Langsdorff, decided to scuttle the ship rather than face what he thought were superior enemy forces waiting outside the neutral harbor where he took refuge.

Interestingly enough, this precise result had been predicted by civilian wargames conducted by Fletcher Pratt and his club of naval wargame enthusiasts in New York. John Curry's edition of the Fletcher Pratt rules recounts the story:

“Often one case study has been presented to demonstrate the validity of the Pratt rules, that of the Battle of the River Plate on the 13th December, 1939. This example was cited in Donald Featherstone's book, *Naval Wargames*. The historical outcome of the German Battleship (sic) Graf Spee being defeated by a British heavy cruiser and two light cruisers was predicted two years before the actual battle in the South Atlantic by a Pratt naval wargame.”

While designed to be the kind of raider that the Spee of World War I never really understood, the World War II Graf Spee failed to solve the inherent problems facing a surface raider in the 20th Century. Even though the pocket battleship wasn't close to being sunk, it did take a damaging hit that reduced its usable fuel supply to a fraction of the amount needed to go anywhere. The German warship also fired off two-thirds of its main battery ammunition, meaning it didn't have enough combat power to go out in a blaze of glory, either. A surface raider had just one good fight in it, win or lose.

The British considered their aggressive tactics justified by the battle's outcome. In 1940 the current First Sea Lord, Sir Dudley Pound, wrote a personal note to Harwood, which praised his aggressiveness and noted “Even if all our ships had been sunk, you would have done the right thing.”

Pound went on to say that “Your action had a great effect in two ways. Firstly it has set a standard for this war, a matter of great importance. *Secondly it has reversed the finding of the Troubridge court martial and shows how wrong that was.*” (Emphasis added.)

And by implication, Pound vindicates “poor Cradock” as well. Cradock did lose most of his ships. But he also set a standard that the Royal Navy took to heart 25 years later.

SOURCES:

A note on sources used:

The sources for this book fall into two main categories : Histories that provide the necessary background for events, technical specifications and understanding of the issues involved and wargames, that provide a means to reality check assertions about what was possible and the potential consequences of various decisions and events.

The major historical sources consulted include Robert K. Massie's incomparable Castles of Steel, supplemented by Jutland: An analysis of the Fighting by John Campbell, Dreadnought Gunnery and the Battle of Jutland by John Brooks, Naval battles of the First World War by Geoffrey Bennett, Coronel and the Falkland Islands by B A. Neville Hilditch, Jutland: Clash of Dreadnoughts by Charles London, British Dreadnought vs. German Dreadnought by Mark Stille, Directory of the World's capital Ships by Paul Silverstone, Conway's All the World's Fighting Ships 1860-1905, various ships logs and other sources.

The primary wargame source is Fear God and Dreadnought, by Larry Bond, with corroboration and cross-checking using Victory at Sea by Tony Morales, Fletcher Pratt's Naval Wargame, and The Fred Jane Naval Wargame (1906) including the Royal Navy's Wargaming Rules (1921) edited by John Curry.

Falling into neither category is the "novelistic history" Death at Sea, by Eric Dorn Brose, which provided both an inspiration and launching point for this project

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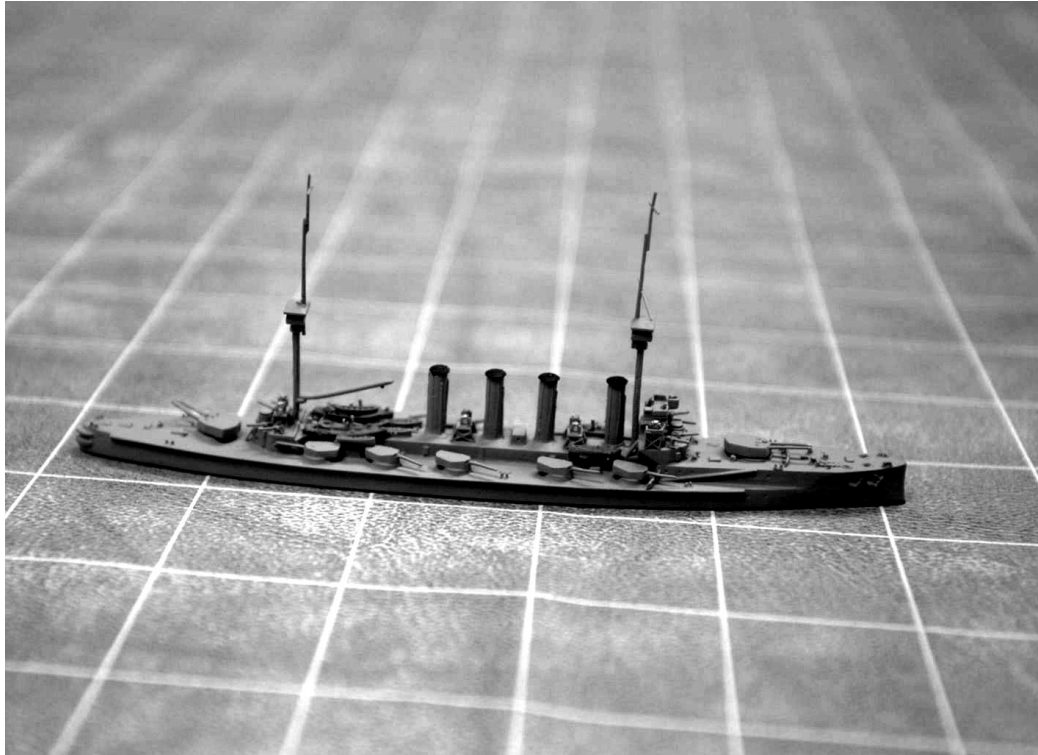


Figure 32 HMS Defence, model by NAVIS. This was the last armored cruiser built. (Kiymora Smith/ Author's Collection)

APPENDIX 1

NAVTAC FATAL CHOICES EXTRACT

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USED WITH PERMISSION

NavTac: Fatal Choices is a wargame depicting tactical naval combat between individual ships during the First World War and is a supplement to the book *Fatal Choices*. The rules use a modified version of Minden Games' NavTac game system, which itself is based on the classic Fletcher Pratt game system. These rules are meant to be a quick and easy introduction to naval wargaming for those who don't have the time or inclination to use the full *Fear God & Dread Nought* rules, albeit at some cost in authenticity and confidence in the verisimilitude of the simulation. Players should feel free to adopt elements from the FG&DN rules as desired.

1. Scale and definitions.

Each turn of the game represents five minutes (12 turns per hour). One inch on the floor or tabletop equals 500 yards. Other scales may also be used. Each ship counter or miniature represents one ship. During movement, each half-inch moved equals three knots, each inch represents 6 knots. So a ship that moved four inches is travelling at 24 knots. In these rules, distances will be listed in yards. Players may then translate that to inches depending on the scale used, although typically one inch equals 500 yards.

Fire combat is calculated and resolved by turret. Game-defined turrets include actual turrets, casemate mounts and individually mounted guns. Turrets are defined as main or secondary, and may contain one or two gun barrels each. When firing at a target, you will roll two dice per turret firing, and depending upon the range, must roll a given number (or numbers) to hit the target. If a hit occurs, you must compare the gun size of the firer with the armor rating of the target to see what damage occurs from the shells fired from that turret during the entire fire phase. A turret hit will most often represent more than one actual shell hit on a target. Always round fractions up, unless otherwise stated in the rules.

Each ship is listed on the Ship Characteristics Table in the annex at the end of this appendix. This table gives the ship's nationality, type (BC= battlecruiser; B = pre-dreadnought battleship; AC = armored cruiser, CL = light cruiser; AMC = armed merchant cruiser), displacement (given in terms of tons/damage points) main belt armor thickness; maximum speed; main and secondary gun size and range; number of turrets able to fire ahead (bow) broadside, and astern (stern); damage levels and results (that is, what happens when the ship receives a certain number of damage points from combat.)

2. Set up and Victory Conditions

According to the scenario instructions in each See For Yourself Scenario.

3. House Rules

As agreed by players. As players gain experience they may want to experiment with adding elements from Fear God & Dread Nought to their NavTac games.

4. Sequence of Play

Each game turn comprises two phases, conducted in order: Movement, and then Fire.

Movement Phase: each side moves its ship(s) within the rules of Movement. Players may agree to move simultaneously (where each player writes down the speed and direction of the ship and then the ships are moved), or sequentially, (i.e. flip a coin or roll a die each turn, to decide who moves first that turn, after which the opponent moves.)

Fire Phase: Ships that are within range of an enemy may fire during this phase. Fire is considered simultaneous, so roll results, and then apply damage (if any) after all ships have fired. "Eligible turrets" means turrets that are within range and within the turrets firing arc (so if the target is off the firer's bow, only the bow turrets may fire). When a turret is 'lost,' it is no longer eligible to fire for the rest of the game. When you are directed to lose a turret of a particular size, determine the turret affected randomly from among those of that size not already lost.

5. Movement

Speed: Each ship has a maximum speed, expressed in inches. (If converting to another scale, remember that every inch represents 6 knots of speed.) A ship cannot exceed its current maximum speed. A ship's maximum speed may be lowered during play. A ship may raise or lower its speed by one inch per turn. (Example, Invincible had a speed of 3.5 last turn, so this turn it can move at a speed of 2.5 to 4.5)

Turning: Ships may turn up to 45 degrees port or starboard per each inch moved. Ships may not move in reverse or sideways. If a ship moves at least one-half inch during a turn it may turn up to 45 degrees during its move.

Formations & Dead in the Water: When multiple ships are on a side, they should steam in formation (line ahead, line abreast, etc). For best results players should employ historical formations. A ship that has its speed reduced to 0 is Dead in the Water and cannot move, but it may still fire.

6. Target aspect

Only bow guns can fire off the firer's bow, only stern guns off its stern and broadside to broadside. If using miniatures use the actual field of fire of the model. If using the counters check the deck plan on the counter for turret placement. Questionable cases should count against the firing ship because of blast effects and fire control limitations. Good sportsmanship should hold sway.



Figure 33 Measuring the range. Measure from bridge to bridge or funnel to funnel. Be consistent, but don't be picky about it. This is 7-inches, 3,500 yards in standard scale. Don't worry about the fraction of an inch left over. Remember the ships are moving, there are physical limits to rulers and models and human dexterity. Good sportsmanship and reasonableness should be the byword at all times. (Author's collection)

7. Fire Combat

Each turret (main and secondary) fires individually. Each eligible turret may fire once per turn. The main guns of a ship may only target one enemy ship each turn; the ship's secondary guns may target one enemy ship per turn (which may be the same or different as the target of the main guns). In order to fire at an enemy target, the target must be within the target aspect, the range of the firing target and the visibility range. Measure from bridge to bridge or fore stack to fore stack as agreed, but be consistent. Ships may fire over enemy ships but not over friendly or neutral ships. Both sides preselect all targets before any fire is resolved. See ship characteristics table for specifics, but generally 8" guns and larger are assumed to have two barrels per turret and smaller guns are assumed to have one barrel per turret.

There are two types of fire combat; Ranging Fire and Regular Fire. Both types use the standard game tables. The fire table gives the dice roll per turret needed at specific ranges to hit the target. Hit numbers apply to all gun sizes and both Ranging and Regular Fire. For example, at 12,000 yards a turret will hit a target on a two-dice roll of a 6 or 7. Main and secondary guns always resolve fire separately.

Ranging Fire: When firing at an enemy ship, the firing ship must first 'acquire' the range (or 'straddle') the enemy ship via Ranging Fire before moving to Regular Fire. Ranging Fire is used until a 'hit' occurs on the target. On subsequent turns all fire from that ship's main or secondary guns (as applicable) towards that enemy ship is conducted as Regular Fire. (Exception: If a ship changes targets it must again use Ranging Fire until it hits the new target). When a target is acquired by one turret then all the firing ship's turrets (main or secondary as applicable) are deemed to have acquired the target as well.

Damage from Ranging Fire: When a hit occurs, cross-index the firing gun size with the target's Armor Rating on the Gun Penetration and Damage Table. When a German ship hits an enemy target from Ranging Fire, use one-third of the damage points normally caused and no Critical Hits are possible. When a non-German ship hits an enemy target from Ranging Fire each hit produces one-tenth the normal damage and no critical hits are possible.

Regular Fire: After a ship has 'hit' the target via Ranging Fire it conducts Regular Fire against that same target with its main or secondary guns (as applicable) on subsequent turns. This continues until that target is not fired upon during a turn.

The firing procedure for Regular Fire is the same as for Ranging Fire, except that the full damage from the table is inflicted on the target and Critical Hits are possible. For each hit cross-index the firing turret gun size with the belt armor rating of the target. The resulting number is the amount of damage, given in 'damage points,' caused to the target. Keep track of the damage points as a cumulative total on a piece of paper.

Critical Hits: In addition, for each hit scored from an 8" or larger (main or secondary) turret, roll one die. A roll of 1-5 has no effect. If a 6 is rolled a Critical Hit occurs. Roll two dice on the Critical Hit Table and apply the result according to the table, modified as applicable by the firing gun size and armor rating. All results from the Critical Hit table are in addition to any effects from accumulated damage points.

Effects of Accumulated Damage: When a ship receives a certain number of damage points, it will lose turrets and/or speed. Damage that does not reach this threshold has no game effect. In game terms turret/speed loss only occurs as thresholds are crossed. Most ships have multiple damage thresholds: one that reduces maximum speed, one that reduces main turrets and one that reduces secondary turrets. Each is tracked separately. For example, HMS Good Hope damage thresholds are one 6" turret lost for every 600 points of damage, speed reduced by 0.5 inch for every 2,000 damage and one 9" turret lost for every 6,300 damage. If HMS Good Hope has taken 6,500 points of damage it will have lost 10 6" turrets, its speed will be reduced by 1.5 and it will have lost one 9" turret due to accumulated damage.

When a ship receives damage equal to or greater than its displacement then it is sunk. Any effects from Critical Hits are in addition to the losses given by accumulated damage. Continuing the previous example, if a Critical Hit had already resulted in a 9" turret being lost on HMS Good Hope it would lose its second 9" turret after taking 6,300 points of damage. If the HMS Good Hope takes 14,200 points of damage it sinks and is removed from play after the fire phase.

8. Optional Rules

Smoke: Any CL may lay a smoke screen. Ships may move through smoke screens normally but may not fire through smokescreens. Procedure: State a ship is laying smoke and place a string at the stern of the ship before it moves and place the end of the string at the stern of the ship after it has finished moving. A smokescreen lasts three turns.

Gunnery Differences: The German system of ‘ranging’ a target was faster than the British, but once they had found the range the British were less likely to lose the range. On any Regular Fire Roll at 6,000 or more yards if a 12 is rolled then the target must be reacquired next turn using Ranging Fire. The British get a subsequent die roll if they lose the target. If odd they do not have to re-acquire the target after all and may continue to use Regular Fire.

Small Target Size: When small ships (CL) are fired at use the range two lines higher than the usual one on the Fire Table. (For example, when firing at HMS Glasgow at 8,000 yards Scharnhorst would use the 12,000 yard table.)

Gun Crews: Ships with “Below average” gun crews (HMS Good Hope and HMS Monmouth at Coronel) roll three dice when firing. (two of one color, and one white die) Add the two dice together as usual, but read the white die separately. If the white die is 1-2, then the below average ship misses automatically.

Canopus 12” guns. Due to slower loading and firing consider damage caused by this pre-dreadnought’s 12” turrets to cause one-third less damage when resolving Regular Fire (not Ranging Fire)

Critical Hits from small guns: Allow guns smaller than 8” to achieve critical hits against ships with armor ratings of 4” or less.

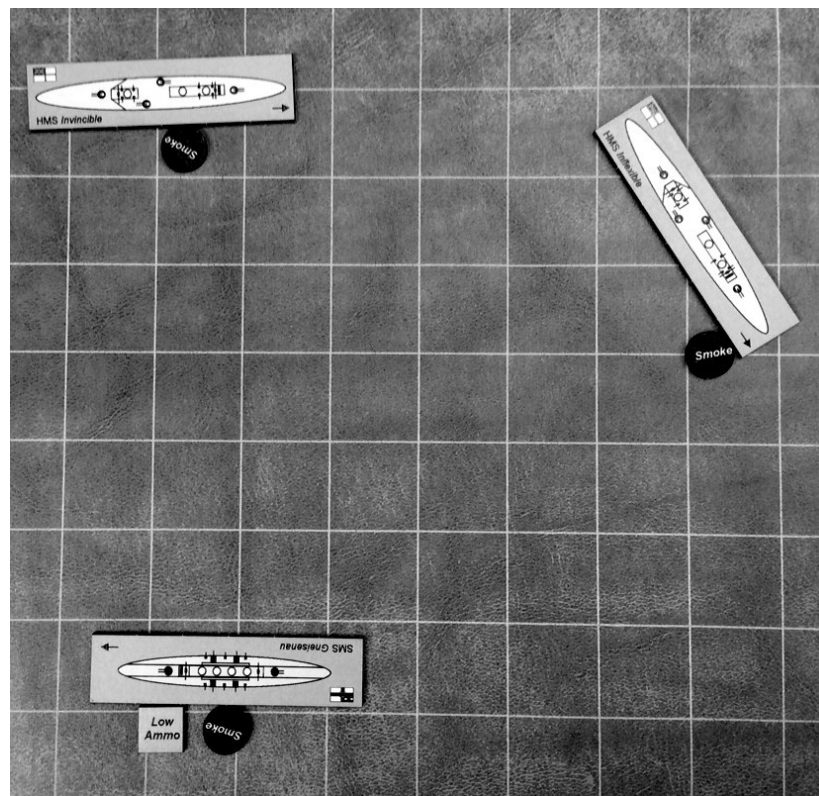


Figure 34 Funnel smoke and Low Ammo optional rules in use. Smoke is to the South of the ships, so HMS Invincible is affected, but HMS Inflexible and SMS Gneisenau are not. Gneisenau is, however, affected by Low Ammo. (Author’s collection.)

Torpedoes: During the Fire phase of any turn, after all fire combat has been resolved and results implemented, torpedoes may be fired by any CL. (Or optionally, by any ship except an AMC). Procedure: To launch torpedoes, determine the range from the launching ship to the target. Roll one 'to hit' die, subtract one from the roll of a CL (subtract 2 otherwise) except subtract zero if the target speed is 2 or less or the range is less than 1,000 yards and multiply the total by 1,000. If the resulting number is higher than the range, then the target has been hit. A "6" is an automatic miss. If the resulting number is equal to or lower than the range then the torpedoes have missed. (So therefore the maximum possible range for a successful torpedo attack against a mobile target will be 4,000 yards for a light cruiser). Each torpedo hit is assumed to be by a single weapon. Roll two dice on the Torpedo Damage Table and apply the result.

Weather and Night: During poor weather conditions or darkness apply the following: No torpedoes. No smokescreens. Visibility as listed per scenario. Add 4,000 yards to the range used on the Fire Table for all firing.

AMC: Targeted at one level less than the actual range and fires at one level higher than the actual range on the Fire Table. AMC use the 2" armor column but take double the listed damage.

Funnel Smoke: All ships produce funnel smoke. Funnel smoke can cause +2 levels to range, in Calm and Rolling Sea states only, when the firing ship fires through its own smoke against a target (i.e. when the target is downwind from it) This penalty reflects the ship's reduced ability to see the target and fall of shot through its own smoke. At the start of a scenario determine the wind direction is blowing in relation to the eight ordinal points (N, NE, E, SE, S, SW, W, NW). When firing at a target that is within the smoke arc of the wind, the fire is shifted up two levels. For example, if the wind is blowing to the NE then a ship firing at a target to its NE at 12,000 yards will use the 16,000-yard range. The other ship, firing back, will be use the actual range of 12,000 yards because its own smoke is blowing clear.

Low Ammunition: When a ship fires its main or secondary guns (ranging or regular fire) and it rolls the Low Ammo Activation Number (normally a two-die roll of 4) the ship receives a Low Ammo counter and will suffer the penalty for the affected guns (main or secondary) for the rest of the game. Make a subsequent die roll upon any hit. A DR of 1-2 means no damage; DR 3-4 means half normal damage, DR 5-6 means normal damage. Critical hits are unaffected unless there is no damage. There is never a Critical Hit unless some damage points are inflicted. If a ship already has a Low Ammo marker then a -1 is applied to the Die roll (i.e.) a DR of 5 will be adjusted to a 4 and cause half damage.

Catastrophic Damage/Capsizing: After a ship has received damage equaling 80% of its displacement or more, every hit of 750 or more damage points it receives thereafter means a die must be rolled. A DR of 1-4 has no effect. A DR of 5-6 means it either explodes or capsizes and is immediately sunk and removed from the game.

GUNFIRE TABLE

Range	20,000	18,000	16,000	14,000	12,000	10,000	8,000	6,000	4,000	2,000	1,000
(inches)	(40)	(36)	(32)	(28)	(24)	(20)	(16)	(12)	(8)	(4)	(2)
Hit No.	6	7	2&7	4&7	6&7	3,6&7	5-7	4-7	2-7	2-8	2-10

Use the next higher range if between ranges. Example, if the range is between 8,001 yards and 10,000 yards use the 10,000 line.

Critical Hit Table

Roll	Result
2-3	Steering Hit: No turning allowed for 6 turns
4	Bridge Hit: Roll die; no turning or voluntary speed changes allowed for that many turns
5-6	Fire Control Hit: No firing of guns allowed next turn
7	Engine Room Hit: Roll one die; maximum speed reduced by 1 for that many turns
8-9	Turret Hit: One main turret lost
10-11	Flooding Hit: Roll die: on 1-2 speed reduced by one-half inch; on 3-4 by one inch and on 5-6 by 1.5 inches for rest of battle
12+	Magazine Hit: Roll on Magazine hit table
Modifiers	Firing turret 9" or smaller: -1; Target armor 4" or less: +2. Modified roll of less than 2 is considered to have no effect

Magazine Hit Table

Die Roll of 1-5: One main turret lost

Die Roll of 6: Magazine explosion, ship destroyed

Modifiers:

Target armor 10" or more: -1

Target armor 6" or less: +1

Firing range over 14,000 yds (28"): +1

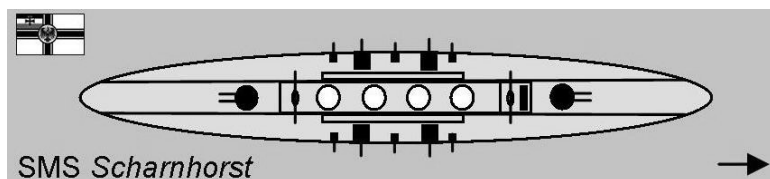
Gun penetration and damage table

Gun <i>Armor</i>	12"*** (double)	11"*** (double)	9"*** (double)	8"*** (double)	7.5"* (single)	6"* (single)	4"* (single)
11"	2400	-	3200	-	250	100	0
6"	3100	2750	4800	1700	550	400	50
4'	3500	3100	5800	2300	750	600	100
2"	5750	3900	6600	2800	1050	900	200

*If firing turret has double guns, damage points are doubled

** If firing turret has a single gun, damage points are halved

For example:



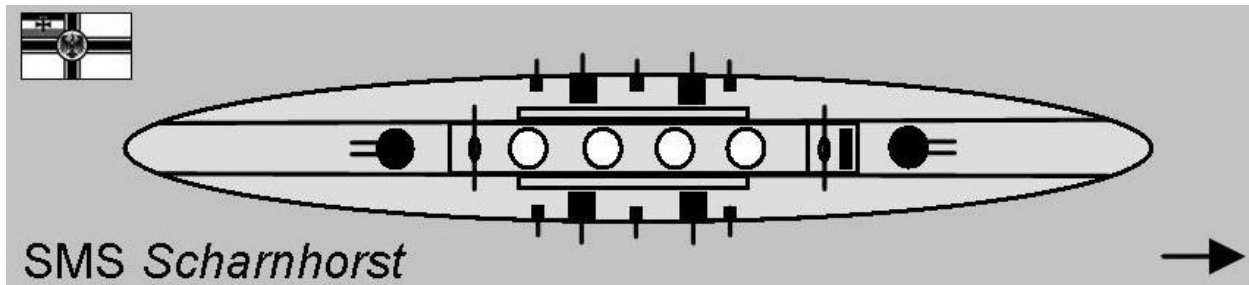
Hits by the SMS Scharnhorst fore and aft 8" turrets do 1700 points damage to HMS Canopus, which has 6" belt armor. Hits by the SMS Scharnhorst casemate 8" only do 850 points of damage because they are just single mounts. Hits by the casemate 6" do 400 points damage to Canopus.

Annex

NavTac Table of Ships

Name & Type	Displacement	Armor	Speed	Guns (range)	Turret Bearings			Damage Level Loss
					Bow	Broad	Stern	
<i>Goeben (BC)</i>	22,800	11"	4.5	10x 11' (42) 12 x 6" (28)	2 2	5 4	3 2	1900 lose a 6" 2500 speed -0.5 4500 lose turret
<i>Scharnhorst</i> <i>Gneisenau</i> <i>(AC)</i>	11800	6"	3.5	8 x 8" (32) (2 double) (4 single) 6 x 6" (20)	3 2	4 3	3 2	1600 speed -0.5 1900 lose a 6" 1900 lose a 8"
<i>Nurnberg</i> <i>(CL)</i>	3500	2"	3.5	10 x 4" (20)	4	5	4	300 lose a 4" 500 speed -0.5
<i>Leipzig</i> <i>(CL)</i>	3800	2"	3.5	10 x 4" (20)	4	5	4	300 lose a 4" 500 speed -0.5
<i>Emden</i> <i>Dresden (CL)</i>	3800	2"	3.5	10 x 4" (20)	4	5	4	300 lose a 4" 500 speed -0.5

+++++



Interpreting the *Fatal Choices* ship counters

Large black circle = Main turret (8.1" double)

Large black Square = Main casemate (8.1" single)

Small black square = Secondary casemate (5.9" single)

Large white circle = funnels

Arrow = bow, front of ship, direction of travel

Flag = Nationality (German)

SMS Scharnhorst = Ship name

British

Name & Type	Displacement	Armor	Speed	Guns (range)	Turret Bearings Bow Broad Stern			Damage Level Loss
Australia (BC)	18900	6"	4.5	8 x 12" (40) 16 x 4" (22)	2 2	3 8	2 2	1100 lose a 4" 2000 speed -0.5 4600 lose a 12"
Invincible Inflexible (BC)	17200	6"	4.5	8 x 12" (40) 16 x 4" (22)	2 2	3 8	2 2	1000 lose a 4" 1900 speed -0.5 4100 lose a 12"
Canopus (B)	13100	6"	2.5	4 x 12" (30) 12 x 6" (20)	1 4	2 6	1 4	1000 lose a 6" 2600 speed -0.5 6100 lose a 12"
Defense (AC)	14600	6"	4.0	4 x 9" (30) 10 x 7.5" (28)	1 2	2 5	1 2	1400 lose a 7.5" 1800 speed -0.5 6700 lose a 9"
Black Prince Duke of Edinburgh (AC)	13500	6" (9" are single)	4.0	6 x 9" (30) 10 x 6" (26)	3 1	4 5	3 1	1300 lose a 6" 1600 speed -0.5 2200 lose a 9"
Warrior (AC)	13500	6" (9" are single)	4.0	6 x 9" (30) 4 x 7.5" (28)	3 0	4 2	3 0	1300 lose a 7.5" 1600 speed -0.5 6700 lose a 9"
Good Hope (AC)	14200	6"	3.5	2 x 9" (30) (single) 16 x 6"	1 2	2 8	1 2	800 lose a 6" 2000 speed -0.5 6300 lose a 9"
Carnarvon (AC)	13500	6"	3.5	4 x 7.5" (28) 6 x 6" (20)	1 0	3 3	1 1	1600 speed -0.5 3300 lose a 7.5"
Monmouth Cornwall Kent (AC)	9,900	4"	3.5	14 x 6" (two double) (12 single)	2	9	2	700 lose a 6" 1400 speed -0.5
Glasgow Bristol (CL)	3600	2"	4.5	2 x 6" (20) 10 x 4" (20)	1 1	2 5	1 1	400 lose a 4" 400 speed -0.5 1700 lose a 6"
Melbourne Sydney (CL)	5500	2"	4.5	8 X 6" (26)	3	5	3	600 lose a 6" 600 speed -0.5
Otranto Macedonia (AMC)	12100	0"	2.5	8 x 4" (18)	2	4	2	1500 lose a 4" 2400 speed -0.5

APPENDIX 2: FEAR GOD & DREAD NOUGHT -- FATAL CHOICES

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USED WITH PERMISSION

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Chapter One - Introduction

This appendix is a special abridged version of Larry Bond's Fear God & Dread Nought game from his Admiralty Trilogy of rules sets covering naval warfare in the Twentieth and Twenty-first centuries. It has been included with Larry's gracious permission and assistance to allow readers of Fatal Choices to see *for themselves* how the various what-ifs of the historical campaign may have played out. To that end the rules have been purged of anything not related to the specific elements that bore directly on the events of late 1914.

Among the elements of naval warfare expunged from these abbreviated rules are anything having to do with aircraft, submarines, amphibious warfare, shore bombardment, mines, small craft and many other aspects of naval warfare. Readers interested in exploring those topics and other fascinating questions of naval wargaming and history are strongly encouraged to go to the Clash of Arms website at www.clashofarms.com and order the full Fear God & Dread Nought rules. The Form 10s in Annex C are fully compatible with the full game rules and include references to things such as anti-aircraft batteries that are not used in this abbreviated rules set.

I also encourage the reader to see Larry's extensive designer's notes where he explains the design philosophy behind the Admiralty Trilogy in detail, but a few extracted comments from his introduction seem appropriate: *The goal of the Admiralty Trilogy in general is to let players understand naval warfare as it evolved during the 20th century at the tactical (i.e., individual unit) level. Fear God and Dread Nought's goal in particular is to provide a workable system that shows how naval forces during the dreadnought era were employed and allow a player with little or no experience in naval combat to understand the basic principles of naval warfare, and to use those principles to expand his knowledge of this historic period.*

Fear God and Dread Nought keeps the details at a level appropriate for the player's role as a tactical naval commander. This lets the player to concentrate on decision-making and tactics. How should the screen be aligned? Should a light cruiser be detached as an advance scout? When should the line of battle be formed? The player gives orders appropriate to the units he is commanding and, as in the real world, must sometimes work with incomplete or faulty information.

