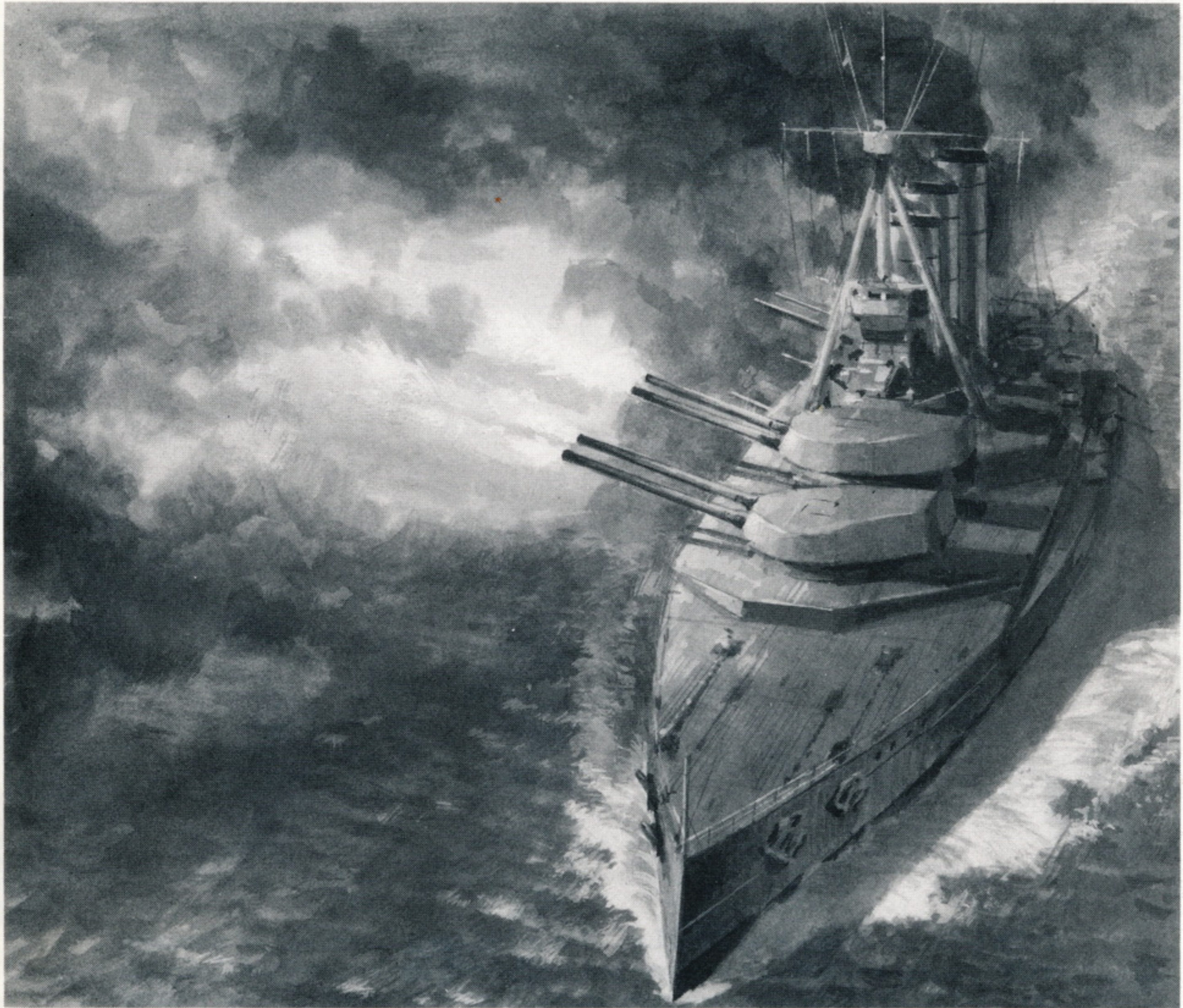# DREADNOUGHTS

DREADNOUGHTS is a surface fleet battle simulator. It accurately recreates the looks, specifications and tactics of fleets during the great age of the battleship. DREADNOUGHTS starts by promoting the user to Admiral, placing them on the bridge of a great flagship, and then resets the clock to start from the critical hour...

THE
DREADNOUGHTS
MANUAL
OF SEAMANSHIP

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Contents

Introduction

Welcome to Dreadnoughts.

Dreadnoughts is a simulation program that enables your instant promotion to Admiral of the Fleet. It recreates the ships, the atmosphere of naval warfare, and the difficulties of command at a period in history dominated by the world's battle fleets.

In 1906 the World was stunned by the launch of a new class of battleship, a class so powerful that all the existing battleships were relegated to third rates overnight. The first of these ships, HMS Dreadnought, gave its name to all that followed.

Before HMS Dreadnought, battleships contained a whole range of guns, perhaps with only two or four of the largest calibre, and were not particularly fast nor had impressive armour plating. HMS Dreadnought revolutionised the design by concentrating on one big calibre gun (initially 12 inch), a speed of over 20 knots, and heavy armour plating designed to survive engagements with similar ships.

The arms race that followed this launch led in part to the First World War, and particularly to the conflict between Great Britain and Germany, a growing and ambitious European power.

The scenarios included with this simulation concentrate on the period 1914 to 1916 (the first three years of the First World War), and a number of the battles show how the old classes of ships were no match for Dreadnoughts.

The biggest battle of them all was the Battle of Jutland, a huge and complicated engagement between 100 German and 150 British ships. Jutland was the last major engagement of battleships in the First World War, and ends the list of scenarios with this game.

A scenario disk covering the earlier Sino-Japanese and Russo-Japanese wars is titled IRONCLADS(*). A second scenario disk covers a selection of naval battles of the Second World War, and is entitled BISMARCK(*).

(*) available as scenario disks for the DREADNOUGHTS program, at extra cost

The concept

The concept of the game is that you take the role of the commanding admiral at one of history's great naval battles, and order your own ship and the rest of your fleet as the historical admiral would have done. You are not given supernatural powers of vision, control or communication, and have to work out for yourself, from visual sightings and reports, what is going on.

All the DREADNOUGHTS scenarios are set-piece battles, the object being the destruction of the enemy's fleet. The following historical narratives cover all the battles that DREADNOUGHTS can recreate, including those on the optional scenario disks. However, these narratives do not go into the same detail as the program itself, and the player is invited to find out more about the battles and the ships involved.

The Background to the simulator

Naval History of the First World War 1914 - 1918

"The due use and control of the sea is but one link in the chain of exchange by which wealth accumulates; but it is the central link" - Alfred Mayan, in The Influence of Sea Power

Alfred Mayan was a little known Captain in the American Navy when he wrote his treatise "The Influence of Sea Power", but he so articulated the importance of it that governments were soon quoting his work in justifying their own policies. Whoever controlled the seas controlled the channels of world commerce. At the turn of the century Great Britain controlled much of the sea, and as a result was both very wealthy and hugely influential in world affairs. Many countries, especially Germany, looked on with considerable envy.

However, overcoming Britain as a trading power meant overcoming the Royal Navy, a formidable task in the early 1900's. The Royal Navy was kept at a size larger than the next two biggest navies put together, it had coaling stations across the globe, and, importantly, its continuous use meant that it had a huge number of experienced men, from gunners to admirals, to call upon.

But there were weaknesses in this vast arsenal of power. One of the most significant was that the Navy had become tradition bound, upholding the reputation of Nelson and his victories that ended with Trafalgar. Along with the hidebound attitudes, and dated views, were the useless organisations that had grown so big that they were politically difficult to dispose of. An example of this was the large Admiralty department responsible for the distribution of

cutlasses (large swords) to the warships. Given the range of the big guns was over 20,000 yards, wielding a cutlass seems a somewhat profitless exercise.

The Royal navy was seriously shaken up, and vigourously modernised by two men in particular: Jacky Fisher and Winston Churchill. Both were enthusiastic supporters of the Dreadnought projects, and both had the great energy to think big and force their ideas and projects through. This created the predictable tensions and political in-fighting, but resulted in a very significant modernisation of the British fleet.

This great push forward must have, in part, led to Germany's challenge for naval supremacy. Germany had none of the naval background of Britain, but certainly had the industrial might to build a navy, and, starting from afresh, was not tied down with old ideas or stifling tradition.

The key figure in Germany's naval expansion was Admiral Von Tirpitz. Like Fisher, Tirpitz was a powerful and relentless figure who initiated the construction of Germany's battle fleet. The first few classes of German Dreadnought were nothing special, but by the outbreak of war Germany had built many that, on a ship to ship comparison, worried Britain's Admirals considerably.

"Commence hostilities against Germany" - telegram to Royal Navy, 1914

The naval war started well for Germany. One of the most embarrassing incidents to Britain became known as the "escape of the Goeben". The Goeben, a Dreadnought battlecruiser, was given by the Germans to Turkey, in response to the latters decision to take sides with the axis powers. The Royal Navy failed to intercept the ship, after numerous attempts, even in the confined waters of the Mediterranean.

A further embarrassment was the success of a distant German light cruiser, the Emden, which preyed on British merchant shipping in the pacific with considerable success.

However, it was on the 1st November 1914 that Britain was most seriously stung. Admiral Von Spee had assembled a squadron of five German warships to attack British ships and bases in the Southern oceans. Called the German East Asiatic Squadron, Spee's two key ships were the armoured cruisers, Scharnhorst and Gneisenau.

The commanding British admiral in the region, Admiral Christopher Cradock, was well aware that he stood little chance on his own against Spee. Cradock made several pleas to the Admiralty for more and better ships. But he only gained the old battleship the Canopus, a ship in which he had so little respect he did not even wait for it.

Winston Churchill proudly claimed "The Canopus is a citadel around which all our cruisers could find absolute security", but Cradock was unimpressed: "with reference to orders to search for enemy...consider it impractical on account of Canopus's slow speed to find and destroy enemy's squadron...Canopus will be employed on necessary convoying of colliers."

Cradock angrily went off in search of the German squadron, and found them off the coast of Chile, late in the afternoon of November 1st 1914, near the port of Coronel. The Battle of Coronel was a complete disaster for Cradock's squadron, which consisted of the flagship Good Hope, the cruisers Monmouth and Glasgow, and an armed merchant ship called Otranto.

Admiral Von Spee managed to manoeuvre his ships to take advantage of the failing light, so silhouetting the British squadron in the sunset, and pumped the Good Hope and the Monmouth full of shells. Both sank with no survivors. Only six inconsequential hits were recorded on the German ships.

An observer on HMS Glasgow, a light cruiser that escaped from Coronel, recorded that it was "the most rotten show imaginable" and watched the last moments of the flagship: "There was a terrible explosion between her mainmast and her funnel, after which she lay...a black hull lighted only by a glow".

The remaining two British ships, the Glasgow and Otranto, escaped South into the darkness.

The Battle of Coronel was the first serious British naval defeat for over 100 years. This battle is recaptured in the Coronel scenario, with a second hypothetical scenario simply called Canopus which models what might have happened if Cradock had waited for this old battleship.

The completeness of Von Spee's victory led to his downfall. Churchill and Fisher, still dominant at the Admiralty, sent two new fast battlecruisers to the South Atlantic, the Invincible and the Inflexible, along with a number of older armoured cruisers. The commander was Admiral Sturdee.

Von Spee decided to make one last attack, on the British coaling base at the Falkland Islands, before heading North. A breakdown in German intelligence failed to inform him of the movement of the British capital ships. He rounded Cape Horn and sent the Gneisenau and Nurnberg to shell the base. They both returned in a hurry. Not only had they been shelled by the Canopus, now grounded in the harbour, but they had seen tripod masts (only used by the British on battlecruisers and battleships). At first Spee did not believe it, but when they appeared on the horizon he ordered his squadron to turn and run.

Although the German gunnery was excellent, their accuracy was no match for the British heavyweights. For the likes of the Invincible the Scharnhorst and Gneisenau were only target practice.

When the Germans were caught they turned to fight, allowing the three small cruisers some chance of escaping. But while the battlecruisers punished Spee's armoured cruisers, the British cruisers split up and chased the Nurnberg, Leipzig and Dresden. Only the Dresden was to escape. The Scharnhorst was the first of the German armoured cruisers to sink. The captain of the Gneisenau was soon to follow: "he called for three cheers for

His Majesty (the Kaiser) and the Gneisenau was then abandoned. I fell into the water as she capsized," recalled one survivor.

The remains of the valiant ship looked "like a great patch of brown seaweed" according to one British rescuer.

This scenario, named Falkland, is probably the most imbalanced of all, the Invincible on its own could deal with the entire German squadron, but it does show how the Dreadnought had so elevated naval firepower as to render previous navies obsolete.

After this battle the Dresden was relentlessly pursued until it too was caught, battered and forced to surrender. With the German raiders now finished, both sides turned their full attention to the immediate battle front in the North Sea.

Despite the great strength of the German battle fleet, called the High Seas Fleet, it was well outnumbered by the massed ranks of the British Dreadnoughts. Early expectations of a major fight in the North Sea never materialised. Germany was very cautious with their fleet, and had badly misjudged British strategy.

One of the most important decisions made by the British, before the start of the war, was not to closely blockade the German ports, as was expected, but to operate a distant blockade. The main fleet was based at Scapa Flow, in the Orkneys, and a smaller older fleet would block the Channel. This both effectively bottled up the German Fleet into the Baltic and North Sea, and also avoided many of the dangers from mines, submarines, shallows, shore batteries, and, later, bombers, that a close blockade would involve. It was indeed a shrewd move.

German strategy towards fighting the British was based on the sensible premise of trying to split the more powerful force, and defeat it in detail. This it achieved to some extent by splitting its own fleet into the faster battlecruisers and the slower Dreadnoughts. The battlecruisers speed would enable them to escape from most pursuers.

To entice the British to split its naval force, several bombardments, by the battlecruiser fleet, of English coastal towns was ordered. One of these raids in particular, on Scarborough, enraged British public opinion, as several women and children were killed by the shells. In response to this Admiral Beatty's battlecruiser force was split from the Grand Fleet, and based further south at the Forth. This would enable him to intervene if any further raids were launched. Also, of course, this was partly what the Germans wanted.

The codebreakers at the Admiralty were impressively successful at cracking the German naval codes, and in January 1915 they were accurate in their predictions of a German raid, in the vicinity of the Dogger Bank.

A message to Winston Churchill read "Those fellows are coming out again.......four German battlecruisers, six light cruisers and 22 destroyers will sail this evening to scout the Dogger Bank".

Admiral Beatty's battlecruisers rushed to intercept the raiders. A lieutenant on Beatty's flagship, HMS Lion, remembered the moment of contact: "The enemy appeared on the eastern horizon in the form of four separate wedges.....suddenly from the rearmost of these wedges came a stab of white flame...we waited for what seemed a long time, probably about 25 seconds, until a great column of water and spray arose in the sea at a distance of more than a mile on our port bow".

The German force was outnumbered five to four in capital ships, and at least two to one in cruisers and destroyers, so Admiral Hipper, the German commander, wisely turned for home.