Fear God and Dread Nought shows the player what kind of decisions must be made by a ship or formation commander during a WW I sea battle. It shows what information the commander has and how he uses it to make decisions. Most importantly, it allows the player to make decisions and to see the results.

All this makes FG&DN sound like a very serious simulation, but any wargame attempts to do this. We just want FG&DN players to understand that they can use the game not just to bash away at each other in a structured way, but to understand what happened out on the oceans of the world.

While we call FG&DN a game, there is no built-in play balance; it is more accurately called a simulation. The data are a reflection of historical weapons and equipment performance used with a game system that allows them to interact. Tactics useful in history will work in this simulation. Whether one player or the other will win 50 percent of the time, we can't say; that depends on the initial setup and the skill of the players, which is, after all, what it's all about.

Every player will learn some naval tactics while playing FG&DN. They will learn the relative value of naval units and how they work together. Players can reenact historical naval engagements and see what forces were at work, or try out hypothetical units which were on the drawing board to see if they would have been worthwhile. In the long run, players will be able to appreciate how a country's naval forces served its national interests.

But players do not have to understand naval warfare to play FG&DN. That understanding will come with experience as they play the game, seeing what works and what does not.

For the most part, changes made to the base FG&DN rules have been kept to the minimum possible. These are Larry's rules, not mine. Much has been removed simply because it had no bearing on the events surrounding Spee's saga. The main exception to that policy has been a substantive change to the rules on using torpedoes that aims to simplify this very complex subject while not ignoring it entirely. In the actual campaign that is examined in this book there were just two uses of a torpedo in combat and of those, the one that resulted in a hit involved a point-blank shot at a stationary and surprised target. I was tempted to ignore torpedoes altogether, but torpedoes loomed large in the tactical decision-making of World War I admirals and it seemed likely to lead to unrealistic decision-making by player-commanders if they were completely left out. While we know now – and the player will know from a look at the rules – that the actual threat from torpedoes against a maneuvering enemy in 1914 was pretty low, that was not so clear at the time. In order to recapture the contemporary fear of the torpedo the torpedo-firing player has been given the benefit of the doubt at certain points in the process that are not present in the main FG&DN rules. The chance of a successful torpedo attack are still very low given the limitations of the technology of the time and they will rarely be fired and will even more rarely have an impact on events.

Any errors in the abbreviated rules are mine and I want to thank Larry again for graciously allowing FG&DN to be used for this project.

I have retained the numbering system of the main FG&DN rules for ease of reference when making comparisons with the full rules, although this necessarily means that there are a lot of skipped numbers and missing sections.

Players are encouraged to use good sportsmanship, common sense and remember that the exercise is meant to be educational, not competitive. None of the battles examined in Fatal Choices were particularly "fair" fights and no attempt has been made to make them so. Admirals Cradock and von Spee had to play the hand they were dealt, so will you.

1.4 Game Scale. Fear God and Dread Nought uses a variety of scales to compress time and distance to make an individual game more manageable.

1.4.1 Turns. Two types of game turns are used. The Intermediate Turn represents 30 minutes, while the Tactical Turn represents 3 minutes.

1.4.2 Distance. Distance is measured in nautical miles (nm), the standard unit of distance at sea, or thousands of yards, often abbreviated as kyds (kiloyards). One nautical mile is about 2000 yards, or 6000 feet, just a little more than the 5280 feet of a standard (statute) mile. Fear God & Dread Nought uses a variable distance scale, but a typical scale is four inches equals one nm (1 inch = 500 yards). This is the smallest scale recommended for daytime surface engagements. Night engagements will require less room and, depending on the playing area, a scale of eight inches per nautical mile (1 in = 250 yards) may be possible.

Centimeters can also be used instead of inches for an even smaller scale. Since centimeter scales are always marked off in tenths, this can make measuring tenths of a nautical mile easy.

1.4.5 Speed. Speeds are given in knots (abbreviated "kts"; nautical miles per hour). One knot of speed allows a ship to move one nautical mile in an hour. A ship's speed in knots divided by two gives the distance the platform moves in one 30-minute Intermediate Turn. The speed in knots divided by 20 gives the distance moved in one three-minute Tactical Turn. In some cases, speed is given in terms of distance covered in one three-minute Tactical Turn. For surface ships, this allows the player to use the "Three-Minute Rule," a standard rule of thumb used by mariners throughout the 20th century.

1.5 Materials needed.

This special edition of the Fear God & Dread Nought rules set.

Kickstarter editions: One sheet of die-cut ship counters and markers. Also available through www.fatalchoices1914.com

Form 10s for the ships Involved in the scenario (see Annex 4) Photocopy before play.

Blank Tactical Log Sheets (see Annex 3)

In addition, the following materials are necessary: but not provided

Two ten-sided dice (D10).

Two six-sided dice (D6).

A flat playing area approximately eight by eight feet.

A tape measure. Distances are always measured from bridge to bridge of the ships in question.

Pens and pencils.

A pocket calculator is not absolutely necessary, but will speed game play.

Miniature ships (or counters) representing those chosen for the game.

1.6 Organization.

The Rules section is the heart of the FG&DN game system. It details how the game works, and how the ship data is used. It explains why the rules operate in a particular way, in relation to real-world conditions.

The scenarios are listed as sidebars in each chapter. Players have permission to photocopy these forms included in the book, specifically the Form 10s and Form 4, without restriction, for personal use.

1.7 Playing pieces. Miniature ship and aircraft models in 1/2400, 1/3000, and 1/6000 scale are ideal for FG&DN. Cardboard counters can be substituted for ship miniatures with no ill effect (except possibly an aesthetic loss). Kickstarter editions of the book include counters. They are also shown in Annex B and can be photocopied and cut out as needed. Die cut counters are also be available for order at www.fatalchoices1914.com.

Counters represent a single ship or a spread of torpedoes.

Other ship scales are possible. With a large enough ground scale and enough playing room, FG&DN can be played with 1/1250 scale ships. It is also possible to play FG&DN directly on paper or a map, dispensing with ship models altogether. In that case, carefully label the map to identify the ships' tracks.

Chapter Two - Game Mechanics

Fear God and Dread Nought (FG&DN) simulates history. Its rules should describe, within limits, how naval warfare worked in WW I. Tactics that worked in the war should work equally well in this game. As it is with reality, common sense is a valuable asset with FG&DN. Rules or rule interpretations that seem silly should be changed or ignored. The game should feel real to its players.

2.1 Preparing for Play. After a scenario has been chosen, the players need one *Form 10* for each ship. The ships to be used are listed in each scenario. The master copies of the *Form 10s* should be photocopied so that the originals remain blank for future games.

2.1.1.1 Basic Data. The first portion of the ship listing in the upper left of the *Form 10* provides basic data about the ship including its size, armor and maneuvering performance.

2.1.1.2 Damage and Speed Breakdown. The Form 10 lists the damage and speed breakdown as a percentage of damage taken which reduced the speed of the ship and has other game effects as noted in the rules. There is space to note any critical hits and the severity of fire and flooding and damage control efforts as specified in the rules. Players should note damage clearly for their own reference, but unless otherwise specified in the rules, the extent and nature of the damage taken is not revealed to other players on either side.

2.1.1.3.1 Searchlights. The number and arcs of the searchlights are listed in the upper right of the Form 10.

2.1.1.4 Weapons. Weapons are presented in the ship listing in a specific format which shows the weapon's firing arc, number of barrels/rails/tubes per mount, the number of mounts of that type on the ship, the weapon name, the ammunition available per mount, and any weapon director present. If more than one mount is present, the mounts are equally split between the available arcs. Similarly, if more than one director is present, they are split between the available arcs.

Some weapons, such as the Light Battery or antiaircraft guns, do not have firing arcs as their strength rating automatically includes arc limitations. Others have a special arc or cannot pivot.

2.1.1.5 Weapon Firing Arcs. Each weapon mount has an arc of fire. A weapon mounted forward may not be able to fire aft because part of the ship's structure blocks its fire. Some weapons may not be able to pivot, or the arc is limited by the weapon's ability to turn after launch. The arc which can be used by each weapon mount is shown in Annex E. If a target is not within the firing arc of a weapon, that weapon will not be able to fire at that target.

Some weapons can fire into more than one arc. If a gun mount can fire into both the Port Quarter and the Port arcs, its firing arc is described by combining the abbreviations with an ampersand (in this case, P&PQ).

A stroke (/) splits the arcs of multiple mounts: P/S(1)2 indicates that there are two mounts, one firing into the Port Arc and one into the Starboard arc. The parentheses refer to the number of tubes each mount has.

Example: P&PQ(1)1 indicates that there is one mount firing into both the Port arc and the Port Quarter. P&PQ/S&SQ(2)2 indicates that there are two twin-tubed mounts, one firing into both the Port arc and the Port Quarter, and one firing into both the Starboard arc and the Starboard Quarter.

During WW I, most secondary batteries were in casemate mounts. All casemate guns could bear to port or starboard as applicable, but only a few (usually one or two on each side) could also fire into the Bow or Quarter arcs.

FG&DN uses a Casemate or CM arc. A ship with casemate guns can only fire one or two of them into the bow or quarter arcs and all guns on that side into the side arcs.

2.1.1.6 Remarks. This has any pertinent Information about the ship not otherwise listed.

2.1.1.7 Communications. This lists the number of signal messages a ship can send and receive in a Tactical Turn. Also includes the range of the wireless telegraphy (W/T) sets that ship has on board.

2.2 Turn Sequence. In a fast-moving naval battle, many decisions have to be made quickly. If a commander lets the situation flow by, even for a few moments, he will get "behind the power curve" and never catch up. However, the events that trigger a battle require few decisions and are stretched out over a long time. Often the ships would be in sight for a considerable period while out of range of any weapons.

Fear God and Dread Nought is played with two different turns that divide time into fixed periods. The first is the Intermediate Turn (IT). Thirty minutes long, it allows ships to move long distances and close on opposing forces. Once one of the sides has detected the other and wants to react to that threat, play is switched to the three-minute long Tactical Turn (TT). Experience has shown that it takes about as much time to perform a Tactical Turn as an Intermediate Turn. Obviously, moving long distances in Tactical Turns would mean a lot of wasted play time. Using IT speeds up play by allowing the two sides to close quickly in "real" time.

The sequence of events for both types of turns is similar. The difference is in the distance moved. The Intermediate Turn simply allows units to move quickly into contact when there are no reactions or decisions to be made.

TURN SEQUENCE

Intermediate Turn (30 minutes)	Tactical Turn (3 minutes)
Plotting Phase	Plotting Phase
Movement Phase	Movement Phase
	Planned Fire Phase
Detection Check Phase	Detection Check Phase
	Reaction Fire Phase
	Resolution Phase

2.2.1 Turn Concept. All play in FG&DN is simultaneous. Both players plot their actions at the same time; they reveal their orders and move their vessels at the same time; they fire their weapons at the same time.

Each Turn (Tactical or Intermediate) is divided into phases. These divide the turn into specific periods when specific actions may be taken.

Turns should be recorded as game times. For example, the first Intermediate Turn might be at time 0100 (zero one-zero zero hours on the twenty-four hour clock). The next turn would be 30 minutes later, at time 0130, the one after at 0200, and so on. If two units moved into detection range during the 0130 Intermediate Turn, the first Tactical Turn would be 0130. The next would be 0133 then 0136, and so on.

2.2.2 Transition between Intermediate and Tactical Turns.

Unless the two sides start the game within gun range they should begin moving using Intermediate Turns. If, at the end of any Intermediate Turn's Detection Check Phase, one unit has moved within the gunnery range of another, the action is stopped. The units involved are then placed at the maximum range of the guns. The action then continues in Tactical Turns.

A player can invoke Tactical Turns any time during the Intermediate Turn. This reflects the fact that although time is passing in 30-minute chunks, a player can react within three minutes, the length of a Tactical Turn, to a threat.

Game play may alternate back and forth between Intermediate and Tactical Turns as is expedient.

2.2.3 Intermediate Turn Sequence. The following phases are executed by the players each Intermediate Turn.

2.2.3.1 Plotting Phase. Players write down (log) movement and other orders, usually standing orders, for their forces. These can be written as a simple movement order, as an order to move until some specific time, or until some condition is met. These are the kind of orders a task force commander gives. For example, he might order the formation to turn to a new course and speed. He might order it to change course and speed until 1500 hours, then return to its original course, or to move towards another ship at 20 knots until it is 60 nm away. These orders are executed in 30-minute Intermediate Turns until it takes less than a full 30-minute turn to reach the spot. At that time the formation will not keep going, but play will stop and the player may issue new orders, or extend the old ones.

2.2.3.2 Movement Phase. Units move a distance equal to 30 minutes of travel.

2.2.3.3 Detection Check Phase. Players check to see if there are any hostile units within detection range and resolve sighting attempts as per the rules. (see section 5.2.2). Play is then shifted to Tactical Turns if expedient.

2.2.4 Tactical Turn Sequence. The following sequence of phases is executed by the players during each Tactical Turn.

2.2.4.1 Plotting Phase. Players write down (log) movement, firing, and other orders for their forces. Players may plan fire for the upcoming Planned Fire Phase only against targets detected in a previous turn's Detection Check Phase. Any messages to be sent this turn are to be written down in this phase.

Plotting ahead (optional rule). If torpedoes are to be fired by surface ships, players should plot ship movement at least one turn ahead (the current and one more). This artificiality is required because opposing players may see each other plotting torpedo fire or placing markers down in the Planned Fire Phase, but the weapons do not move until the following Movement Phase.

2.2.4.2 Movement Phase. Surface ships and torpedoes move a distance equal to three minutes of travel. Torpedoes that reach their target in this phase have a chance to hit and inflict damage.

2.2.4.3 Planned Fire Phase. All weapons ordered to fire in the Plotting Phase are fired simultaneously. Surface gunfire is resolved immediately during this phase. Torpedoes are launched in this phase but they do not move until the next Tactical Turn, and their attacks are solved only in the Movement Phase.

2.2.4.4 Detection Check Phase. Players attempt to detect ships visually. A unit can react only to detected threats, even though the controlling player may be aware of others.

2.2.4.6 Reaction Fire Phase. Shipboard guns which have not been used so far this turn may now fire at any target, including ones just detected. Torpedoes may not be fired in this phase. Guns fired only in the reaction fire phase do half normal damage.

2.2.4.7 Resolution Phase. Die rolls for damage control and critical hits are made now.

2.3 Ship Size Classes. Many rules are based on the size of the ships involved. This includes maneuvering, detection and damage. To simplify things, ships are grouped into size classes. The rules will refer to size A, or size C, or so on. The ship class of each ship is listed on its Form 10. The classes that may appear in FG&DN Fatal Choices are:

SIZE CLASS TABLE

Class	Example Ship Types
A	BC
B	AMC, OBB, CR, Large Merchant
C	CL, Medium Merchant
D	DD, Small Merchant

2.4 Target Aspect. Gun and torpedo fire depend on the apparent aspect of the target. A bow-on battleship is a smaller target than a destroyer broadside to an observer.

Using the Target Aspect Diagram in the annex, players can decide whether they have a broad, quarter, or narrow aspect on the target. This affects their ability to hit the target.

2.5 Plotting Movement Orders. Since units move simultaneously, movement must be plotted ahead of time. For surface ships, players record course and speed, which cannot be changed during the turn. Any increase or decrease in speed should be checked against the ship's acceleration/deceleration ability (section 3.1.1). If the player wants the ship to steer evasively (section 3.1.4), he applies the modifier to figure out the ship's final speed over the water.

Direction and course changes can be written in any clear, consistent manner on the Form 4. It may be in terms of a destination ("Head for Horns Reef") or be based on another ship's movements ("Close on enemy battleship, turn to parallel its course at 1500 yards.") Remember to keep it simple and focus on the goal of the movement, not the process itself.

2.5.2 Torpedo Movement. Torpedoes move in each Movement Phase starting the Tactical Turn after they are fired. Torpedoes are moved like any other units, however, the firing player can invoke proportional movement if it looks like the torpedo has a chance of hitting (see Chapter 3 (3-1) and section 6.3.1).

If torpedoes are fired, or if it is expected that torpedoes will be used in a game, the players should plot their ship's movement one Tactical Turn in advance (the current and one more). If new units are detected or a ship suffers damage, the affected player can alter his movement plot at that time, writing a new set of orders for that Tactical Turn and the next one.

2.6 Command and Control. Command and Control (C²) is one of the most critical and yet least simulated areas of naval warfare due to its complexity and many variables. Yet it is the unique method and manner by which fleets at sea are operated to avoid chaos and achieve victory. C² covers two basic areas: Command - the organization or chain-of-command of forces at sea, and Communications - the processes and mechanisms that allow coordination of those forces. For the most authentic experience players should only command one ship at a time and all communication between players should be through the procedures listed later.

2.6.1 Command. Command structure and organization, essential parts of all naval operations, are scenario dependent and based upon the types and number of units involved. The number of players may also affect any command structure for each game, so let common sense and fair play be your guide. The basic unit for naval organizations at sea is the individual ship. Each organization level builds up from the ship based on groupings of ships by ship type, by mission or by scenario design. The main purpose behind organizing ships and establishing a chain-of-command is to minimize confusion and save time when coordinating action. Instead of a commander having to tell seven separate destroyers to attack the enemy with torpedoes, he simply orders the squadron to which the seven ships belong to attack. Each destroyer captain understands this means him and plots his movement to attack. The command structure should be clearly outlined at the start of each game so that each ship (and player) is identified in the organization. This is especially important for issuing orders and passing information. However, having a command structure also means dealing with the potential loss of command.

2.6.1.1 Loss of Command. One of the drawbacks to having a command structure is when that structure is broken or interrupted. If the ship carrying the organizational commander is sunk or loses the ability to communicate, then that organization has suffered a loss of command. This is true until either the next senior in command signals who is the new commander, someone in that organization sends a signal assuming command of the organization, or the current commander shifts to another ship and signals he is back in command. Until there is a functioning commander, that organization cannot operate as a unit. No new formation movement or coordinated attacks are allowed. The organization will act to carry out the last order given prior to loss of command. Ships may operate independently to attack if necessary, but any coordination must be done via ship to ship communications.

For example, if a ship carrying a flotilla commander is sunk, then that flotilla is temporarily not under command. Either the next senior in command must issue an order directing a ship to become the flotilla commander or one of the ships in the flotilla sends a signal assuming command of the flotilla. In either case, a signal must be sent telling the flotilla who is the new commander. This can delay the flotilla's ability to act at a crucial moment in the battle or fail to seize an opportunity. (Command succession could be covered in the standing orders to prevent this problem).

2.6.2 Organization. Different navies have used different terms for their fleet organizations as they developed. Large formations are made up of smaller ones that fit together like a floating jigsaw puzzle. Sometimes the same grouping of ships can be referred to in two different ways. The first is usually an administrative designation and the second intended for Fleet operations. In Fatal Choices all ships present in any scenario are members of a squadron, unless operating alone.

2.6.3 Formation Movement. Formation movements are the best reason for having a well-run command structure. A single order can shift an entire destroyer flotilla to cover a submarine threat or maneuver a battle squadron from divisional columns to a single battle line. Formation integrity is what makes a group of ships effective. It allows for concentration of firepower and mutual protection. Therefore keeping formations intact or maneuvering ships into a new formation can be critical to victory. A standard maneuvering procedure used by most navies was the simple “follow the leader” and used by ships in a column or line ahead. In this manner ships could keep their relative formation and the risk of collision was minimized. It also eliminated the need for additional communications. Often ships drifted into open columns so that they could see signals from the ship in front for course or speed changes, or tactical signals from the formation commander such as fire disposition or which enemy to engage. For FG&DN, the advantage of following the leader is that only the lead miniature or ship counter needs to be carefully moved on the playing surface. All other ships are then moved to maintain formation on the leader.

2.6.4 Formation Changes. (optional rule) Any formation other than a line ahead requires a signal to adjust the course and speed. This is because the column formation was the easiest (and safest) formation for traveling from point A to point B. Only when the tactical situation required a more advantageous arrangement, would ships shift from their formation. Tactics decided the best formation. If a signal for the course and speed is not received, a D10 detection die roll is required to detect the new course and speed of the guide. A 1-4 indicates only a change in relative position is detected, 5-7 the correct course is observed, and 8-10 the correct course and speed are estimated. Unfortunately, this may come too late if steaming in close formations.

2.6.5 Plotting Movement Orders. Using Communications Message Form (FG&DN Form 6), an organizational commander indicates the group(s) that need to maneuver, the desired movement and indicate time to begin the maneuver. When received, the ships being ordered plot their new courses and speeds to take effect as ordered. If following the leader, players can simply indicate “follow in wake of HMS Monmouth” or some manner that indicates which ship they are following. If maintaining a relative position to a guide ship, then indicate the bearing and range to be maintained and place the ship appropriately. When executing plotted orders, they are to be followed as written. Even if the order seems wrong, orders must be obeyed. For example, in the 1920s, a division of U.S. destroyers was operating off the coast of California in column formation. The order was given to change course and turn . . . towards the shore! Seven of the eleven ships turned together as ordered and went aground. The commanding officers who followed the lead ship ashore were acquitted. While blind obedience to orders may seem unnatural to those unfamiliar with naval tradition, the man in command usually is presumed to have better information and more experience. That makes his decisions, by definition, the best. Besides, failure to obey usually results in the end of a career – yours.

2.6.6 General Orders. Good communications is essential for victory at sea. Having a common understanding of what those signals mean is just as important. The common reference for all ships and commanders is known as “General Orders.” These are issued by the admiral and his staff, and are meant to ensure that the same order means the same thing throughout the fleet. General Orders provide instructions or guidelines ranging from very specific directives to general guidance. Players should take advantage of using general orders to establish who will do what when the enemy is encountered. This saves time and effort spent on sending signals telling others what to do. A simple signal to “execute Plan A,” is far easier than sending a lengthy message to all three light cruisers to form a scouting line 5 nm in front of the formation with 2 nm between ships. The Royal Navy Grand Fleet Battle Orders used two-letter flag combinations to quickly communicate different tactics and formations.

2.7 Communications. Communications is crucial for the coordination and execution of naval warfare. Scouts must report back what they have discovered to the Fleet Commander to act. Likewise, Fleet Commanders must tell the fleet when to deploy. Proper execution depends on accurate communications between various units. There are many systems and methods that have been developed to make this occur, but FG&DN has broken these down into two functional areas: Visual Signals (2.7.1) and Electronic Signals (2.7.2). The term “signal” indicates the method and manner of communicating. The term “message” refers to the content of any signals. All messages are drafted during the Plotting Phases of either the Intermediate or Tactical Turns and sent or received during the Detection Phase. The signaling method determines how long it takes for the message to be read and understood. The specific mechanics of communicating is found in section 2.7.3, Communications Procedures.

2.7.1 Visual Signals. Until the development and use at sea of wireless telegraphy and radio telephony, all communication between ships was accomplished by visual means. In FG&DN, visual signals are organized into Flag Hoist, Signal Lights, and Rockets or Flares. Each method has its own benefits and drawbacks.

Flag Hoist is reasonably fast and the most comprehensive form of signaling. Because it relies on code books to translate the signal into message content, Flag Hoist is reasonably secure. Since Flag Hoists are readable by several units at once and the process uses the up and down motion of the flags to coordinate action, Flag Hoist is best for group communication.

Flashing Light is the most secure method because it is normally readable only by the unit at which the light is aimed, and can be encoded as well. But Flashing Light requires each character to be sent individually, and if there are questions or problems, repeated by the receiver. Flashing Light is normally the backup to Flag Hoist except at night, when it is the primary signaling method.

Rockets and Flares are the fastest means of signaling and readable by several units at once, but are limited in the number of messages they can convey and have limited security since anyone can see them. For FG&DN, Rockets and Flares are used for emergency signals only.

The number of visual signals a ship can send or receive during a turn is determined by equipment and personnel on board. The number of signals a ship can process per Tactical Turn is shown on its form 10. If a ship carries a command staff on board, they provide additional personnel to send and receive one more signal per Tactical Turn. Kyds equals 1,000 yards, half a nautical mile or two inches in standard scale.

VISUAL SIGNALS RANGE TABLE (Kyds)

Visibility	Flag	Day Flash	Night flash
100%	8.0	16.0	26.0
85%	6.8	13.6	22.1
75%	6.0	12.0	19.5
60%	4.8	9.6	15.6
50%	4.0	8.0	13.0
40%	3.2	6.4	10.4
25%	2.0	4.0	6.5
10%	0.8	1.6	2.6
5%	0.4	0.8	1.3
2%	0.2	0.3	0.5

2.7.1.1 Flag Hoist. The signal flags used for Flag Hoist signals are large cloth flags and pennants (approx. 3-4 feet in length), each with a unique meaning; the letters of the alphabet, numbers 1 through 0, and several special purpose flags and pennants. The flags and pennants are displayed on signal hoists, which are lines suspended from various yardarms down to the signal bridge. Each navy had its own code or signal book which defined what each signal meant, in addition to international versions for common communications. In FG&DN, the Flag Hoist process has been simplified to avoid the need for these massive signal books. The number of signals a ship can hoist and relay depends upon the number of actual hoists and signal personnel aboard, both of which are based on the size of the ship. The Form 10 shows the number of Flag Hoist signals a ship can hoist or relay in one turn. Sending a Flashing Light signal at the same time will reduce the number of possible Flag Hoist signals by one, and a ship is always allowed one rocket or flare signal.

The detection ranges for reading a Flag Hoist signal are shown in the Visual Signals Range Table. These ranges are affected by the same factors that affect visual detection found in section 5.2.2.1 Because the angle of the signal flags, as well as smoke from stacks and gunfire, sometimes obscured the Flag Hoist signal from the intended recipient, relay ships were often stationed to make sure that signals were successfully passed from one ship to another. To read a Flag Hoist signal, a ship must be within the Broad or Quarter Aspect of the ship displaying the Flag Hoist. (See section 2.4 for the Aspect Diagram.)

2.7.1.2 Flashing Light. Flashing Light signals are sent by the light sets similar to search lights and have a limited range. The daylight and nighttime ranges are listed in the table on page 2-12. Because of the limits of signal personnel and equipment, only one Flashing Light signal may be sent per side (port/starboard) at a time.

2.7.1.3 Flares, Rockets and signal guns. Flares, Rockets and signal guns are used for emergency signals and have a detectable range equal to Flashing Lights. To prevent confusing several signals, only one flare/rocket signal can be sent at a time.

2.7.2 Electronic Signals. With the advent of Wireless Telegraphy (WT) and Radio Telephony (RT), naval communications changed drastically. The span of control greatly increased as commanders could now communicate with ships and aircraft out of visual sight and shore commands could contact Fleet units at sea. Wireless Telegraphy was Morse code or dash-dot communications. Radio Telephony was voice communications, but it was not yet available in 1914. WT was the primary method of electronic signaling.

2.7.2.1 Range of WT/RT. The range of WT/RT depended greatly on the frequency and power of the transmission, which was determined by the type of transmitter used, as well as the receiver at the other end of the signal. The range of a ship's Wireless is shown on its Form 10. Shore sites have a range of 1,800 nm.

2.7.2.2 Jamming of WT/RT. One way to prevent an enemy from communicating with WT or RT was to broadcast a continuous signal on the same frequency so that the receiving set could not separate the intended signal from the radio "noise." This is called jamming. To jam an enemy's radio, a ship must transmit a constant signal. However, a radio/wireless set being used to jam cannot be used to send a message at the same time. During the early years of radio, jamming was not as successful as had been anticipated. The chances of successfully jamming an enemy's signal depended upon proximity to the receiving radio set. The base chance for successfully jamming a signal is 25%. This is modified by the distance of the sender to the receiver and the jamming set to the receiver. Subtract the two distances in nautical miles from one another. If the jamming set is closer, then add the difference to the base 25%. If the sending set is closer, then subtract the difference from the base 25%.

Example: A jamming radio is 25 nm from the intended receiving station and the sending unit is 50 nm from the receiver. This adds 25 to the base 25% for a total chance of 50% successfully jamming the signal.

Inadvertent jamming can occur when three or more ships in the same formation attempt to send signals during the same Tactical Turn. Each ship has the same 25% chance of jamming the other's signals.

2.7.3 Communications Procedures. Using the Communications Message Form, fill out the message to be sent and indicate the signaling method used. Be sure to note the range between units to check against visibility conditions or in cases of attempted jamming.

With the exception of Flag Hoist signals, relaying a signal adds one Tactical Turn to receipt of any message. The base chance to correctly read any signal (within range) is 80%. All visual signals are affected by the visibility modifiers found in section 5.2.1.1 Flag Hoist signals are also affected by the bearing of the observer to the angle of the flag and must be in the broad or quarter aspect. Relayed signals must be correctly read to be properly sent on to the intended recipient.

Example: During Turn 0909, HMS Good Hope drafts a tactical message during the Plotting Phase for HMS Glasgow to "Scout ahead of formation." The message is sent by Flag Hoist. HMS Glasgow is within visual range and during the Detection Phase of Turn 0909 receives the message. A die roll of 32 indicates HMS Glasgow can read the message. Movement orders can now be rewritten during the Plotting Phase of Turn 0912. During the Movement Phase of Turn 0912, HMS Glasgow changes course and speeds towards her new destination.

SIGNALS PROCESSING CAPABILITY TABLE

	Send	Receive	Understand	Relay
Flag	T1 Det.	T1 Det.	T2 Plotting	Same Turn
Flash	T1 Det.	T1 Det.	T2 Plotting	+1 Turn
RT/WT	T1 Det.	T3 Det.	T4 Plotting	+1 Turn

Chapter Three - Ship Movement

Ships and torpedoes move in the Movement Phase of the Intermediate and Tactical Turns.

Proportional Movement. Since miniatures may move several inches on the playing surface in the course of a single Movement Phase, if their paths cross it may be hard to tell if two units pass close to each other. This is important if there is a chance of two ships colliding, ramming, torpedo attacks, or other special situations.

To see how closely two units approach each other, move the involved units first in small steps. The standard Tactical Turn of three minutes is broken down into three one-minute segments, each step being one-third the length of a regular move.

Any player may invoke proportional movement to resolve a possible movement conflict after all movement for a Turn has been plotted.

If the players wish, they may use intervals of less than one minute for proportional movement. If one or both of the units are at high speed, a one-minute interval may not show their positions clearly enough. In that case, use 30 seconds, or some other convenient time period.

Proportional movement can also be applied to an Intermediate Turn, with the forces in question moving at intervals of five, ten, or fifteen minutes, as the players or referee desire. The goal is to allow exact measurement of the distances between units with the fewest steps.

3.1 Ship Movement. Ships have a maximum speed listed on their Form 10. This can be reduced by damage received in combat. Ships may move at any speed up to the maximum speed available to them. This may be limited by sea state.

When a ship is damaged, look at the Damage and Speed Breakdown Chart on the Form 10. As it accumulates damage, a ship's speed is automatically reduced. Each 25% of its maximum damage reduces a ship's speed by 25%, until it reaches 90% damage, when its speed is zero (it is "dead in the water"). The ship sinks if it reaches 100% damage.

3.1.1 Speed Change. Players order speed changes in the Plotting Phase of a Tactical Turn. The amount of acceleration or deceleration is limited by the size of the ship, and for acceleration, its starting speed must also be considered. A ship will automatically accelerate during a turn to try and maintain its speed unless specifically ordered not to do so.

A ship can move from a dead stop to half of full speed quickly, but above that water resistance increases greatly and the rate of acceleration is less. Acceleration rates are listed on the Form 10. For simplicity, speed changes ordered in the Plotting Phase of a 30-minute Intermediate Turn are assumed to happen immediately.

3.1.2 Astern. Maximum speed astern for any surface ship or submarine is half its maximum speed forward. The maximum astern acceleration rate is one half of the ahead value. Deceleration rates are unchanged.

3.1.3 Course Changes and Turning. Ships need a minimum distance to turn. Called "advance," it is the distance the ship moves in the original direction as the rudder bites and the ship starts to change direction. Large ships need more space than small ones.

In many cases, such as maneuvering in open water, advance distances will not be an issue. At other times, such as at slow speed or in restricted waters such as Port Stanley, the exact amount needed will be very important. The Ship Turning Distance table lists the advance for each ship by size class for both a Standard and Hard rudder. Most turns are made with Standard rudder, but in emergency situations it can turn a little tighter by "putting it over to the stops." There is a risk of the rudder jamming, though, 5% (5 or less on a D100). If it does jam, treat it as a Rudder Critical Hit. The ship continues to circle in that direction until the Critical Hit is fixed.

Unless otherwise plotted, all turns are assumed to use Standard rudder.

To turn, first move the ship the required distance, based on its size class and the rudder used, then pivot it in place up to 45 degrees. A turn greater than 45° must be made in steps of 45° or less. There is no reduction in the distance required for a turn of less than 45°, except that adjustments of 10° or less per Turn do not need to be accounted for.

Even if a ship has moved in a straight line for several turns, the player must still move it the stated distance in a straight line before beginning a turn. Advance is the distance the ship moves along its original course line after the rudder is put over. If a player knows ahead of time that he will turn in a particular spot, and there is sufficient maneuvering room, he can order the turn then, and the ship will be allowed to make a turn at the start of its next Movement Phase.

When a ship turns, it significantly increases the drag forces it experiences and the ship will slow down. For every 45° turn made, there is a speed loss depending on the rudder angle and ship's size. This loss is listed in the Form 10 and is applied for each 45° turn up to a maximum of four times. Beyond the fourth 45° turn the ship has reached its new steady state and will not experience any additional speed loss.

In most cases, the speed lost will be regained within one or two Tactical Turns, unless the ship makes a large course change.

Example: A battle cruiser (size class A) is moving at 10 knots trying to leave Port Stanley. It covers 1,000 yards in a three-minute Tactical Turn. At the beginning of the Turn, in the Plotting Phase, the player writes that he wants to change course 90° to the left, using standard rudder. In the Movement Phase, he figures out the speed made good through the turn by subtracting the speed loss per 45° turn and adding the acceleration rate. Taking the ship's initial speed of 10 knots, the player subtracts 6 knots for the two 45° turns and adds 3 knots for his acceleration rate (halved during a turn) for a modified speed of 7 knots. Thus, the ship covers only 700 yards in the Tactical Turn. The player then moves the battle cruiser 300 yards, pivots it 45°, moves it another 300 yards, pivots another 45°, and moves a final 100 yards.

In the above example, the amount turned and the distance traveled was critical because of the ship's slow speed and the tight confines of the harbor. In cases such as these, the table becomes critical. At higher speeds or in the open ocean, a ship can maneuver more freely.

3.1.4 Evasive Steering. Ships that want to become harder surface gunfire targets can steer irregular courses, or "chase salvos." By turning toward the shell splashes from the last enemy salvo, a ship can throw off the enemy's gunfire corrections. It is not foolproof, but it does help.

Of course, the rapid, unexpected turns also throw off the maneuvering ship's gunners as well, and ships steering evasively cannot fire torpedoes.

Rather than try to model every twist and turn of a ship in the water, a ship that wants to maneuver evasively just plots it and declares it during the Movement Phase. The ship moves normally, but covers only 75% of the distance it normally would. The distance lost is due to steering to the left and right of the base course, and the speed loss caused by all the turns.

A ship must have a current speed of 20 knots or more to steer evasively. Speeds slower than that do not give the ship enough maneuverability. Ships of size class B or smaller except for pre-dreadnought battleships can steer evasively. Larger ships (size class A) are not maneuverable enough to use the tactic effectively. While a ship is steering evasively apply modifiers according to the Gunfire Hit Chance Modifiers Worksheet in the annex.

3.1.5 Effects of Weather. As the action of wind and weather increases the wave height, a ship pitches and rolls. If the weather is severe enough, the ship starts to "pound," part of its length leaving the water as a trough passes and then crashing into the next wave. The shock can damage steering gear and even buckle hull plates in severe cases. It also means a rough ride for the crew. Sea State can also affect casemate guns on some ships. See their Form 10s for effects.

As the sea state increases, ships must slow down to prevent pounding. If the weather gets rough enough they must "heave to," turning to keep their bows to the wind and slowing to bare steerageway (3-5 knots). Combined with a strong wind pushing the ships, they are essentially stationary.

Check the Sea State/Speed Table to see how fast a ship can go in any sea state. Cross-reference the ship's size class with the sea state. An "M" means that the ship can move at maximum speed. An "H" means the ship must heave to. A fraction - 3/4, 1/2, or 1/4 means that the ship may move at no more than that much of its maximum speed. Engineering casualties or battle damage may already restrict a ship's speed, but the fraction of a ship's speed for weather effects is based on its original, undamaged speed.

SEA STATE / SPEED TABLE

Sea State	Ship Size class			
	A	B	C	D
1-3	M	M	M	M
4	M	M	M	3/4
5	M	M	3/4	1/2
6	3/4	3/4	1/2	1/2
7	1/2	1/2	1/2	1/4
8	1/4	1/4	1/4	H
9	H	H	H	H

M = Maximum speed, no restrictions
H = Ship must heave to.

3.3 Torpedo Movement. Torpedoes are fired in the Planned Fire Phase, after movement for the Turn is completed. When fired, place two counters next to the firing ship. One marks the torpedoes' starting position, the other is for the torpedo salvo itself. The torpedo salvo marker is not moved until the following Movement Phase.

In the Tactical Turns following the launch, the torpedo salvo marker is moved in a straight line toward the target selected by the firing player (within firing arc limits) while the torpedo firing marker is left at the origin point in order to calculate the range of the run. Counters can be used to show the location of torpedoes on the way to their targets. Torpedo speeds are listed on the Form 10.

3.3.1 Speed. Some torpedoes have several speeds listed. Slower speeds give the torpedo a longer range. Any available speed may be chosen at the time of launch. It cannot be changed once the torpedo is launched.

3.3.4 Range. Form 10 lists the range for each torpedo. If a torpedo reaches maximum range without hitting anything, it runs out of fuel and stops without exploding

Minimum arming range for all torpedoes is 300 yards. If one is fired at a target inside that distance, it will not arm and will therefore not explode if it hits a ship.

3.4 Collisions and Ramming. Whenever two ships not engaged in towing pass within 250 yards (.25 kyd or 0.125 nm) of one another, there is a risk of collision.

3.4.1 Resolution. Whenever there is a risk of collision, look at the Collision table and Roll D6. Players must declare before the die roll if they are attempting to ram or avoid a collision. No declaration means they are attempting to avoid a collision.

If the result, including modifiers, is a 6 or more, then a collision has occurred. Both ships have their speed reduced by 25%, and if one ship is larger, the smaller ship's by 25% for each difference in size class.

3.4.2 Damage. When a collision occurs, each ship inflicts damage on the other based on its size. A bigger ship inflicts more damage on the other vessel than a little ship.

Roll D6 for each ship and consult the right-hand column of the Collision Table. Each player takes the percentage he rolled and multiplies it times the original damage point value for his ship. This is the number of damage points he inflicts on the other vessel.

Resolve the damage normally. If any critical hits result, they are rolled on the torpedo damage column of the Critical Hit Table (Section 8.1). Damage results are applied immediately (that is, during the Movement Phase).

Die roll modifiers for collision damage:

- For each point of belt armor less than the other ship, reduce the percent damage inflicted by one. For each point of belt armor more than other ship, increase the percent damage inflicted by one.
- A ship making a bow-on ram (within 30° of perpendicular impact) reduces the damage it suffers by half. A glancing blow (an angle 30° or less between the ships' courses) halves the damage for both ships.
- Add 1% to the damage percentage for both ships for each knot of relative speed. To find out the relative speed, add the two speeds if the two bows are pointed toward each other, subtract the lower from the higher if the bows are pointed in the same direction, and use the higher of the two speeds if it is a bow-on ram.

The minimum damage inflicted on a ship is 5% of the damage points of the vessel it collides with.

Example: HMS Invincible successfully rams SMS Leipzig in the side, so it will be a bow-on ram for the battlecruiser. The relative speed was 15 knots. Invincible's damage point rating is 371; the Leipzig's is 97. The battlecruiser's belt armor rating is 14, the cruiser's is 4. Invincible's player rolls D6 and gets a 2, or 15%. This is modified by the armor difference (+10) to 25%. Leipzig's player rolls D6 and gets a 4, or 25%. This is modified by the armor difference (-10) to 15%. Invincible inflicts 25%+15% (for speed) of 371 or 148 damage points on Leipzig, enough to sink it. The cruiser inflicts 10%+15% (for speed) of 97 points or 24 points, halved because Invincible rammed with its bow (12 damage points).

COLLISION TABLES

D6 Roll	Collision Result	D6 Roll	Ship Damage
1	No Effect	1	5%
2	No Effect	2	15%
3	No Effect	3	20%
4	No Effect	4	25%
5	No Effect	5	30%
6	Collision	6	40%

Die Roll Modifiers for chance of collision. The modifiers on this table are cumulative:

Per Small size ship involved (Size class D)	-1
Per Large size ship involved (Size class A)	+1
Per ship deliberately attempting to ram	+2
If Bridge critical hit and attempted ram	-1
If Bridge critical hit and attempted avoidance	+1
If one ship attempts to ram a stationary ship	+3
Per ship over 20 knots attempting to ram	-1
Per ship over 20 knots avoiding collision	+1

Chapter Four omitted.

Chapter Five - Detection

5.1 Sensor Basics. Sensors were extremely limited in capability and diversity during and after World War I. Even by 1924, most warships received virtually all of their information on potential targets from lookouts and optical range finders. A very few ships were equipped with an early radio direction-finding system.

Passive sensors detect energy (such as sound) given off by the potential contact. They will, at the very least, alert a ship to the presence of another vessel and could also give a direction, but not distance. An active sensor sends out energy, which is then reflected from the target back to the sensor. This provides the detecting ship with both direction and range to a target. Radar is a good example of an active sensor, as is active sonar. Throughout WW I, all sensors used by warships were passive.

5.1.1 Types of Sensors. Military sensors today use the full spectrum of electromagnetic and acoustic energy to gather information. This can be noise from a ship's screws (sound waves) or reflections of radar energy off a ship's hull (electromagnetic waves). In WW I, ship sensors were restricted to those portions of the electromagnetic and acoustic spectrums that the human senses were capable of seeing and hearing. This limitation, combined with the lack of electronics to amplify weak signals, resulted in restricted detection ranges.

5.1.2. Sharing Sensor Information. For game play purposes, information about a target's location gained in the Detection Phase of a Tactical Turn is known only by the detecting unit. In this early age of wireless, passing contact data on to other ships could take five minutes or more. While visual signaling was usually a little quicker, it was restricted to very short ranges.

Unlike the other Admiralty Trilogy games *Command at Sea* and *Harpoon*⁴, where these "command and control" issues are largely assumed to occur automatically, in *FG&DN* they must be accounted for. Section 2.6 *Command and Control* provides the procedures to prepare, send, and react to signals.

5.2 Visual Detection. The human eye, aided and unaided, was the most widely used sensor in WW I.

5.2.1 Weather Effects. The distance someone can see is affected by the light (day or night) and the weather (haze, rain, or snow). The Sighting Conditions Table shows how range is reduced by various conditions.

5.2.1.1 Sighting Conditions. There are four categories: Clear Day, Clear Night, Day Precipitation, and Night Precipitation. Days and Clear Night are modified by weather, Clear Night is also modified by the phases of the moon. Night Precipitation is not modified by the moon since the clouds obscure it.

SIGHTING CONDITIONS TABLE

% Visibility	Day	Night Moon	Day Precip	Night Precip
100	Unlimited			
85	Unlimited			
75	V Clear			
60	V Clear			
50	Clear	Full		
40	Clear	3/4		
25	Lt Haze	1/2		
10	Haze/Lt Fog	1/4	Light	
5	Thick Fog	New	Interm	Light
2	Dense Fog	Heavy	Intm-Hvy	

The sighting range will be provided in the scenario description, or can be determined based on the existing conditions. For example, on a clear night with a half moon (25% visibility), the average sighting distance to a darkened ship is 6-9 kyds. This will be reduced or increased by events during the battle. For example, gun flashes at night increase surface-to-surface and air-to-surface visibility by two tables (25% surface visibility would be increased to 50%). These modifiers are listed in the Visibility Variation Table on page 5-5.

Sighting ranges are further modified by a "sigma," or variation. This represents not only local variations in the sighting conditions, but differences in the performance of the lookouts themselves. The amount of variation changes depending on the sighting conditions and is shown at the top of each sighting range table (page 5-9). For example, with 100% surface visibility, the sigma is 6 kyds, meaning that the sighting range will actually vary by ± 6 kyds from the value in the table. This is rolled on the Visibility Variation Table when a player attempts to detect something visually.

If a player is using more than one table use the same D10 roll for the Sigma on both tables. The die roll represents the variation in sighting conditions immediately around the unit that Tactical Turn. It will vary from one turn to the next, and must be rerolled for each unit each turn it attempts detection.

The procedure for making a visual detection is described in section 5.2.2.

5.2.1.3 Squalls. Intense local rain or snow storms can block visibility. Visible from many miles away, they are a cluster of cumulus clouds with a solid curtain of rain or snow hanging beneath them. They can be present at any time of the day or night.

If squalls are present, represent them with circles of paper or plastic 6 kyds (3 nm) in diameter. Within the circle, because of heavy precipitation, the visibility will be either Intermediate (1-7 on D10) or Heavy precipitation values (8-0 on D10). Write the visibility distance on the circle, or use two different colors to represent the difference.

Normal squall activity can be represented by 3D6 circles. There will be 2D6 circles for light squalls, and 4D6 for heavy squall activity.

Scatter the circles randomly over the playing area (dropping them from about three feet over the table works well). As the game progresses, move them with the wind, at the same speed and in the same direction.

5.2.2 Making Detections. Players trying to see another unit must find out if it is in visual range. If it is, detection is automatic.

Visual sighting range depends on the sighting conditions (weather and light). Sighting ranges are either expressed in thousands of yards, or as a percentage of maximum. Maximum sighting range against a ship is 40 kyds (20 nm) for another ship.

Detection is checked from a unit to an enemy formation or group of units, not to each individual unit in a formation. The human eye, once cued to a location, can easily detect nearby units, and sighting conditions to each unit in the formation are usually identical.

For ship formations, test detection to the nearest ship of a formation. If it is spotted, all the ships within sighting range are seen. This may be all of the formation, or just part of it.

5.2.2.1 Sighting from Ships. The farthest sighting range for a ship is affected by its “height of eye,” the distance of the observer above the water. The higher the observer, the greater the visual horizon.

This horizon is reduced by the sighting conditions to give the effective range in the existing sighting conditions. The Surface-to-Surface Sighting Range Table includes the modified horizon distances.

In the Detection Phase of a Tactical Turn, when a player wants to have one ship or group of ships try to see another ship or group of ships, they should first find the maximum line of sight on the appropriate Surface-to-Surface Sighting Range Table for the existing conditions, then roll D10 for the variation and apply it to that sighting range.

Example: A battle cruiser (size class A) attempts to see an armored cruiser (size class B) on a clear night with a half moon (25% visibility). On the Surface-to-Surface table for 25% visibility sighting conditions, base range between two units of that size is 9,500 yds. The sigma for 25% visibility is ±2 kyds. Rolling D10 on the 2 kyd line, the player gets a 2, or -1 kyds, so the maximum range that the battleship can see the cruiser in that Tactical Turn is 8,500 yards. If the actual range is less than or equal to this, the battleship can see the armored cruiser and any other size class B ship or larger inside that radius.

If the armored cruiser was firing, increase the visibility by two tables (from 25% to 50%). This changes the base range from 9.5 kyds to 19.0 kyds and the sigma from ±2 to ±3 kyds.

5.2.2.4 Sighting Torpedo Launches. All torpedoes in Fatal Choices are from submerged tubes and are not detectable at launch.

5.2.2.5 Sighting Torpedo Wakes. Torpedo wakes could be detected by alert lookouts, sometimes in time for the ship to maneuver to ‘comb the wake’ of the incoming weapons. During WW I this was the only way to detect an incoming torpedo attack if the launch was not spotted.

Torpedo wakes are detectable as shown on the Sighting Range Table in the annex, but with no visibility variation. Since all torpedoes in the dreadnought era used compressed air or steam propulsion, the chance of seeing it is:

In daylight:	20%
Visibility 40% or less:	15%
Visibility 25% or less	10%

Torpedo wakes cannot be visually detected in Sea State 5 or greater.

If an attacking torpedo is detected, the target ship is allowed to disregard its plotted movement and maneuver freely in the following Movement Phase.

See section 6.3 for the rules on attacking surface ships with torpedoes.

5.2.2.6 Sighting in Intermediate Turns When moving ships in 30-minute Intermediate Turns, use unadjusted ranges only, without any die roll variation. This speeds play considerably and over the course of 10 Tactical Turns the die rolls average out.

5.2.2.7 Identifying Visual Contacts In normal play, ships that have been spotted visually are immediately identified by class. In reality, and especially in the heat of battle, ships were often misidentified by class, by type, and sometimes even by nationality. A full set of rules for classification would slow play, but as an optional rule for a quick test in refereed games, roll D10. If the roll is:

- 2 or more: Correct type (Battleship, cruiser, etc.)
- 4 or more: Correct nationality
- 7 or more: Correct class.

Modifiers to the die roll:

Visibility less than 25%	-4
Visibility less than 40%	-2
Observer under fire	-2
Contact firing	+4
Distance to contact more than 50% Visibility Range	-2
Distance to contact less than 25% Visibility Range	+2

Example: A player detects a B-size ship approaching at night, in 25% visibility. The detecting player’s ship is C-size and the range is 7.0 kyds. Neither ship is firing. Rolling D10, he gets a 5. The adjusted number is 5 -2 (visibility < 40%) -2 (7 kyds > 4.4 kyds: 50% visibility range) = 1. No identification is possible. Referee reports "a ship."

Next turn, the two ships close so that they are at a range of 4.2 kyds. The unknown ship also opens fire, at least confirming its identity as an enemy. The sighting player rolls D10 and again gets a 5. This time the adjusted roll is 5 -2 (visibility < 40%) +4 (contact firing) = 7. The ship is correctly identified by class. Referee reports "a Scharnhorst-class armored cruiser."

5.2.2.8 Sighting Ships and Miniatures Play. Until a ship is sighted by the enemy, use a counter to mark its position. Dummy counters can be used to confuse the enemy about the number of units present. Once the ship is sighted, replace it with a counter showing the general type of the ship, e.g., destroyer, battleship, or whatever. When a ship is correctly identified by class, replace the counter with a miniature, or a counter showing the actual ship.

5.2.5. Smoke Effects. Smoke in WW I was both a blessing and a curse. It could be used defensively to obscure a target and reduce its chance of being hit during an attack. Smoke from one's own guns could be just as much of a nuisance, depending on the wind. And finally, stack smoke often revealed a target's presence because of the vast quantities of smoke produced.

Visibility in or through a dense smoke screen is reduced to 1,000 yards (.5 nm) in the daytime and 500 yards (.25 nm) at night. On the last turn that the smoke exists, it is dissipating and the surface visibility is reduced to 1/4 of the unobstructed visibility.

If a ship moves into smoke during the Movement Phase, and ends the phase within the smoke, it may still be fired on if it spent at least half of its movement outside the smoke. If the ship is obscured for more than half, but not all of the turn, all gunfire suffers a -20% dead reckoning penalty for that turn only. This is 2/3 of the normal blind fire modifier, since the ship's location was known before it became obscured. If the ship remains hidden on the following turns, it can't be fired on at all.

5.2.5.1. Shipboard Smoke Screens. These can be created in any Plotting Phase. In the Movement Phase of that turn, a ship will leave a smoke screen in its wake. The smoke screen can be turned on or off each Tactical Turn as the player desires. The smoke screen will remain for four Tactical Turns (in winds of less than 5 kts), then disperse.

Reduce this time by one turn for every 10 knots of wind. (e.g., If it is from 5 - 15 knots, it will last three turns. If the wind is 16 - 25 knots, the smoke screen will only last two turns). Smoke is removed in the Plotting Phase of the turn in which it disappears.

5.2.5.3 Using Smoke for Detection. On relatively calm days, ships can detect stack smoke from other ships beyond the horizon. Merchant ships were frequent "smokers." Warships, because of better training, equipment, and a desire to avoid detection, tended to emit less smoke, except at high speed.

If the wind is less than 20 knots, roll for each surface ship each 30-minute Intermediate Turn. A merchant ship has a 70% chance of emitting heavy smoke, and if at 75% or more of its maximum speed, it automatically does so.

Warships have a 40% chance of emitting heavy smoke, and if at 75% or more of its maximum speed, it automatically does so.

Heavy stack smoke and smoke from burning ships and can be seen at twice normal sighting range, as long as the wind is less than 20 knots.

5.2.5.4 Battle Smoke. Ships at 75% or more of their maximum speed produce large amounts of smoke, and while the powder used in WW I guns was "smokeless" in comparison to the brown powder of the late 1800s, it certainly wasn't smoke-free. Both of these factors had a significant effect on the visibility of nearby ships in the battle line.

The effects of battle smoke are checked at the beginning of the Detection Phase when one or both of the following conditions occur:

- Ships in the formation are at a speed of 75% of maximum or greater during the Movement Phase.
- There has been sustained gunfire for a specific period of time depending on gun size.

Large guns (11+ in)	2 Tac Turns of Fire
Medium guns (5.9-10 in)	4 Tac Turns of Fire
Small guns (<5.9 in)	6 Tac Turns of Fire

To find the effects of battle smoke, the players roll D10 and consult the following table taking into account any applicable modifiers.

<u>Die Roll</u>	<u>Effect</u>
1 - 5	No reductions in visibility.
6 - 8	Reduce visibility one table.
9 - 10	Visibility blocked by smoke.

Modifiers:

- Adjacent ship fired its guns in the previous turn
+1
- Ship ahead of sighting ship at $\geq 75\%$ max speed
+1
- Wind blows the smoke between the LOS +1
- Wind blows the smoke clear of the LOS -2
- Wind speed is >20 knots -1

Note: LOS = Line-of-sight.

Example: Two formations of ships (HMS Invincible and HMS Inflexible vs. SMS Scharnhorst and SMS Gneisenau at the Battle of the Falklands, for example) have been engaged in battle long enough for battle smoke to become an issue. Both formations are at flank speed and are plotted to shoot their guns in the Planned Fire Phase. At the beginning of the Detection Phase every ship has to roll for the effects of battle smoke. Formation A (Invincible and Inflexible), however, is at a disadvantage because the wind is blowing the smoke between them and Formation B. The wind speed is 5 knots. The resulting die modifiers for the ships in both formations are:

Formation A lead ship (HMS Invincible):

- +1 for adjacent ship firing in previous turn
- +1 for wind blowing the smoke between the LOS

Formation A remaining ship (HMS Inflexible):

- +1 for adjacent ship firing in previous turn
- +1 for ship ahead at $\geq 75\%$ maximum speed
- +1 for wind blowing the smoke between the LOS

Formation B lead ship (SMS Scharnhorst):

- +1 for adjacent ship firing in previous turn
- 2 for wind blowing the smoke clear

Formation B remaining ship (SMS Gneisenau):

- + 1 for adjacent ship firing in previous turn
- + 1 for ship ahead at $\geq 75\%$ maximum speed
- 2 for wind blowing the smoke clear

If a ship has its visibility blocked by smoke, it will not see the target it was intending to shoot at. On the first turn this occurs, the ship may still fire but the Dead Reckoning modifier of -4 is applied to the gunnery attack die roll. If there are subsequent consecutive turns where the ship is blinded by smoke, it must stop firing as it has no idea as to the enemy's location.

In addition to the effect on gunnery, any ship that has its visibility blocked cannot see any visual (flag or light) signals and therefore, cannot respond to orders sent in this manner until the visibility clears.

Chapter Six - Naval Combat

In general, a ship may only engage as many targets as it has directors. A ship equipped with one gunfire director and two gun mounts may only fire at one target, since the director controls both mounts. Weapons without directors, such as torpedo tubes can engage only one target per turn per mount, although they may fire more than one weapon per turn at the target, if their rate of fire allows. Gun mounts or turrets in local control (i.e., without the director) can engage individual targets, but with a loss in accuracy (see 6.1.3 Gunfire in Local Control)

Refer to the Form 10 for information on each type of weapon to be fired. The listed chance to hit is sometimes modified by rules described in this chapter. The modified chance is then rolled for with two D10 as percentile dice (D100).

The number rolled must be equal to or less than the modified percentage chance to get a hit.

Unless stated otherwise in the remarks section for a ship class, each weapon (except guns) may only fire one round per tube or rail. Multiple-barreled weapons (such as torpedo tubes) may fire all of their tubes at once.

For gunfire, the number of shells fired is already included in the hit chance and damage values. If a hit is made, it means that measurable damage was inflicted in that three minutes of fire (one Tactical Turn).

Guns are assumed to have an infinite ammunition supply unless the scenario states otherwise. Unless reloads for torpedoes or other weapons are listed in the remarks section for a particular ship, it has available only the ammunition listed on the weapons line for each mount.

If the weapon is listed as being manually reloaded, assume that it takes two Tactical Turns to reload one mount. Several mounts can be reloaded at once.

6.1 Surface Gunnery. Surface ships can attack other surface targets with guns. Most ships carried several different calibers of guns. Large-bore, long-range guns were the principal ship-killing weapons of the day and ships were rated by the size of the guns they carried. Destroyers mounted guns smaller than 4.0 inch, light cruisers mounted 4.1 to 6.0-inch guns, armored cruisers 7.5 to 9.2-inch guns, and capital ships mounted guns of 11 inches and larger.

Larger ships also mounted a medium-caliber secondary battery for protection against smaller surface craft so as to not distract the main battery from its primary work of destroying capital ships.

6.1.1 Directors. Before about 1910, directors did not exist, although Captain Percy Scott, RN did most of his experiments on director-based fire during 1900 to 1909. In this special edition of Fear God & Dread Nought all ships are Gunnery Standard 2, although for most ships the guns were under local control as the fitting of directors had not reached cruisers yet. Even the battlecruisers did not have a full set of the equipment. It's not clear how much of a difference the partial set of fire control equipment made. Players can use their own judgment as either give the battlecruisers the benefit of director fire or treat them as being under local control.

Large guns on capital ships were usually aimed by a "director." Mounted high on a ship, directors used powerful optics and sometimes analog fire control computers to track a target. This is the device knocked out when a gun battery takes a fire control hit. Its loss reduces the guns to local control. Even if a warship did not have a formal "director system," it would have range finders and a gunnery officer in charge of allocating the ship's gunfire. Main batteries on all combatants and some secondary batteries on major combatants are fitted with optical directors. The effective range of the optical rangefinder depends on its baseline, or length, and its magnification. The effective sighting range for all optical rangefinders is listed on the Form 10.

As the director tracked a target, guns that it controlled located all over the ship would automatically follow its movements, with corrections added to allow for such things as the range to the target, wind, distance between the director and the mount ("parallax"), and on large guns, even the rotation of the Earth.

Guns could be controlled "locally," at the mount or turret itself, but this was less effective than using the director. Rules for local control are in section 6.1.3.

Each gun type on a ship is controlled by a different director. However, this is not always the case as the Royal Navy did not incorporate directors for the secondary battery until after the start of the war. A single director can control many gun mounts, but a ship can only engage as many surface targets as it has gun directors, unless the individual gun mounts or turrets were in local control. All guns linked to a director fire as a group, rolling once to hit. All local control mounts firing at the same target roll together as well, but with a penalty on their chance to hit die roll.

6.1.2 Types of Fire Control. During the years immediately preceding World War I, the major navies of the world were involved in the development of analog computing devices to calculate the future position of a target based on optical rangefinder data. While several systems emerged, the most complete system was one that could accommodate rapid changes in range rate. The first such system was developed for the Royal Navy by A.H. Pollen in 1909, although the Royal Navy ultimately chose another system which was used on the battle cruisers depicted in *Fatal Choices*. The outbreak of war found the battlecruisers in the midst of fitting the system. Only parts of the system were in place in the fall of 1914.