In the running fight that followed the old Blucher, the weakest of the German capital ships, was unable to escape. A survivor recorded how tension mounted within the ship as its speed faltered under the heavy bombardment: "now the shells came thick and fast with a horrible droning hum". The Blucher was sunk, much to the huge delight of the British press and civilian population. Beatty was not impressed though, in private he said to a colleague: "the disappointment of that day is more than I can bear to think of. Everybody thinks it was a great success, when in reality it was a terrible failure". Admiral Beatty had hoped to sink far more than just the Blucher.

This battle is recaptured in the Dogbank scenario.

Having successfully split the British fleet, the basic German plan was to chip away at British naval power with submarines and mines, and hopefully to entice Beatty's battlecruisers to chase the German battlecruisers into a trap laid by the High Seas Fleet. The German High Seas Fleet now had a new commander, Admiral Scheer, who, unlike his predecessor, was willing to put the trap plan into action.

Unfortunately for Scheer, the British had cracked the naval codes so comprehensively that Admiral Jellicoe, the commander-in-chief of the Grand Fleet, and Admiral Beatty were fully aware of German intentions, and able to take advantage of them.

The British plan was to allow Beatty's battlecruisers to take the bait of the German trap, but then in turn to lead the German fleet into the guns of the entire Grand Fleet.

On the 31st May 1916 both Beatty's force and the Grand Fleet sailed from harbour. All the reports of the officers and sailors of that day show how they expected nothing more than another fruitless boring sweep of the North Sea. Beatty had a powerful fleet, the 5th Battle squadron of 15 inch gunned battleships had been temporarily placed under his command, to add to his

five battlecruisers, and considerable number of light cruisers and destroyers.

At around 2pm, near the Jutland bank off Denmark, one of the scouting light cruisers, HMS Galatea, was sent to investigate a merchant ship. The merchant ship was indeed harmless, but the Galatea also spotted some German light vessels, and a short engagement followed. These German ships were scout cruisers of Hipper's battlecruiser force. Beatty turned South to try to cut off Hipper's retreat to his bases. The battlecruisers closed and a fierce running fight took place. This is now known as "the Run to the South". The firing started at about 3 48pm. Soon after 4pm the first disaster struck the British battlecruisers. HMS Indefatigable was hit by a salvo from the old German battlecruiser Von der Tann, and first veered out of line, and then exploded.

Admiral Beatty, brave to a fault, did not flinch from his pursuit. However, before 4 30 pm the Queen Mary similarly took a plunging salvo, crashing through the under-protected armour deck and causing an explosion which set off the ship's magazines. The Queen Mary was a wreck in seconds. Beatty showed some of his frustration to his Flag Captain: "Chatfield, there is something wrong with our bloody ships today". He again did not flinch from his pursuit. The German ships were firing very accurately and although they were being hit, all were steaming well. The other officers in the British battlecruiser fleet looked to HMS Lion, Beatty's flagship, after the loss of the Queen Mary, for any signal that might indicate a change of plan. But the Lion looked resolute in its pursuit, even though near misses from German shells were drenching it in spray.

But for the heroic thinking of a gunnery officer on HMS Lion it too would have exploded. A direct hit on its midship turret tore the roof off and exploded inside. The fire would have reached the magazine had not the dying officer ordered it to be flooded. Smoke poured from this wound in the Lion, but the flagship remained active for the entire battle.

Before 5pm the battle rapidly changed. The German High Seas Fleet came into view, an impressive line of Dreadnoughts stretching back into the horizon. Beatty signalled his force to alter course to the North, and the battlecruisers followed in turn to begin the next stage of the battle "the Run to the North". Fortunately for Beatty the 5th Battle Squadron took up the rear of this line, and these powerful modern Dreadnoughts took the full anger of the firing of the leading German ships. The ships of the 5th Battle Squadron, the Barham, Valiant, Warspite and Malaya, fired continuously at the German fleet. The Germans concentrated their fire on the last ship, the Malaya, in the hope of slowing her down and picking her off. Despite some very heavy hits, the Malaya kept her station and kept firing relentlessly back.

Meanwhile Jellicoe, is his powerful Dreadnought the Iron Duke had increased speed to rendesvous with Beatty and add the weight of the full Grand Fleet to the battle. His short signal to the Admiralty in London raised the tension and expectation there to new height: "Fleet action is imminent". Jellicoe was, however, confused and uncertain about how the battle was developing, being none too impressed by the vagueness and contradiction of the reports: "I have never felt so 'out of it' - I could not make out the situation a bit. Whether the enemy battle fleet was ahead, abeam or on the quarter."

The accuracy of fire of the German battlecruisers had dropped off considerably, as all five had taken a considerable punishment. However the leading German Dreadnoughts had their chance when a hit on Warspite's rudder jammed it, and forced the great warship into turning in a huge sweep, initially straight at the German Fleet. Warspite took a terrific pounding, being hit many times, but unlike the battlecruisers its heavy armour plating withstood the battering and it kept firing as it steamed around in its lonely circle. This may have saved another British ship, the Warrior, from immediate destruction.

The Warrior had been following its squadron flagship, the Defence, about 10 miles or so ahead of Jellicoe. Both ships were old armoured cruisers and had turned to fire into the advancing Germans, disabling the light cruiser Wiesbaden. But when the old armoured cruisers took the fire from the German Dreadnoughts, they were severely punished. The Defence exploded and sank under a rain of shells, and the Warrior limped off, fortunately saved by the Warspite as the German gunners shifted targets.

Despite Jellicoe's uncertainty about the exact German position and course, he ordered his fleet to change from six columns abreast to one long battle line, lead by the powerful Dreadnought King George V.

The Germans, eagerly seeking fresh laurels, were taken aback. They could not see the British fleet itself, but just the bright yellow flashes of over 100 heavy guns all along the Northern horizon. The ships in the van of the British line found great difficulty in seeing any targets in the mist, but the ships to the rear fired many broadsides, hitting the leading German battlecruisers and Dreadnoughts.

The fighting lasted for about half an hour, but despite the weight of advantage in the British favour a salvo of shells hit the British battlecruiser Invincible, and it too went into its death throes, first pulling out of line sharply, and then exploding.

Admiral Scheer then signalled to his fleet to carry out a manoeuvre it had practised many times, a "battle turn away", where all ships turn together and head away on an opposite course.

This manoeuvre was carried out with considerable skill and ended the firing.

Jellicoe signalled to the flagship leading the rear of his line, the Marlborough: "Can you see enemy?". "No" came the reply. Admiral Scheer, who had successfully extricated his fleet, then turned around and again headed straight

back into the centre of the British line. Despite his later insistence that this was designed to re-engage Jellicoe, it is far more likely he was trying to steer round the back of the Grand Fleet and escape back to base. In the event though he gave Jellicoe a second chance, and had to resort to even more desperate measures to escape. Scheer order Hipper's badly mauled battlecruisers to charge the British line. First the Derfflinger, then the others slowly built up speed and, in an episode that has motivated seafarers ever since, launched themselves forward against enormous odds.

As this was being done the rest of the German fleet's big ships turned away for the second time. The German battlecruisers took a predictable battering before they turned away, the Lutzow being so badly damaged that it was abandoned. This was the first serious German loss. Scheer also ordered his destroyers to launch a torpedo attack to cover the retreat. This achieved the desired effect of turning the British Dreadnoughts away, a decision that was possibly unnecessary as the torpedoes were launched at maximum range, and a counter-attack by British destroyers largely drove off the attacking flotillas.

This second escape ended the main engagement between the Dreadnoughts, although Beatty's battlecruisers, now at the head of the battle line, did engage some German ships, believed to be the pre-Dreadnought battleships for a short while.

Throughout the fighting the mist played a decisive role in shielding each side's ships from the gunners view. Report after report in the logs of the British fleet show the frustration at being unable to make out the targets clearly, if at all.

Admiral Scheer decided to turn a second time to try to make Horns Reef, and the security of his bases, but this time using the cover of night. He ordered his ships to maintain course, as they quite desperately sought to escape from Jellicoe's battle fleet.

Scheer's escape route took him though the rear of the British fleet, now heading South in its search. The rear was made up of the British destroyer flotilla's. In the considerable confusion and uncertainly of battle at night, the British destroyers flung themselves in torpedo attacks at the German ships as they occasionally came into view. There were several collisions between the destroyers, and one even collided with the German Dreadnought Nassau before making good its escape (the German guns could not be lowered to be brought to bear on the tiny destroyer).

These attacks cost the flotillas several destroyers and many lives, but were eventually successful as a torpedo hit on the pre-Dreadnought battleship Pommern sent it up in a huge explosion.

The light of early morning brought huge relief to the German fleet. Hundreds of binoculars scanned the horizon in the expectation of seeing the Grand Fleet barring its way home, but it was too far away to intervene, and the ships of the High Seas Fleet made it safely back to port.

The Germans were quick to claim victory at Jutland, and certainly the list of British ships sunk is awesome:

Battlecruisers: Queen Mary, Indefatigable and Invincible

Armoured cruisers: Defence, Warrior and Black Prince

Destroyers: Tipperary, Ardent, Fortune, Sparrowhawk, Shark, Nestor, Nomad and Turbulent

The German losses were significant:

Battlecruiser: Lutzow

Battleship: Pommern

Light cruisers: Wiesbaden, Elbing, Rostock and Frauenlob

Destroyers: V48, V4, V27, S35 and V29

British casualties were painfully high, over 6,000 men were killed (around 3,000 on the three battlecruisers). German losses were around 2,500 killed.

Credit certainly has to be given to the skillfull handling of the German fleet, its accurate gunnery and its bravery (especially of the battlecruisers), but the clear resilience of the German ships to punishment saved several from going down.

On the British side bravery, particularly of the battlecruisers, light cruisers and destroyers, is beyond question. The tactics were again good, although Jellicoe's rigid command discipline prevented other admirals acting on their own initiative when perhaps they could have done. The ships however where far from beyond question, the battlecruisers were not well protected, and the armoured cruisers should have become museum pieces years before.

In the end though the poor visibility, helped by vague British communications, probably saved the German fleet from crippling losses in its escape.

Despite British losses, Jutland did not change the strategic balance in the North Sea. The Grand Fleet did not lose a single Dreadnought, Beatty still had an advantage in the numbers of battlecruisers, and British shipyards were building replacements three times faster than their German counterparts.

Jutland caused consternation in Britian, and a deep loss of faith by the British public in the Royal Navy (who confidently expected a naval battle to be another Trafalgar). However it was most succinctly summarised by an American journalist who wrote "The German navy has assailed its jailor - but remains in jail".

After Jutland the German fleet made few sorties, although one of which could have led to another battle. Germany though was exhausted on the land battle fronts, and its capitulation there led to the surrender of the entire fleet to the British (now commanded by Admiral Beatty).

"The German flag will be hauled down at sunset, and will not be hoisted again without permission" - Admiral Beatty, after the surrender of the German High Seas Fleet, November 1918

Naval History of The Sino Japanese War - 1894

Japan began the transition from a medieval state to a modern power around 1850, taking most of its lessons from the colonial Europeans. Only a small fraction of Japan is inhabitable, the rest being inhospitable mountains, so the country's lack of sovereign territory has long dominated its policy towards other Asian countries.

By early 1894 Japanese rulers felt confident enough to expand, and were enviously eyeing nearby Korea, Formosa (now Taiwan) and the huge land mass of China. Deliberate Japanese provocations soon led to war with China.

Both Japanese and Chinese troop movements to the land around the Yalu river were carried out by sea, and the escorting squadrons of warships clashed in the Yellow Sea on 17th September 1894. Neither side expected the clash to result in one of the biggest naval engagements for decades, but that is just what happened.

The Chinese, led by two 12 inch gunned battleships, came out from the Yalu river in near to line abreast formation. The whole squadron was somewhat slow, maintaining a speed of only six knots.

The Japanese, with no battleships but several more modern cruisers, adopted the traditional line astern formation, and were capable of twice the speed of the Chinese. In addition they split into two squadrons, enabling more rapid manoeuvres.

The fleets first sighted each other between the islands of Talu and Haiyang around midday. The battle that followed is sometimes refered to as the battle of Haiyang.

As the fleets engaged the Chinese line abreast formation first became a wedge, then became a mess, as the Japanese moved swiftly passed them. The Japanese squadrons circled round the hapless Chinese, with the range at times decreasing to under 1000 yards.

Both sides had peculiar disadvantages. The biggest Japanese guns, the French designed 12.6 inch Canets, could only fire once every five minutes, and proved all but useless. However the Chinese ammunition was so poor that some reports suggest many shells were not filled with explosives, but contained sand or were just empty.

The most effective results were gained by the Japanese cruisers, in particular the Yoshino, armed with German 21cm (8.2 inch) guns.

After five hours of fighting the results of the battle were conclusive. The Chinese ships Chao_Yung, Chih_Yuen, and King_Yuen were sunk in the battle, and the Kwang_Chia struck a reef and later exploded while trying to flee. The Yang_Wei was rammed and sunk accidentally by the Chi_Yuen. The Ping_Yuen also sank in shallow water after escaping from the fight.

No Japanese ships were lost, although all but one reported casualties and damage. Newspapers reported that the flagship Matsushima, and the Akagi and Hiei showed the worst effects of the fighting.

Japan went on to capture the rest of the Chinese fleet in its harbours at Port Arthur and Wei-hai-Wei. However its colonisation of the land soon ended under great pressure from Germany and Russia.

This humiliation of Japan did not stop its attempts at expansion, as the Russo-Japanese war of 1904/05, and more recently the Second World War, show clearly enough.

The battle of Yalu, or Haiyang, is the first scenario on the IRONCLADS disk, and the oldest battle recreated by this program.

Naval History of The Russo-Japanese War – 1904 to 1905

As the Russians and Japanese contested the mainland and islands of the Far East, considerable interest in the balance of power there was shown by the other world powers. Britain sided with Japan, worried about Russian expansion into China, and supplied the Japanese with modern warships, including four powerful battleships.

Russia turned to France for assistance, and a naval arms race began that both sides felt would inevitably lead to war. Japan was strongly influential in Korea at the time, as the Russians were in Manchuria (now Northern China). The southernmost point of Manchuria was the strategically valuable port called Port Arthur.

Showing a willingness to take the initiative without bothering with War declarations (as with Pearl Harbour), the Japanese chose a favourable moment and attacked Port Arthur. This attack was nowhere near as successful as Pearl Harbour, but it demonstrated the aggression of Japanese

naval tactics, and the Russian fleet, commanded by Admiral Witgeft, became crippled by indecision amongst its high command.

The Japanese managed to move troops out of Korea to surround Port Arthur on the land side, while the navy blockaded the entrance. The Russians showed considerable courage in the bloody defence of Port Arthur in the land battles, but the fleet of six battleships in the port had to be repeatedly ordered by Moscow to attempt a breakout and sail to Vladivostock.

Eventually, on 10th August 1904, Admiral Witgeft did put to sea, and initally made good his escape from the Japanese Admiral Togo. However Togo managed to re-engage the Russian fleet while it was still in the Yellow Sea, and a shell killed Admiral Witgeft while he stood outside on the bridge. After this event senior officers in many navies were ordered to take cover, and ignore the Nelsonian image of flag officers standing bolt upright on deck, oblivious to danger.

Despite Witgeft's orders to the second-in-command, Admiral Ukhotomski, to make for Vladivostock regardless, Ukhotomski ordered the fleet to follow and went straight back to Port Arthur. No ships were sunk in the battle (named the Battle of the Yellow Sea, or the Battle of Round Island) but the fighting was fierce between the battleships for a while. The three leading Japanese battleships all took direct hits, the flagship Mikasa having most of its main guns knocked out. Needless to say Admiral Ukhotomski was relieved of his command on return. Some of the cruisers and destroyers did attempt to slip away in the night and reach Vladivostock, but all were captured before they made it.

This battle is recreated in the Yellow Sea scenario.

When the Russian Admiral in Vladivostock, Admiral Iessen, heard that the Port Arthur fleet was attempting a breakout, he rushed to sea with his small

force of three armoured cruisers. A brave attempt to meet up and help the larger fleet. As soon as Ukhotomski's turn back was reported to Vladivostock a fast destroyer was sent out to stop Admiral Iessen.

Unfortunately this destroyer did not reach the Rossia, Iessen's flagship, in time and the Russian squadron ran into a more powerful Japanese force, commanded by Admiral Kamimura, guarding the Straights of Tsushima.

In a battle that became known as the Battle of Ulsan, the slow Russian armoured cruiser Rurik was caught, pounded, and sunk. Iessen made several circular sweeps to draw the fire off the Rurik, but it ended in vain, and the Russians fled back to Vladivostock. Admiral Kamimura did not maintain his pursuit long enough to catch Iessen's two remaining cruisers.

This small battle is captured in the Ulsan scenario.

Meanwhile the Russian Baltic fleet, commanded by Admiral Rozhdestvensky in the battleship Suvarov, had been ordered to start its epic voyage, halfway around the world, to raise the naval blockade of Port Arthur.

Unfortunately for the Russians, the Japanese captured a famous hill overlooking Port Arthur, named 203 metre hill, long before the Baltic fleet was due to arrive. This hill enabled the Japanese to direct the fire of powerful 11 inch howitzers into the bay at Port Arthur, and systematically sink the Russian ships in it.

Soon after this Port Arthur surrendered.

The Baltic fleet completed the journey around the world in six months. Sailing via the Cape of Good Hope, there was no shortage of mishaps and adventures on the way.

The nervousness of the Russians is shown in one incident in the North Sea when they completely unrealistically took British fishing vessels to be Japanese torpedo boats and opened fire on them. Fishermen were killed and a war with Britain was only narrowly avoided.

One startling feature of the Baltic fleet was its age. The four new Borodino class battleships were respectable enough, but many of the ships were hopelessly old, some resembling sailing men-of-war with funnels.

It is no secret that the Russian fleet was hoping to slip through the Straights of Tsushima and reach its new destination of Vladivostock (there was hardly any point heading for Port Arthur) without a major fight. After six months at sea this is understandable.

As the fleet closed on the narrow straights, it was obvious from listening to Japanese radio transmissions that the Russian fleet had not been spotted. Hopes were high and nerves were on edge. However, as the fleet moved on the monitored radio transmissions changed, they became rapid and excitable. It was clear that the Russians had been seen.

At first the Russians just saw several Japanese cruisers appear out of the mist, then after a brief exchange of fire, disappear again. As the fleet, sailing in a tight formation, got nearer to Tsushima Island, these brief encounters with the Japanese cruisers became more frequent. It was the slow build up to a major action.

About midday on 27th May 1905 the Russians first sighted a line of big ships heading South on a nearly opposite course. Initial wishful thinking that this was only part of the Japanese fleet turned out to be just that, as every powerful ship that Admiral Togo could muster slowly appeared on the horizon.

Admiral Togo tried repeatedly to use the extra speed of his main ships to "cross the T" of the Russians. This is a tactic were the full broadside of one fleet engages simply the van of the other, in the hope of disabling some ships before the rest can get into action.

Despite this extra speed the Russians consistently turned to avoid being caught, although they had to endure some punishment while closing the range to bring their secondary armament and smaller guns into action.

Both flagships took the brunt of the fighting in the first hours of the battle, and the Suvarov, the Russian flagship became badly damaged. The Russian second-in-command, in the battleship Alexander_III took over leading the line when the Suvarov could no longer keep up a reasonable speed.

It was mainly from the experience of this battle that future admirals decided not to place their flagships at the head of the battle line (in particular, note the positions of the flagships at Jutland).

As smoke poured out of the Russian ships observers on them kept peering at the Japanese line to see if any were hit. But they could see nothing but a line of ships firing relentlessly at them. Hits on the Russian battleships became more frequent as their guns were slowly knocked out.

A key factor in the fight seems to be the quality of the Japanese ammunition, its shells exploding violently and causing far more damage than the Russian return fire seemed to be.

Admiral Rozhdestvensky was injured on the Suvarov, and eventually a destroyer appeared out of the confusion to take him off. A number of other officers escaped onto the destroyer, which, without any small boats, had to come alongside the flagship and enabled the officers to cross to it while it was lifted by a wave. This was a once-in-a-lifetime desperate move by the destroyer captain, which was successful.

When a destroyer was sent back to the Suvarov to pick up the rest of the survivors the once formidable battleship could not be found. It was apparently sunk by repeated torpedo attacks from Japanese destroyers. One Japanese observer watched the Suvarov's final demise, its remaining guns firing desperately right to the end "as is befitting of a flagship".

The rest of the fleet made an effort to continue on course for Vladivostock, but only one armed yacht (the Almaz) and two destroyers ever reached it.

The Russian battleships Borodino and Alexander III were both sunk, and almost every other ship was sunk or badly damaged in the fighting that continued well into the night. The next day many of the Russian ships surrendered, being virtually unable to make steam and in a clearly hopeless situation.

No Japanese ships were lost during this battle, the Battle of Tsushima, and it clearly bares comparison with Trafalgar in the decisiveness of the result. Admiral Togo became a national hero, Japan had established itself as a world power beyond question, and the humiliation of Russia helped fuel the discontent that led to the Bolshevick revolution of 1917.

Naval History of the Second World War – 1939 to 1945

The Second World War involved the World's five biggest navies, those of Britain, USA, Japan, Germany and Italy, in a fight to the death. As the War stretched to all the corners of the Globe, these navies were engaged in the fighting to a degree unknown in previous wars. It is, for example, impossible to separate the involvement of the US Army and Navy in the Pacific War with Japan, as so much of the fighting required combined operations.

DREADNOUGHTS

The DREADNOUGHTS simulator does not pretend to encompass the full scope of naval conflict in this war, but concentrates on the battles that were good old-fashioned engagements between surface warships. Easily the most famous of these is the pursuit and sinking of the German battleship Bismarck, although others such as the battle of the River Plate were important and are well known.

At the outbreak of war in September 1939 Germany's navy was clearly the weakest of its three main forces. The Treaty of Versailles, which somewhat humiliated Germany after the First World War, severely restricted the ships it could build. Hitler seems to have been anxious to have kept (at least publicly) within the treaty limits, in order not to provoke Britain. The limits imposed on German shipbuilding resulted in some clever designs, none more successful than the "pocket battleships" such as the Graf Spee.

The Graf Spee was one of a class of ships built with the displacement of a cruiser but with the armament of a small battleship. This made it an excellent commerce raider, as its speed enabled it to escape from more powerful ships, but its firepower (six 11 inch guns) could easily outmatch any cruiser the British could put against it.

Just before the war started the Graf Spee sailed for the South Atlantic, escaping unnoticed through the Faeroes-Iceland gap. The early weeks of the war were dominated by politics and caution, and the Graf Spee was not allowed to attack French or US ships, but could attack and sink British merchantmen. This she did with considerable success, sowing a huge amount of confusion in the Royal Navy as to the raider's whereabouts, and how many ships were involved. The pursuing force in the South Atlantic was commanded by Commodore Harwood in HMS Ajax, along with her sister ship HMS Achilles (both armed with 6 inch guns), and the more powerful HMS Exeter and HMS Cumberland (both with 8 inch guns). None of these ships on their own were any match for Graf Spee, and even all four together were in great danger from 11 inch guns.

After a cruise of several months and with nine British ships sunk, Captain Langsdorff, commanding the Graf Spee, decided to head for the River Plate Estuary to attack British shipping there. In an inspired piece of guesswork Commodore Harwood decided to concentrate his force at this estury as the most likely next target. Unfortunately for Harwood the Cumberland had to be sent to the Falklands to refuel.

Harwood's cruisers had already worked out tactics on how to fight a superior ship before they met Graf Spee on December 13th. The tactics were to split their force, the Exeter attacking independantly with its 8 inch guns, and the smaller Ajax and Achilles racing in to attack when the Graf Spee's shells started falling too close to the Exeter. This should force the Graf Spee to switch targets, so losing the range on the Exeter, which would then re-engage and force the Graf Spee to switch targets again.

When Langsdorff sighted the three cruisers he decided to close the range, to enable his secondary armament to deal with the two smaller cruisers. Graf Spee's gunners quickly established the range on the Exeter, and started hitting, causing an alarming amount of damage. However, the Graf Spee was hit both by the Exeter and the small cruisers, and Langsdorff was worried about allowing the Ajax and Achilles the opportunity of closing to torpedo range. He therefore switched his main armament to fire at them, thus giving the Exeter a respite. Dynamic ship handling on the Ajax and Achilles spared them any hits, although several near misses showered them with splinters. The Exeter re-engaged the Graf Spee, but again the German gunners found their target and punished the British cruiser with several hits. Again the Ajax and Achilles threatened with torpedoes, and again the Exeter was saved, now with only one turret left firing.

For a third time Graf Spee turned on the Exeter, and Harwood, in the Ajax, steamed towards the German ship to close the range. Langsdorff again switched target, but this time hit the Ajax hard, knocking out the two after

turrets with one hit. Graf Spee was also hit, losing its spotter plane. The Exeter was now out of the action, and the Ajax and Achilles were low on ammunition. Harwood decided to call off the action, and under the cover of smoke, broke free. Graf Spee headed for the sanctuary of neutral Montevideo in Uruguay, blazing away with all its guns. Thus ended the battle of the River Plate, but not the saga of the Graf Spee.

Tied down by the complicated politics of a warship in a neutral port, and with knowledge of an increasing British presence to blockade him in, Langsdorff and the German Admiralty were in a quandary on how to proceed. An initial plan to break out for Argentina was thwarted by clever British diplomacy, and the Graf Spee was scuttled on 17th December. Langsdorff felt compelled to shoot himself. Harwood had already been promoted to Rear-Admiral following the battle on the 13th.

The battle of the River Plate was a brilliantly handled cruiser action, and is the first battle on the BISMARCK scenario disk.

The next three battles involve the Bismarck in its famous breakout into the Atlantic. The Royal Navy committed five battleships, three battlecruisers, two aircraft carriers, 14 cruisers, 33 destroyers and eight submarines to, in Churchill's famous order "sink the Bismarck".

The Bismarck was a powerful battleship, claimed to be within the limits of the Treaty of Versailles, but in fact was well outside it. With eight 15 inch guns, and a considerable turn of speed at 29 knots, it was both fast and deadly.

The original plan was for it to break out into the Atlantic with the cruiser Prinz Eugen, and meet up with the battleships Scharnhorst and Gneisenau, currently in Brest. This would create an impressive and swift fleet of raiders to disrupt the Atlantic convoys. Unfortunately for the Germans, the

Scharnhorst, undergoing a refit, was not ready for sea, and the Gneisenau suffered bomb damage in port. The revised plan was simply to get the Bismarck and Prinz Eugen out on a raid in May 1941.

Initially events went well for Admiral Lutjens on the Bismarck. The ships sailed in bad weather and made it to the Denmark Straight before being spotted by the British cruisers, Norfolk and Suffolk. These two cruisers shadowed the Bismarck until the battlecruiser Hood and the new battleship Prince of Wales could engage it.

At first light on 24th May the German ships saw the British fleet, commanded by Admiral Holland on the Hood, but initially mistook them for cruisers. Prinz Eugen engaged the Hood for a short time, scoring at least one hit. This hit started a fire on Hood that enabled the Bismarck's spotters to find the range quickly. The British dispositions were poor. The Hood led the more heavily protected Prince of Wales, in a tight formation, in a diagonal course towards the Bismarck that enabled the Germans to fire full broadsides, but did not close the range as quickly as they could have done.

In the event the Hood was hit by a salvo from Bismarck that caused a serious explosion that broke the Hood in two. Conventional wisdom is that Hood's magazine exploded, although eyewitnesses reported that the explosion took place well away from any magazine, and may have been Hood's torpedoes exploding. In any event, there were only three survivors, and the world's largest battlecruiser was sunk, possibly after only four salvos from Bismarck. Contrary to some reports that Prinz Eugen was kept out of the fight, it played an active part, and the fire from both ships was then concentrated on the Prince of Wales. HMS Prince of Wales was not a happy ship, it was plagued by jamming turrets, and was reduced to firing from its one twin barrelled "B" turret. It took seven hits from the two Germans before turning and escaping through its smoke screen. Bismarck took a damaging hit from the Prince of Wales, which flooded some of the forward compartments.

DREADNOUGHTS

The loss of the Hood was treated as a national calamity by the British, although careful analysis would show it was simply not well protected enough to have been put into such a fight. The Germans have long lamented Admiral Lutjens decision not to pursue the Prince of Wales.

This battle, the battle of the Denmark Straights, is the first in the Bismarck trio.

Following this disaster the British concentrated on their attempts to slow the Bismarck down using torpedo attacks from ancient Swordfish biplanes. However a clever turn by Lutjens evaded the shadowing forces and contact was lost with Bismarck and Prinz Eugen.

The Prinz Eugen then separated from Bismarck to make its own way back to Brest, the Bismarck taking a more direct route.

After several harrowing days the Bismarck was located by an RAF Catalina, and the Swordfish attacks continued. After a serious mistake when the Swordfish attacked the cruiser Sheffield, two more strikes scored two or three torpedo hits on Bismarck. Although the midship hits increased Bismarck's flooding, it was the one hit on the stern, jamming the rudder, that was to prove critical.

Bismarck started to turn erratically, and despite desperate attempts to free its rudder, the great battleship started heading back towards her pursuers. That night, on the 26th May, Captain Vian's destroyer flotilla, lead by the Cossack, launched a further torpedo attack. Because of appalling weather the results, and even course, of this battle are unknown. However this attack by four Tribal class destroyers, and the Polish destroyer Piorun, is recaptured in the Tribal scenario.

One thing this attack did achieve is that it kept Bismarck's gunners up through the night. It was an exhausted crew that sighted two more British battleships, the flagship King George V and the Rodney, and two heavy cruisers, the Norfolk and Dorsetshire, the next morning.