6.1.3 Gunfire in Local Control. Some guns may be fired without their director, in “Local Control,” while others can only fire locally because no director is fitted. Any gun mount can be put in local control by ordering it in the Plotting Phase. In local control, the crew in the gun mount aim the gun themselves, instead of relying on an external director. This is the normal procedure when the director has been knocked out. There is a -2 modifier to the chance of a hit for surface targets when guns are fired in local control. While the Allied battle cruisers depicted in *Fatal Choices* did not yet have the full director equipment installed in 1914, they may have had enough of the system in place to warrant the director benefit. If players disagree they may impose an additional -1 modifier for BC fire or treat them as being under local control.

The gun director is located at one of the highest points on the ship, while the gun mounts and their sights are mounted much lower, usually on the main deck itself. This meant that if the gun crew depended only on the mount’s sights, the visual horizon and spotting range was reduced. In local control, reduce the ship’s size two classes for A and B size ships and one size class for smaller ships when sighting for firing purposes.

6.1.4 Gunnery Procedure. Gun ranges are divided into four range bands: Short, Medium, Long, and Extreme. Long range is often called “effective” range.

The ballistics of a shell in flight are the same from gun to gun. The only things that change are the size and shape of the shell, and muzzle velocity and elevation it is fired at. These parameters affect how far it will fly and what damage it will do if it hits something.

Since the exterior ballistics are essentially the same, the chance of a hit is the same for each range band.

The base chance to hit for the four range bands for Gunnery Standard 2 are:

<u>Range Band</u>	<u>Gunnery Standard 2</u>
Short	50%
Medium	30%
Long	10%
Extreme	5%

The chance to hit cannot be raised over 90%, even with modifiers.

While the base hit chances are the same for each range band, the size of the band varies for each gun. For example, a Royal Navy 12 inch/45 MkX gun has a Short range of 4,500 yards, while a German 21cm SKL/40 has a short range of 6,100 yards. The terms Short, Medium, Long, and Extreme are relative, depending on the gun. Only the chance to hit remains unchanged.

To attack a surface ship with guns, measure the distance from the firing ship to the target and note the target’s range and aspect. Find the proper range band (Short, Medium, Long, or Extreme) by comparing the measured range with the numbers for that gun. Count the number of barrels firing. Be sure to consider arcs of fire (section 2.2.1.5) and check which guns can actually bear on the target.

Add up all applicable environmental, weapon system, and target modifiers using the Gunnery Worksheet in Annex A. Multiply the modifier by 2 at long or extreme range or by 3 at short and medium range and add this number to the base chance to hit. *Note that adding a negative modifier will actually subtract from the hit chance.* This is the modified or adjusted chance to hit.

A modified chance to hit of less than 0% is still a valid shot for “ranging” purposes, and counts toward any consecutive turn gunfire modifiers.

Roll D100. If the roll is less than or equal to the adjusted chance to hit for that range band, the target has been hit. Note the number of damage points inflicted by the shell type in that range band as shown on the Form 10. Guns that fire only in the Reaction Fire Phase (in response to a newly-detected target) have their damage halved.

Example: A RN Chatham-class light cruiser's lookouts detect a German light cruiser. The British cruiser opens fire with its 6-inch main battery. The target, a light cruiser, is at long range off the starboard beam of the RN cruiser. Five of the eight gun mounts of the British cruiser's main battery will bear (five barrels total). The German light cruiser's aspect is quarter to the British ship and is steaming at 20 knots.

The base chance of a hit at Long range is 10% on a D100. The British player applies the following modifiers:

- Five barrels firing: +2
- First salvo on target at long range: -2
- Firing ship is not being fired upon: +1
- Local control GS 2: -2
- Target size class C, quarter aspect: -1.

The modifier total is -2. Multiplying the total by two gives -4%. This is then added (adding a negative number subtracts!) to the 10% base chance to hit to get the final adjusted chance to hit of 6%.

The player rolls D100 and gets an 05, resulting in a hit. The cruiser's guns (firing APC, which will penetrate 6 at long range the CL's armor of 3) inflict 11 damage points on the German light cruiser.

Players do not have to keep track of gun ammunition unless specified in the scenario special rules.

6.1.5 Overconcentration. Accurate shellfire required being able to see the shell splashes and correct the next salvo based on whether the previous ones were long or short of the target. These corrections were added manually, by the director officer.

If a second ship fires at the same target, the director officer will have a hard time telling which shell splashes belong to him and which belong to the other ship. A third ship makes the problem even worse, and so on.

The problem is most acute at longer ranges, when the extended time of flight makes it hard to link a salvo with its shell splashes.

For overconcentration to occur, the shell splashes must be of roughly the same size. No battleship would be confused by the splashes of a destroyer firing at the same target, but a cruiser with 9.2-inch guns would certainly not be able to tell its splashes from those of 7.5-inch guns also firing at the same target.

For figuring overconcentration, large shells are 11 to 18 inches, medium shells are 5.9 to 10.9 inches, and small shells are less than 5.9 inch diameter.

If more than one ship fires at the same target, all the ships firing the same size guns at that target at Long or Extreme range are subject to a -1 gun hit chance modifier equal to the number of ships firing (N) at that target minus one.

It doesn't matter if some of the ships firing at the target are at Short or Medium range. Those ships can easily link their shots with the splashes and adjust their fire, but their splashes will cause problems for ships firing at the same target from Long or Extreme range.

Example: An armored cruiser is fired on by a battle cruiser's main (12-inch) and secondary (4-inch) batteries and two cruisers' main (6-inch) battery. All 6-inch and 4-inch guns are firing at Extreme range. The battle cruiser's main 12-inch battery is firing at Medium range. The overconcentration penalties are:

- *BC main battery: No overconcentration, the target is at Medium range for this gun and no other ship is firing large shells.*
- *CR main battery: Two ships firing medium-sized shells, penalty of $(2-1) \times -1 = -1\%$.*
- *BC secondary: no overconcentration, only one ship firing shells of that size.*

6.1.6 Light Battery. A warship's light battery consists of all small caliber guns (90mm and smaller) that often made up the tertiary battery of dreadnoughts, pre-dreadnoughts and some armored cruisers. The light battery was carried as a defense against torpedo craft. However, as the effective range of torpedoes increased, the light battery became obsolete and many ships removed them in favor of anti-aircraft guns. In *Fatal Choices* light batteries should generally be ignored. No torpedo craft are included in any scenario and the light battery gun crews would normally be kept in protected positions during action rather than being exposed at their stations in a battle with larger ships. If players want to experiment with smaller craft being present, they should use the main FG&DN rules.

6.1.7 Line of Fire Restrictions. A ship's line of fire to a target may be blocked. If another ship is in the gun's Short or Medium range band and is also within $\pm 10^\circ$ of the line of fire then the line of fire is blocked.

Land of 100 m elevation or more will block a ship's line of sight. Land of less than 100 meters elevation may still block line of sight. This will be specified in the scenario description.

6.3 Surface-Launched Torpedoes. During World War I cruisers and most capital ships carried torpedo tubes. Internal torpedo tubes, which are the type carried by all ships depicted in *Fatal Choices*, could be reloaded.

Torpedoes must be fired against a specific target ship that has been visually detected. They cannot be fired in a barrage attack into a general area.

Range for torpedoes is measured from the point of firing to the torpedo's current position. If the distance traveled by the torpedo since its launch is greater than the listed range, the torpedo runs out of fuel and automatically misses.

The following rules apply to torpedo attacks from surface ships in *Fatal Choices*. It is an abbreviated and simplified version of the full FG&DN, which provide a much fuller scope for torpedo usage than these rules. None of the ships depicted in *Fatal Choices* were primarily torpedo attack craft and they were not well-trained in their use. All the torpedoes listed in FG&DN are straight-running torpedoes.

6.3.1 Straight-Running Torpedoes. Torpedoes of this era have no guidance systems. The only necessary presets were running depth, speed and a course, which hopefully would intersect that of their targets. Once launched, torpedoes travel in a straight line until they hit something or run out of fuel and sink.

On board ships of this era, dedicated torpedo fire control equipment was very primitive, if fitted at all, and firing angles were estimated visually. With such meager means, it was extremely difficult to track a potential target and compute an intercept course for the torpedo. Thus, most successful attacks were made from very short range. In many cases, the speed of a torpedo was about twice that of its target, but this was only possible over a very short range. This means the “Deflection Angle,” the amount of lead, must be fairly large to even have a chance of hitting. In Fatal Choices players are assumed to have calculated a torpedo angle that will intercept the target if it does not change course or speed significantly between the time of firing and the point of interception. In the full FG&DN rules it is the player’s responsibility to calculate the Interception angle, so these simpler rules favor the torpedo-firing craft significantly.

On the turn of launch, a ship must steer in a straight line. It is allowed to make one 45 turn (within normal maneuvering limits) at the beginning of the three-minute Tactical Turn, but afterwards must steer in a straight line. Surface ships launching torpedoes cannot use evasive steering.

Torpedoes must be set at the time of launch to run shallow or deep. Shallow weapons will hit any ship of Size Class D or larger, but will strike the belt armor of larger ships, which reduces their effectiveness. Deep torpedoes will run under smaller ships (size classes C and D) but will hit a larger ship under the belt armor.

Reduction of effect for shallow torpedoes hitting deck armor:

Target belt	Damage reduction
0-5	None
5-10	10%
11-15	15%

Most torpedoes used in WW I and after can have their gyro “set” to run on a particular course, which need not be the same direction as the launching tube is facing. Most of them could have their “gyro angle” set up to $\pm 45^\circ$ off the axis of the torpedo tube.

On the turn of launch, place a torpedo counter next to the firing ship, along with a torpedo launch marker that will let the player measure the length of its run. The torpedo moves in the Movement Phase of the following turns. Record the torpedo’s course, speed and the number of weapons in the spread on the firing ship’s log sheet.

After a torpedo is launched on its preset course and speed, it cannot be changed. If a target maneuvers, changing either course or speed, the torpedo may miss. Enemy ships may zig-zag to frustrate a torpedo shooter’s aim, and if a ship sees an approaching torpedo, will almost certainly try to “comb the wake,” turning bow or stern-on to the weapon to present the smallest target aspect possible.

These early torpedoes had sensitive depth sensing systems, thus they were significantly affected by Sea State. For Sea States 1-4, there are no modifiers to the Torpedo Attack Tables chances to hit. In Sea State 5, there is a penalty, which is described in Section 6.3.2. At sea state 6 and higher, torpedoes will not function properly and will automatically miss the target.

Aiming Torpedoes:

Often a spread of torpedoes, fanned out at slightly different angles, was fired to increase the chance of a hit. If a player wants to fire more than one torpedo, he just decides how many torpedoes are in the spread. This can be as many weapons as he wants, up to the number of tubes on an individual mount. The tables automatically assume that more than one weapon is fanned out.

Example: The British battle cruiser Invincible has five 18-in torpedo tubes. One is a single tube mount aft in the stern. The remaining four are in two mounts of two tubes each located in the ship’s stern with firing arcs to port and starboard. The largest individual salvo size this ship can fire is a two-torpedo salvo. No ship in Fatal Choices can fire a spread of more than two torpedoes and most can only fire single shots.

Torpedo Movement to Target. In every Movement Phase the turn after they were fired, torpedoes move at their rated speed in a straight line towards the target decided by the player (within the tubes’ firing arc). Depending on the targets’ maneuvers after launch, the torpedoes may or may not be at the expected point of intercept. Torpedoes in Fatal Choices are directed at a specific target ship and can hit no other.

If a torpedo spread reaches its target before the range runs out, that unit is attacked by the spread and the torpedo attack should be resolved against it unless the target speed has changed more than 5 knots or its course has changed 45 degrees or more from its course when the torpedo was launched. In this case the spread is deemed to have automatically missed.

Torpedoes move like any other surface ship. If there appears to be a chance of a torpedo spread and a ship’s path intersecting, use proportional movement to see if the torpedoes pass close enough to warrant an attack. Note that nearly all torpedoes carried by ships in Fatal Choices have such low speeds and short ranges that an alert target can easily evade or outrun them.

6.3.2 Resolving Torpedo Attacks. When a salvo of torpedoes reaches the intended target attacking player must roll to see how many torpedoes actually hit.

This is based on the target’s actual size (battleship, cruiser, destroyer, etc.) and the angle from which the torpedoes attack. A side shot on a destroyer stands a better chance of hitting than a bow-on attack on a battleship.

Find the target’s effective length by using the Torpedo Aspect Table in the Annex.

First, look at the diagram to see from what angle the torpedoes are attacking the ship. The degree numbers around the edges of the box refer to relative bearings, in other words, the bearing of the torpedo relative to the target ship's bow. A broad target aspect is the best, and a narrow target aspect is the worst.

Cross-index the ship's real size with its angle, the resulting Roman numeral is the table to use to resolve the attack. Combat Results Table I is the best, Table VI is the worst.

Choose the appropriate chart for the number of torpedoes in the spread, one or two.

Now measure the distance from the impact point back to the firing point (where the datum marker was placed). Note: torpedo run at impact is not necessarily the same as target range at time of fire. The range that matters is not the range at the time of fire, but at impact. This is how far the torpedo has actually traveled, and this is what affects its chance to hit. Look down the Range column for the range closest to the torpedo's run. Round even splits up, i.e., 3,700 yards becomes 4,000 yards.

Roll D100, and starting at the right, compare the result to the hit chances in the corresponding row. If the die roll is that value or less, the number at the top of the column is the number of torpedoes that have hit the target.

As the number rolled gets bigger, the number of torpedoes that hit the target get smaller. If the die roll is bigger than the number in the column with "1" at the top, all the torpedoes in the spread missed.

Example: The HMS Invincible fires a spread of two RGF 18 MkVI torpedoes at SMS Gneisenau. At the time of impact the Gneiseanu had a broad aspect and the torpedo run was 1,400 yards. Looking on the Torpedo Aspect Table we find that a B size class ship with a broad aspect is resolved on Torpedo Combat Result Table II. Finding the Spread Size =2 section and cross referencing a torpedo run of 1,500 yards (closest to 1,400 yards) we get the following probability of hit values:*

Range	1	2
1,500	0.33	0.03

This means:

Die roll of 34 - 00	no hits
Die roll of 04 - 33	1 hit
Die roll of 01 - 03	2 hits

Rolling D100, the result is 22 which is less than 33 but more than 03 thus the Gneisenau was hit by one torpedo.

If the target ship is stationary (speed zero, "dead in the water"), move four lines up on the torpedo attack table.

Example: A single torpedo is fired at a stationary ship. At the end of its run, it has covered 4,000 yards. Instead of using the 4,000 yard line, use the 2,000 yard line. This compensates for the difficulty in estimating a target's exact speed, which does not exist with a stationary ship.

If a torpedo is fired in Sea State 5, move two lines down on the torpedo attack table. Torpedoes fired in Sea States of 6 or higher automatically miss.

6.3.3 Torpedo Depths. Torpedoes can be set to attack either shallow-draft or deep-draft targets. Torpedoes set deep will not hit light cruisers, destroyers or smaller craft (size class C or D), but will hit larger ships below the armor belt. If they are set shallow, they will hit any ship, but if they hit a cruiser or larger vessel (Size class A or B) with armor, it will hit the main armor belt and will have a reduced effectiveness. The effect of armor on torpedoes is described in section 8.1.7.

6.7 Combat Considerations. Combat is restricted by the following considerations.

6.7.1 Weapons Danger Space. Surface ships may not fire their guns at other surface targets if friendly ships are in the line of fire. The danger area lies ten degrees to either side of the line of fire in the gun's Short and Medium range band. By the time a shell has passed into the Long range band it is high enough so that it will pass over any friendly ships. *(Exception: This does not apply for neutral ships. Ships can never fire over neutral ships at any range)* For a friendly ship to be included in the weapons danger space surrounding an enemy ship, it must be inside the space for at least half of the enemy ship's Movement Phase. There is a second danger space directly around the target. It lies within five degrees of the line of fire and ten percent of the range between the firer and the target. If a friendly or enemy ship passes through either danger space, it is also subject to an attack at half the modified chance to hit and if hit, half the damage for that range band. This danger space represents the occasional shell that does not follow a predicted ballistic path, an unexpected roll that a stabilization system cannot account for, or aiming errors by the director. Such errors would usually just include a single shell or a single salvo, but the damage values on the Form 10 actually represent only a few shells out of the many fired actually striking an intended target. If two ships collide and remain in close proximity to each other, within 100 yards, then both ships are attacked as a single target without additional modifiers.

6.7.2 Rates of Fire: If a weapon does not have a rate of fire listed in the remarks section for that ship, it may fire once per tube per turn. The Form 10s already account for the effects of rate of fire.

6.7.3 Shipboard Readiness for Combat. Most scenarios assume that all ships are full manned, alerted, and prepared for battle. There were some circumstances when they were not, however. A surprise air attack on ships in harbor, or on a ship transiting in open ocean, might catch them unawares. Ships can be at one of three Readiness Conditions:

- **Condition X-Ray** - Minimum readiness. Many watertight doors are open to allow easy access throughout the ship. This condition is often set in port. Weapons, sensors, and propulsion are unmanned while the crew rests and performs maintenance. In this status, they may fire only their *light* armament at 1/4 of its normal value.

Flooding criticals inflicted while the ship is at Condition X-Ray have a +3 modifier to their severity. All damage control rolls made while the ship is at condition X-Ray (Fire and Flooding) have a +3 modifier to their effectiveness.

It takes D6 Tactical Turns to go to battle stations (except propulsion, see 3.7 Getting Underway) once the player orders it.

- **Condition Yoke** - Partial readiness. This condition is set when the ship is steaming in wartime but battle is not immediately expected. Watertight doors to little-used compartments are closed, but ones that allow easy movement through the ship are left open.

Ships with steam propulsion may maneuver at up to three-quarters of their maximum speed. This is because steam-powered ships in transit usually had only half their boilers lit off to save fuel and allow for maintenance. They need the other half of their engine power to gain that upper 25% of their speed. Flooding criticals inflicted while the ship is at Condition Yoke have a +2 modifier to their severity. All damage control rolls made while the ship is at condition Yoke (Fire and Flooding) have a +2 modifier to their effectiveness.

The ship cannot launch torpedoes and cruisers and above cannot fire their main batteries.

It takes D6/2 Tactical Turns to go to General Quarters once the player orders it.

- **Condition Zebra** - This condition is set during battle stations, or "General Quarters." Virtually every watertight door on the ship is closed. This inhibits easy movement through the ship, but personnel are supposed to already be at their battle stations. A ship at General Quarters can perform all operations normally.

Chapter Seven - Omitted

Chapter Eight - Ship Damage

Weapons hurt a surface ship in several ways. First, the explosive effects damage or destroy a part of the ship's structure, including its shell plating. If this is close enough to the waterline, flooding will occur. If enough of the framing and longitudinal members that make up the ship's structure are broken or damaged the stresses on the remaining ribs could break it in half. This is almost certain if the keel is broken.

An explosion will also send a shock wave through the ship. This may knock heavy machinery off its mountings, or stress previously damaged components to the point where they fail. The explosion's pressure wave will damage exposed items such as weapons and people.

Finally, shells, bombs and torpedoes create fragments as they detonate. These jagged pieces of shrapnel will fly off on their own, creating more holes in the hull and may strike vital components and crew members.

Attacks are modeled in FG&DN by measuring damage in two ways: damage points and critical hits. Shells, bombs, and other weapons reduce a ship's damage point level until it reaches zero, thereby sinking it. Those same hits will also knock out weapons and other vital equipment, start fires, or cause flooding. These critical hits to specific parts of a ship may cripple it or sink it indirectly long before the ship's structure is destroyed. Procedures for each type of hit are provided below.

8.1 General Concept. Players resolve attacks as shown on the Combat Resolution Summary Table. Some attacks, such as gun and torpedo attacks, are rolled for immediately. Other damage effects such as critical hits are resolved at the end of the turn.

Combat Resolution Summary

Plotting Phase. No combat resolution occurs.

Movement Phase. Resolve torpedoes, including damage effects, which come within range of a ship after all movement is completed.

Planned Fire Phase. Gunfire attacks made in this phase are resolved in this phase, including damage effects.

Detection Phase. No combat resolution occurs.

Reaction Fire Phase. Gunfire attacks made in this phase are resolved in this phase. Damage from any hits is halved.

Resolution Phase. Die rolls for damage control and critical hits are made now.

Note: Critical hits are computed and inflicted after every phase, before the next phase begins. Additional damage points received as a result of critical hits are accumulated during the turn and inflicted in the Resolution Phase of that Tactical Turn.

8.1.1 Computing Hits. Damage in FG&DN is measured in “damage points.” These are used to measure the amount of damage a weapon will do, and the amount of damage a ship can absorb before it sinks. The bigger a ship, the more damage it can take, but it is not a linear scale. Larger ships get fewer points for each ton of displacement than smaller ships.

When a weapon inflicts damage on a target, the weapon must first penetrate any armor in the location of the hit before it can do internal damage. Non-penetrating hits will still cause some damage anyway.

The effects of damage, including critical hits, are applied simultaneously to both sides at the end of the phase. If a critical hit, like a fire or flooding, inflicts more damage points, they are applied in the Resolution Phase of the same Tactical Turn. Secondary effects, like explosions, are applied immediately, in the phase in which the damage is resolved.

Example: In Turn 1200, a cruiser is hit by a torpedo in the Movement Phase. Resolving the damage at the end of the Movement Phase, the ship suffers several Flooding criticals, which will inflict 35 points of damage on the ship. In the Planned Fire Phase it is hit by enemy gunfire, which results in a Fire Critical. The fire inflicts 10 more points of damage. A total of 45 damage points will be applied to the cruiser in the Resolution Phase of Turn 1200. If one of the shell hits in turn 1200 had hit the main battery magazine, the cruiser would be destroyed by the explosion at the end of the Planned Fire Phase of turn 1200.

Whenever a ship is hit by a weapon, subtract the damage points inflicted by the weapon from the ship's damage point total. When the ship's total reaches zero the ship sinks.

8.1.2 Speed Reduction. As a ship's damage point total is reduced, its speed goes down as well. Loss of structural strength may force a ship to slow down. Drag on the hull will slow it as its smooth lines are broken by holes and other damage, and general damage to the propulsion plant will affect its efficiency.

A ship's speed is reduced by one quarter each time it takes one quarter of its original damage point level, and is reduced to zero at the 90% damage level.

The break points for damage are 0%, 25%, 50%, 75%, 90%, and 100%. The speed percentages are 100%, 75%, 50%, 25%, 0%, and sunk.

Each ship class has a different table which is shown on its Form 10. The top line represents the damage point levels where the speed is reduced, while the bottom line shows the new maximum speed at that level of damage.

Example: A British Invincible-class battle cruiser takes 371 points of damage. Its damage and speed breakdown table is shown below:

Damage and Speed Breakdown:

Dam Pts:	0	93	186	278	334	371
Surf Speed:	25	19	13	6	0	Sinks

With no damage (0), HMS Invincible is capable of 25 knots. At 90 points of accumulated damage, it can still do 25 knots, assuming no propulsion criticals or other restrictions. At 105 points though, its maximum speed is 19 knots. From 186-277 points of damage, it can make 13 knots. The 278th point reduces its speed to 6 knots, and so on.

Acceleration/Deceleration rules (section 3.1.1) apply here, so the ship slows, coasting to a slower speed at half the deceleration rate, so its speed next turn would be 25 - (8/2) = 21 knots. The following turn it would slow to its new maximum speed, 19 knots.

If a ship has taken propulsion criticals or other damage that also reduces its speed, these are applied to the ship's maximum speed as it changes.

8.1.3 Surface Ship Critical Hits. A ship is a platform which carries the weapons and sensors that allow it to fight. A ship can be destroyed by sinking it, but it can also be rendered useless by destroying the equipment that makes it a warship. Destroying a ship's weapons or sensors while leaving it relatively undamaged is called a “mission kill,” meaning that the damage a ship has received prevents it from performing its mission. It is as good as sunk as far as the battle is concerned.

Damage to a vital component of the ship is called a critical hit. These include not only its weapons, but engineering (propulsion) and the rudder. In FG&DN, whenever a ship is hit, the severity of the hit will be used as a way of determining if there is a chance of one or more critical hits.

DAMAGE RATIO TABLE
See Annex B

CRITICAL HIT TABLE
See Annex B

In each phase that a ship takes damage, divide the damage points taken by the number of points the ship has remaining after that phase's damage points are applied. This is the damage ratio and is used to figure out how many critical hits a ship may have suffered.

Roll D6 and cross-index the result with the ratio on the Damage Ratio Table. The result is the number of critical hits inflicted on the ship.

Example: HMS Good Hope has 315 damage points. If it takes 32 points of damage from gunfire in the Planned Fire Phase, the critical hit ratio is 32/(315-32) or 32/283 = .11. The players use the .10 line (always round down). On a die roll of 1 to 4 there are no critical hits. A DR of 5 equals one Critical Hit and a DR of 6 equals two.

Once the number of critical hits is determined, find the nature of each on the Critical Hit Table in Appendix 3. Roll D10 for each critical hit to see what its effect on the ship is. The critical hit types with asterisks are armored (*) if the ship has an armor rating greater than zero. Section 8.1.6 has the rules for armor.

In addition to the critical hits inflicted on a ship by any weapon, each **torpedo** which hits a ship will automatically inflict a **flooding** critical hit, in addition to any other critical hits. If the ship hit has a torpedo protection system (see section 8.1.7.2) the torpedo must penetrate it for the flooding critical to occur.

8.1.5 Effects of Massive Damage. Even though most of a ship's weapons may still be intact there is a point where massive damage to the ship overall will prevent the operation of various weapons.

When a ship has only 25% of its original damage points remaining, all primary and secondary batteries and torpedo tubes are out of action. Remaining Light Battery is unaffected. When a ship has only 10% of its original damage points left, all of its weapons are out of action.

8.1.6 Effects of Armor. Armor reduces the amount of damage a ship takes and provides special protection to critical areas of a ship. In World War I, ships larger than a destroyer carried armor covering the magazines and engineering spaces (belt), major weapons (turret top and faces), and the deck. Other critical items, such as the conning station, could also be armored. The armor belt provided protection against close-range shell fire and shallow torpedoes. The deck provided protection from plunging fire at long ranges.

Larger warships also had special protection against torpedoes. Below the waterline, most ships had a large empty compartment called a void. These were designed to absorb the force of a torpedo's warhead, and prevent the true inner hull from being ruptured. While a torpedo would destroy the void, no real harm would be done to the ship.

Each weapon has a **penetration rating** as part of its statistics. These values are precalculated for each gun at each range bracket, and are listed on Form 10. To find a gun's penetration, measure the range and find the appropriate range band for that gun and shell type. The most common shell types are Armor-Piercing (AP), Common (CP) and High Explosive (HE). Most of the AP and some CP shells had a special cap added to improve the armor penetrating capability of the shell against face hardened armor. A shell with a cap on it has a "C" after its designator. Thus, a capped armor-piercing round would be APC. Some HE was fused at the "nose" (NHE) or "base" (BHE).

Short and Medium-range gunfire has a relatively flat trajectory, and will strike the side of a ship on the armor belt. Long and Extreme-range fire must arc much higher and is called plunging fire. At Long range, there is a 70-30 chance the shellfire will strike the belt or deck armor, and the firing player must roll to see which armor value must be penetrated. Extreme-range shellfire has a 40-60 chance of striking the belt or deck armor.

Deck and belt **armor ratings** are provided for each ship. For example, the Invincible-class battlecruisers have a rating of 14/5, meaning a belt thickness equivalent to 14 centimeters, and a deck armor equivalent to 5 cm. The deck is much thinner than the belt, but shells at Long range do not penetrate as much armor and the chance of getting a hit is much less as well.

In the diagram of HMS Invincible on its Form 10, you will note that some locations have armor thicknesses greater than the associated belt or deck armor rating. This is due to the fact that all armor is not alike and that a quality modifier has been applied to the weighted average used in determining the ratings.

When the ship is attacked by a weapon, compare the penetration ability of that weapon with the armor rating where it struck (Deck or Belt). If the weapon's penetration is greater than the armor rating, full damage will occur.

If a shell *does not* penetrate, divide the damage depending on the type shell by:

AP or APC:	3
CP, CPC or HE:	4

If the weapon does not penetrate the armor where it struck certain critical hits will not happen either. These are marked with an asterisk (*) on the critical hit table. For example, to knock out a ship's main battery, a shell must penetrate the ship's armor.

A shell must penetrate the belt or deck armor at Long or Extreme range, or just the belt armor at Short or Medium range. If the projectile penetrates, all critical hits are inflicted as well as full damage.

8.1.6.1 Faulty shells (optional rule). The game's gun system assumes shells are 100% reliable and the damage model reflects this assumption. The one thing that was 100% certain in WW I was that nothing worked perfectly - particularly British shells. As early as 1910, the Royal Navy's armor-piercing shells filled with Lyddite were known to have very poor performance when they struck armor at high angles of obliquity. These shells had a tendency to detonate or break up before they had penetrated the armor, significantly reducing their effectiveness.

If a warship is fitted with British guns, and fires British APC shells, they will have their damage reduced by 40% when firing at targets at Long or Extreme range, provided the target has a belt armor rating greater than, or equal to 1/3 of the shell's diameter. In other words, all gunfire attacks by British APC rounds are resolved normally, with the exception that the final damage is multiplied by 0.60 if the above condition is met. If the shells would normally not penetrate the target's armor, then the damage is calculated normally (according to 8.1.6).

In Fatal Choices this rule would only affect British 6-inch, 7.5-inch, 9.2-in and 12-inch guns firing APC on the belt armor of the German armored cruisers.

Example: HMS Invincible engages SMS Scharnhorst at long range with 12 in (305mm) APC shells. The Invincible successfully attacks Scharnhorst and scores a hit from her eight guns. Normally, the APC shell (penetration of 20) would easily defeat Scharnhorst's belt armor (rating of 11) at this range, but since the German armored cruiser's armor is greater than 10 ($30.5/3 = 10.16$ or 10), the British shell does not perform properly and the damage is reduced from 20 to 12 DPs ($20 \times 0.6 = 12$).