The commander of the British fleet, Admiral Tovey, had taken on board the lessons of the sinking of the Hood, and split his force up to make life for the German gunners as difficult as possible. HMS Rodney, distinctive for its three triple barrelled 16 inch guns, was the first to open fire, at 8 47am, followed quickly by the King George V (with ten 14 inch guns), and then the Bismarck itself. A hit from the cruiser Norfolk first wounded the Bismarck, knocking out its fire control director. A 16 inch hit from Rodney knocked out both Bismarck's forward guns. As the Germans shifted their fire control to the after position, a 14 inch salvo from King George V knocked out this fire control station too. The weight of firepower against the Bismarck was telling rapidly. By 9 31am all Bismarck's main turrets were out of action, and it had scored no hits.

The British mercilessly pounded the Bismarck for the next 45 minutes, until at 10 45 am Tovey broke off the action. At the same time engineers on board the Bismarck were ordered to prepare the ship for sinking. At 10 36 the Dorsetshire was ordered to torpedo the burning hulk, two of the four torpedoes fired hit, and the Bismarck sank at 10 40. Although many hundreds of German survivors escaped into the water, only 119 were picked up by the Dorsetshire before it was forced to escape following a U boat scare. A few more survivors were indeed picked up by a U boat and a German weather vessel. A much relieved Royal Navy, now desperately short of fuel, turned and headed for home.

The third of the three Bismarck scenarios recaptures this last fight.

After Japan's undeclared start to the Pacific War, with its attack on Pearl Harbour, there followed a catalogue of disasters for the Allied powers.

DREADNOUGHTS

Britain was, temporarily, under the illusion that the presence of its capital ships in Singapore would deter any Japanese aggression in that area. Some in the Admiralty also believed that aircraft alone could not sink a capital ship at sea. These mistakes resulted in the sinking of the battleship Prince of Wales and battlecruiser Repulse, in their attempts to interfere with the Japanese invasion of Malaya and Siam.

The ships sailed from Singapore on the 8th December 1941, changed plan and headed back for Singapore on 9th December, were located by Japanese submarines on 10th December, and were relentlessly bombed and torpedoed until they both sank.

As the Japanese attacked throughout the Far East, a joint force called ABDA (American - British - Dutch - Australian) was set up to try to organise naval resistance. On the 24th January 1942 this force tried to prevent the invasion of Borneo at Balikpapan, but failed.

On the 27th February 1942 the ABDA force tried to intercept Japanese invasion transport ships heading for the island of Java, but instead ran into its covering force of cruisers and destroyers. The battle of the Java Sea marked the end of the ABDA fleet.

The commander of the ABDA fleet was Admiral Doorman, in the Dutch cruiser De Ruyter, and the force included the British heavy cruiser HMS Exeter and the US heavy cruiser Houston. There was also the Australian cruiser Perth and Dutch light cruiser Sumatra, along with 9 destroyers. The Japanese covering force, commanded by Admiral Takagi, consisted of two heavy cruisers, the Nachi and Haguro, two light cruisers, the Naka and Jintsu, and 14 destroyers.

On sighting the Japanese force Admiral Doorman tried to break off the engagement, as his intended target was the transports. However hits on HMS Exeter slowed the allied escape, and soon the force became heavily engaged.

The Japanese started using their new Long Lance torpedoes to great effect. With a range of over 30,000 yards these torpedoes hit and sunk first the destroyer Kortenaer then the flagship De Ruyter. Soon afterwards the Java went the same way. HMS Electra, a destroyer, was sunk trying to help the Exeter.

The Exeter survived, only to be sunk two days later in an attempt to escape through the Sunda Straight. The remaining allied cruisers, the Houston and Perth, were also sunk while trying to prevent another landing at Bantam Bay in the Sunda Straight. The remnants of the ABDA force headed for Australia and Celyon.

Almost the entire ABDA force had been lost for very little gain. Churchill called the battle of Java Sea, the fifth scenario on the Bismarck disk, a "forlorn hope". The defeat of the Japanese in the Pacific was to involve a very different kind of naval action, a battle of submarines, carrier fleets, and intelligence.

In the war against Germany, Russia was repeatedly asking the British and Americans for help, which was provided through the Arctic convoy system to the port of Murmansk. The German navy, based in the superb protection of the Norwegian fjords, repeatedly disrupted these convoys with submarines and surface ships.

The mere presence of the battleships Tirpitz and Scharnhorst in Norway caused severe problems for the allies. Battleship covering forces were necessary for convoys if there was just the possibility that one of these giants was to put to sea. The Tirpitz was repeatedly bombed by the RAF, and was successfully damaged in an attack using midget submarines, but the Scharnhorst was a lucky and successful ship, and had largely escaped serious damage throughout the war.

On the 26th December 1943, Scharnhorst's luck was to run out. It left its secure base, Alten Fjord, to try to attack a convoy bound for Murmansk. The

close escort of the convoy included the three cruisers Belfast, Sheffield and Norfolk. The battleship covering force, many miles more distant (as it had to cover several convoys) was made up of the battleship Duke of York, cruiser Jamaica, and four escorting destroyers. The British were commanded by Admiral Frazer in the Duke of York.

The Scharnhorst, commanded by Admiral Bey, was escorted by five large destroyers. However these destroyers were stationed 10 miles ahead of the battleship, too far in the very bad weather and light conditions of an Arctic winter.

The Scharnhorst first ran into the three cruisers, and a short engagement followed. Admiral Burnett, in the Belfast, broke off contact to protect the convoy, as he was sure that the Scharnhorst would continue with its attack. Admiral Frazer, now steaming towards the action, became very anxious when contact with the German ship was lost. Nevertheless Scharnhorst, now without its destroyers, did reappear and fight a further engagement with Burnett's cruisers before calling the attack off.

Burnett shadowed the Scharnhorst, and was reinforced by four destroyers, the 36th Destroyer division, from another convoy escort. Frazer, in the Duke of York, headed to cut off Scharnhorst's retreat to Alten Fjord. Finally, at 4 47pm, Duke of York made radar contact with the Scharnhorst, and closed in for the kill. In the very poor light the heavy guns of the two ships engaged mostly by radar, and even though Scharnhorst was hit several times it looked as though it would escape. However a last salvo from Duke of York penetrated a boiler room in the Scharnhorst, and destroyed it. The battleship's speed dropped to around 8 knots, but only for a while.

Admiral Frazer had sent his destroyers in pursuit of the Scharnhorst, and there was considerable elation on board when the radar showed the destroyers to be gaining. In the desperate torpedo attacks that followed, with Scharnhorst flinging her helm to one side and the other to avoid the attackers, the Duke of York and the cruisers closed on the now frantic prey.

The destroyers scored several torpedo hits, and succeeded in bringing the Scharnhorst speed down again from 22 knots to around 8 knots.

At 7 pm the British battleship opened fire, hitting with the first salvo. The cruisers joined in to add to Admiral Bey's troubles. Bey seems to have accepted the Scharnhorst's fate at around 7 pm, with only one main turret left firing, when he signalled German high command: "We shall fight to the last shell: Scharnhorst ever onwards." The Duke of York ceased fire at 7 29 pm, the Scharnhorst a battered hulk, and ordered the cruiser Jamaica to finish it off with torpedoes. This was easier said than done. The German ship was still firing her secondary armament, even after the Abandon Ship order was given, around 7 30 pm. The Belfast joined in with its torpedoes, but it was not until the four destroyers of the 36th Division joined in that Scharnhorst finally sank. In the end Scharnhorst was hit by at least eleven 21 inch torpedoes before she went under, at 7 45 pm. Only 36 survivors were picked up from the icy waters of the Arctic Sea.

The loss of the Scharnhorst ended the capital ship actions between the British and German navies, and is the last scenario for the Dreadnoughts program.

The role of warships

"The main thing - perhaps the only thing - for the Commander-in-Chief, was to issue a general idea of attack, so that everyone could act with confidence and determination in destroying the enemy's force" - Admiral Dewar

A wartime navy is made up of many different types of ship, each with identified roles. Here is an introduction to the classification of warships.

Ship classes

Once a design for a warship has been accepted by the Admiralty, it is normal practice for several to be built to the same specification. The first ship built usually gives its name to the class as a whole. Sometimes the class was limited to one ship, for example HMS Tiger was the only Tiger class battlecruiser, and SMS Blucher the only Blucher class armoured cruiser. Normally though several ships are built to the same design before improvements are made and a new design, resulting in a new class, is built.

The charts supplied with the games list the names of all the ships present at the simulations, and in square brackets [...] the class of the ship is given.

Battleships

A battleship has only one main active role, to overcome and destroy any enemy ships with its immense artillery. Battleships were heavily protected with armour plating, mounted 11 to 16 inch guns in large turrets, and, at the time of the First World War, represented the ultimate weapon. Properly built a battleship could withstand an immense pounding.

A battleship would normally serve in a squadron of ships of similar or identical class, and that squadron would form part of a main battle fleet.

Battlecruisers

"Rein in dem Feind! Ran!" (Straight into the enemy! Charge!) - Admiral Sheer's desperate order to his battlecruises at Jultand

The battlecruisers were an exciting and macho class of ships, but the concept was distinctly flawed. The strength of a battlecruiser lay in its high speed and

hitting power. The guns mounted on battlecruisers matched those of battleships, but their armour plating was sacrificed in order to get the speed.

The role of battlecruisers was supposed to be as a powerful scouting force, capable of drawing the enemy's battle fleet into action. Their speed also helped them intercept enemy raids.

However the great flaw of reduced armour plating meant that they were incapable of withstanding the punishment that the big guns could deliver. The maxim of "speed is life" does not apply in an engagement between capital ships, it is staying power that counts.

The list of British battlecruisers destroyed by only a few big shells is frightful - the Invincible, Queen Mary and Indefatigable all blew up at Jutland, and of course the famous fight between the Hood and Bismarck lasted only four or five salvos.

Battlecruisers were eventually discarded in favour of the concept of the fast battleship.

Armoured and Protected Cruisers

Armoured Cruisers, at the time of Jutland, were a left-over from a previous era. They belong to the pre-Dreadnought classes of ships, but were strangely kept on as third-rate battleships. They did not possess the speed of light or battle cruisers, and their role at battles like Jutland was not much more than cannon fodder. Losses among Armoured Cruisers were great when in contact with more modern warships, and had almost no protection against torpedo hits.

In theatres far from home, Armoured Cruisers were more justifiably used as small battleships in making up trade protection fleets.

Protected Cruiser is an older term, referring to any medium sized ship where some effort has been made with armour plating. They are only present in the IRONCLADS scenarios.

Light Cruisers

Light cruisers were the light cavalry of the navy. Their main role was as the eyes of the fleet, gathering information and sending sighting reports to the flagships. It was common for a force of light cruisers to be stationed several miles ahead of a fleet, to act as scouts. This was clearly a dangerous role as it sometimes meant being too close to an enemy battle fleet for comfort. In this role light cruisers took over from the frigates of Nelson's time.

Other roles of light cruisers include escorting larger ships, and in operating as commerce raiders and protection vessels (particularly in the oceans far from home).

Cruisers

In the Second World War, and since, the term "light" has been dropped and the role (and strength) of cruisers uprated to include engagements with larger enemy vessels.

Destroyers

"It was a wild scene of groups of long low forms vomiting heavy trails of smoke and dashing hither and thither at thirty knots or more through the smother and splashes, and all in a rain of shell from the secondary armament" - Corbett, on the destroyer melee's at Jutland

Destroyers were one of the great successes of the First World War. Originally called Torpedo Boats, then Torpedo Boat Destroyers, and finally just Destroyers, they were lethal little craft that were to be produced in huge numbers both in the First and Second World Wars.

The uses of destroyers increased as their worth became proven, particularly in later years as submarine chasers, convoy escorts, close support for amphibious operations, anti-aircraft gun platforms, and so on. In the early days they served in small numbers as escorts for larger ships, and in much larger numbers (flotillas) for mass torpedo attacks. These mass attacks were rarely very successful, but fear of them greatly affected the movements of much larger ships. A battleship was well protected if it had a destroyer escort, as it could escape from a heavier force using the threat or reality of a destroyer torpedo attack to force its enemy to turn away.

The best protection against such a mass attack was found to be a mass destroyer counter-attack.

A destroyer relies on its speed and small size for protection, and on its two or three small guns (typically 4 inch guns) and torpedoes as offensive weapons.

Gunboats

Gunboats are very small vessels, typically used on rivers or coastal patrols. Occasionally they got caught up in a major battle, and so have been included for completeness. They will have almost no effect on the outcome, being too lightly armed to have much impact.

For this simulation vessels such as minesweepers, minelayers, armed yachts and the like are classified as gunboats.

DREADNOUGHTS

Fleet organisation

Fleets are made much easier to control by their organisation into squadrons. A squadron can by anything from two to 20 ships, though is typically around four large ships, such as battleships and cruisers, or six or more destroyers.

A fleet is commanded by the Admiral in his flagship, and the other squadrons are usually commanded by Rear-Admirals in their squadron flagships. The fleet flagship may well have a squadron of its own.

A typical fleet organisation might be:

∧
LION
(Flagship)
Battlecruiser

∧   ∧
SOUTHAMPTON   **AURORA**
(Squadron   (Squadron
Flagship)   Flagship)
Light_Cruiser   Destroyer

∧   ∧   ∧
BIRMINGHAM   **PRINCESS_ROYAL**   **ACHERON**
Light_Cruiser   Battlecruiser   Destroyer

∧   ∧   ∧
NOTTINGHAM   **TIGER**   **ATTACK**
Light_Cruiser   Battlecruiser   Destroyer

+1 other   +10 others
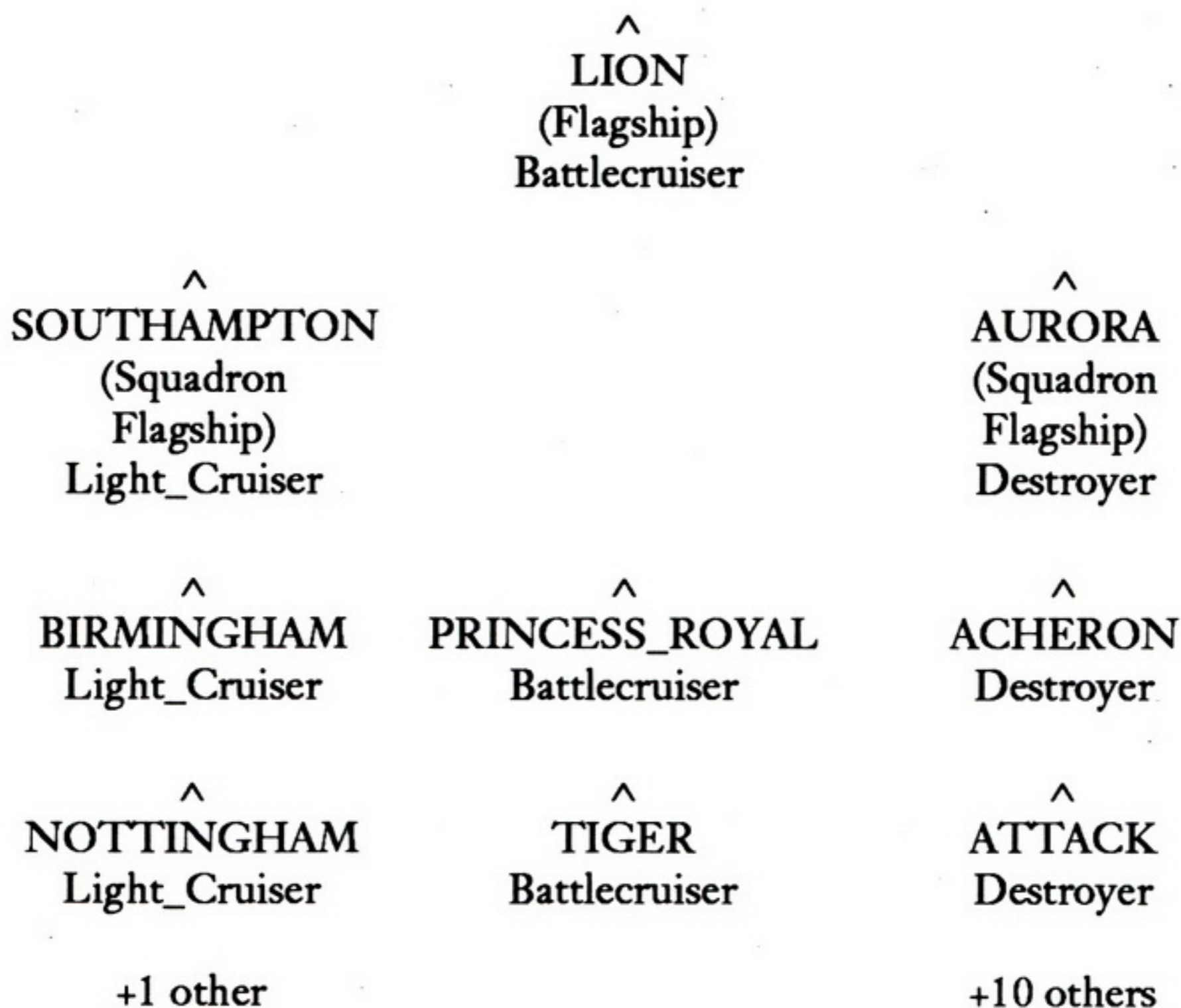
The flagship can order squadrons around as if they were single ships. The subordinate ships to a flagship will simply follow their leader, unless specifically ordered to do otherwise.

Communications

"The Germans originally changed their general cypher once a month but soon changed it to every 24 hours, which they no doubt believed would defeat attempts to find the key. Twice we had the good fortune to obtain the new book. The first time from a sunken submarine; the second time from a Zeppelin. The Zeppelins, being under naval command, used the Navy signal book and cyphers" - Commander James (Room 40 - A secret Admiralty intelligence department)

Radio was certainly in use in the early 20th century, and all ships are assumed to carry one. If this gets damaged the Signal Officer is reduced to using either flags (during the daytime) and lamps (in bad light and at night).

When signalling an order to another ship it must be preceded by:

SIGNAL THE <ship> ....

for example:

SIGNAL THE TIGER SEND ME YOUR SIGHTING REPORT

There is no need to specify radio communications, as it will always be used in preference to the other two methods. The tactics of radio-silence are not simulated in this version of DREADNOUGHTS.

Radar

Radar was not invented until the Second World War, and is not simulated in this program.

Latitude and Longitude

"My position 41 degrees 10 minutes South 76 degrees 20 minutes West, Course North" - HMS Canopus signalling to the flagship HMS Good Hope, indicating that she was 250 miles away before the fateful battle of Coronel

Ships will often report their position as a latitude (distance North or South of the equator) and longitude (distance East or West of the Greenwich Meridian). This is not a particularly easy reference and involves some practice to get right.

Latitude and Longitude are measured in degrees and minutes. Each degree being 60 minutes. Lines of latitude, fortunately, are evenly spaced, with one minute of latitude being exactly one nautical mile. Longitude lines are not evenly spaced, being widest at the equator and narrowing to nothing at the poles. However, as this over-complicates navigation for this simulation, lines of longitude are also assumed to be evenly spaced, and one minute of longitude also measures exactly one nautical mile.

A nautical mile is just over 2000 yards, but is taken here to be exactly 2000 yards, so one minute of latitude or longitude is also exactly 2000 yards. Both degrees of latitude and longitude are exactly 60 minutes apart or 120,000 yards.

Another difficulty with latitude and longitude (often shortened to lat-long) is that the lowest coordinate is only in the bottom left hand position on a chart

(assuming North is always to the top of the chart, which is the Admiralty standard) if the area is North of the Equator and to the East of Greenwich. An area of sea West of Greenwich (say in the Atlantic) will have its lowest coordinate in the bottom right hand position. Needless to say in the Southern Hemisphere the lowest lat-long coordinates are at the top of the chart.

Because it takes some practice to efficiently place a ship on a chart using its lat-long position, the charts enclosed with this game have lat-long coordinates marked every 5 or 10 minutes along each margin.

Gunnery

There is a whole range of factors which affect the accuracy and damage caused by naval guns. The most important being the weight of explosives in the shell, its armour piercing capability, rate-of-fire, and the maximum range.

This simulation also takes the following into account:

FIRING ARCS

Guns can clearly only fire at targets that they are capable of pointing at. The firing arcs of any gun are coded into the graphic descriptions of the ships in the class data files. Forward and Aft mounted guns have a fairly clean sweep from one broadside round to the other. Most secondary armaments are limited to firing out the port or starboard side of a ship. Some interesting turrets on First World War battleships have a wide firing arc out of the port or starboard side, but can be rotated to fire across the deck, so giving a small firing arc out of the other side. All these variations are taken into account.

RANGING SHOTS

The more shots a ship has fired at a target the more likely it is to hit it, and the first few salvos are most likely to fall short or go over.

"The British guns were ranging. Those deadly waterspouts crept nearer and nearer. Men on deck watched them with a strange fascination" - German survivor, SMS Blucher, Dogger Bank

DIRECTORS

Directors are optical sighting systems that help coordinate all the main guns. Newer battleships and battlecruisers are assumed to be firing with main directors, which increase the chances of a hit. German ships had a similar sighting system, which they called a Periscope:

"All the guns are kept dead on the enemy, without anyone working the guns needing to see the target at all...as long as the periscope is on the target, and as long as the proper range from the enemy has been established, every gun is aiming dead at that part of the hostile ship at which the periscope is pointing" - Gunnery Officer, SMS Derfflinger

In this simulation all centrally controlled sighting systems are referred to as "directors".

Secondary armament, and guns mounted on light cruisers and Destroyers, are not controlled by central directors. In the Second World War, Cruisers were fitted with them.

SHIP UNDER FIRE

"All around us huge columns of water, higher than the funnels, were being thrown up as the enemy shells plunged into the sea....some of these gigantic

splashes curled over and deluged us with water" - Lieutenant Chalmers, HMS Lion, Jutland

The effectiveness of fire depends partly on the state of mind of the gunners and their ability to see clearly. The accuracy of a ship under fire is noticably reduced.

SHELL WEIGHT

The heavier the shell the better the ballistics, so a marginally improved chance of a hit.

"I felt one or two very heavy shakes but didn't think much of it at the time, and it never occurred to me that we were being hit. I saw two of our salvos hit the leading German battleship. Sheets of yellow flame went right over her masthead....told everybody in the turret that we were doing all right and to keep her going; machinery working like a clockwork mouse" - Executive officer, HMS Warspite, Jutland

NUMBER OF GUNS FIRING

The more barrels that can be brought to bear on the target, the better. It can be critical not to allow the enemy to fire full broadsides against a fleet that can only reply with its forward or aft guns, a famous manoeuvre known as "crossing the T":

"The entire arc from North to East was a sea of fire. The flash from the muzzles of the guns was distinctly seen....more than one hundred heavy guns joined in the fight on the enemy's side" - Admiral Scheer, German Fleet Commander, on having his 'T' crossed at Jutland.

TARGET LENGTH AND SPEED

The smaller and faster a target the more difficult it is to hit.

"There was handling of ships in that ten minutes such as never been dreamed of by seamen before" - observer, Jutland

TARGET OR FIRING SHIP TURNING

The more turns made by either the target or the ship firing, the less likely a hit.

SEA CONDITION

Secondary armaments accuracy is limited above a wind force 6 (Strong Breeze), and main armaments limited at a force 7 or more.

NIGHT TIME

The bad light severely affects visibility and accuracy.

"We had absolutely no idea of where the enemy was and only a vague idea of the position of our own ships" - Destroyer captain, during night action, Jutland.

"A lottery" - Admiral Jellicoe on night action.

Damage and Damage Control

A ship is a complicated instrument and shells bursting within them can cause a multitude of problems. Two general problems are those of fires and

flooding. If they are not controlled these will both engulf and sink any ship. Hits on particular sections of the ship have the following effect:

BRIDGE: This limits the Quartermaster's ability to see clearly and react to sudden dangers. The Quartermaster is in charge of steering the ship.

COMMUNICATIONS MAST: If the communications mast is damaged, communications will be limited to flags and lamps until it is repaired.

DIRECTORS: If the ship is fitted with a main director, and it is damaged, gunners have to use local (and less accurate) range finding systems. The main director is too delicate an instrument to be repaired at sea.

TORPEDO TUBES: If any torpedo tubes are damaged they cannot be used. Again they will not be repaired at sea.

MAIN AND SECONDARY TURRETS: Main and secondary guns can be damaged, though in some cases are repairable at sea (for example, the mechanisms become jammed with schrapnell). A direct hit though will knock them out for good.

Main turrets are named from "A" through to "J", depending on the number of them, starting at the bow. Similarly secondary guns are named "A", "C", "E", "G" and "I" down the port side of a ship, and "B", "D", "F", "H" and "J" down the starboard side.

ENGINE ROOM: A hit in the engine room will affect both the ships speed and ability to turn. Some engine damage can be repaired.

"The engines still went on running, which seemed to show that the cylinders had not been hit. But in the dim uncertain light I perceived what appeared to be Niagara, though whether the sheet of water was rising up from below or pouring down from above I couldn't be sure at the time." - Engineering Officer, HMS Warrior, Jutland

"In the engine room a shell licked up the oil and sprayed it around in flames of blue and green, scarring its victims and blazing where it fell. In the terrific air pressure of explosions in confined spaces the bodies of men were whirled around like dead leaves in a winter blast" - survivor SMS Blucher

RUDDER: The achilles heel of battleships. A hit on the rudder will clearly affect the ships ability to turn, though it can turn on its engines alone. Sometimes a rudder is repairable.

"The only thing that could stop a Dreadnought quickly was a torpedo hit on a vulnerable point - rudders, propellers or possibly an engine room" - author David Howarth on Jutland

DAMAGE CONTROL PERSONNEL: The damage control parties, set up to control and repair the damage, can themselves become casualties.

MAGAZINE EXPLOSION: An explosion in a magazine (the storage compartment for the shells) is the ultimate calamity. It is unrecoverable and the ship is lost within minutes if not immediately.

"Is this wreck one of ours?" - Admiral Jellicoe at Jutland to a nearby Destroyer

"Yes - the Invincible" - Destroyer's reply, after witnessing the British battlecruiser's magazine explode.

Damage Control parties

Damage Control parties are set up on each ship by the Executive Officer during and after any battle, and will attempt to control and repair the damage done. Generally, if the damage is light it can be repaired quite quickly, but if there are fires and floods to fight it can take some time to get round to less

immediate problems such as communication masts and engine damage.

If a ship is not in action then repairs can be carried out more quickly (as gun crews can join the damage control parties).

Winning and Losing

"A victory is judged not merely by material losses and damage, but by its results" - Admiral Jellicoe

"The quickest way of ending a war is to lose it" - George Orwell

"A dead enemy always smells good" - Alus Vitellius

As Admiral Jellicoe rightly points out, a true assessment of a victory or defeat depends not on a simple assessment of damage and casualties, but on how the battle affected future events. This, though, is the stuff for historians, as such assessments are both difficult and controversial: both sides claimed victory (with considerable justification) after the Battle of Jutland, for example.

However, such arguments are beyond the scope of this computer program. The player is invited to make their own assessments of the strategic significance of their victories or defeats when playing DREADNOUGHTS. A points system is implemented to give a material assessment, and is based on the tonnage of shipping sunk, the damage done to ships remaining afloat, and other factors such as the number of survivors and prisoners rescued.

There are few episodes in naval history where the maxim of Alus Vitellius applies. Sailors often saw the enemy as the enemy ships, not their crews, and would genuinely attempt to rescue the survivors of sinking ships, and then treat them well. This is very different from the treatment of prisoners on land, which has so often been one of a land war's greatest horrors.

Captured senior naval officers would be given the best accommodation available, and, almost traditionally, joined the senior officers of the winning side for dinner.

Using the material damage points system there are five possible conclusions:

A draw
A marginal victory
A significant victory
A decisive victory
A complete victory

Game time and scale

This simulation operates in cycles of six minutes. Every six minutes the admiral may enter up to six orders.

Measurements and ranges are always given accurate to 1000 yards.

A battle starts at the time stated on the maps. And finishes either at the historical end time (usually at night when contact between the fleets would probably be lost), or about one hour after all of one fleet's ships have been sunk, wrecked or fled from the scene. This extra time is allowed for to enable the victor to rescue any survivors from the wreckage, carry out any repairs, and perhaps have the satisfaction of heading for home.

The Scenarios

The data for each scenario is held in two files, a data file and a chart file. The data file (such as SEATRIAL.DAT) can be inspected, using a word processor, to examine any details. The chart file (say, SEATRIAL.CHT) is a coded representation of any land within the battle area, and is not in any form that can be inspected. If no chart file exists, then the entire battle area is open sea.

Altering either the data or chart files could result in the DREADNOUGHTS program crashing in a heap.

The scenario names are shown in capitals.

First World War scenarios:

i)	SEATRIAL	(hypothetical)
ii)	The Battle of CORONEL	- 1st November 1914
iii)	The CANOPUS at Coronel	- 2nd November 1914
iv)	The Battle of The FALKLANDS	- 8th December 1914
v)	CHANNEL Patrol	(hypothetical)
vi)	The Battle of DOGger BANK	- 24th January 1915
vii)	The Battle of JUTLAND	- 31st May 1916

On the IRONCLADS scenario disk...

Sino-Japanese War of 1894:

viii)	The Battle of YALU	- 17th September 1894

Russian-Japanese War of 1904/05:

ix)	The Battle of The YELLOW Sea	- 10th August 1904
x)	The Battle of ULSAN	- 14th August 1904
xi)	The Battle of TSUSHIMA	- 27th May 1905

On the BISMARCK scenario disk...

xii)	The Battle of the River PLATE	- 13th December 1939
xiii)	The Battle of DENMARK Straight	- 24th May 1941
xiv)	Attack by TRIBAL class destroyers	- 26th May 1941
xv)	The sinking of the BISMARCK	- 27th May 1941
xvi)	The Battle of the JAVA SEA	- 27th February 1942
xvii)	The Battle of NORTH CAPE	- 26th December 1943

The ships involved in any battle are listed beside the appropriate chart.

Each name is followed by the class of the ship in square brackets, for example:

Princess_Royal [BC Lion] implies Princess Royal is a Lion class battlecruiser.