Note: If players intend to use this rule, they should make up a table before the game for each British gun, listing the required armor thickness and the reduced damage.

The Royal Navy wasn't the only one with defective shells. On average, the failure rate of WW I shells of all types for all nations was about 20%. If players desire, all gunfire damage can be multiplied by 0.85 to reflect this historical deficiency. This will tend to make the battles last a little longer.

8.1.7 Armor and Torpedoes. Torpedoes can be set to run shallow or deep. Torpedoes must run shallow to hit size C-class (light cruisers) and smaller ships. A shallow torpedo will strike a larger ship's belt armor, however. Deep torpedoes will run under small ships and will strike larger ships below the belt armor, in the area of the anti-torpedo void, if they have any. While many large ships carried torpedo protection systems a number of the older designs did not.

Whatever their depth, torpedoes that strike a ship from the narrow aspect (see the Torpedo Aspect Table on page 6-11) hit outside the armor belt or the torpedo protection system.

8.1.7.1 Shallow-Running Torpedoes. If a shallow-running torpedo strikes the armor belt, its damage is reduced according to the following table.

Target's Belt Armor	Damage Point Reduction
0 - 5	None
5 - 10	10%
11- 15	15%

8.1.7.2 Deep-Running Torpedoes. Underwater protection ratings are given for those ships that have them. A British Indefatigable-class battle cruiser's armor rating, for example, is 14/6/90. The first two numbers are belt and deck ratings, as before. The third number is the underwater protection rating. Unlike the first two numbers, the third number is not an armor thickness but the number of damage points the protection system will absorb on each side of the ship before it fails. However, the system can absorb only one-third the total damage points (30 in this case) from a single torpedo. Any damage points over this inflicted by a single hit are applied to the ship's total.

Example: The HMAS Australia is hit by a torpedo with a 58-damage point warhead. The torpedo protection system absorbs the first 30 points of damage with the remaining 28 damage points ($58 - 30 = 28$) on the interior of the ship.

If a ship takes several torpedo hits on the same side, the protection system will be destroyed. The system itself consists of empty compartments, called voids, just inside the skin of the ship. By lining the ship's side with them, the torpedo will hit one of them and expend its explosive force. The more voids, the better the protection. The compartments will only absorb one torpedo hit in a given area of the ship though. After that, a hit in the same area will reach the ship's vitals. Also, the area around the actual hole is weakened, and is less able to resist a hit.

A ship can absorb torpedo damage on each side equal to the strength of the protection system.

Note: This system is an abstracted model of the reduction of a ship's torpedo defense system. It is a lot easier to keep a running total of damage points inflicted than it is to determine the location of each torpedo hit on the hull, the size of the hole it makes, and whether it is close to any other holes.

8.1.8 Torpedoes & Target Aspect. If a torpedo hits a ship at a narrow aspect (bow or stern), divide the torpedo's damage by two. An extreme bow or stern hit wasted a lot of its energy moving water and not damaging the ship. If the ship is hit in the stern, the first two critical hits, besides the automatic flooding which doesn't count against the critical hit number, are automatically engineering and rudder hits. Roll the remaining critical hits normally.

8.1.9 Sinking. A ship or surfaced sub that has received enough damage to sink it rolls D10 x 10 for the number of minutes it will take to sink. The final disappearance happens in the Movement Phase. Ships that have magazine explosions sink immediately. Until the hulk sinks, it is a menace to navigation and will still cause damage if another ship collides with it.

8.2 Effects of Critical Hits. Critical hits take systems out of action, affecting the fighting capability of the target.

8.2.4 Bridge. The main conning station has been damaged. Roll D10. 1-6 it maintains current movement orders. 7-8 it circles to starboard at current speed. 9-10 it circles to port. Circles are made in 45° increments.

It takes four Tactical Turns to correct the steering problem. After the problem has been corrected, all changes to course and speed take two Tactical Turns to execute. Note: If a ship also suffers a Rudder critical hit, the latter takes precedence over a Bridge hit. If the Rudder critical hit is repaired, then the long term effects of the Bridge critical hit are applied. There is a Minor fire in the bridge/control room.

8.2.6 Casemate. One of the ship's casemate guns has been knocked out (the armor protection for casemate weapons is 2/3's the belt armor value). Roll D10. On a 1-2, the fire control (if fitted) for the casemate battery has been knocked out (armor penetration not required). On a 3-0, one of the casemate guns is out of action. Roll D10 again. On a roll of 9 or 0 the ready ammunition detonates, inflicting two times the Short range HE damage of that casemate gun to its own ship. Roll randomly to see which gun has been disabled. For Great Britain, add one (+1) to the die roll because they used a picric acid based explosive in some or all of their shells.

Some ships lost their entire casemate batteries on one side during WW I because of chain-reaction explosions.

If a casemate gun's ready ammunition detonates there is a chance the explosion will damage adjacent casemate mounts. Roll 2D6 and consult the table below to see how many guns are affected. For each gun that is affected, roll D10 to see if the ready ammo also detonates (9 or 0). If this happens, roll 2D6 again. Continue this procedure until there are no more explosions.

2D6	Additional
<u>Die Roll</u>	<u>Guns Damaged</u>
2 - 5	None
6 - 8	1 gun
9 - 11	2 guns
12	3 guns

8.2.7. Communications: One of the communications systems has been hit. Roll D10 on the following table:

- 1-2: Port signal lights destroyed
- 3-4: Starboard signal lights destroyed
- 5-6: Port signal halyards destroyed
- 7-8: Starboard signal halyards destroyed
- 9: Main Wireless (WT)/radio (RT) (if fitted) destroyed
- 10: Auxiliary Wireless (WT) (if fitted) destroyed

8.2.8 Engineering. Roll D10. On a 1-9, the ship's engineering plant has been damaged. Reduce speed to the next lower level on the Damage and Speed Breakdown chart. A Minor Fire has started in the engineering spaces.

On a roll of 0, there has been a boiler explosion. The ship receives 25% of its original total in damage points and has a Severe Fire.

8.2.9 Fire. A fire has been started, the severity of which depends greatly on when the ship was built. Later ship designs were constructed with better fire resistant characteristics. Roll D10 to find out how bad each fire is. The amount of damage for each type of fire is given in the following table.

<u>Year Completed</u>	<u>Fire Damage: Minor to Severe</u>
Before 1906	4%/8%/12%
1906 - 1916	3%/6%/9%

1-5 Minor Fire. The ship loses 4%/3% of its original damage points per **Intermediate Turn** until the fire is extinguished.

6-8 Major Fire. The ship loses 8%/6% of its original damage points per Intermediate Turn. Ships must maneuver to put the wind 30 degrees on either bow and slow to 15 knots or less. If they do not maneuver and reduce speed, add +2 to the die roll for reducing the fire.

The ship is considered illuminated at night for visual detection and gunfire purposes. It will also illuminate or silhouette other ships similarly to a flare or starshell.

9-10 Severe Fire. The ship loses 12%/9% of its *original* damage points per **Intermediate Turn**. Ships must maneuver to put the wind 30 degrees on either bow and slow to 15 knots or less. If they do not maneuver and slow, add +2 to the die roll for reducing the fire.

The ship is considered illuminated at night for visual detection and gunfire purposes. It will also illuminate or silhouette other ships similarly to a flare or illumination round.

Conflagration: A conflagration is defined by the US Navy as a fire which is out of control. If the total percentage of fires present on the ship is 15% or more of the ship's original damage point rating, the ship is suffering a conflagration. There is a 25% chance per Intermediate Turn (cumulative) that the ship's magazines will explode and sink the ship immediately. This may be avoided by ordering the magazines flooded in the Plotting Phase of an Intermediate or Tactical Turn, but the ship loses all main battery and secondary battery ammunition. Only Light Battery ammunition is unaffected.

If the total percentage is not reduced below 15% on the next Intermediate Turn, the fires are out of control and the order is given to abandon ship. If the percentage is reduced below 15%, the danger of conflagration is removed.

Damage Control: Reducing Fires. For each fire, roll D10 in the Resolution Phase of the Tactical Turn the fire started and each following Intermediate Turn: 1-5 means that the fire has been reduced one level, and minor fires have been extinguished; 6-9 means that the fire continues as before; 10 means that the fire increases one level of intensity. A severe fire will not increase in severity beyond the 12%/9% associated with a ship's completion date.

Ships which reduce all fires to minor before the Planned Fire Phase are not illuminated. If they have a major or severe fire, they are illuminated.

Assistance From Other Ships. If another ship maneuvers within 100 yards of the damaged ship and parallels its course and speed, it can assist in battling major and severe fires. Up to two ships may assist, one per side. As long as the ships' speed is below 10 knots, there is no risk of collision.

Each ship assisting in firefighting allows the player to subtract one from the fire reduction die roll for one major or severe fire on the damaged vessel.

Ships which themselves have any fires, including minor ones, or which have more than 50% damage, cannot assist in fighting fires on another ship.

8.2.10 Fire Control. The fire control system has been damaged. Size class A ships lose one of the directors controlling that gun (roll randomly). Ships with only one director for that gun type lose it, and all guns of that type are forced to operate in local control.

8.2.12 Flooding. If a major breach is made in the hull, the area must be quickly isolated or the ship will sink. Damage to other sections or failure to close off all possible paths for flooding water may make this difficult. The severity of the flooding also depends greatly on when the ship was built. Many ships in WW I were lost due to “progressive flooding”, with pre-dreadnoughts having one of the worst records. For each flooding critical, Roll D10 to find out how bad it is. The amount of damage for each type of flooding is given in the following table:

<u>Year Completed Flooding Damage: Minor to Severe</u>	
Before 1906	4%/*5/12%
1906 - 1916	3%/6%/9%

1-5 Minor Flooding. The ship loses 4%/3% of its original damage points per Intermediate Turn until the flooding is isolated.

6-8 Major Flooding. The ship loses 8%/6% of its original damage points per Intermediate Turn. Ships must slow to 15 knots or less .

9-10 Severe Flooding. The ship loses 12%/9%/6% of its original damage points per Intermediate Turn. Ships must slow to 15 knots or less.

Capsizing: If the total percentage of all flooding on the ship totals 15% or more of the ship’s original damage points there is a risk that the ship will capsize (roll over). It is not the total amount of water in the ship, but the uncontrolled rate of entry, that creates a risk of capsizing.

The chance of this happening is 25% (cumulative), rolled each Intermediate Turn until the flooding casualties are isolated reducing the percentage below 15%.

Damage Control: Isolating Flooding. For each flooding critical, roll D10 in the Resolution Phase of the Tactical Turn the flooding started and in each following Intermediate Turn: 1-4 means that the flooding has been reduced one level in intensity, and minor flooding is completely isolated; 5-8 means that the flooding continues as before; 9-10 means that the flooding increases one level of severity. Severe flooding will not increase in severity beyond the 12%/9% associated with a ship’s completion date.

National Effectiveness. Different navies were more or less effective in training their crews in how to control flooding. These represent average values, and individual leadership or circumstances could change a crew’s performance dramatically. Modify the D10 roll by -1 for German crews but a die roll of zero (10) is always treated as a 10, regardless of modifiers.

8.2.15 Main Battery. Roll D10. On a 1-2, the fire control for the main gun battery has been knocked out (armor penetration not required). See 8.2.10. On a 3-0, one of the gun mounts/turrets in the main battery is out of action. Roll D10 again. On a roll of 9 or 0 the magazine detonates, destroying the ship. Ships within 300 yards of the exploding ship suffer damage equal to the battery’s HE damage at Short range.

If a main battery mount/turret is hit, roll randomly to see which one is destroyed. All mounts/turrets are counted, even if they are already out of action. If the mount has already been destroyed, no further damage is inflicted.

(Optional) Because some navies exercised poor flash protection procedures and/or used a picric acid based explosive in some or all of their shells, one of the following modifiers is applied to the main magazine detonation die roll. This modifier is only applicable to A, B and C size class ships.

<u>Nation and Time Period</u>	<u>Die Roll Modifier</u>
Germany:	
1914 to Early 1915	+1
Great Britain:	
1914 to Mid-1916	+2

8.2.16 Other Weapon. One of the weapons listed for the ship on its Form 10, except a main battery or casemate, has been knocked out. Roll randomly to find out which mounts have been hit. Previously hit mounts can be hit again. If the mount has already been destroyed, no further damage is inflicted. If there are no applicable weapons, ignore the critical.

Light Batteries have their strength reduced by 1/3. There is no chance for a magazine explosion with these light guns.

If it is a torpedo tube see 8.2.20.

8.2.17 Rudder. The ship’s steering or control surfaces are damaged. Maximum speed is reduced to 1/3 of the ship’s undamaged speed. Course changes after moving the required advance are reduced from 45° to 15°, and the reduction in speed remains in effect. Roll D10 for the rudder’s position.

- 1 - 4: Jammed to Port - ship turns slowly to port (left)
- 5 - 8: Jammed to Stbd - ship turns slowly to starboard (right)
- 9 - 0: Jammed Ahead - ship continues on course

8.2.18 Sensors: One of the ship’s sensors is destroyed. Roll randomly to determine which one is affected.

- 1 - 5: One forward searchlight platform
- 6-0: One after searchlight platform

Note: Size class C&D ships only have one forward and one aft searchlight platform.

8.2.20 Torpedo. A torpedo mount. Roll D10. On a 9 or 0, the mount's ammunition explodes, doing half the number of weapons warhead's present worth of damage to the ship. If the mount has fired all of its weapons, there is no danger of explosion.

If a torpedo in the tube detonates, and is below the waterline (all ships in Fatal Choices) it inflicts an automatic flooding critical, and the damage points should be applied as underwater damage. Battle cruisers with submerged torpedo tubes should ignore any torpedo protection system they are fitted with.

8.2.21 Weapon. One of the ship's weapons has been knocked out. Check the total number of mounts carried by the ship and roll randomly to see which one has been hit. If is the Main Battery, see 8.2.15. If it is a torpedo tube, see 8.2.20.

8.3 Repairs. Damage cannot be repaired during a battle, except to stop fires and flooding. Some damage, especially to sensors and weapons, may be correctable after battle. Players may want to consider the reparability of damage when they evaluate the outcome of the battles depicted in Fatal Choices. Damage to the ship's structure is not repairable, except in port. Some flotation damage from flooding can be removed by pumping the water out.

To find the chance of repairing a system take the ship's remaining damage points and divide them by the ship's original damage points. This is the Repair Roll. Roll D100 for each critical. A D100 roll less than or equal to the Repair Roll means the system has been repaired and is operational. Early attempts to repair, at the 6- or 12-hour points, halve the Repair roll.

For example, a ship with 37 damage points remaining out of 100 original points has a 37% Repair Roll. Attempting to repair a system at 6 and 12 hours after the battle, the player has an 18% chance ($37\%/2$) of fixing the problem. At the 24 and 48-hour points, he has a full 37% chance.

8.3.1 Weapon Mount. Make Repair rolls 6 hours, 12 hours, 24 hours, and 48 hours after the battle is over. If a system is hit or damaged again before the roll is successful, compute the new roll and start over. Failure to successfully roll the 48 hour Repair roll means that the system cannot be repaired at sea.

8.3.2 Communications. Make Repair rolls 6 hours, 12 hours, 24 hours, and 48 hours after the battle is over. If a system is hit or damaged again before the roll is successful, compute the new roll and start over. Failure to successfully roll the 48 hour Repair roll means that the system cannot be repaired at sea.

8.3.3 Flooding. Remove one half of the flooding damage points automatically (they pump the water out), but there is a chance of the patch popping. The chance for surface ships equals the (sea state x 5%) - (30 - maximum speed that day in knots)%.

A failing patch inflicts a flooding Critical hit.

Example: A ship with a flooding patch spends one Intermediate Turn at 20 knots in sea state 3. The chance of the patch popping is $(3 \times 5\%) - (30 - 20)\% = 15\% - 10\% = 5\%$, a low chance. If the sea state were 6, though, the chance would be $(6 \times 5\%) - (30 - 20)\% = 30\% - 10\%$, or 20%. It pays to reduce speed in rough weather when you have holes in your ship.

8.3.4 Fire. A fire may restart at the 6- (10%), 12- (5%), 24- (2%), and 48-hour (1%) marks. Find out the size of the fire by rolling D10-2 applied to 8.2.9..

8.3.5 Engineering. Make repair rolls 6 hours, 12 hours, 24 hours, and 48 hours after the battle is over. If a system is hit or damaged again before the roll is successful, compute the new roll and start over. Failure to successfully roll the 48 hour repair roll means that the system cannot be repaired at sea.

8.3.6 Bridge. Repair rolls are made at the 12 hour, 24 hour, and 48 hour marks. A fire on the bridge is resolved according to 8.3.4. Degraded operations are allowed automatically 1 hour after the critical hit was taken. Two Tactical Turns are needed to change course. Normal operations are allowed after the repair roll is successfully made.

8.3.7 Rudder. Make repair rolls 6 hour, 12 hours, 24 hours, and 48 hours after the battle is over. If a system is hit or damaged again before the roll is successful, compute the new roll and start over. Failure to successfully roll the 48 hour repair roll means that the system cannot be repaired at sea.

Solitaire play

The best experience is achieved when there are sufficient players taking part so that each ship is controlled by one player with a referee to coordinate the entire affair. It's even better if separate players represent the squadron commanders. With the exception of the Battle of the Falklands, the scenarios are small enough to be easily playable by two players without a referee. Players will have the most authentic experience if they remember that in the actual event the squadron commander would not have instant obedience to his orders and they should self-impose appropriate delays to their maneuvers.

Similarly, smaller scenarios are easily explored through solo play so long as the player is conscientious about not giving one side or the other unrealistic advantages in foreknowledge. The easiest way to achieve this is to commit each side to a "battle plan" before the action starts and then see if they can carry it out.

Conclusion

In all cases of differing Interpretations of the rules players should use common sense and good sportsmanship to reach an understanding that retains the educational value of the scenario. In general, players should assume that any action not expressly allowed by the rules is prohibited. Players should not strive to bend the rules for advantage nor read into the rules more than they say. If an honest disagreement can't be resolved through discussion, the ruling of the game referee is final. Every attempt has been made to make these truncated rules clear and self-contained, but there is always the danger of some contradiction or redundancy slipping through. Judicious application of Occam's razor should head off most difficulties. If there is no referee, then players should flip a coin or roll a die to resolve the particular point at issue. Players may also contact the author or refer to the full FG&DN rules.

In particular, players should bear in mind the limits of technology in 1914. None of the weapons available during this campaign were precision weapons, communications were limited and staff procedures were rudimentary, compared to modern practice. Complicated plans were discouraged and any attempt to be overly clever would most probably result in confusion and disaster.

Annex A

Gunnery Worksheet

1 Part A Environment

<i>Condition</i>	(-)	(+)
Visibility <25% -4 /Visibility < 40% -2 (unless Illuminated/Silhouetted)		x
Target 10 degrees or less in line with sun -2		x
Target 30 degree or less in line with twilight sun +1	x	
Target silhouetted by fire -1		x
Target using a searchlight 0 , Illuminated by searchlight +1	x	
Dead reckoning fire: First turn after losing visual contact -4		x
Blind fire: Firing at muzzle flashes (ignore other visibility modifiers) -6		x
<i>Sea State: Heavy seas hinder aiming guns</i>		
SS 4 A&B 0 C -2 SS 5 A&B -2 C -4 SS 6 A&B -4 C -6 SS 7 No Fire		x
Total Environmental and Visibility Modifiers		
Final For Part A (add (-) and (+)		

2 Part B Firing Ship Modifiers

<i>Condition</i>	(-)	(+)
Firing Ship Not Fired Upon +1 / Kaiser's Cup Winner +1	x	
First salvo (long and extreme range only) -2		x
Second salvo (all ranges) 0	0	0
Third and subsequent salvos at same target (all ranges) +1	x	
Overconcentration (long and extreme range only) -1 per extra ship		x
Exceeding range finder by 3000 yds -1 3-6,000 yds -2 over 6,000 -3		x
Coincidence RF in under 40% visibility (long and extreme range) -1		x
Firing ship moving over 15 knots -1		x
Local Control -2		x
Firing ship changes course by 45 degrees or more -3		x
Firing ship move evasively (takes precedence over course change) -4		x
<i>Number of barrels firing</i>		
1-2 0 3-4 +1 5-6 +2 7-8 +3 9-10 +4 11 or more +5	x	
Total Firing ship Modifiers		
Final For Part B (add (-) and (+)		

3 Part C Target Ship Modifiers

<i>Condition</i>	<i>(-)</i>	<i>(+)</i>
<i>Target Speed:</i>		
25 kts+ -3 20-24 kts -2 10 kts or less +1 Dead in water +2		
<i>Target steering evasively</i>		
Size B (Pre-dreadnoughts cannot) -2 Size C -3		x
<i>Target Aspect</i>		
Size A Broad +2 / Quarter +1 / Narrow +0		
Size B Broad +1 / Quarter +0 / Narrow -1		
Size C Broad +0 / Quarter -1 / Narrow -2		x
Total Target ship Modifiers		
Final For Part c (add (-) and (+)		

Final calculation: combine modifiers for Parts A, B & C. Multiply by 3 at Short or medium range, or 2 for long or extreme range to determine a percentage change to the base chance to hit.



Annex B

Tables



Sighting Range Tables

All distances in 1,000s of yards



35 100% Visibility (Sigma 6)

Observer  Target 	A	B	C
A	40.0	38.0	36.0
B	38.0	36.0	34.0
C	36.0	35.0	32.0
T	4.0	4.0	4.0



85% Visibility (Sigma 5)

Observer  Target 	A	B	C
A	34.0	32.3	30.6
B	32.3	30.6	28.9
C	30.6	29.8	27.2
T	3.4	3.4	3.4



75% Visibility (Sigma 4)

Observer  Target 	A	B	C
A	30.0	28.5	27.0
B	28.5	27.0	25.5
C	27.0	26.3	24.0
T	3.0	3.0	3.0



60% Visibility (Sigma 4)

Observer  Target 	A	B	C
A	24.0	22.8	21.6
B	22.8	21.6	20.4
C	21.6	21.0	19.2
T	2.4	2.4	2.4



50% Visibility (Sigma 3)

Observer  Target 	A	B	C
A	20.0	19.0	18.0
B	19.0	18.0	17.0
C	18.0	17.5	16.0
T	2.0	2.0	2.0



40% Visibility (Sigma 3)

Observer  Target 	A	B	C
A	16.0	15.2	14.4
B	15.2	14.4	13.6
C	14.4	14.0	12.8
T	1.6	1.6	1.6



25% Visibility (Sigma 2)

Observer  Target 	A	B	C
A	10.0	9.5	9.0
B	9.5	9.0	8.5
C	9.0	8.8	8.0
T	1.0	1.0	1.0



2% Visibility (Sigma 0)

Observer  Target 	A	B	C
A	0.8	0.8	0.7
B	0.8	0.7	0.7
C	0.7	0.7	0.6
T	0.1	0.1	0.1

10% Visibility (Sigma 2)

Observer  Target 	A	B	C
A	4.0	3.8	3.6
B	3.8	3.6	3.4
C	3.6	3.5	3.2
T	0.4	0.4	0.4

5% Visibility (Sigma 1)

Observer  Target 	A	B	C
A	2.0	1.9	1.8
B	1.9	1.8	1.7
C	1.8	1.7	1.6
T	0.2	0.2	0.2

Modifiers

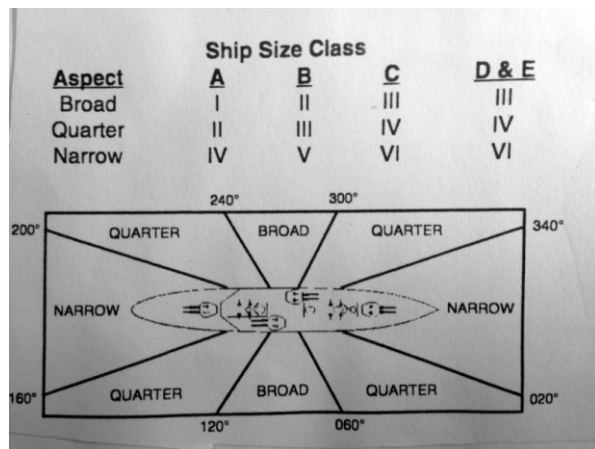
- Ship stack smoke doubles normal surface to surface range in good visibility (75% or better) Ships emit large quantities of smoke when they area at 75%+ of maximum speed because of incomplete combustion. A group of six or more ships at any speed is also detected at twice normal range.
- Coal-burning ships (all warships in Fatal Choices are coal-burners) steaming at 75%+ maximum sped at night increase their chance of being seen by one table. Sparks and glowing around the stack make it easier to spot a ship at high speed.
- Gun flashes increase night surface-to-surface visibility by two tables.

Visibility Variation Table

[illegible]



DAMAGE RATIO TABLE

Damage	D6 Die Roll					
Ratio	1	2	3	4	5	6
<.10						1
0.10					1	2
0.20				1	2	3
0.30			1	2	3	4
0.40		1	2	3	4	5
0.50	1	2	3	4	5	6
0.60	2	3	4	5	6	7
0.70	3	4	5	6	7	8
0.80	4	5	6	7	8	9
0.90	5	6	7	8	9	10
1.00	6	7	8	9	10	11
1.20	7	8	9	10	11	12
1.40	8	9	10	11	12	13
1.60	9	10	11	12	13	14
1.80	10	11	12	13	14	15
2.00	11	12	13	14	15	16
2.20	12	13	14	15	16	17
2.40	13	14	15	16	17	18
2.60	14	15	16	17	18	19
2.80	15	16	17	18	19	20
3.00	16	17	18	19	20	21



Note: Higher ratios may be extrapolated by adding one to the number of critical hits for each 0.3 that the Damage Ratio exceeds 3.0.

Table 4 CRITICAL HITS

D10  Size 	Warship A&B	Warship C	Auxiliary	By Torpedoes
1	Main Battery*	Main Battery	Weapon	Weapon
2	Casemate*	Other weapon	Cargo (No Effect)	Weapon
3	Other Weapon	Other weapon	Cargo (No Effect)	Fire
4	Sensors	Sensors	Cargo (No Effect)	Flooding
5	Flooding*	Flooding	Flooding	Flooding
6	Comms	Comms	Cargo (No Effect)	Flooding
7	Engineering*	Engineering	Engineering	Engineering
8	Bridge*	Bridge	Bridge	Engineering
9	Fire	Fire	Fire	Engineering
10	Rudder*	Rudder	Rudder	Rudder

Locations with (*) require armor penetration, otherwise No Effect

Table 5 Torpedo CRT I

Salvo Size = 1		Salvo Size = 2		
Torp Run		Torp Run		
Yards	Hit % for 1	Yards	Hit % for 1	Hit % for 2
500	0.64	500	0.85	0.41
750	0.46	750	0.71	0.21
1000	0.35	1000	0.58	0.12
1500	0.24	1500	0.42	0.06
2000	0.18	2000	0.33	0.03
3000	0.12	3000	0.23	0.01
4000	0.09	4000	0.17	0.01
6000	0.06	6000	0.12	-
8000	0.05	8000	0.09	-
10000	0.04	10000	0.07	-

Table 6 Torpedo CRT II

Salvo Size = 1		Salvo Size = 2		
Torp Run		Torp Run		
Yards	Hit % for 1	Yards	Hit % for 1	Hit % for 2
500	0.51	500	0.76	0.26
750	0.35	750	0.58	0.12
1000	0.27	1000	0.47	0.07
1500	0.18	1500	0.33	0.03
2000	0.14	2000	0.26	0.02
3000	0.09	3000	0.17	0.01
4000	0.07	4000	0.14	-
6000	0.05	6000	0.10	-
8000	0.04	8000	0.09	-
10000	0.03	10000	0.07	-

Table 7 Torpedo CRT III

Salvo Size = 1		Salvo Size = 2		
Torp Run		Torp Run		
Yards	Hit % for 1	Yards	Hit % for 1	Hit % for 2
500	0.35	500	0.58	0.12
750	0.24	750	0.42	0.06
1000	0.18	1000	0.33	0.03
1500	0.12	1500	0.23	0.01
2000	0.09	2000	0.17	0.01
3000	0.06	3000	0.12	-
4000	0.05	4000	0.10	-
6000	0.03	6000	0.07	-
8000	0.02	8000	0.05	-
10000	0.02	10000	0.04	-

Table 8 Torpedo CRT IV

Salvo Size = 1		Salvo Size = 2		
Torp Run		Torp Run		
Yards	Hit % for 1	Yards	Hit % for 1	Hit % for 2
500	0.27	500	0.47	0.07
750	0.18	750	0.33	0.03
1000	0.14	1000	0.26	0.02
1500	0.09	1500	0.17	0.01
2000	0.07	2000	0.14	-
3000	0.05	3000	0.10	-
4000	0.03	4000	0.07	-
6000	0.02	6000	0.04	-
8000	0.01	8000	0.02	-
10000	0.01	10000	0.02	-

Table 9 Torpedo CRT V

Salvo Size = 1		Salvo Size = 2		
Torp Run		Torp Run		
Yards	Hit % for 1	Yards	Hit % for 1	Hit % for 2
500	0.18	500	0.33	0.03
750	0.12	750	0.23	0.01
1000	0.09	1000	0.17	0.01
1500	0.06	1500	0.12	-
2000	0.05	2000	0.10	-
3000	0.03	3000	0.06	-
4000	0.02	4000	0.04	-
6000	0.01	6000	0.02	-
8000	0.01	8000	0.02	-
10000	-	10000	-	-

Table 10 Torpedo CRT VI

Salvo Size = 1		Salvo Size = 2		
Torp Run		Torp Run		
Yards	Hit % for 1	Yards	Hit % for 1	Hit % for 2
500	0.11	500	0.21	0.01
750	0.07	750	0.14	-
1000	0.05	1000	0.10	-
1500	0.04	1500	0.06	-
2000	0.03	2000	0.04	-
3000	0.02	3000	0.06	-
4000	0.01	4000	0.03	-
6000	-	6000	0.02	-
8000	-	8000	0.01	-
10000	-	10000	-	-

Counter Manifest

On the following page is an image of the counters needed to play the scenarios included in Fatal Choices. If you have the eBook edition you can print it out, mount the counters on cardstock and cut them out for personal use. If you have the physical edition of the book you can make photocopies for personal use.