The abbreviated class types are:

Dn	Dreadnought Battleship
BS	Battleship (pre or post-Dreadnought)
BC	Battlecruiser
AC	Armoured cruiser
Cr	Cruiser
LC	Light cruiser
AM	Armoured merchant ship
PC	Protected (or just old) cruiser
Dy	Destroyer
Gb	Gunboat (or small vessel such as a Minesweeper)

Refer to Appendix B for brief details of each class of ship (class type and main armament), and to the class data file for a complete specification.

Refer to Appendix C for details of the naval guns.

Notes on hypothetical scenarios, Seatrial and Channel Patrol:

i)   Both use the chart of the Channel.

ii)   Seatrial

This is a fictional scenario, having none of the complications or imbalance of historical events, and can be used to learn the ropes of command of a squadron of ships.

The British Admiral (a fictional Admiral Sheldrake) in command of four light cruisers is ordered out into the Channel to intercept a German force (commanded by the fictional Admiral Tapken), again consisting of four light cruisers.

iii)   Channel Patrol

This is a hypothetical scenario simulating a mass torpedo-boat destroyer attack on pre-Dreadnought battleships.

Notes on Jutland:

i) The battle fleets at Jutland were huge, 150 British against 100 or so German ships. In order to make the battle more manageable for both the human player (and the program), one large warship in the simulation represents two in the actual battle, and the flotillas are reduced to one ship representing four destroyers.

Section 2: Operations

Getting started

Run the DREADNOUGHTS program, referring to the README file on the program disk for any tips, amendments to this manual, or machine specific information.

The first question asked is whether you wish to play the SEATRIAL scenario. The SEATRIAL scenario is a fairly simple cruiser action fought in the Channel, designed to help new players become familiar with the command system.

Answer "Y" if this is your first game, otherwise you may choose this scenario, or answer "N" and type in the name of one of the others when prompted.

The other questions you will be asked determine which admirals are human players and which controlled by the computer. Usually a human player will take on the computer, but it is perfectly acceptable to have two human players, or even a demonstration with two computer players.

Users of computers that do not come with a mouse as standard will also be asked whether a mouse is being used or not. The mouse is used to operate a telescope.

The admiral is initially presented with a view of their flagship, heading on its current course. Also, a current sighting report will be given if there are any ships in view.

Files and Hard disk installation

"A new name for the Dreadnought 'The Hard Boiled Egg'. Why? Because she can't be beat" - Jacky Fisher

The Dreadnoughts program can be run from a hard disk, simply copy all the files from the disk(s) supplied into one appropriately named directory. The files are listed in the README file.

The Compass

The ships compass, shown top left, shows the direction of the current view. It also gives the wind direction and force. Unless the wind gets very strong, it can for the most part be ignored. High winds can effect the accuracy of guns (see the Gunnery section).

Beaufort Wind Scale:

0	Flat calm
1	Light Air
2	Light Breeze
4	Moderate Breeze
6	Strong Breeze
8	Gale
9	Strong Gale
10	Storm

The Ships clock

The ships clock will appear top right; it shows local time.

Orders

Orders are typed in English, when a prompt appears, and vary in their purpose from looking in various directions, controlling the operation of the game, to ordering subordinates.

<u>Looking around</u>

LOOK <direction> This will give the view from the flagship in any one of the main eight compass directions.
Example:

LOOK WEST (or LOOK W)

LOOK NORTHEAST (or LOOK NE)

LOOK <direction>FROM <ship/named feature>

This will give the view from any ship in the admiral's fleet, or from the feature named.

Examples:

LOOK NORTH FROM THE TIGER

LOOK SW FROM PORTSMOUTH

LOOK AT <ship>
This gives the view from the flagship towards the named ship, as long as it is in sight (but see note i). The named ship can be an enemy.

Example:

LOOK AT THE TIGER

LOOK AT THE DERFFLINGER

LOOK AT <ship> FROM <ship/named feature>

Gives the view from any ship in the admiral's fleet, or any feature, towards any other ship.

Examples:

LOOK AT THE LION FROM THE TIGER

LOOK AT THE BLUCHER FROM THE METEOR

LOOK AT THE CHATHAM FROM PORTSMOUTH

Note i) There are occasional discrepancies when a ship is on the line between being on one bearing (such as North) and another (such as Northeast). This means that if only part, or none, of the ship appears on the screen with one view, try looking at the adjacent view to see if it appears more complete.

Operational commands

QUIT abandons the game immediately

SAVE saves off the game data at the end of the current six minute round, but does not terminate the game

POINTS gives the player a tally of damage points inflicted by both fleets

X (or Esc) stops the requests for orders

HELM take the wheel of the flagship and steer the ship yourself

BRIDGE hand back the wheel to the Quartermaster and get on with the job of being Admiral

COMPASS if the compass is shown, giving this command will remove it from future views until this command is given again (when it will instantly reappear)

CLOCK. If the clock is shown, giving this command will remove it from future views until this command is given again (when it will instantly reappear)

The Telescope

Use the mouse pointer as a telescope to focus in on distant ships. This also reveals the most prominent ship's name and range.

Note that the telescope only works on ships, and not on recognising any coastline features. Also you cannot look at your own ship through the telescope.

Taking the Helm

If the admiral takes control of the helm (by typing HELM), then both the ships wheel and engine-room telegraph need to be operated.

To operate the wheel use the left and right cursor keys if the current course is to be changed.

To call the engine room with the desired speed use the up and down cursor keys to operate the telegraph. The water speed indicator on the left indicates the current speed in knots.

When the required course and speed have been selected, press <return> to move on.

Note that the ship may well not be able to make a major turn (say of 90 or 135 degrees) in one six minute time period.

To go back to the bridge, just enter BRIDGE.

Giving and signalling orders

Commands to subordinates are classified as follows:

A. Reports

B. Formations

C. Ship stations

D. Command structure

E. Setting a course

F. Setting a speed

G. Mayday, Assistance, Abandon ship and Lifeboats

H. Engaging and Disengaging the enemy

I. Torpedo attacks and defensive measures

Notes:

i) in the following formats words shown in capitals are entered as they appear here, and those in angled brackets are replaced by an appropriate name.

ii) A name such as Friedrich der Grosse has to be entered with underscores between the words (typing a hyphen will be automatically replaced with an underscore). That is, the ship should be entered as Friedrich_der_Grosse.

iii) The case of the letters is insignificant, Friedrich_der_Grosse can be entered as FRIEDRICH_DER_GROSSE.

A. Reports

"The unknown is the governing condition of War" - Marshal Foch

There are three main types of report: for a ships position, its sightings, and its condition.

Format:

i) <report type> REPORT

ii) SEND ME YOUR <report type> REPORT

Examples:

To get a report on your own ship:

POSITION REPORT

SIGHTING REPORT

DAMAGE REPORT

To get a report from another ship

SIGNAL THE TIGER SEND ME YOUR SIGHTING REPORT

SIGNAL THE NOTTINGHAM SEND ME YOUR DAMAGE REPORT

SIGNAL THE AURORA SEND ME YOUR POSITION REPORT

If you ask another ship for a report, it will always precede it with its own position. Also, the sighting report will inform the admiral of any current engagement that the ship is involved in.

Note also that the words REPORT, THE and ME can be omitted, so the following would be legal:

SIGNAL TIGER SEND YOUR POSITION

Ships will also send sighting reports on their own initiative, if it is likely that the flagship cannot see an enemy vessel.

B. Formations

In almost all of the scenarios the ships will start off in their historical squadrons in a specified sailing order. To change the style and make-up of squadrons and formations use the following orders:

Format:

i) CHANGE TO <formation> FORMATION

ii) FOLLOW <ship>

iii) RETURN TO STATION

<formation> can be one of LINE ASTERN, LINE ABREAST TO PORT or LINE ABREAST TO STARBOARD

<ship> can be any ship's name, or THE FLAGSHIP

Line Astern: <-   <-   <-   <-
Flagship

Line Abreast to Port: Line Abreast to Starboard

<- Flagship   <-

<-   <-

<-   <-

<-   <- Flagship

Examples:

SIGNAL THE SOUTHAMPTON TO CHANGE TO LINE ABREAST
TO PORT FORMATION

SIGNAL THE TIGER TO FOLLOW THE FLAGSHIP

SIGNAL THE PRINCESS_ROYAL TO FOLLOW THE TIGER

If a ship is sent off on a task, which the Admiral later wishes to cancel, the RETURN TO STATION order can be issued.

SIGNAL THE TIGER TO RETURN TO STATION

C. Ship Stations

Format:

i) STATION YOUR SHIP <n> MILES <direction> OF THE <ship>

ii) STATION YOUR SHIP <n> MILES <course> OF THE <ship>

<n> is any reasonable number of miles
<direction> is any of the main eight compass directions
<course> is one of

AHEAD, (OFF THE) PORT BOW, PORT BEAM, PORT QUARTER,
ASTERN, (OFF THE) STARBOARD BOW, STARBOARD BEAM,
STARBOARD QUARTER

```
                          Starboard

              BOW         BEAM        QUARTER

    AHEAD                 <===                    ASTERN

              BOW         BEAM        QUARTER

                           Port
```
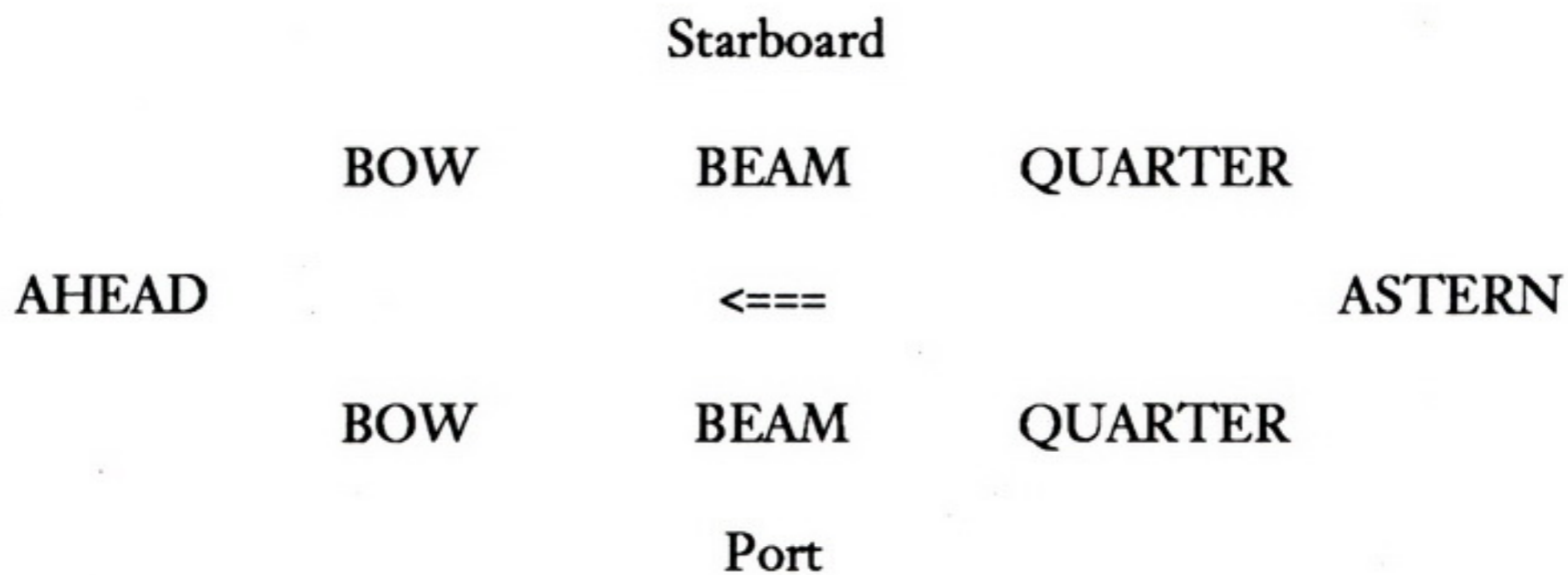
If a ship or squadron is stationed by a compass direction, it will endeavour to keep the correct distance away from the flagship, whichever direction the flagship is heading.

If the ship is stationed by course it has to take note of the flagship's course, and alter its own position accordingly.

Examples:

SIGNAL THE SOUTHAMPTON TO STATION YOUR SHIP 5 MILES EAST OF THE FLAGSHIP

SIGNAL THE AURORA TO STATION YOUR SHIP 3 MILES OFF THE PORT BOW OF THE FLAGSHIP

SIGNAL THE AURORA TO STATION YOUR SHIP 4 MILES ASTERN OF THE TIGER

SIGNAL THE TIGER TO STATION YOUR SHIP 2 MILES OFF THE STARBOARD QUARTER OF THE FLAGSHIP

D. Command structure

To transfer a ship from one squadron to another it is best to do it through the squadron leader, in order to avoid confusion between your subordinates, so use the Transfer command in preference to the Join command.

Format:

i) TRANSFER <ship> TO <squadron flagship>

ii) JOIN <squadron flagship>

Examples:

SIGNAL THE AURORA TO TRANSFER THE ACHERON TO THE SOUTHAMPTON

SIGNAL THE SOUTHAMPTON TO TRANSFER THE BIRMINGHAM TO THE FLAGSHIP

If the admiral wishes to order the ship specifically:

BIRMINGHAM JOIN THE FLAGSHIP

This should only be done if contact has been lost with the Southampton (Birmingham's squadron leader).

E. Setting a course, patrolling and anchoring

Format:

i) SET A COURSE FOR <ship/lat-long/named feature>

ii) PATROL FROM <lat-long/named feature> TO
<lat-long/named feature> TO
<lat-long/named feature> TO   (optional)
<lat-long/named feature>   (optional)
iii) ANCHOR

<named feature> can be one of:

HOME   (short for home port)

any port, bay, island or other feature marked on the chart supplied.

If the SET A COURSE order is given the ship will head for the given destination, and anchor if that destination is not a ship, or simply stop within the vicinity if it is. It will make no further moves unless ordered to do so (or forced by enemy action).

The PATROL order can take between two and four points on the map, which cannot be ship names, and will repeatedly patrol from one point to the next, and then back to the beginning to start again. The Patrol will be left off if the ship(s) find any enemy forces, which they will engage if they can.

Ships can ANCHOR anywhere in this simulation.

Examples:

SIGNAL THE TIGER SET A COURSE FOR THE INDOMITABLE

SET A COURSE FOR HOME

PATROL FROM HOME TO 53 25 NORTH 3 15 WEST
TO 53 6 NORTH 4 50 WEST

PATROL FROM SOUTHAMPTON_WATER TO 50 0 NORTH
2 0 WEST TO WEYMOUTH_BAY

F. Setting a speed

Format:

i) FULL SPEED

ii) CRUISING SPEED

iii) HALF SPEED

iv) DEAD SLOW

v) STOP ENGINES

These orders indicate the admiral's wishes to the engine room of his flagship. In a big ship it can take a few minutes to speed up or slow down. These orders are as if given verbally, if the admiral is at the helm (and using the mechanical engine-room telegraph) then the equivalent speeds are full ahead, 3/4 ahead, half ahead, dead slow and stop.

It is not possible, in this simulation, to put a ship into reverse.