Laser-cut ship counters on thick cardboard are also available from **www.fatalchoices1914.com** for the price listed on the Website.

Included on the counter sheet are the following:

24 ships, including all six ships that were part of Spee's squadron at one point or another as well as the 16 British and Australian warships that either fought Spee or could have. The ships are depicted in a stylized fashion to highlight the layout of the gun batteries in a way that is clear for novice admirals. Players desiring a more realistic style are strongly urged to purchase a set of the special edition Fatal Choices counters from Topside Miniatures at **www.topsideminis.com**.

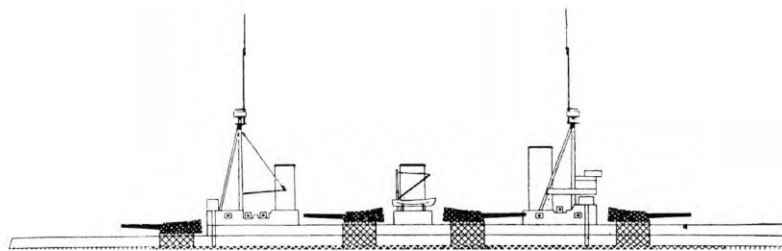
The other two ships are the sailing ship Fairport that sailed through the middle of the Falklands battle and a generic collier for use in player-designed scenarios.

There are four torpedo counters for use with the FG&DN rules and six Low Ammo counters for use with the NavTac rules. The eight smoke counters can be used with either set of rules to mark the direction affected by stack smoke.

The final two counters can be used by players to mark the respective flagship of each squadron for signaling and formation purposes.

Annex C

Ship Forms



Australia BC

Indefatigable class GB

BASIC SHIP DATA

Size Class: A/Large
 Armor: 14/6/90
 Advance per 45° turn
 Standard Rudder: 300 yds
 Hard Rudder: 200 yds
 Accel/Tac Turn from 0-50% Max Speed: 6
 Accel/Tac Turn from 51-100% Max Speed: 3
 Deceleration/Tact Turn from any Speed: 8

In Service: 1911
 Crew: 800
 (Speed Loss)

COMMUNICATIONS

Visual Signals	# of Signals	W/T Types	Range (nm)
Flag Hoists:	5	Primary:	500 nm
Flashing Light:	2	Auxiliary:	30 nm
Total Signals:	5		

SEARCHLIGHTS:

Port Wing, Stbd Wing,
 Port Aft, Stbd Aft 4 kys

WEAPONS

MkX 12 in/45 Fwd <input type="checkbox"/> Port & Stbd <input type="checkbox"/> Port & Stbd <input type="checkbox"/> Aft <input type="checkbox"/> // Main Btry Director Fwd <input type="checkbox"/> Aft <input type="checkbox"/>											
Short Rng (50% Hit)				Med Rng (30% Hit)				Long Rng (10% Hit)			
100% vs Belt				100% vs Belt				70% vs Belt			
Shell	kyds	Pen	Dam	kyds	Pen	Dam	kyds	Pen	Dam	kyds	Pen
APC	0 -	42	28	4.6 -	29	23	10.0 -	22/6	20	14.1 -	17/8
CPC	4.5	32	25	9.9	22	20	14.0	17/4	18	16.5	13/6
HE		7	31		5	26		4/1	24		3/2

MkVII BL 4 in/50 Port Wing <input type="checkbox"/> Port <input type="checkbox"/> Port <input type="checkbox"/> Port Aft <input type="checkbox"/> Port Aft <input type="checkbox"/>											
MkVII BL 4 in/50 Stbd Wing <input type="checkbox"/> Stbd <input type="checkbox"/> Stbd <input type="checkbox"/> Stbd Aft <input type="checkbox"/> Stbd Aft <input type="checkbox"/>											
Short Rng (50% Hit)				Med Rng (30% Hit)				Long Rng (10% Hit)			
100% vs Belt				100% vs Belt				70% vs Belt			
Shell	kyds	Pen	Dam	kyds	Pen	Dam	kyds	Pen	Dam	kyds	Pen
CP	0 -	2	10	3.6 -	1	9	7.1 -	1/0	8	9.4 -	1/0
HE	3.5	1	13	7.0	1	11	9.3	0/0	10	11.6	0/0

Port ☐ Stbd ☐ 21 in subm TT w/12 RGF 21 in MkII torp total ☐☐☐☐☐☐☐☐☐☐
 RGF 21 in MkII Range 3.8 kys, 45 kts, 70 DP
 Range 10.0 kys, 29 kts

Small Caliber Guns	Strength	Range Finder	Range	+3 kys	+6 kys
Antiaircraft Btry: 1 12 pdr/20cwt, 1 6 pdr QF MkI	(2.0)	B&S FQ2	14.5	17.5	20.5

REMARKS

Virtual repeat of *Invincible* design. No director for secondary battery. Gunnery Standard 2, local control.

DAMAGE & SPEED BREAKDOWN

	None	25%	50%	75%	90%	100%	Critical Hits
Damage Taken	0	98	195	293	351	390	Engineering: <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> Rudder: _____
Max Speed	25	19	13	6	0	Sunk	Bridge: <input type="checkbox"/>

Fire/Flooding Severity Conditions:

Starting DP	Dmg Rcvd	on Turn	Remaining Dmg	CH Ratio	Starting DP	Dmg Rcvd	on Turn	Remaining Dmg	CH Ratio
390	_____	_____	_____	_____	_____	_____	_____	_____	_____
_____	_____	_____	_____	_____	_____	_____	_____	_____	_____
_____	_____	_____	_____	_____	_____	_____	_____	_____	_____
_____	_____	_____	_____	_____	_____	_____	_____	_____	_____
_____	_____	_____	_____	_____	_____	_____	_____	_____	_____

Fire/Flooding D6+2

Fire/Flooding _____%

Fire/Flooding _____%

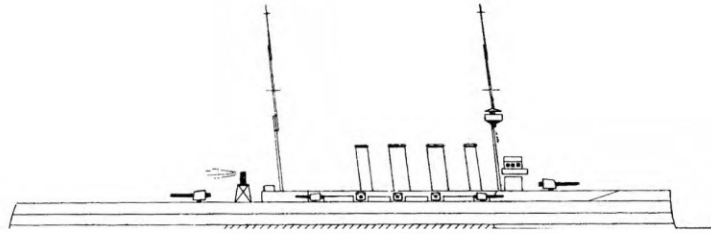
Fire/Flooding _____%

Fire/Flooding _____%

Minor (1-09%)
 Major (10-14%)
 Severe (15-16%)
 Overwhelmed (17+%)



Fear God & Dread Nought Form 10



Bristol CL

Bristol class GB

BASIC SHIP DATA

Size Class: C/Small
Armor: 2/2
Advance per 45° turn
Standard Rudder: 200 yds
Hard Rudder: 100 yds
Accel/Tac Turn from 0-50% Max Speed:
Accel/Tac Turn from 51-100% Max Speed:
Deceleration/Tact Turn from any Speed:

In Service: 1910
Crew: 480
(Speed Loss)
(2)
(3)
8
4
10

COMMUNICATIONS

of W/T Range
Visual Signals Signals Types (nm)
Flag Hoists: 2 Primary: 100 nm
Flashing Light: 3 Auxiliary: 5 nm
Total Signals: 2

SEARCHLIGHTS:

Fwd, Aft 3 kyds

WEAPONS

MkXI BL 6 in/45 Fwd <input type="checkbox"/> Aft <input type="checkbox"/>				MkVII 4 in/50 Port Wing <input type="checkbox"/> Stbd Wing <input type="checkbox"/> Port <input type="checkbox"/> Port <input type="checkbox"/> Stbd <input type="checkbox"/> Stbd <input type="checkbox"/> Stbd <input type="checkbox"/> Port Aft <input type="checkbox"/> Stbd Aft <input type="checkbox"/>			
Short Rng (50% Hit)				Med Rng (30% Hit)			
100% vs Belt				100% vs Belt			
Shell	Type	kyds	Pen Dam	kyds	Pen Dam	kyds	Pen Dam
APC	0 -	13	16	4.4 -	8	13	8.7 - 6/1 11
CPC	4.3	10	14	8.6	6	11	11.4 4/1 10
HE	2	18		1	16		1/0 14

Short Rng (50% Hit)				Med Rng (30% Hit)			
100% vs Belt				100% vs Belt			
Shell	Type	kyds	Pen Dam	kyds	Pen Dam	kyds	Pen Dam
CP	0 -	2	10	3.6 -	1	9	7.1 - 1/0 8
HE	3.5	1	13	7.0	1	11	9.3 0/0 10

Port ☐ Stbd ☐ 18 in subm TT w/7 RGF 18 in MkVII torp total ☐☐☐☐☐☐

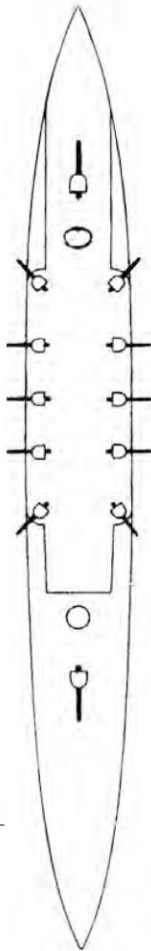
RGF 18 in MkVII (1909) Range 3.0 kyds, 41 kts, 62 DP

Range 5.5 kyds, 29 kts

Small Caliber Guns	Strength	Range Finder	Range	+3 kyds	+6 kyds
Anitarcraft Btry: (1)1 12 pdr/20cwt	(0.8)	B&S FQ2	14.5	17.5	20.5

REMARKS

No director for main or secondary batteries. Gunnery Standard 2, local control.



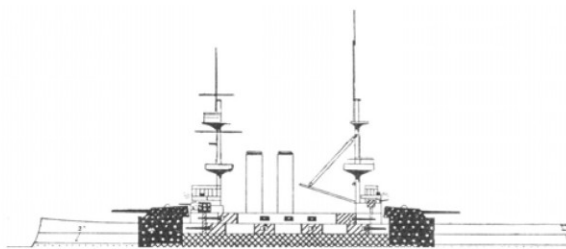
DAMAGE & SPEED BREAKDOWN

	None	25%	50%	75%	90%	100%	Critical Hits
Damage Taken	0	33	67	100	120	133	Engineering: <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> Rudder: _____
Max Speed	25	19	13	6	0	Sunk	Bridge: <input type="checkbox"/>

Fire/Flooding Severity Conditions:

Starting DP	Dmg Rcvd	on Turn	Remaining Dmg	CH Ratio	Starting DP	Dmg Rcvd	on Turn	Remaining Dmg	CH Ratio
133									
Fire/Flooding D6+2			Fire/Flooding _____%		Fire/Flooding _____%			Fire/Flooding _____%	

Minor (1-07%)
Major (08-11%)
Severe (12-13%)
Overwhelmed (14+%)



Canopus OBB

Canopus class GB

BASIC SHIP DATA

Size Class: B/Medium In Service: 1899
Armor: 11/3 Crew: 683
Advance per 45° turn (Speed Loss)
Standard Rudder: 300 yds (3)
Hard Rudder: 200 yds (4)
Accel/Tac Turn from 0-50% Max Speed: 4
Accel/Tac Turn from 51-100% Max Speed: 2
Deceleration/Tact Turn from any Speed: 6

COMMUNICATIONS

Visual Signals	# of Signals	W/T Types	Range (nm)
Flag Hoists:	3	Primary:	100 nm
Flashing Light:	4	Auxiliary:	5 nm
Total Signals:	3		

SEARCHLIGHTS:

Port Wing, Stbd Wing, Port Aft, Stbd Aft 4 kyds

WEAPONS

MkVIII 12 in/35 Fwd ☐ Aft ☐ // Main Btry Director Fwd ☐ Aft ☐

Shell Type	Short Rng (50% Hit) 100% vs Belt			Med Rng (30% Hit) 100% vs Belt			Long Rng (10% Hit) 70% vs Belt			Extreme Rng (5% Hit) 40% vs Belt		
	kyds	Pen	Dam	kyds	Pen	Dam	kyds	Pen	Dam	kyds	Pen	Dam
APC	0 -	35	27	4.7 -	24	22	11.1 -	19/5	19	--	--	--
AP	4.6	28	27	11.0	19	22	13.9	15/5	19	--	--	--
CP		12	25		8	21		6/1	18	--	--	--
HE		6	31		4	26		3/1	24	--	--	--

MkII QF 6 in/40 Port Wing ☐ Port ☐ Port ☐ Port Aft ☐ Port Aft ☐
MkII QF 6 in/40 Stbd Wing ☐ Stbd ☐ Stbd ☐ Stbd Aft ☐ Stbd Aft ☐

Shell Type	Short Rng (50% Hit) 100% vs Belt			Med Rng (30% Hit) 100% vs Belt			Long Rng (10% Hit) 70% vs Belt			Extreme Rng (5% Hit) 40% vs Belt		
	kyds	Pen	Dam	kyds	Pen	Dam	kyds	Pen	Dam	kyds	Pen	Dam
CP	0 -	8	15	3.1 -	5	12	6.1 -	3/1	11	8.1 -	2/1	10
HE	3.0	7	14	6.0	4	11	8.0	3/1	10	10.0	2/1	9

MkI QF 12 pdr/12cwt Port Wing ☐ Port ☐ Port ☐ Port Aft ☐
MkI QF 12 pdr/12cwt Stbd Wing ☐ Stbd ☐ Stbd ☐ Stbd Aft ☐

Shell Type	Short Rng (50% Hit) 100% vs Belt			Med Rng (30% Hit) 100% vs Belt			Long Rng (10% Hit) 70% vs Belt			Extreme Rng (5% Hit) 40% vs Belt		
	kyds	Pen	Dam	kyds	Pen	Dam	kyds	Pen	Dam	kyds	Pen	Dam
CP	0 -	1	8	3.6 -	1	7	7.2 -	1/0	8	9.5 -	0/0	5
HE	3.5	1	11	7.1	0	9	9.4	0/0	10	11.8	0/0	7

Port ☐ Stbd ☐ 21 in subm TT w/12 RGF 18 in MkV* torp total ☐☐☐☐☐☐☐☐

RGF 18 in MkV* Range 1.0 kyds, 33 kts, 54 DP
Range 3.0 kyds, 21 kts
Range 4.0 kyds, 18 kts

Small Caliber Guns

Strength

Antiaircraft Btry: 1 12 pdr/20cwt, 1 6 pdr QF MkI
Lt Btry: (1) 6 3 pdr QF MkI

(2.0)
(2.0)

Range Finder

Range

+3 kyds

+6 kyds

B&S FQ2

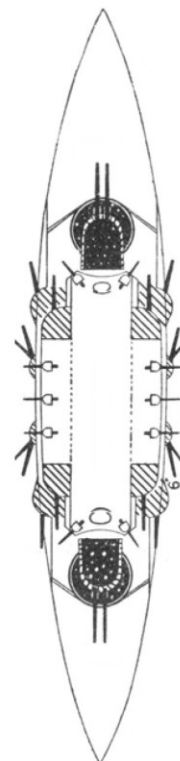
14.5

17.5

20.5

REMARKS

No director for secondary battery. Gunnery Standard 2, local control.



DAMAGE & SPEED BREAKDOWN

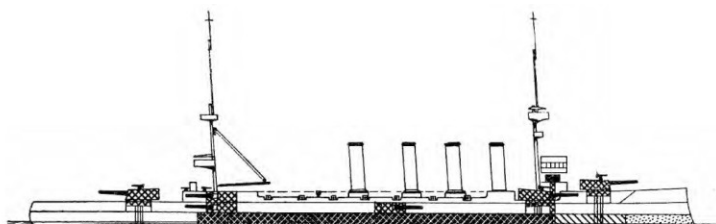
	None	25%	50%	75%	90%	100%	Critical Hits	Engineering:	Rudder:
Damage Taken	0	74	149	223	267	297	<input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/>	<input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/>	_____
Max Speed	13	10	7	3	0	Sunk	Bridge: <input type="checkbox"/>		

Fire/Flooding Severity Conditions:

Starting DP	Dmg Rcvd	on Turn	Remaining Dmg	CH Ratio	Starting DP	Dmg Rcvd	on Turn	Remaining Dmg	CH Ratio
297	_____	_____	_____	_____	_____	_____	_____	_____	_____
_____	_____	_____	_____	_____	_____	_____	_____	_____	_____
_____	_____	_____	_____	_____	_____	_____	_____	_____	_____
_____	_____	_____	_____	_____	_____	_____	_____	_____	_____
_____	_____	_____	_____	_____	_____	_____	_____	_____	_____
Fire/Flooding D6+2	_____	_____	Fire/Flooding _____%	_____	Fire/Flooding _____%	_____	_____	Fire/Flooding _____%	_____

Minor (1-09%)
Major (10-14%)
Severe (15-16%)
Overwhelmed (17+%)

Fear God & Dread Nought Form 10



Carnavon CR

Devonshire class GB

BASIC SHIP DATA

Size Class: B/Medium
 Armor: 12/3
 Advance per 45° turn
 Standard Rudder: 300 yds (3)
 Hard Rudder: 200 yds (4)
 Accel/Tac Turn from 0-50% Max Speed: 6
 Accel/Tac Turn from 51-100% Max Speed: 3
 Deceleration/Tact Turn from any Speed: 8

In Service: 1905
 Crew: 655
 (Speed Loss)

COMMUNICATIONS

Visual Signals	# of Signals	W/T Types	Range (nm)
Flag Hoists:	3	Primary:	100 nm
Flashing Light:	4	Auxiliary:	5 nm
Total Signals:	3		

SEARCHLIGHTS:

Port Wing, Stbd Wing,
 Port Aft, Stbd Aft 4 kyds

WEAPONS

MkI 7.5 in/45 Fwd ☐ Port Wing ☐ Stbd Wing ☐ Aft ☐

Shell Type	Short Rng (50% Hit)			Med Rng (30% Hit)			Long Rng (10% Hit)			Extreme Rng (5% Hit)		
	kyds	Pen	Dam	kyds	Pen	Dam	kyds	Pen	Dam	kyds	Pen	Dam
APC	0 -	18	19	4.5 -	13	15	9.2 -	9/2	13	12.3 -	6/3	12
CPC	4.4	14	17	9.1	10	14	12.2	7/2	12	15.2	5/2	11
HE		3	22		2	19		1/1	17		1/1	15

MkVII BL 6 in/45 Casemate Port ☐☐☐

MkVII BL 6 in/45 Casemate Stbd ☐☐☐

Shell Type	Short Rng (50% Hit)			Med Rng (30% Hit)			Long Rng (10% Hit)			Extreme Rng (5% Hit)		
	kyds	Pen	Dam	kyds	Pen	Dam	kyds	Pen	Dam	kyds	Pen	Dam
APC	0 -	11	15	4.5 -	7	12	8.9 -	5/1	11	11.8 -	3/2	10
AP	4.4	9	15	8.8	5	12	11.7	4/1	11	14.6	3/2	10
CPC		8	14		5	11		4/1	10		3/0	9
CP		4	15		2	12		2/0	11		1/0	9
HE		2	18		1	16		1/0	14		1/0	12

Port ☐ Stbd ☐ 18 in subm TT w/12 (est) RGF 18 in MkVI torp total ☐☐☐☐☐☐☐☐

RGF 18 in MkVI (1905)
 Range 1.0 kyds, 34 kts, 54 DP
 Range 2.0 kyds, 28 kts
 Range 4.0 kyds, 20 kts

Small Caliber Guns

Antiaircraft Btry: (1)18 3 pdr QF MkI

Lt Btry: (1)2 12 pdr/18 cwt.

(1)18 3 pdr QF MkI (CP/HE)

Strength

(20.2)

(5.6/7.9)

Range Finder

B&S FQ2

Range

14.5

+3 kyds

17.5

+6 kyds

20.5

REMARKS

No director for main and secondary batteries. Gunnery Standard 2, local control.
 Both 12 pdr guns in the light battery are mounted on the 9.2 inch turrets and cannot be used if the 9.2 inch guns are firing.

DAMAGE & SPEED BREAKDOWN

	None	25%	50%	75%	90%	100%	Critical Hits
Damage Taken	0	64	128	191	230	255	Engineering: <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> Rudder: _____
Max Speed	23	17	12	6	0	Sunk	Bridge: <input type="checkbox"/>

Fire/Flooding Severity Conditions:

Starting DP	Dmg Rcvd	on Turn	Remaining Dmg	CH Ratio	Starting DP	Dmg Rcvd	on Turn	Remaining Dmg	CH Ratio
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255	_____	_____	_____	_____	_____	_____	_____	_____	_____
_____	_____	_____	_____	_____	_____	_____	_____	_____	_____
_____	_____	_____	_____	_____	_____	_____	_____	_____	_____
_____	_____	_____	_____	_____	_____	_____	_____	_____	_____

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_____	_____	_____	_____	_____	_____	_____	_____	_____	_____

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_____	_____	_____	_____	_____	_____	_____	_____	_____	_____

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_____	_____	_____	_____	_____	_____	_____	_____	_____	_____

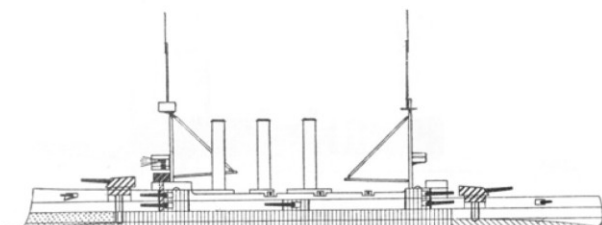
_____	_____	_____	_____	_____	_____	_____	_____	_____	_____
_____	_____	_____	_____	_____	_____	_____	_____	_____	_____

Minor (1-08%)
 Major (09-13%)
 Severe (14-15%)
 Overwhelmed (16+%)

Fire/Flooding _____%

Fear God & Dread Nought Form 10

This form is provided by Clash of Arms.
 It can be photocopied for use with any
 Admiralty Trilogy games.



Cornwall CR

Monmouth class GB

BASIC SHIP DATA

Size Class: B/Medium
 Armor: 9/4
 Advance per 45° turn
 Standard Rudder: 300 yds
 Hard Rudder: 200 yds
 Accel/Tac Turn from 0-50% Max Speed: 6
 Accel/Tac Turn from 51-100% Max Speed: 3
 Deceleration/Tact Turn from any Speed: 8

In Service: 1903
 Crew: 678
 (Speed Loss)

COMMUNICATIONS

Visual Signals	# of Signals	W/T Types	Range (nm)
Flag Hoists:	3	Primary:	100 nm
Flashing Light:	4	Auxiliary:	5 nm
Total Signals:	3		

SEARCHLIGHTS:
 Port Wing, Stbd Wing,
 Port Aft, Stbd Aft
 4 kyds

WEAPONS

MkVII BL 6 in/45 Fwd ☐ Aft ☐

MkVII BL 6 in/45 Casemate Port ☐☐☐☐

MkVII BL 6 in/45 Casemate Stbd ☐☐☐☐

Shell Type	Short Rng (50% Hit)			Med Rng (30% Hit)			Long Rng (10% Hit)			Extreme Rng (5% Hit)		
	100% vs Belt	100% vs Belt	100% vs Belt	100% vs Belt	100% vs Belt	100% vs Belt	70% vs Belt	70% vs Belt	70% vs Belt	40% vs Belt	40% vs Belt	40% vs Belt
APC	0 -	11	15	4.5 -	7	12	8.9 -	5/1	11	11.8 -	3/2	10
AP	4.4	9	15	8.8	5	12	11.7	4/1	11	14.6	3/2	10
CPC		8	14		5	11		4/1	10		3/0	9
CP		4	15		2	12		2/0	11		1/0	9
HE		2	18		1	16		1/0	14		1/0	12

Port ☐ Stbd ☐ 18 in subm TT w/12 (est) RGF 18 in MkV* torp total ☐☐☐☐☐☐☐☐☐☐

RGF 18 in MkV*

Range 1.0 kyds, 33 kts, 54 DP

Range 3.0 kyds, 21 kts

Range 4.0 kyds, 18 kts

LIGHT BATTERIES

Lt Btry: (1)2 12 pdr/18 cwt QF MkIII,
 (1)3 3 pdr QF MkI (CP/HE)

Strength

(20.2)
 (5.6/7.9)

Range Finder

B&S FQ2

Range

14.5

+3 kyds

17.5

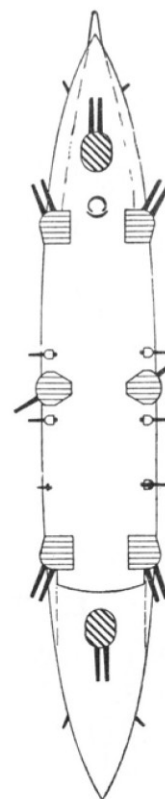
+6 kyds

20.5

REMARKS

No director for main and secondary batteries. Gunnery Standard 2, local control.

Three casemate guns in lower bank are unworkable in anything but calm weather (sea states 0 -2). Armored cruiser.



DAMAGE & SPEED BREAKDOWN

	None	25%	50%	75%	90%	100%	Critical Hits
Damage Taken	0	59	118	176	212	235	Engineering: <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> Rudder: _____
Max Speed	23	17	12	6	0	Sunk	Bridge: <input type="checkbox"/>

Fire/Flooding Severity Conditions:

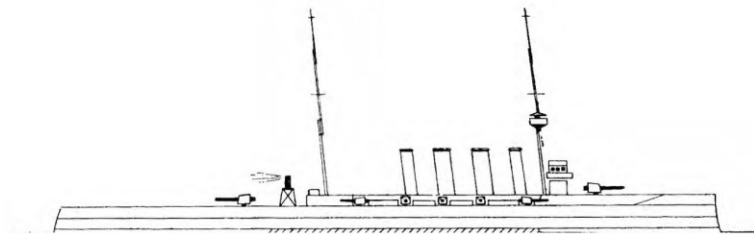
Starting DP	Dmg Rcvd	on Turn	Remaining Dmg	CH Ratio	Starting DP	Dmg Rcvd	on Turn	Remaining Dmg	CH Ratio
-------------	----------	---------	---------------	----------	-------------	----------	---------	---------------	----------

235 _____

Minor (1-08%)
 Major (09-13%)
 Severe (14-15%)
 Overwhelmed (16+%)

Fire/Flooding 2D6+2 Fire/Flooding _____% Fire/Flooding _____% Fire/Flooding _____% Fire/Flooding _____%

Fear God & Dread Nought Form 10



Glasgow CL

Bristol class GB

BASIC SHIP DATA

Size Class: C/Small
 Armor: 2/2
 Advance per 45° turn
 Standard Rudder: 200 yds
 Hard Rudder: 100 yds
 Accel/Tac Turn from 0-50% Max Speed: 8
 Accel/Tac Turn from 51-100% Max Speed: 4
 Deceleration/Tact Turn from any Speed: 10

In Service: 1910
 Crew: 480
 (Speed Loss)

COMMUNICATIONS

Visual Signals	# of Signals	W/T Types	Range (nm)
Flag Hoists:	2	Primary:	100 nm
Flashing Light:	3	Auxiliary:	5 nm
Total Signals:	2		

SEARCHLIGHTS:

Fwd, Aft 3 kyds

WEAPONS

MkXI BL 6 in/45 Fwd ☐ Aft ☐

Shell Type	Short Rng (50% Hit)			Med Rng (30% Hit)			Long Rng (10% Hit)			Extreme Rng (5% Hit)		
	kyds	Pen	Dam	kyds	Pen	Dam	kyds	Pen	Dam	kyds	Pen	Dam
APC	0 -	13	16	4.4 -	8	13	8.7 -	6/1	11	11.5 -	4/2	10
CPC	4.3	10	14	8.6	6	11	11.4	4/1	10	14.3	3/1	9
HE		2	18		1	16		1/0	14		1/0	13

MkVII 4 in/50 Port Wing ☐ Stbd Wing ☐ Port ☐ Port ☐ Port ☐ Stbd ☐ Stbd ☐ Stbd ☐ Port Aft ☐ Stbd Aft ☐

Shell Type	Short Rng (50% Hit)			Med Rng (30% Hit)			Long Rng (10% Hit)			Extreme Rng (5% Hit)		
	kyds	Pen	Dam	kyds	Pen	Dam	kyds	Pen	Dam	kyds	Pen	Dam
CP	0 -	2	10	3.6 -	1	9	7.1 -	1/0	8	9.4 -	1/0	7
HE	3.5	1	13	7.0	1	11	9.3	0/0	10	11.6	0/0	9

Port ☐ Stbd ☐ 18 in subm TT w/7 RGF 18 in MkVII torp total ☐☐☐☐☐☐

RGF 18 in MkVII (1909) Range 3.0 kyds, 41 kts, 62 DP

Range 5.5 kyds, 29 kts

Small Caliber Guns

Anitarcraft Btry: (1)1 12 pdr/20cwt

Strength

(0.8)

Range Finder

B&S FQ2

Range

14.5

+3 kyds

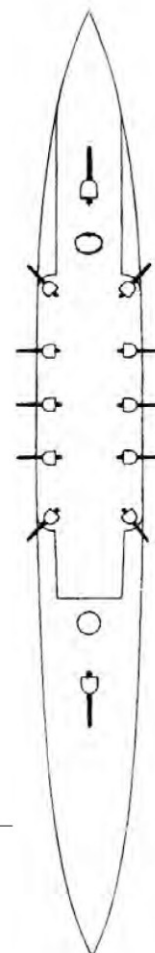
17.5

+6 kyds

20.5

REMARKS

No director for main or secondary batteries. Gunnery Standard 2, local control.



DAMAGE & SPEED BREAKDOWN

	None	25%	50%	75%	90%	100%	Critical Hits
Damage Taken	0	33	67	100	120	133	Engineering: <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> Rudder: _____
Max Speed	25	19	13	6	0	Sunk	Bridge: <input type="checkbox"/>

Fire/Flooding Severity Conditions:

Starting DP	Dmg Rcvd	on Turn	Remaining Dmg	CH Ratio	Starting DP	Dmg Rcvd	on Turn	Remaining Dmg	CH Ratio
133	_____	_____	_____	_____	_____	_____	_____	_____	_____
_____	_____	_____	_____	_____	_____	_____	_____	_____	_____
_____	_____	_____	_____	_____	_____	_____	_____	_____	_____
_____	_____	_____	_____	_____	_____	_____	_____	_____	_____

Fire/Flooding D6+2

Fire/Flooding _____%

Fire/Flooding _____%

Fire/Flooding _____%

Fire/Flooding _____%

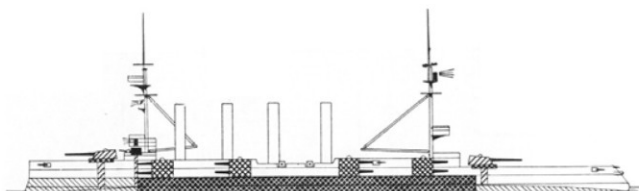
Minor (1-07%)

Major (08-11%)

Severe (12-13%)

Overwhelmed (14+%)

Fear God & Dread Nought Form 10



Good Hope CR

Drake class GB

BASIC SHIP DATA

Size Class: B/Medium
 Armor: 9/5
 Advance per 45° turn
 Standard Rudder: 300 yds
 Hard Rudder: 200 yds
 Accel/Tac Turn from 0-50% Max Speed: 6
 Accel/Tac Turn from 51-100% Max Speed: 3
 Deceleration/Tact Turn from any Speed: 8

In Service: 1902
 Crew: 655
 (Speed Loss)

COMMUNICATIONS

Visual Signals	# of Signals	W/T Types	Range (nm)
Flag Hoists:	3	Primary:	100 nm
Flashing Light:	4	Auxiliary:	5 nm
Total Signals:	3		

SEARCHLIGHTS:
 Port Wing, Stbd Wing,
 Port Aft, Stbd Aft

4 kyds

WEAPONS

MkX 9.2 in/47 Fwd ☐ Aft ☐

Shell Type	Short Rng (50% Hit)			Med Rng (30% Hit)			Long Rng (10% Hit)			Extreme Rng (5% Hit)		
	100% vs Belt			100% vs Belt			70% vs Belt			40% vs Belt		
APC	0 -	28	22	4.3 -	20	18	9.4 -	15/4	13	13.3 -	11/5	14
CPC	4.2	9	20	9.3	7	17	13.2	5/1	12	15.5	4/2	14
HE		4	25		3	21		2/1	17		2/1	17

MkVII BL 6 in/45 Casemate Port ☐☐☐☐☐☐☐

MkVII BL 6 in/45 Casemate Stbd ☐☐☐☐☐☐☐

Shell Type	Short Rng (50% Hit)			Med Rng (30% Hit)			Long Rng (10% Hit)			Extreme Rng (5% Hit)		
	100% vs Belt			100% vs Belt			70% vs Belt			40% vs Belt		
APC	0 -	11	15	4.5 -	7	12	8.9 -	5/1	11	11.8 -	3/2	10
AP	4.4	9	15	8.8	5	12	11.7	4/1	11	14.6	3/2	10
CPC		8	14		5	11		4/1	10		3/0	9
CP		4	15		2	12		2/0	11		1/0	9
HE		2	18		1	16		1/0	14		1/0	12

Port ☐ Stbd ☐ 18 in subm TT w/12 (est) RGF 18 in MkVI torp total ☐☐☐☐☐☐☐☐☐☐

RGF 18 in MkVI (1905)

Range 1.0 kyds, 34 kts, 54 DP
 Range 2.0 kyds, 28 kts
 Range 4.0 kyds, 20 kts

LIGHT BATTERIES

Antiaircraft Btry: (1)18 3 pdr QF MkI
 Lt Btry: (1)12 12 pdr/12 cwt QF MkII,
 (1)3 3 pdr QF MkI

Strength

(20.2)

Range Finder

B&S FQ2

Range

14.5

+3 kyds

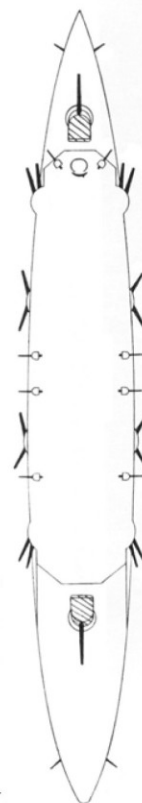
17.5

+6 kyds

20.5

REMARKS

No director for main and secondary batteries. Gunnery Standard 2, local control.
 Enlarged Cressey class. Armored cruiser.
 Four casemate guns in lower bank are unworkable in anything but calm weather (sea states 0 -2). Armored cruiser.



DAMAGE & SPEED BREAKDOWN

	None	25%	50%	75%	90%	100%	Critical Hits
Damage Taken	0	79	158	236	284	315	Engineering: <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> Rudder: _____
Max Speed	23	17	12	6	0	Sunk	Bridge: <input type="checkbox"/>

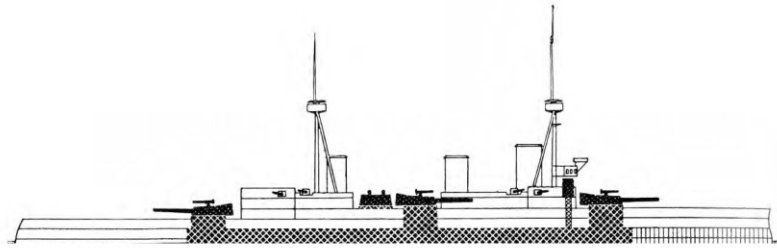
Fire/Flooding Severity Conditions:

Starting DP	Dmg Rcvd	on Turn	Remaining Dmg	CH Ratio	Starting DP	Dmg Rcvd	on Turn	Remaining Dmg	CH Ratio
315	_____	_____	_____	_____	_____	_____	_____	_____	_____
_____	_____	_____	_____	_____	_____	_____	_____	_____	_____
_____	_____	_____	_____	_____	_____	_____	_____	_____	_____
_____	_____	_____	_____	_____	_____	_____	_____	_____	_____
_____	_____	_____	_____	_____	_____	_____	_____	_____	_____
Fire/Flooding 2D6+2	_____	_____	Fire/Flooding _____%	_____	Fire/Flooding _____%	_____	_____	Fire/Flooding _____%	_____

Minor (1-08%)
 Major (09-13%)
 Severe (14-15%)
 Overwhelmed (16+%)

Fire/Flooding _____%

Fear God & Dread Nought Form 10



Inflexible BC

Invincible class GB

BASIC SHIP DATA

Size Class: B/Medium
Armor: 14/5/90
Advance per 45° turn
Standard Rudder: 300 yds
Hard Rudder: 200 yds
Accel/Tac Turn from 0-50% Max Speed: 6
Accel/Tac Turn from 51-100% Max Speed: 3
Deceleration/Tact Turn from any Speed: 8

In Service: 1908
Crew: 784
(Speed Loss)

COMMUNICATIONS

Visual Signals	# of Signals	W/T Types	Range (nm)
Flag Hoists:	5	Primary:	500 nm
Flashing Light:	2	Auxiliary:	30 nm
Total Signals:	5		

SEARCHLIGHTS:

Port Wing, Stbd Wing,
Port Aft, Stbd Aft
4 kyds

WEAPONS

MkX 12 in/45 Fwd ☐ Port ☐ Stbd ☐ Aft ☐ //Main Btry Director Fwd ☐ Aft ☐

Shell	Short Rng (50% Hit)			Med Rng (30% Hit)			Long Rng (10% Hit)			Extreme Rng (5% Hit)		
	100% vs Belt			100% vs Belt			70% vs Belt			40% vs Belt		
Type	kyds	Pen	Dam	kyds	Pen	Dam	kyds	Pen	Dam	kyds	Pen	Dam
APC	0 -	42	28	4.6 -	29	23	10.0 -	22/6	20	14.1 -	17/8	17
CPC	4.5	32	25	9.9	22	20	14.0	17/4	18	16.5	13/6	16
HE		7	31		5	26		4/1	24		3/2	21

MkIII QF Open Mount 4 in/40 Port Wing ☐ Stbd Wing ☐ Port ☐ Port ☐ Stbd ☐ Stbd ☐ Port Aft ☐ Stbd Aft ☐ Aft ☐
MkIII QF Turret Mounted 4 in/40 Fwd ☐ Fwd ☐ Port ☐ Port ☐ Stbd ☐ Stbd ☐ Aft ☐ Aft ☐

Shell	Short Rng (50% Hit)			Med Rng (30% Hit)			Long Rng (10% Hit)			Extreme Rng (5% Hit)		
	100% vs Belt			100% vs Belt			70% vs Belt			40% vs Belt		
Type	kyds	Pen	Dam	kyds	Pen	Dam	kyds	Pen	Dam	kyds	Pen	Dam
CP	0 -	2	10	3.0 -	1	8	5.9 -	1/0	7	7.8 -	1/0	7
HE	2.9	1	13	5.8	1	11	7.7	0/0	10	9.6	0/0	9

Port ☐ Stbd ☐ Stern ☐ 18 in subm TT w/14 (est) RGF 18 in MkVI* torp total ☐☐☐☐☐☐☐☐☐☐

RGF 18 in MkVI* (1907)

Range 1.0 kyds, 35 kts, 62 DP
Range 2.0 kyds, 29 kts
Range 4.0 kyds, 21 kts

Small Caliber Guns

Antiaircraft Btry: 1 12 pdr/20 cwt, 7 Maxim mg

Strength

(3.8)

Range Finder

B&S FQ2

Range

14.5

+3 kyds

17.5

+6 kyds

20.5

REMARKS

No director for secondary battery. Gunnery Standard 2, local control.

Eight of the 4 inch guns are mounted on the 12 inch turrets and cannot be used if the 12 inch guns are firing.

DAMAGE & SPEED BREAKDOWN

	None	25%	50%	75%	90%	100%	Critical Hits
Damage Taken	0	93	186	278	334	371	Engineering: <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> Rudder: _____
Max Speed	25	19	13	6	0	Sunk	Bridge: <input type="checkbox"/>

Fire/Flooding Severity Conditions:

Starting DP	Dmg Rcvd	on Turn	Remaining Dmg	CH Ratio	Starting DP	Dmg Rcvd	on Turn	Remaining Dmg	CH Ratio
371	_____	_____	_____	_____	_____	_____	_____	_____	_____
_____	_____	_____	_____	_____	_____	_____	_____	_____	_____
_____	_____	_____	_____	_____	_____	_____	_____	_____	_____
_____	_____	_____	_____	_____	_____	_____	_____	_____	_____
_____	_____	_____	_____	_____	_____	_____	_____	_____	_____

Fire/Flooding D6+2

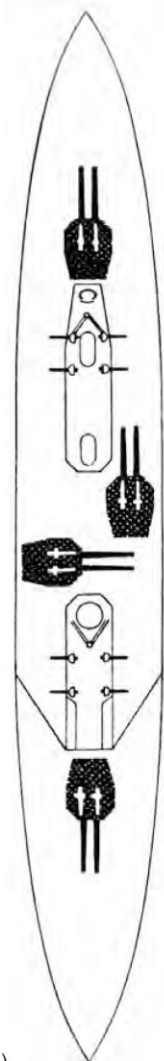
Fire/Flooding _____%

Fire/Flooding _____%

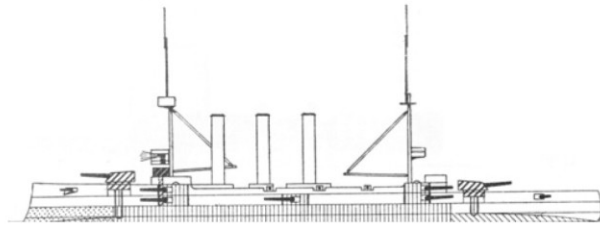
Fire/Flooding _____%

Fire/Flooding _____%

Minor (1-09%)
Major (10-14%)
Severe (15-16%)
Overwhelmed (17+%)



Fear God & Dread Nought Form 10



Kent CR

Monmouth class GB

BASIC SHIP DATA

Size Class: B/Medium
Armor: 9/4
Advance per 45° turn
Standard Rudder: 300 yds
Hard Rudder: 200 yds
Accel/Tac Turn from 0-50% Max Speed: 6
Accel/Tac Turn from 51-100% Max Speed: 3
Deceleration/Tact Turn from any Speed: 8

In Service: 1903
Crew: 678
(Speed Loss)

COMMUNICATIONS

Visual Signals	# of Signals	W/T Types	Range (nm)
Flag Hoists:	3	Primary:	100 nm
Flashing Light:	4	Auxiliary:	5 nm
Total Signals:	3		

SEARCHLIGHTS:

Port Wing, Stbd Wing,
Port Aft, Stbd Aft 4 kyds

WEAPONS

MkVII BL 6 in/45 Fwd ☐ ☐ Aft ☐ ☐

MkVII BL 6 in/45 Casemate Port ☐ ☐ ☐ ☐

MkVII BL 6 in/45 Casemate Stbd ☐ ☐ ☐ ☐

Shell Type	Short Rng (50% Hit)			Med Rng (30% Hit)			Long Rng (10% Hit)			Extreme Rng (5% Hit)		
	100% vs Belt			100% vs Belt			70% vs Belt			40% vs Belt		
APC	0 -	11	15	4.5 -	7	12	8.9 -	5/1	11	11.8 -	3/2	10
AP	4.4	9	15	8.8	5	12	11.7	4/1	11	14.6	3/2	10
CPC		8	14		5	11		4/1	10		3/0	9
CP		4	15		2	12		2/0	11		1/0	9
HE		2	18		1	16		1/0	14		1/0	12

Port ☐ Stbd ☐ 18 in subm TT w/12 (est) RGF 18 in MkV* torp total ☐ ☐ ☐ ☐ ☐ ☐ ☐ ☐
RGF 18 in MkV*

Range 1.0 kyds, 33 kts, 54 DP

Range 3.0 kyds, 21kts

Range 4.0 kyds, 18 kts

LIGHT BATTERIES

Lt Btry: (1)2 12 pdr/18 cwt QF MkIII,
(1)3 3 pdr QF MkI (CP/HE)

Strength

(20.2)
(5.6/7.9)

Range Finder

B&S FQ2

Range

14.5

+3 kyds

17.5

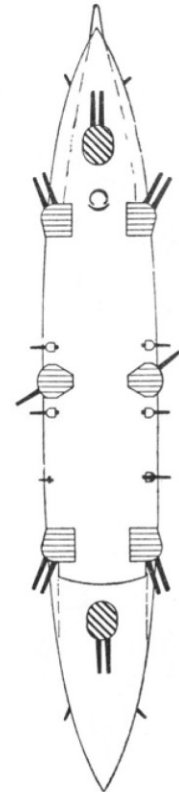
+6 kyds

20.5

REMARKS

No director for main and secondary batteries. Gunnery Standard 2, local control.

Three casemate guns in lower bank are unworkable in anything but calm weather (sea states 0 -2). Armored cruiser.



DAMAGE & SPEED BREAKDOWN

	None	25%	50%	75%	90%	100%	Critical Hits
Damage Taken	0	59	118	176	212	235	Engineering: <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> Rudder: _____
Max Speed	23	17	12	6	0	Sunk	Bridge: <input type="checkbox"/>

Fire/Flooding Severity Conditions:

Starting DP	Dmg Rcvd	on Turn	Remaining Dmg	CH Ratio	Starting DP	Dmg Rcvd	on Turn	Remaining Dmg	CH Ratio
235	_____	_____	_____	_____	_____	_____	_____	_____	_____
_____	_____	_____	_____	_____	_____	_____	_____	_____	_____
_____	_____	_____	_____	_____	_____	_____	_____	_____	_____
_____	_____	_____	_____	_____	_____	_____	_____	_____	_____
_____	_____	_____	_____	_____	_____	_____	_____	_____	_____
Fire/Flooding 2D6+2	_____	_____	Fire/Flooding _____%	_____	Fire/Flooding _____%	_____	_____	Fire/Flooding _____%	_____

Minor (1-08%)
Major (09-13%)
Severe (14-15%)
Overwhelmed (16+%)

Fear God & Dread Nought Form 10

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Admiralty Trilogy games.

Macedonian AMC

Macedonian class GB

BASIC SHIP DATA

Size Class: B/Medium
 Armor: 0
 Advance per 45° turn
 Standard Rudder: 300 yds
 Hard Rudder: 300 yds
 Accel/Tac Turn from 0-50% Max Speed: 3
 Accel/Tac Turn from 51-100% Max Speed: 2
 Deceleration/Tact Turn from any Speed: 4

In Service: 1909 (1914)
 Crew: ???
 (Speed Loss)
 (3)
 (4)

COMMUNICATIONS

Visual Signals	# of Signals	W/T Types	Range (nm)
Flag Hoists:	2	Primary:	100 nm
Flashing Light:	2	Auxiliary:	5 nm
Total Signals:	2		

SEARCHLIGHTS:

Fwd, Aft 3 kyds

WEAPONS

MkIV QF 4.7 in/40 Port Wing ☐ Stbd Wing ☐ Port ☐ Stbd ☐ Stbd ☐ Port Aft ☐ Stbd Aft ☐

Shell Type	Short Rng (50% Hit)			Med Rng (30% Hit)			Long Rng (10% Hit)			Extreme Rng (5% Hit)		
	kyds	Pen	Dam	kyds	Pen	Dam	kyds	Pen	Dam	kyds	Pen	Dam
CP	0 -	2	12	3.1 -	1	10	6.1 -	1/0	9	8.1 -	1/0	8
HE	3.0	1	15	6.0	1	13	8.0	0/0	12	10.0	0/0	10

Range Finder	Range	+3 kyds	+6 kyds
B&S FQ2	14.5	17.5	20.5

REMARKS

No director for main battery. Gunnery Standard 2, local control.
 Merchant construction, special damage modifier of -50%.

DAMAGE & SPEED BREAKDOWN

	None	25%	50%	75%	90%	100%	Critical Hits
Damage Taken	0	23	46	68	82	91	Engineering: <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> Rudder: _____
Max Speed	16	12	8	4	0	Sunk	Bridge: <input type="checkbox"/>

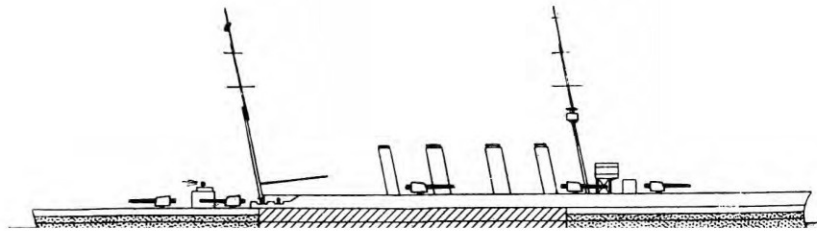
Fire/Flooding Severity Conditions:

Starting DP	Dmg Rcvd	on Turn	Remaining Dmg	CH Ratio	Starting DP	Dmg Rcvd	on Turn	Remaining Dmg	CH Ratio
91	_____	_____	_____	_____	_____	_____	_____	_____	_____
_____	_____	_____	_____	_____	_____	_____	_____	_____	_____
_____	_____	_____	_____	_____	_____	_____	_____	_____	_____
_____	_____	_____	_____	_____	_____	_____	_____	_____	_____
_____	_____	_____	_____	_____	_____	_____	_____	_____	_____
Fire/Flooding D6+2	Fire/Flooding _____%	Fire/Flooding _____%	Fire/Flooding _____%	Fire/Flooding _____%	Fire/Flooding _____%	Fire/Flooding _____%	Fire/Flooding _____%	Fire/Flooding _____%	Fire/Flooding _____%

Minor (1-07%)
 Major (08-11%)
 Severe (12-13%)
 Overwhelmed (14+%)

Fear God & Dread Nought Form 10

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 Admiralty Trilogy games.



Melbourne CL

Chatham class GB

BASIC SHIP DATA

Size Class: C/Small
Armor: 4/3
Advance per 45° turn
 Standard Rudder: 200 yds
 Hard Rudder: 100 yds
Accel/Tac Turn from 0-50% Max Speed: 8
Accel/Tac Turn from 51-100% Max Speed: 4
Deceleration/Tact Turn from any Speed: 10

In Service: 1912
Crew: 475
(Speed Loss)

COMMUNICATIONS

Visual Signals	# of Signals	W/T Types	Range (nm)
Flag Hoists:	2	Primary:	100 nm
Flashing Light:	3	Auxiliary:	5 nm
Total Signals:	2		

SEARCHLIGHTS:

Fwd, Aft 3 kyds

WEAPONS

MkXI BL 6 in/50 Fwd <input type="checkbox"/> Port <input type="checkbox"/> Port <input type="checkbox"/> Port <input type="checkbox"/> Stbd <input type="checkbox"/> Stbd <input type="checkbox"/> Stbd <input type="checkbox"/> Aft <input type="checkbox"/>											
Short Rng (50% Hit)				Med Rng (30% Hit)				Long Rng (10% Hit)			
100% vs Belt				100% vs Belt				70% vs Belt			
Shell	kyds	Pen	Dam	kyds	Pen	Dam		kyds	Pen	Dam	
APC	0 -	13	16	4.4 -	8	13		8.7 -	6/1	11	
CPC	4.3	10	14	8.6	6	11		11.4	4/1	10	
HE		2	18		1	16			1/0	14	
Extreme Rng (5% Hit)				40% vs Belt							
				kyds	Pen	Dam					
				11.5 -	4/2	10					
				14.3	3/1	9					
					1/0	13					

Port ☐ Stbd ☐ 21 in subm TT w/8 RGF 21 in MkII torp total ☐☐☐☐☐☐
 RGF 21 in MkII (1910) Range 3.8 kyds, 45 kts, 70 DP
 Range 10.9 kyds, 29 kts

Small Caliber Guns

Anitarcraft Btry: (1)1 12 pdr/20cwt,
 (1)4 MkII 3 pdr QF, (1)4 mg
Light Btry: (1)4 MkII 3 pdr QF (CP/HE)

Strength

(7.0)
 (0.9/1.3)

Range Finder

B&S FQ2

Range

14.5

+3 kyds

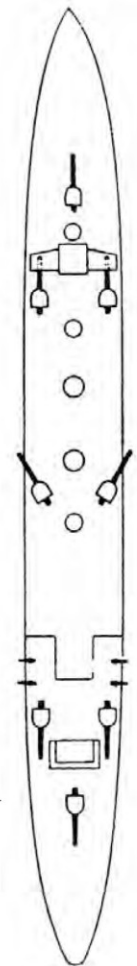
17.5

+6 kyds

20.5

REMARKS

No main battery director. Gunnery Standard 2, local control.



DAMAGE & SPEED BREAKDOWN

	None	25%	50%	75%	90%	100%	Critical Hits	
Damage Taken	0	37	73	110	131	146	Engineering: <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/>	Rudder: _____
Max Speed	25	19	13	6	0	Sunk	Bridge: <input type="checkbox"/>	

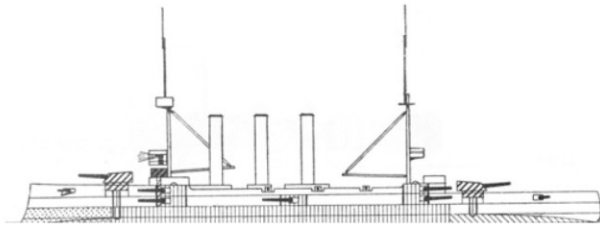
Fire/Flooding Severity Conditions:

Starting DP	Dmg Rcvd	on Turn	Remaining Dmg	CH Ratio	Starting DP	Dmg Rcvd	on Turn	Remaining Dmg	CH Ratio
146									

Minor (1-07%)
 Major (08-11%)
 Severe (12-13%)
 Overwhelmed (14+%)
 Fire/Flooding D6+2 Fire/Flooding _____% Fire/Flooding _____% Fire/Flooding _____% Fire/Flooding _____%

Fear God & Dread Nought Form 10

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 Admiralty Trilogy games.



Monmouth CR

Monmouth class GB

BASIC SHIP DATA

Size Class: B/Medium
Armor: 9/4
Advance per 45° turn
Standard Rudder: 300 yds
Hard Rudder: 200 yds
Accel/Tac Turn from 0-50% Max Speed: 6
Accel/Tac Turn from 51-100% Max Speed: 3
Deceleration/Tact Turn from any Speed: 8

In Service: 1903
Crew: 678
(Speed Loss)

COMMUNICATIONS

Visual Signals	# of Signals	W/T Types	Range (nm)
Flag Hoists:	3	Primary:	100 nm
Flashing Light:	4	Auxiliary:	5 nm
Total Signals:	3		

SEARCHLIGHTS:
Port Wing, Stbd Wing,
Port Aft, Stbd Aft

4 kyds

WEAPONS

MkVII BL 6 in/45 Fwd ☐ ☐ Aft ☐ ☐

MkVII BL 6 in/45 Casemate Port ☐ ☐ ☐ ☐

MkVII BL 6 in/45 Casemate Stbd ☐ ☐ ☐ ☐

Shell Type	Short Rng (50% Hit)			Med Rng (30% Hit)			Long Rng (10% Hit)			Extreme Rng (5% Hit)		
	100% vs Belt			100% vs Belt			70% vs Belt			40% vs Belt		
	kyds	Pen	Dam	kyds	Pen	Dam	kyds	Pen	Dam	kyds	Pen	Dam
APC	0 -	11	15	4.5 -	7	12	8.9 -	5/1	11	11.8 -	3/2	10
AP	4.4	9	15	8.8	5	12	11.7	4/1	11	14.6	3/2	10
CPC		8	14		5	11		4/1	10		3/0	9
CP		4	15		2	12		2/0	11		1/0	9
HE		2	18		1	16		1/0	14		1/0	12

Port ☐ Stbd ☐ 18 in subm TT w/12 (est) RGF 18 in MkV* torp total ☐ ☐ ☐ ☐ ☐ ☐

RGF 18 in MkV*

Range 1.0 kyds, 33 kts, 54 DP

Range 3.0 kyds, 21kts

Range 4.0 kyds, 18 kts

LIGHT BATTERIES

Lt Btry: (1)2 12 pdr/18 cwt QF MkIII,
(1)3 3 pdr QF MkI (CP/HE)

Strength

(20.2)
(5.6/7.9)

Range Finder

B&S FQ2

Range

14.5

+3 kyds

17.5

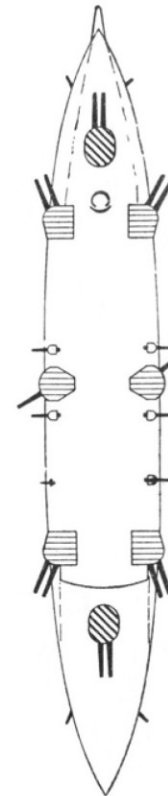
+6 kyds

20.5

REMARKS

No director for main and secondary batteries. Gunnery Standard 2, local control.

Three casemate guns in lower bank are unworkable in anything but calm weather (sea states 0 -2). Armored cruiser.



DAMAGE & SPEED BREAKDOWN

	None	25%	50%	75%	90%	100%	Critical Hits	
Damage Taken	0	59	118	176	212	235	Engineering: <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/>	Rudder: _____
Max Speed	23	17	12	6	0	Sunk	Bridge: <input type="checkbox"/>	

Fire/Flooding Severity Conditions:

Starting DP	Dmg Rcvd	on Turn	Remaining Dmg	CH Ratio	Starting DP	Dmg Rcvd	on Turn	Remaining Dmg	CH Ratio
235									

Minor (1-08%)
Major (09-13%)
Severe (14-15%)
Overwhelmed (16+%)

Fire/Flooding 2D6+2 Fire/Flooding _____% Fire/Flooding _____% Fire/Flooding _____% Fire/Flooding _____%

Fear God & Dread Nought Form 10

Otranto AMC

Otranto class GB

BASIC SHIP DATA

Size Class: B/Medium
 In Service: 1909 (1914)
 Armor: 0
 Crew: ???
 Advance per 45° turn
 (Speed Loss)
 Standard Rudder: 300 yds (3)
 Hard Rudder: 300 yds (4)
 Accel/Tac Turn from 0-50% Max Speed: 3
 Accel/Tac Turn from 51-100% Max Speed: 2
 Deceleration/Tact Turn from any Speed: 4

COMMUNICATIONS

Visual Signals	# of Signals	W/T Types	Range (nm)
Flag Hoists:	2	Primary:	100 nm
Flashing Light:	2	Auxiliary:	5 nm
Total Signals:	2		

SEARCHLIGHTS:

Fwd, Aft 3 kyds

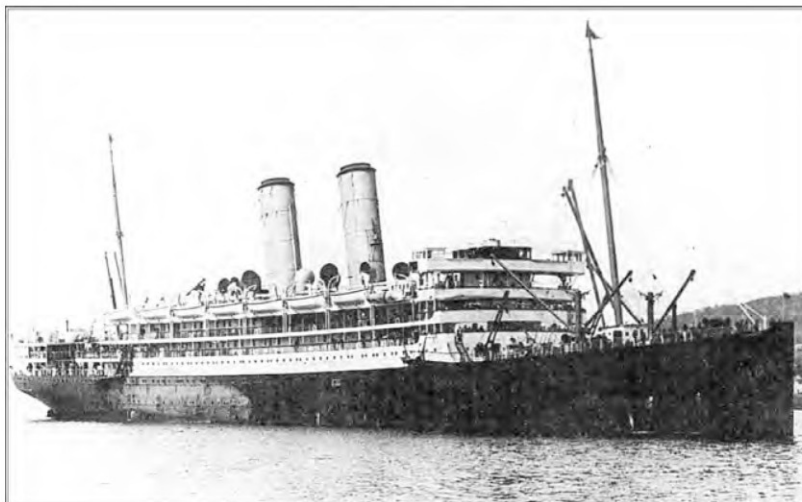
WEAPONS

MkIV QF 4.7 in/40 Port Wing <input type="checkbox"/> Stbd Wing <input type="checkbox"/> Port <input type="checkbox"/> Port <input type="checkbox"/> Stbd <input type="checkbox"/> Stbd <input type="checkbox"/> Port Aft <input type="checkbox"/> Stbd Aft <input type="checkbox"/>												
	Short Rng (50% Hit)			Med Rng (30% Hit)			Long Rng (10% Hit)			Extreme Rng (5% Hit)		
Shell	100% vs Belt			100% vs Belt			70% vs Belt			40% vs Belt		
Type	kyds	Pen	Dam	kyds	Pen	Dam	kyds	Pen	Dam	kyds	Pen	Dam
CP	0 -	2	12	3.1 -	1	10	6.1 -	1/0	9	8.1 -	1/0	8
HE	3.0	1	15	6.0	1	13	8.0	0/0	12	10.0	0/0	10

Range Finder	Range	+3 kyds	+6 kyds
B&S FQ2	14.5	17.5	20.5

REMARKS

No director for main battery. Gunnery Standard 2, local control.
 Merchant construction, special damage modifier of -50%.