In most cases it will not be necessary to set a speed, and the admiral's permission will simply be asked when a change is considered desirable.

G. Mayday calls, Assistance, Abandoning ship and Lifeboats

"Of what what is store for us there was now not a vestige of doubt. We fired our last torpedo at the (German) High Seas Fleet. The Nestor, enwrapped in a cloud of smoke and spray, the centre of a whirlwind of shrieking shells, began slowly to settle by the stern. I gave my last order as her commander 'Abandon Ship'" - Captain, HMS Nestor, Jutland.

Format:
i) ABANDON SHIP

ii) MAYDAY

iii) ASSIST THE <ship>

iv) RESCUE THE LIFEBOATS

Example:

ABANDON SHIP

SIGNAL THE PRINCESS_ROYAL MAYDAY

SIGNAL THE AURORA MAYDAY

SIGNAL THE TIGER TO ASSIST THE NOTTINGHAM

SIGNAL THE ACHERON TO RESCUE THE LIFEBOATS

Should things get desperate (the Admiral's officers will probably inform him when they are), then the Abandon Ship order will initiate the lowering of the lifeboats and as many crew as are able will get into them. The Abandon Ship order is a captains perogative, and an admiral cannot order any other ship than his own to do this.

A Mayday call will request immediate assistance from the ship signalled to come and rescue the lifeboats. Should that ship find it impossible to respond, it will relay the message to other ships in the area.

Assistance is a more flexible order, if possible the ordered ship will head for the ship in trouble, and either help fight off its attackers, or rescue its survivors, depending on the situation when it arrives.

When lifeboats have been spotted an order can be sent to send a ship to pick up the survivors (becoming prisoners if they are from an enemy ship). It is best to send a manoeuverable and small craft, such as a destroyer or light cruiser, as rescuing lifeboats from something larger can be awkward.

H. Engaging and Disengaging from the Enemy

Format:

i) CLOSE RANGE   (WITH THE <enemy ship>)

ii) MAINTAIN RANGE (WITH THE <enemy ship>)

iii) OPEN RANGE   (WITH THE <enemy ship>)

iv) DISENGAGE

v) FIRE AT THE <enemy ship>

vi) PURSUE THE <enemy ship>

vii) RUN

Examples:

CLOSE RANGE

CLOSE RANGE WITH THE KAISER

SIGNAL THE TIGER TO OPEN RANGE

SIGNAL THE SOUTHAMPTON TO MAINTAIN THE RANGE WITH THE EMDEN

SIGNAL THE AURORA TO PURSUE THE STRALSUND

SIGNAL THE PRINCESS_ROYAL TO RUN

The admiral's officers will certainly give advice on the appropriate command during an engagement, especially if it differs from the order given.

The PURSUE order is more complex than the others. It implies both close the range if within sight of the enemy ship, or use the latest sighting reports to try to catch up with it.

The RUN order simply tells a ship to run for its home port.

I. Torpedo attacks and defensive measures

"Damn the torpedoes - full speed ahead" - credited to Admiral Farragut in his attack on New Orleans harbour during the American Civil War.

Format:

Launching the attack

i) ATTACK (<enemy ship>)

To specify the tactics for future emergencies:

i) TURN TOWARDS TORPEDO ATTACKS

ii) TURN AWAY FROM TORPEDO ATTACKS

To give an immediate order:

iii) TURN AWAY FROM THE TORPEDOES

iv) TURN TOWARDS THE TORPEDOES

Examples:

SIGNAL THE METEOR TO ATTACK

SIGNAL THE MENTOR TO ATTACK THE DERFFLINGER

...orders the ship, and any under its command, to launch an all out attack

SIGNAL THE SOUTHAMPTON TO TURN AWAY FROM
TORPEDO ATTACKS

...changes Southampton's future tactics

SIGNAL THE AURORA TO TURN TOWARDS THE TORPEDOES

...orders the Aurora to react immediately

Caution:

Any ships can be ordered to attack: it is interpreted to mean steam at
maximum knots to within torpedo range, and loose off torpedoes until there
are none left. Given the short range of torpedoes, and the extreme nature of
the move, it is best given only to destroyers, or possibly light cruisers. Larger
ships are better controlled carefully with the Open / Maintain / Close range
orders. Only squadron flagships of destroyer flotillas will initiate a torpedo
attack on their own initiative (althouth other ships will certainly fire
torpedoes if a target comes within range).

The default action when being attacked by torpedoes is to turn away from them (partly to present the torpedoes with a small target, and partly to try to out-run their maximum range). There is no need to order any ship to turn away unless it has previously been ordered to turn towards them.

The Torpedo Officer will advise the Admiral when a potential target is within range, and may request permission to launch a couple of torpedoes at it.

In this simulation torpedoes will only be fired if the target is within 10,000 yards, and also within the maximum range of the torpedo.

Appendices

Appendix A: Recommended reading

There are many good books on the Dreadnought era, and a mass on the Second World War, but very few on the earlier wars covered by the IRONCLADS scenario disk:

Historical accounts (First World War):

The Dreadnoughts, David Howarth, Time Life Books.

The Great War at Sea 1914-1918, Richard Hough, Oxford Press.

Narrative of the Battle of Jutland(*), HMSO.
Naval Operations Vol 1: To the Battle of the Falklands(*), Corbett, Longmans (Published as an official account in 1920).

The Fighting at Jutland(*), Maclure Macdonald & Co. (Published in 1920).

Atlas of Maritime History, Natkiel & Preston, Gallery Books.

Naval Battles of the First World War, G. Bennett.

The Great War, Liddell Hart.

With the Battle Cruisers(*), Filson Young.

Reference books (First World War):

All the World's Fighting ships 1906-1922, Conway Maritime Press.

Jane's Fighting Ships of World War 1.

Battleships and Battle Cruisers 1905 - 1970(*), Siegfried Breyer, Macdonald Press.

Historical accounts (Earlier wars):

The Battle of Tsushima(*), Captain Semenoff, John Murray Ltd (1908).

The Fleet that had to die, Richard Hough.

Russia against Japan 1904-05, J.N.Westwood, Macmillan.

Reference books (Earlier wars):

All the World's Fighting ships 1860 - 1905, Conway Maritime Press.

Jane's Fighting Ships: volumes 1898 - 1905

Historial accounts (Second World War):

Sea Battles in Close up: World War 2, Martin Stephen, Ian Allan.

Frazer of North Cape, R.Humble, Routledge and Kegan Paul.

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(*) These books may only be available second-hand.

Appendix B: Warship classes

i) Summary of ship classes used in the DREADNOUGHTS scenarios:

	Class name	Type	Main armament
1:	Dreadnought	527ft Battleship	10 x 12in_45cal/13
2:	Bellerophon	526ft Battleship	10 x 12in_45cal/13
3:	St_Vincent	536ft Battleship	10 x 12in_50cal
4:	Invincible	567ft Battlecruiser	8 x 12in_45cal/13
5:	Neptune	546ft Battleship	10 x 12in_50cal
6:	Colossus	546ft Battleship	10 x 12in_50cal
7:	Indefatigable	590ft Battlecruiser	8 x 12in_45cal/13
8:	Orion	581ft Battleship	10 x 13.5in_45cal
9:	Lion	700ft Battlecruiser	8 x 13.5in_45cal
10:	King_George_V	597ft Battleship	10 x 13.5in_45cal
11:	Queen_Mary	703ft Battlecruiser	8 x 13.5in_45cal
12:	Iron_Duke	622ft Battleship	10 x 13.5in_45cal
13:	Tiger	704ft Battlecruiser	8 x 13.5in_45cal
14:	Queen_Elizabeth	645ft Battleship	8 x 15in_42cal_BS
15:	Revenge	624ft Battleship	8 x 15in_42cal_BS
16:	Erin	559ft Battleship	10 x 13.5in_45cal
17:	Agincourt	700ft Battleship	14 x 12in_45cal/16
18:	Canada	661ft Battleship	10 x 14in_45cal
19:	Canopus	421ft Battleship	4 x 12in_35cal
20:	Grounded_Canopus	421ft Battleship	4 x 12in_35cal

Class name	Type	Main armament
21: Drake	533ft Armoured_Cruiser	2 x 9.2in_46cal
22: Monmouth	463ft Armoured_Cruiser	4 x 6in_25cal
23: Devonshire	473ft Armoured_Cruiser	4 x 7.5in_50cal
24: Duke_Of_Edinburgh	505ft Armoured_Cruiser	6 x 9.2in_50cal
25: Warrior	505ft Armoured_Cruiser	6 x 9.2in_50cal
26: Minotaur	519ft Armoured_Cruiser	4 x 9.2in_50cal
27: Boadicea	405ft Light_Cruiser	6 x 4in_50cal
28: Blonde	405ft Light_Cruiser	10 x 4in_50cal
29: Bristol	453ft Light_Cruiser	2 x 6in_50cal
30: Weymouth	453ft Light_Cruiser	8 x 6in_50cal
31: Active	406ft Light_Cruiser	10 x 4in_50cal
32: Chatham	458ft Light_Cruiser	8 x 6in_45cal
33: Birmingham	457ft Light_Cruiser	9 x 6in_45cal
34: Arethusa	436ft Light_Cruiser	2 x 6in_45cal
35: Caroline	446ft Light_Cruiser	2 x 6in_45cal
36: Calliope	446ft Light_Cruiser	2 x 6in_45cal
37: Birkenhead	446ft Light_Cruiser	10 x 5.5in_50cal
38: Cambrian	446ft Light_Cruiser	2 x 6in_45cal
39: Centaur	446ft Light_Cruiser	5 x 6in_45cal
40: Caledon	450ft Light_Cruiser	5 x 6in_45cal
41: Ceres	450ft Light_Cruiser	5 x 6in_45cal
42: Danae	471ft Light_Cruiser	6 x 6in_45cal
43: Otranto	600ft Merchant_Ship	8 x 4.7in_40cal
44: Tribal	250ft Destroyer	2 x 4in_27cal
45: Cricket	175ft Destroyer	2 x 12pdr
46: Swift	353ft Destroyer	4 x 4in_39cal
47: Palmer	215ft Destroyer	3 x 12pdr
48: Repeat_River	220ft Destroyer	1 x 12pdr
49: Beagle	263ft Destroyer	1 x 4in_40cal
50: Acorn	246ft Destroyer	2 x 4in_39cal

DREADNOUGHTS

Class name	Type	Main armament
51: Acheron	246ft Destroyer	2 x 4in_39cal
52: Acasta	267ft Destroyer	3 x 4in_39cal
53: Laforey	268ft Destroyer	3 x 4in_40cal
54: New_L_Class	268ft Destroyer	3 x 4in_40cal
55: M_Class	273ft Destroyer	3 x 4in_40cal
56: Lightfoot	324ft Destroyer	4 x 4in_40cal
57: Faulknor	330ft Destroyer	6 x 4in_40cal
58: Medea	273ft Destroyer	3 x 4in_40cal
59: Talisman	309ft Destroyer	5 x 4in_40cal
60: Repeat_M	273ft Destroyer	3 x 4in_40cal
61: Parker	324ft Destroyer	4 x 4in_40cal
62: R_Class	276ft Destroyer	3 x 4in_40cal
63: V_Leaders	312ft Destroyer	4 x 4in_45cal
64: Shakespear	329ft Destroyer	5 x 4.7in_45cal
65: Scott	332ft Destroyer	5 x 4.7in_45cal
66: V_Class	312ft Destroyer	4 x 4in_45cal
67: W_Class	312ft Destroyer	4 x 4in_45cal
68: S_Class	276ft Destroyer	3 x 4in_40cal
69: Modified_W	312ft Destroyer	4 x 4.7in_45cal
70: Nassau	451ft Battleship	12 x 28cm_SKL45
71: Helgoland	548ft Battleship	12 x 30cm_SKL50/13
72: Kaiser	565ft Battleship	10 x 30cm_SKL50/13
73: Konig	575ft Battleship	10 x 30cm_SKL50/13
74: Bayern	589ft Battleship	8 x 38cm_SKL45
75: Blucher	530ft Armoured_Cruiser	12 x 21cm_SKL45
76: Von_der_Tann	563ft Battlecruiser	8 x 28cm_SKL45
77: Moltke	611ft Battlecruiser	10 x 28cm_SKL50/13
78: Seydlitz	657ft Battlecruiser	10 x 28cm_SKL50/16
79: Derfflinger	690ft Battlecruiser	8 x 30cm_SKL50/13
80: Lutzow	690ft Battlecruiser	8 x 30cm_SKL50/13

Class name	Type	Main armament
81: Hindenburg	698ft Battlecruiser	8 x 30cm_SKL50/16
82: Mackensen	731ft Battlecruiser	8 x 35cm_SKL45
83: Braunschweig	419ft Battleship	4 x 28cm_KL40
84: Deutschland	418ft Battleship	4 x 28cm_KL40
85: Scharnhorst	474ft Armoured_Cruiser	8 x 21cm_SKL40
86: Konigsberg	383ft Light_Cruiser	10 x 10cm_SKL45
87: Dresden	386ft Light_Cruiser	10 x 10cm_SKL45
88: Kolberg	426ft Light_Cruiser	12 x 10cm_SKL45
89: Magdeburg	446ft Light_Cruiser	7 x 15cm_SKL45
90: Karlsruhe	456ft Light_Cruiser	12 x 10cm_SKL45
91: Graudenz	465ft Light_Cruiser	7 x 15cm_SKL45
92: Pillau	440ft Light_Cruiser	8 x 15cm_SKL45
93: Brummer	442ft Light_Cruiser	4 x 15cm_SKL45
94: Wiesbaden	476ft Light_Cruiser	8 x 15cm_SKL45
95: Konigsberg_II	478ft Light_Cruiser	8 x 15cm_SKL45
96: Coln	491ft Light_Cruiser	8 x 15cm_SKL45
97: Gazelle	345ft Light_Cruiser	10 x 10cm_SKL35
98: Bremen	364ft Light_Cruiser	10 x 10cm_SKL35
99: G132	215ft Destroyer	4 x 5cm_SKL55
100:G138	231ft Destroyer	1 x 8cm_SKL35
101:V150	237ft Destroyer	2 x 8cm_SKL35
102:V162	242ft Destroyer	2 x 8cm_KL30
103:S165	242ft Destroyer	2 x 8cm_KL30
104:V1	233ft Destroyer	2 x 8cm_KL30
105:V25	257ft Destroyer	3 x 8cm_KL45
106:V43	261ft Destroyer	3 x 8cm_KL45
107:V67	269ft Destroyer	3 x 8cm_KL45
108:G85	272ft Destroyer	3 x 8cm_KL45
109:G92	272ft Destroyer	3 x 10cm_KL45
110:G96	277ft Destroyer	3 x 10cm_KL45

DREADNOUGHTS

Class name	Type	Main armament
111:B97	321ft Destroyer	4 x 8cm_KL45
112:G101	312ft Destroyer	4 x 8cm_KL45
113:V105	205ft Destroyer	2 x 8cm_L30
114:V125	269ft Destroyer	3 x 10cm_KL45
115:A1	136ft Destroyer	1 x 5cm_KL40
116:A26	164ft Destroyer	2 x 8cm_KL30
117:A56	200ft Destroyer	2 x 8cm_KL30

ii) Summary of the ship classes used in the IRONCLADS scenarios:

Class name	Type	Main armament
1: Borodino	397ft Battleship	4 x R_12in_40cal
2: Tsarevitch	389ft Battleship	4 x R_12in_40cal
3: Retvisan	386ft Battleship	4 x R_12in_40cal
4: Peresviet	434ft Battleship	4 x R_10in_45cal
5: Petropavlovsk	369ft Battleship	4 x R_12in_40cal
6: Ushakov	286ft Battleship	4 x R_10in_45cal
7: Sissoi_Veliki	351ft Battleship	4 x R_12in_40cal
8: Navarin	357ft Battleship	4 x R_12in_35cal
9: Alexander_II	333ft Battleship	2 x R_12in_30cal
10: Monomakh	296ft Protected_Cruiser	5 x R_6in_45cal
11: Dmitri_Donskoi	296ft Protected_Cruiser	6 x R_6in_45cal
12: Nakhimov	333ft Armoured_Cruiser	8 x R_8in_35cal
13: Rurik	435ft Armoured_Cruiser	4 x R_8in_35cal
14: Rossia	480ft Armoured_Cruiser	4 x R_8in_45cal
15: Gromoboi	481ft Armoured_Cruiser	4 x R_8in_45cal
16: Svietlana	331ft Protected_Cruiser	6 x R_6in_45cal
17: Pallada	415ft Protected_Cruiser	8 x R_6in_45cal

Class name	Type	Main armament
18: Askold	437ft Protected_Cruiser	12 x R_6in_45cal
19: Bogatyr	439ft Protected_Cruiser	12 x R_6in_45cal
20: Novik	60ft Protected_Cruiser	6 x R_4.7in
21: Izumrud	364ft Protected_Cruiser	6 x R_4.7in
22: Almaz	365ft Protected_Cruiser	4 x R_11pdr
23: Bezstrashni	202ft Destroyer	1 x R_11pdr
24: Vnimatelni	185ft Destroyer	1 x R_11pdr
25: Boiki	210ft Destroyer	1 x R_11pdr
26: Mikasa	432ft Battleship	4 x J_12in_45cal
27: Asahi	425ft Battleship	4 x J_12in_40cal
28: Shikishima	438ft Battleship	4 x J_12in_40cal
29: Fuji	412ft Battleship	4 x J_12in_40cal
30: Fuso	220ft Protected_Cruiser	4 x J_9.4in
31: Kongo	220ft Protected_Cruiser	3 x J_6.7in
32: Chin_Yen	308ft Protected_Cruiser	4 x J_12in_35cal
33: Chiyoda	310ft Protected_Cruiser	10 x J_4.7in
34: Asama	442ft Armoured_Cruiser	4 x J_8in_40cal
35: Yakumo	434ft Armoured_Cruiser	4 x J_8in_40cal
36: Adzuma	452ft Armoured_Cruiser	4 x J_8in_40cal
37: Idzumo	434ft Armoured_Cruiser	4 x J_8in_40cal
38: Kasuga	366ft Armoured_Cruiser	3 x J_8in_45cal
39: Nisshin	366ft Armoured_Cruiser	4 x J_8in_45cal
40: Naniwa	300ft Protected_Cruiser	2 x J_10.3in
41: Matsushima	301ft Protected_Cruiser	1 x J_12.6in_Canet
42: Itsukushima	301ft Protected_Cruiser	1 x J_12.6in_Canet
43: Akitsushima	301ft Protected_Cruiser	4 x J_6in_40cal
44: Yoshino	360ft Protected_Cruiser	4 x J_6in_40cal
45: Idzumi	270ft Protected_Cruiser	2 x J_6in_40cal
46: Suma	306ft Protected_Cruiser	2 x J_6in_40cal
47: Chitose	396ft Protected_Cruiser	2 x J_8in_40cal

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Class name	Type	Main armament
48: Tsushima	334ft Protected_Cruiser	6 x J_6in_40cal
49: Otowa	341ft Protected_Cruiser	2 x J_6in_50cal
50: Tsukushi	210ft Protected_Cruiser	2 x J_10in
51: Katsuragi	206ft Protected_Cruiser	2 x J_6.7in
52: Takao	232ft Protected_Cruiser	4 x J_5.9in
53: Yaeyama	318ft Protected_Cruiser	3 x J_4.7in
54: Tatsuta	240ft Gunboat	2 x J_4.7in
55: Chihaya	273ft Protected_Cruiser	2 x J_4.7in
56: Maya	154ft Gunboat	2 x J_5.9in
57: Uji	189ft Gunboat	4 x J_12pdr
58: Ikazuchi	220ft Destroyer	1 x J_12pdr
59: Murakumo	208ft Destroyer	1 x J_12pdr
60: Akatsuki	220ft Destroyer	2 x J_12pdr
61: Shirakumo	216ft Destroyer	2 x J_12pdr
62: Harusame	227ft Destroyer	2 x J_12pdr
63: Hayabusa	147ft Destroyer	1 x J_6pdr
64: Ting_Yuen	308ft Battleship	4 x C_30cm_20cal
65: Chao_Yung	210ft Protected_Cruiser	2 x 10in_Armstrong
66: Chi_Yuen	236ft Protected_Cruiser	2 x C_21cm_35cal
67: Chih_Yuen	250ft Protected_Cruiser	3 x C_21cm_35cal
68: King_Yuen	270ft Protected_Cruiser	2 x C_21cm_35cal
69: Ping_Yuen	196ft Protected_Cruiser	1 x C_26cm
70: Kwang_Chia	221ft Protected_Cruiser	1 x C_15cm_40cal
71: Kwang_Yi	235ft Protected_Cruiser	3 x C_12cm_40cal

iii) Summary of ship classes used in the BISMARCK scenarios:

Class name		Type	Main armament
1:	Nelson	660ft Battleship	9 x 16in_MkI
2:	King_George_V	700ft Battleship	10 x 14in_MkVII
3:	Hood	860ft Battlecruiser	8 x 15in_MkI_BC
4:	Kent	590ft Cruiser	8 x 8in_MkVIII
5:	Norfolk	595ft Cruiser	8 x 8in_MkVIII
6:	Exeter	540ft Cruiser	6 x 8in_MkVIII
7:	Leander	522ft Cruiser	8 x 6in_MkXXIII
8:	Perth	522ft Cruiser	8 x 6in_MkXXIII
9:	Southampton	558ft Cruiser	12 x 6in_MkXXIII
10:	Edinburgh	579ft Cruiser	12 x 6in_MkXXIII
11:	Fiji	538ft Cruiser	12 x 6in_MkXXIII
12:	A_class	312ft Destroyer	4 x 4.7in_MkIX
13:	E_class	318ft Destroyer	4 x 4.7in_MkIX
14:	G_class	312ft Destroyer	4 x 4.7in_MkIX
15:	H_class_leader	326ft Destroyer	5 x 4.7in_MkIX
16:	Tribal	355ft Destroyer	8 x 4.7in_MkXII
17:	J_class	339ft Destroyer	6 x 4.7in_MkXII
18:	M_class	345ft Destroyer	6 x 4.7in_MkXI
19:	O_class	328ft Destroyer	4 x 4in_MkV
20:	S_class	339ft Destroyer	4 x 4.7in_MkIX
21:	Bismarck	792ft Battleship	8 x 380mm_SKC/34
22:	Scharnhorst	741ft Battlecruiser	9 x 280mm_SKC/34
23:	Deutschland	596ft Cruiser	6 x 280mm_SKC/28
24:	Hipper_I	638ft Cruiser	8 x 203mm_SKC/34
25:	Hipper_II	654ft Cruiser	8 x 203mm_SKC/34
26:	1934A_type	381ft Destroyer	5 x 127mm_SKC/34

DREADNOUGHTS

Class name	Type	Main armament
27: 1936_type	393ft Destroyer	5 x 127mm_SKC/34
28: 1936A_type	399ft Destroyer	4 x 150mm_KC/36
29: 1936A_Mob_type	399ft Destroyer	5 x 150mm_KC/36
30: Sendai	500ft Cruiser	7 x J_140mm/50
31: Nachi	661ft Cruiser	10 x J_200mm/50
32: Fubuki	367ft Destroyer	6 x J_127mm/50
33: Shiratsuyu	339ft Destroyer	5 x J_127mm/50
34: Kagero	364ft Destroyer	6 x J_127mm/50
35: Asashio	364ft Destroyer	6 x J_127mm/50
36: Sumatra	509ft Cruiser	10 x N_149mm/50
37: De_Ruyter	552ft Cruiser	7 x N_149mm/50
38: Van_Ghent	307ft Destroyer	4 x N_120mm/50
39: Van_Galen	307ft Destroyer	4 x N_120mm/50
40: Northampton	582ft Cruiser	9 x US_8in/55
41: Clemson	310ft Destroyer	4 x US_4in/50

Appendix C: Naval guns and torpedoes

Technical specifications of the naval guns and torpedoes is listed, in a readable form, in the following files:

Dreadnoughts:	GUN1914
Ironclads:	GUN1900
Bismarck:	GUN1939

On some computers this file will be followed by the extension .DAT

The technical information is as follows:

Gun = the name of the gun, including the bore, calibre and, occasionally, maximum elevation where there are variants

Shell = explosive weight in lbs

AP = armour piercing category (see Appendix D)

Rof = rate of fire
(1 implies 1 round per minute or less)
(2 or more gives loading time in minutes)

Range = maximum range in yards

The file GUN1914 is listed here for easy reference, the other two files can be inspected on the scenario disks.

Gun	Shell	RoF	AP	Range
15in_42cal_BC	1920	1	A_9	24350
15in_42cal_BS	1938	1	A_9	26650
14in_45cal	1586	1	A_8	24400
14in_44cal	1400	1	A_8	19540
13.5in_45cal	1400	1	A_7	23740
13.5in_30cal	1250	1	A_7	12620
12in_50cal	850	1	A_6	21200
12in_45cal/13	850	1	A_5	18850
12in_45cal/16	850	1	A_5	20670
12in_40cal	850	1	A_4	15600
12in_35cal	850	1	A_3	13900
12in_25cal	714	1	A_3	9400

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Gun	Shell	RoF	AP	Range
10in_45cal	500	1	A_3	14800
9.2in_50cal	378	1	A_2	16200
9.2in_46cal	378	1	A_1	15500
9.2in_40cal	378	1	A_1	12800
7.5in_50cal	200	1	A_1	15571
6in_50cal	99	1	A_c	14310
6in_45cal	99	1	A_c	14000
6in_40cal	99	1	A_d	10000
6in_25cal	99	1	A_e	8830
5.5in_50cal	82	1	A_c	17770
4.7in_45cal	50	1	A_e	15800
4.7in_40cal	45	1	A_f	9900
4in_50cal	31	1	A_f	11600
4in_45cal	31	1	A_f	13840
4in_44cal	31	1	A_f	13840
4in_40cal	31	1	A_f	11580
4in_39cal	31	1	A_f	10210
4in_27cal	25	1	A_f	7700
12pdr	12	1	A_f	7000
21in_Torpedo	500	1	A_9	12000
18in_Torpedo	388	1	A_9	5000

Gun	Shell	RoF	AP	Range
38cm_SKL45	1653	1	A_9	25400
35cm_SKL45	1323	1	A_8	25400
30cm_SKL50/13	893	1	A_6	20500
30cm_SKL50/16	893	1	A_6	22400
28cm_SKL50/13	666	1	A_4	19500
28cm_SKL50/16	666	1	A_4	21000
28cm_SKL45	666	1	A_3	22400
28cm_SKL40	529	1	A_1	20600
28cm_KL40	529	1	A_1	16500
28cm_KL35	529	1	A_b	15800
24cm_SKL40	309	1	A_1	18500
24cm_KL35	309	1	A_b	14200
21cm_SKL45	238	1	A_1	20900
21cm_SKL40	238	1	A_1	17780
17cm_SKL40	141	1	A_b	15850
15cm_SKL45	100	1	A_d	16350
15cm_KL45	100	1	A_d	15850
15cm_SKL40	88	1	A_e	15200
15cm_SKL35	88	1	A_e	13750
10cm_SKL45	38	1	A_f	13900
10cm_KL45	38	1	A_f	10350
10cm_SKL40	38	1	A_f	13340
10cm_SKL35	38	1	A_f	11800

Gun	Shell	RoF	AP	Range
8cm_SKL45	22	1	A_f	11700
8cm_KL45	22	1	A_f	10500
8cm_KL30	22	1	A_f	7700
8cm_L30	22	1	A_f	10700
8cm_SKL35	15	1	A_f	9940
8cm_SKL30	15	1	A_f	8000
5cm_SKL55	4	1	A_f	7770
5cm_KL40	4	1	A_f	6760
5cm_SKL40	4	1	A_f	5290
60cm_Torpedo	616	1	A_9	16350
50cm_Torpedo	441	1	A_9	11700
45cm_Torpedo	308	1	A_9	6560

Appendix D: Armour penetration table

The armour penetration of any shell is the thickness of armour plating that it will go through at a certain range. Fred T. Jane, the originator of the famous Jane's Fighting Ships research works, devised a simple system based on a set of ratings (from "A7" for the most powerful guns to "f" for the smallest).

This system has been modified for the DREADNOUGHTS game (using data from actual battles), and A8 and A9 ratings have been added for the later guns not introduced when Jane's system was published.

To find the rating of a gun, refer to Appendix C. The class data file details the specific guns mounted on each ship.

Rating   Penetration in inches of Krupps armour

	close range	medium range	long range	very long range
A_g	0	0	0	0
A_f	2	1	0	0
A_e	3	2	1	0
A_d	4	3	2	1
A_c	5	4	3	2
A_b	6	5	4	3
A_1	9	7	6	5
A_2	12	10	8	6
A_3	14	12	10	8
A_4	15	13	11	9
A_5	16	14	12	10
A_6	17	15	13	11
A_7	18	16	14	12
A_8	20	18	16	14
A_9	21	19	17	15

The armour plate in the ship class files can be one of the following, the number in brackets gives the thickness in inches equivalent to 10 inches of Krupps cemented steel:

Krupps : almost all ships in the First World War will have had this form of plating, which was a German developed technique for hardening steel

Harvey	(13)	(the following are only used with
Nickel	(15)	the IRONCLADS scenarios)
Compound	(17)	
Steel	(17)	
Solid_iron	(23)	
Laminated_iron	(29)	
None	(no protection - any shell will penetrate)	

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The four ranges represent the maximum range of the gun divided into four. For example, a gun with a maximum range of 18,000 yards:

close range   <= 4,500 yards

medium   <= 9,000 yards

long   <= 13,500 yards

very long   <= 18,000 yards

Appendix E: Technical support and replacement parts

If you have any difficulty running Dreadnoughts, or any of the scenarios, please explain the problem in a letter to:

Turcan Research Systems Ltd.,
83 Greencroft Gardens,
London NW6 3LJ

If you require a replacement manual or map please also write to the above address, asking for a price list of replacement documentation for Dreadnoughts.

In both cases we will reply as promptly as we can.