DAMAGE & SPEED BREAKDOWN

	None	25%	50%	75%	90%	100%	Critical Hits
Damage Taken	0	23	46	68	82	91	Engineering: <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> Rudder: _____
Max Speed	16	12	8	4	0	Sunk	Bridge: <input type="checkbox"/>

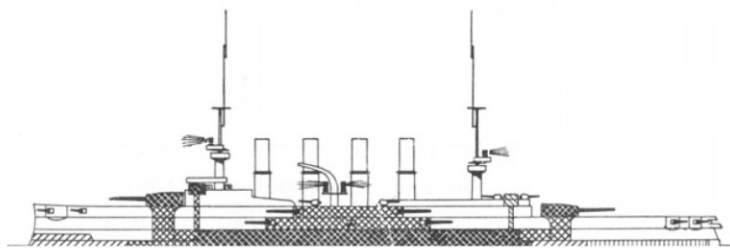
Fire/Flooding Severity Conditions:

Starting DP	Dmg Rcvd	on Turn	Remaining Dmg	CH Ratio	Starting DP	Dmg Rcvd	on Turn	Remaining Dmg	CH Ratio
91									
Fire/Flooding D6+2			Fire/Flooding ____%		Fire/Flooding ____%			Fire/Flooding ____%	

Minor (1-07%)
 Major (08-11%)
 Severe (12-13%)
 Overwhelmed (14+%)

Fear God & Dread Nought Form 10

This form is provided by Clash of Arms.
 It can be photocopied for use with any
 Admiralty Trilogy games.



Gneisenau CR

Scharnhorst class Germany

BASIC SHIP DATA

Size Class: B/Medium In Service: 1907
 Armor: 11/4 Crew: 838
 Advance per 45° turn (Speed Loss)
 Standard Rudder: 300 yds (3)
 Hard Rudder: 200 yds (4)
 Accel/Tac Turn from 0-50% Max Speed: 6
 Accel/Tac Turn from 51-100% Max Speed: 3
 Deceleration/Tact Turn from any Speed: 8

COMMUNICATIONS

Visual Signals	# of Signals	W/T Types	Range (nm)
Flag Hoists:	2	Primary:	100 nm
Flashing Light:	2	Auxiliary:	5 nm
Total Signals:	2		

SEARCHLIGHTS:

Fwd, Aft 3 kyds

WEAPONS

21cm SKL/40 Fwd ☐ ☐ Aft ☐ ☐

Shell	Short Rng (50% Hit)				Med Rng (30% Hit)				Long Rng (10% Hit)				Extreme Rng (5% Hit)			
	100% vs Belt				100% vs Belt				70% vs Belt				40% vs Belt			
Type	kyds	Pen	Dam		kyds	Pen	Dam		kyds	Pen	Dam		kyds	Pen	Dam	
APC	0 -	13	16		5.3 -	8	13		10.8 -	6/1	11		14.3 -	4/2	10	
BHE	5.2	10	14		10.7	6	11		14.2	4/1	10		17.8	3/1	9	

21cm SKL/40 Casemate Port ☐ ☐

21cm SKL/40 Casemate Stbd ☐ ☐

Shell	Short Rng (50% Hit)				Med Rng (30% Hit)				Long Rng (10% Hit)				Extreme Rng (5% Hit)			
	100% vs Belt				100% vs Belt				70% vs Belt				40% vs Belt			
Type	kyds	Pen	Dam		kyds	Pen	Dam		kyds	Pen	Dam		kyds	Pen	Dam	
APC	0 -	13	16		6.2 -	8	13		12.6 -	6/1	11		--	--	--	
BHE	6.1	10	14		12.5	6	11		16.7	4/1	10		--	--	--	

15cm SKL/40 Casemate Port ☐ ☐

15cm SKL/40 Casemate Port ☐ ☐

Shell	Short Rng (50% Hit)				Med Rng (30% Hit)				Long Rng (10% Hit)				Extreme Rng (5% Hit)			
	100% vs Belt				100% vs Belt				70% vs Belt				40% vs Belt			
Type	kyds	Pen	Dam		kyds	Pen	Dam		kyds	Pen	Dam		kyds	Pen	Dam	
BHE	0 -	3	16		4.7 -	2	13		9.2 -	1/0	12		12.3 -	1/0	11	
NHE	4.6	2	17		9.1	1	14		12.2	1/0	13		15.2	1/0	11	

Bow ☐ Port ☐ Stbd ☐ Stern ☐ 45cm subm TT w/11 C/06 torp total ☐ ☐ ☐ ☐ ☐ ☐ ☐ ☐

C/06

Range 1.6 kyds, 35 kts, 60 DP

Range 3.3 kyds, 26 kts

Small Caliber Guns

Light Btry: (1)18 8.8cm SKL/35

Strength

(14.8)

Range Finder

Zeiss Bg 3m

Range

14.5

+3 kyds

17.5

+6 kyds

20.5

REMARKS

No director for main or secondary batteries. Gunnery Standard 2, local control.

Armored Cruiser. 30° elevation for guns. The 21cm casemate guns can be fired as part of the main battery (or separately), but because they cannot elevate as far, they cannot fire into the extreme range band.

DAMAGE & SPEED BREAKDOWN

	None	25%	50%	75%	90%	100%	Critical Hits	Engineering:	Rudder:
Damage Taken	0	67	135	202	242	269	<input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/>		
Max Speed	24	18	12	6	0	Sunk	Bridge: <input type="checkbox"/>		

Fire/Flooding Severity Conditions:

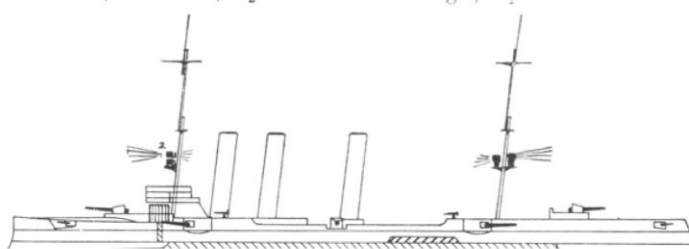
Starting DP	Dmg Rcvd	on Turn	Remaining Dmg	CH Ratio	Starting DP	Dmg Rcvd	on Turn	Remaining Dmg	CH Ratio
-------------	----------	---------	---------------	----------	-------------	----------	---------	---------------	----------

269

Fire/Flooding D6+2 Fire/Flooding ____% Fire/Flooding ____% Fire/Flooding ____% Fire/Flooding ____%

Minor (1-07%)
 Major (08-11%)
 Severe (12-13%)
 Overwhelmed (14+%)

Fear God & Dread Nought Form 10



Nürnberg CL

Königsberg class Germany

BASIC SHIP DATA

Size Class: C/Small
 In Service: 1907
 Armored: 1/2
 Crew: 322
 Advance per 45° turn
 Standard Rudder: 200 yds (2)
 Hard Rudder: 100 yds (3)
 Accel/Tac Turn from 0-50% Max Speed: 8
 Accel/Tac Turn from 51-100% Max Speed: 4
 Deceleration/Tact Turn from any Speed: 10

COMMUNICATIONS

Visual Signals	# of Signals	W/T Types	Range (nm)
Flag Hoists:	2	Primary:	100 nm
Flashing Light:	3	Auxiliary:	5 nm
Total Signals:	2		

SEARCHLIGHTS:

Fwd, Aft 3 kyds

WEAPONS

10.5cm SKL/40 Port Wing ☐ Starboard Wing ☐ Port ☐ Sribd ☐ Port Aft ☐ Starboard Aft ☐

10.5cm SKL/40 Casemate Port ☐

10.5cm SKL/40 Casemate Stbd ☐

Shell Type	Short Rng (50% Hit)			Med Rng (30% Hit)			Long Rng (10% Hit)			Extreme Rng (5% Hit)		
	100% vs Belt	Pen	Dam	100% vs Belt	Pen	Dam	70% vs Belt	Pen	Dam	40% vs Belt	Pen	Dam
BHE	0 -	2	13	4.1 -	8	13	8.1 -	6/1	11	10.7 -	4/2	10
NHE	4.0	1	14	8.0	6	11	10.6	4/1	10	13.3	3/1	9

Port ☐ Stbd ☐ 45cm subm TT w/5 C/07 torp total ☐☐☐☐
 C/07 Range 1.6 kyds, 36 kts, 58 DP
 Range 2.2 kyds, 32 kts

Small Caliber Guns

Anitarcraft Btry: (1)4 8mm mg

Anitarcraft Btry: (1)8 5.2cm SKL/55

Strength

(1.8)

(2.6)

Range Finder

Zeiss Bg 3m

Range

14.5

+3 kyds

17.5

+6 kyds

20.5

REMARKS

No director for main battery. Gunnery Standard 2, local control.



DAMAGE & SPEED BREAKDOWN

	None	25%	50%	75%	90%	100%	Critical Hits
Damage Taken	0	26	51	77	92	102	Engineering: <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> Rudder: _____
Max Speed	23	17	12	6	0	Sunk	Bridge: <input type="checkbox"/>

Fire/Flooding Severity Conditions:

Starting DP	Dmg Rcvd	on Turn	Remaining Dmg	CH Ratio	Starting DP	Dmg Rcvd	on Turn	Remaining Dmg	CH Ratio
102	_____	_____	_____	_____	_____	_____	_____	_____	_____
_____	_____	_____	_____	_____	_____	_____	_____	_____	_____
_____	_____	_____	_____	_____	_____	_____	_____	_____	_____
_____	_____	_____	_____	_____	_____	_____	_____	_____	_____

Fire/Flooding D6+2

Fire/Flooding _____%

Fire/Flooding _____%

Fire/Flooding _____%

Fire/Flooding _____%

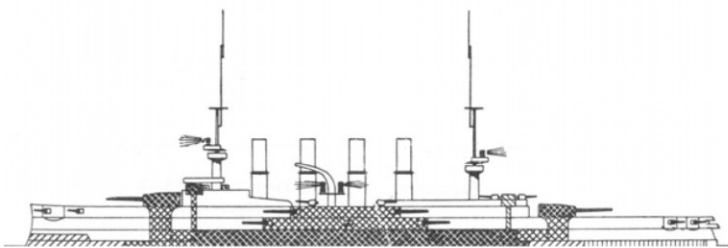
Minor (1-07%)

Major (08-11%)

Severe (12-13%)

Overwhelmed (14+%)

Fear God & Dread Nought Form 10



Scharnhorst CR

Scharnhorst class Germany

BASIC SHIP DATA

Size Class: B/Medium
 Armor: 11/4
 Advance per 45° turn
 Standard Rudder: 300 yds (3)
 Hard Rudder: 200 yds (4)
 Accel/Tac Turn from 0-50% Max Speed: 6
 Accel/Tac Turn from 51-100% Max Speed: 3
 Deceleration/Tact Turn from any Speed: 8

In Service: 1907
 Crew: 838
 (Speed Loss)

COMMUNICATIONS

Visual Signals	# of Signals	W/T Types	Range (nm)
Flag Hoists:	3	Primary:	100 nm
Flashing Light:	4	Auxiliary:	5 nm
Total Signals:	3		

SEARCHLIGHTS:

Fwd, Aft 3 kyds

WEAPONS

21cm SKL/40 Fwd ☐ ☐ ☐ ☐

Short Rng (50% Hit)				Med Rng (30% Hit)				Long Rng (10% Hit)				Extreme Rng (5% Hit)			
100% vs Belt				100% vs Belt				70% vs Belt				40% vs Belt			
Shell	Type	kyds	Pen Dam	kyds	Pen Dam	kyds	Pen Dam	kyds	Pen Dam	kyds	Pen Dam	kyds	Pen Dam	kyds	Pen Dam
APC	0 -	13	16	5.3 -	8	13		10.8 -	6/1	11		14.3 -	4/2	10	
BHE	5.2	10	14	10.7	6	11		14.2	4/1	10		17.8	3/1	9	

21cm SKL/40 Casemate Port ☐ ☐

21cm SKL/40 Casemate Stbd ☐ ☐

Short Rng (50% Hit)				Med Rng (30% Hit)				Long Rng (10% Hit)				Extreme Rng (5% Hit)			
100% vs Belt				100% vs Belt				70% vs Belt				40% vs Belt			
Shell	Type	kyds	Pen Dam	kyds	Pen Dam	kyds	Pen Dam	kyds	Pen Dam	kyds	Pen Dam	kyds	Pen Dam	kyds	Pen Dam
APC	0 -	13	16	6.2 -	8	13		12.6 -	6/1	11		--	--	--	
BHE	6.1	10	14	12.5	6	11		16.7	4/1	10		--	--	--	

15cm SKL/40 Casemate Port ☐ ☐ ☐

15cm SKL/40 Casemate Port ☐ ☐ ☐

Short Rng (50% Hit)				Med Rng (30% Hit)				Long Rng (10% Hit)				Extreme Rng (5% Hit)			
100% vs Belt				100% vs Belt				70% vs Belt				40% vs Belt			
Shell	Type	kyds	Pen Dam	kyds	Pen Dam	kyds	Pen Dam	kyds	Pen Dam	kyds	Pen Dam	kyds	Pen Dam	kyds	Pen Dam
APC	0 -	3	16	4.7 -	2	13		9.2 -	1/0	12		12.3 -	1/0	11	
BHE	4.6	2	17	9.1	1	14		12.2	1/0	13		15.2	1/0	11	

Bow ☐ Port ☐ Stbd ☐ Stern ☐ 45cm subm TT w/11 C/06 torp total ☐ ☐ ☐ ☐ ☐ ☐ ☐ ☐ ☐ ☐

C/06

Range 1.6 kyds, 35 kts, 60 DP

Range 3.3 kyds, 26 kts

Small Caliber Guns

Light Btry: (1)18 8.8cm SKL/35

Strength

(14.8)

Range Finder

Zeiss Bg 3m

Range

14.5

+3 kyds

17.5

+6 kyds

20.5

REMARKS

No director for main or secondary batteries. Gunnery Standard 2, local control.
 Armored Cruiser. 30° elevation for guns. The 21cm casemate guns can be fired as part of the main battery (or separately), but because they cannot elevate as far, they cannot fire into the extreme range band.

• Damaged in a severe grounding in 1909, repaired but speed permanently reduced from 24 to 22 knots.

DAMAGE & SPEED BREAKDOWN

	None	25%	50%	75%	90%	100%	Critical Hits
Damage Taken	0	67	135	202	242	269	Engineering: <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> Rudder: _____
Max Speed	22	17	11	7	0	Sunk	Bridge: <input type="checkbox"/>

Fire/Flooding Severity Conditions:

Starting DP	Dmg Rcvd	on Turn	Remaining Dmg	CH Ratio	Starting DP	Dmg Rcvd	on Turn	Remaining Dmg	CH Ratio
269									
Fire/Flooding D6+2			Fire/Flooding _____%		Fire/Flooding _____%			Fire/Flooding _____%	

Minor (1-07%)
 Major (08-11%)
 Severe (12-13%)
 Overwhelmed (14+%)

Fear God & Dread Nought Form 10

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 It can be photocopied for use with any
 Admiralty Trilogy games.

Annex D

General Forms

From: _____ To: _____ Time: _____

1	2	3	4	5	6	7	8	9	10	11	12	13	14	15

16	17	18	19	20	21	22	23	24	25	26	27	28	29	30

☐ Wireless ☐ Visual

A space between a word or groups of numbers counts as a character.

This form is provided by Clash of Arms. It can be photocopied for use with any Admiralty Tillygy games.

13 Apr 1995

From: _____ To: _____ Time: _____

1	2	3	4	5	6	7	8	9	10	11	12	13	14	15

16	17	18	19	20	21	22	23	24	25	26	27	28	29	30

☐ Wireless ☐ Visual

A space between a word or groups of numbers counts as a character.

This form is provided by Clash of Arms. It can be photocopied for use with any Admiralty Tillygy games.

13 Apr 1995

From: _____ To: _____ Time: _____

1	2	3	4	5	6	7	8	9	10	11	12	13	14	15

16	17	18	19	20	21	22	23	24	25	26	27	28	29	30

☐ Wireless ☐ Visual

A space between a word or groups of numbers counts as a character.

This form is provided by Clash of Arms. It can be photocopied for use with any Admiralty Tillygy games.

13 Apr 1995

From: _____ To: _____ Time: _____

1	2	3	4	5	6	7	8	9	10	11	12	13	14	15

16	17	18	19	20	21	22	23	24	25	26	27	28	29	30

☐ Wireless ☐ Visual

A space between a word or groups of numbers counts as a character.

This form is provided by Clash of Arms. It can be photocopied for use with any Admiralty Tillygy games.

13 Apr 1995

From: _____ To: _____ Time: _____

1	2	3	4	5	6	7	8	9	10	11	12	13	14	15

16	17	18	19	20	21	22	23	24	25	26	27	28	29	30

☐ Wireless ☐ Visual

A space between a word or groups of numbers counts as a character.

This form is provided by Clash of Arms. It can be photocopied for use with any Admiralty Tillygy games.

13 Apr 1995

FG&DN Form 3 Message Form 13 April 1995

This form is provided by Clash of Arms. It can be photocopied for use with any Admiralty Tillygy games.

[illegible]

Player Name:

Turn	Course	Speed	Depth	Main Batt Target	2nd Batt Target	Torpedo Cse/Spd	DC #/Band	ASW Depth	DPs Left	DPs Taken	Remarks/Critical Hits
------	--------	-------	-------	---------------------	--------------------	--------------------	--------------	--------------	-------------	--------------	-----------------------

This form is provided by Clash of Arms. It can be photocopied for use with any Admiralty Trilogy games.

SIGHTING REPORT

From: _____ To: _____ Time: _____

Units Sighted:

1	2	3	4	5	6	7	8	9	10	11	12

Location:

13	14	15	16	17	18	19	20	21	22	23	24

Course:

25	26	27

 Speed:

28	29	30

Type:

Visual

Sonar

HF/DF

This form is provided by Clouth of Arms. It can be photocopied for use with any Admiralty Trilogy games.

23 Mar 1995

SIGHTING REPORT

From: _____ To: _____ Time: _____

Units Sighted:

1	2	3	4	5	6	7	8	9	10	11	12

Location:

13	14	15	16	17	18	19	20	21	22	23	24

Course:

25	26	27

 Speed:

28	29	30

Type:

Visual

Sonar

HF/DF

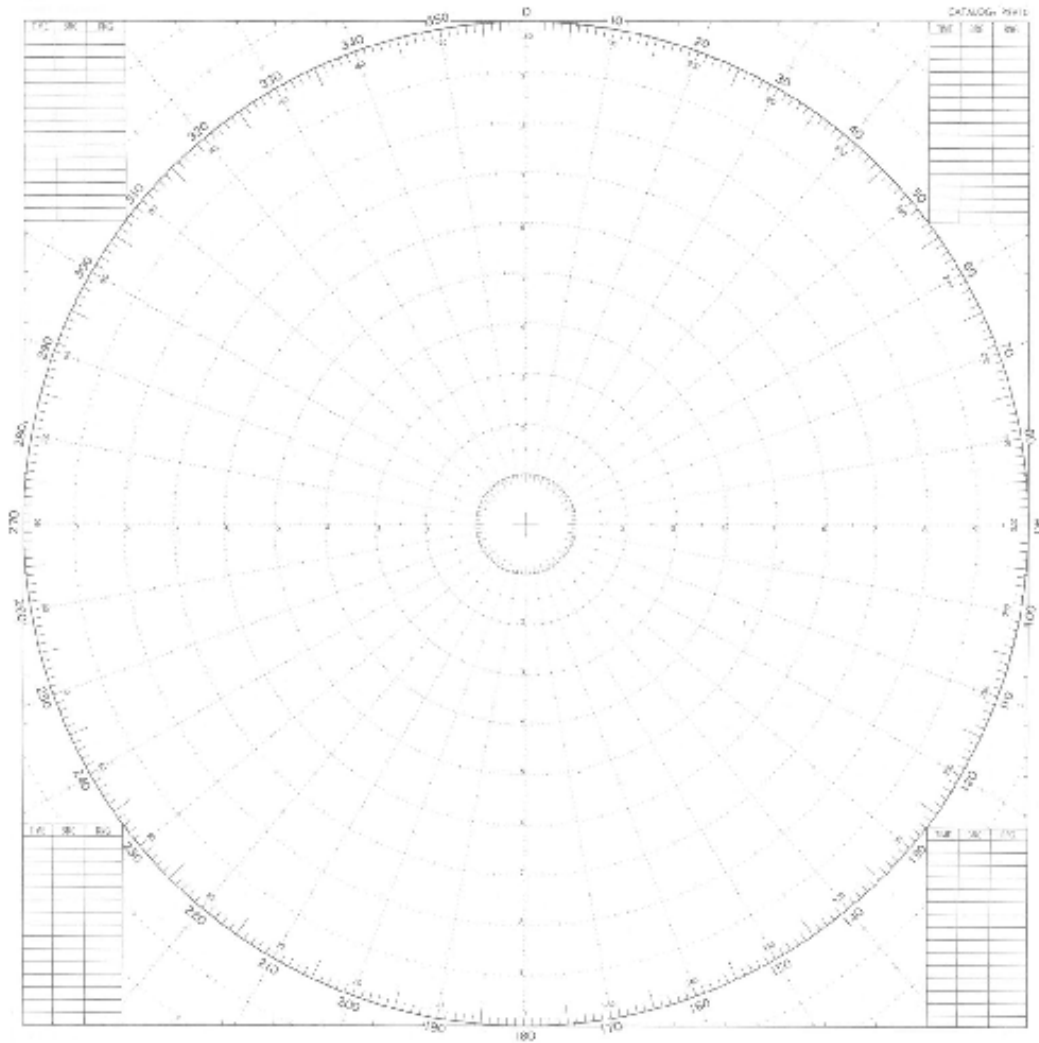
This form is provided by Clouth of Arms. It can be photocopied for use with any Admiralty Trilogy games.

23 Mar 1995

FG&DN FORM 6 13 April 1995

This form is provided by Clouth of Arms. It can be photocopied for use with any Admiralty Trilogy games.

Formation Plotting Board



Formation Name: _____

Flagship: _____

Top of Chart is:



True
North



PIM



Threat
Axis

Guide: _____

Scale: _____

Prepared By: _____

Date: _____

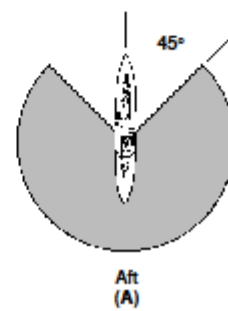
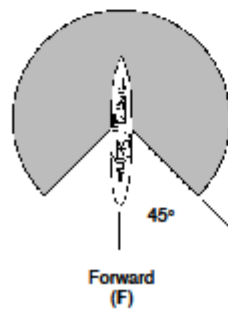
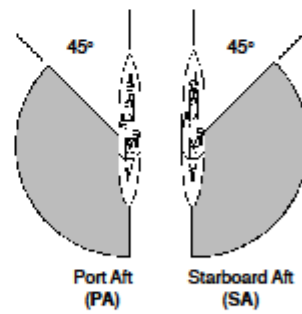
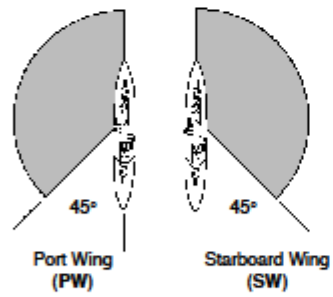
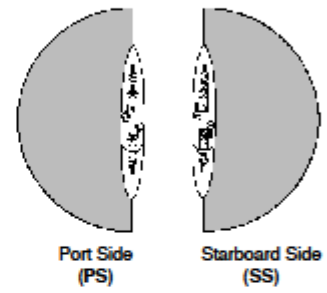
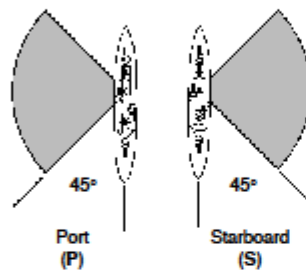
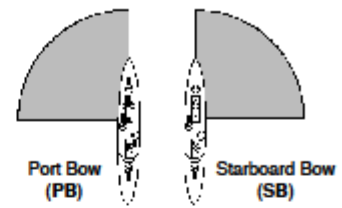
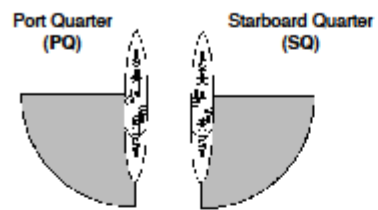
Notes: _____

FG&DN Form 7 1 Mar 2009

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Annex E

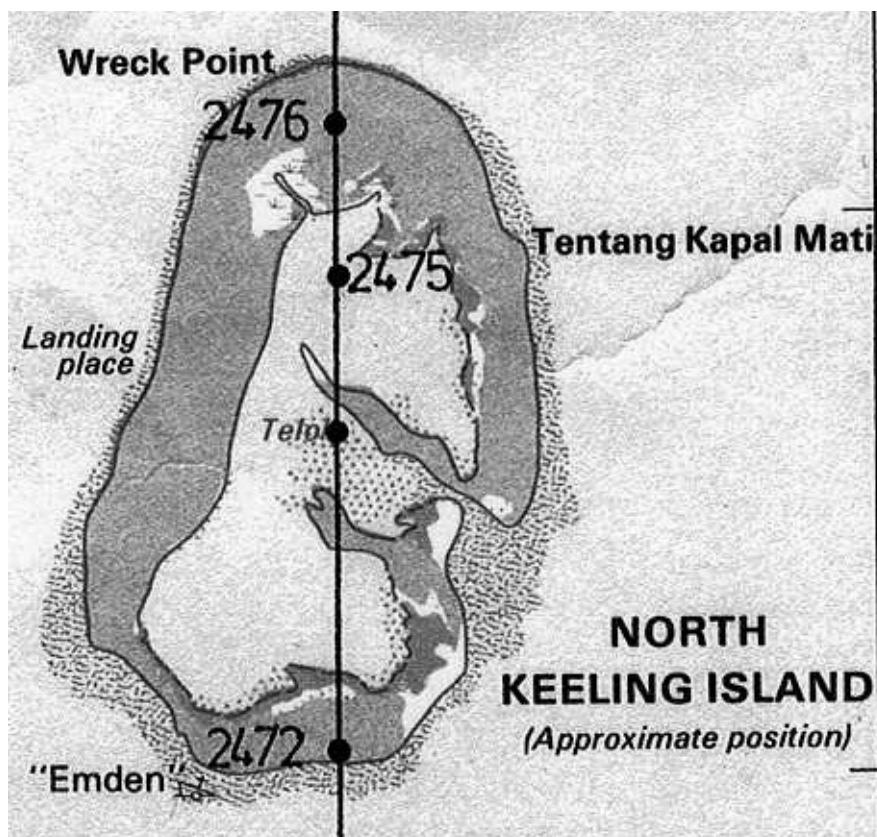
Firing Arcs

SHIPBOARD WEAPON FIRING ARCS

Annex F

North Keeling Island

North Keeling Island at 1" = 500 meter scale for use in SFY 1



RESOURCES

Home page for Fatal Choices

www.fatalchoices1914.com

- ❖ Here you can order laser-cut counters for all the ships included in the book, additional copies of the book and take part in a forum to discuss the book, Spee's campaign or World War I naval warfare in general.
- ❖ Topside Miniatures has produced a special *Fatal Choices* set of their full-color overhead view ship counters. These sturdy and attractive depictions of the ships are wargamer-friendly and reasonably priced. In addition to the same 24 ships included in the Fatal Choices counter set, the Topside Miniatures set includes some additional ships for what-ifs, including Troubridge's Dilemma. See the next page for more information on ordering.
- ❖ A good source for Navis 1:1250 metal ship models is ALNAVCO, which was the company that got me into wargaming back in the 1960s. It's still a going concern and can be found online at www.alnavco.com
- ❖ A less expensive but still serviceable source for miniature warships is Panzerschiffe. Their 1:2400 scale resin warships runs about \$3-\$5 each and can be found at www.panzerschiffe.com
- ❖ Information about the battle of Coronel and Spee's voyage can be found online at <http://www.worldwar1.co.uk/coronel.html>
- ❖ An online memorial to those who died in the battle can be found at <http://www.coronel.org.uk/>



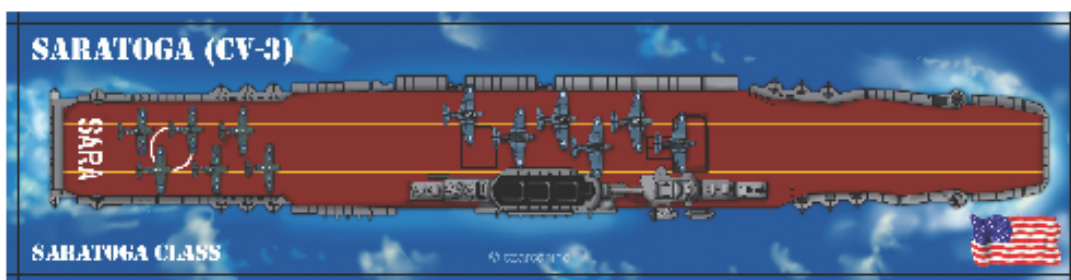
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- Low cost, perfect for building large engagement sets
 - *Fatal Choices* battle set available for purchase!

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'In memory of the 1418 officers and sailors of the British battle squadron and their Commander-in-Chief, Rear Admiral Sir Christopher Cradock, who sacrificed their lives in the Naval Battle of Coronel. Their only tomb is the sea.'

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