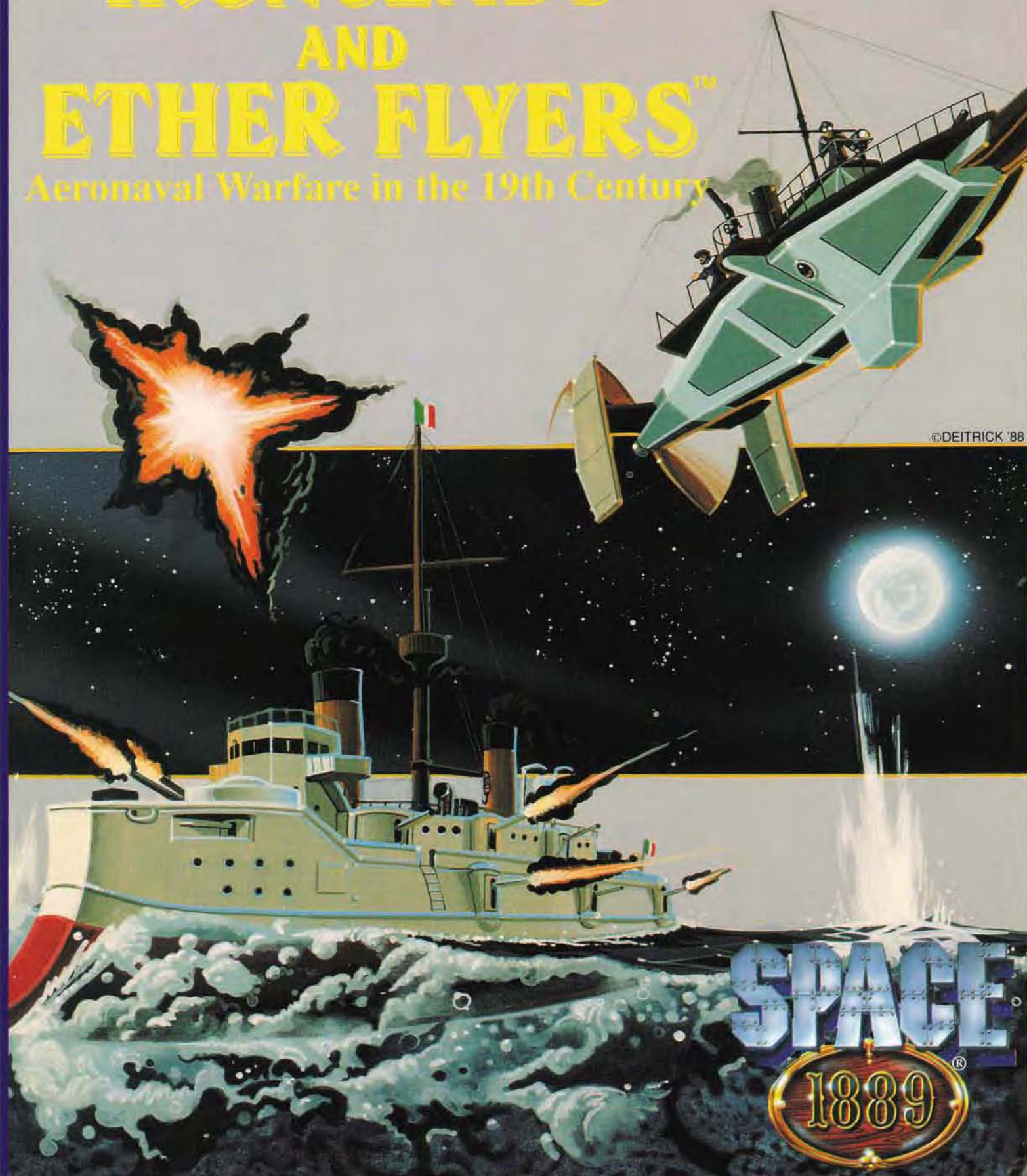


FRANK CHADWICK

IRONCLADS AND ETHER FLYERS™ Aeronaval Warfare in the 19th Century

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FRANK CHADWICK



**IRONCLADS
AND
ETHER FLYERS**
Aeronaval Warfare in the 19th Century



IRONCLADS AND ETHER FLYERS

To Walt, for years of assistance.

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Ironclads and Ether Flyers4	Drogue Torpedoes23	Maps.....41
Why this Game4	Aerial Bombs and Torpedoes23	Movement42
Using These Rules5	Smutts Dischargers24	Endurance42
Glossary5	Tether Mines24	Sighting42
	Martian Liquid Fire25	Battles43
	Spike Droppers.....25	Weather44
Basic Rules: Naval Vessels7	Advanced Rules26	Repairs44
Facing.....7	Crew Quality26	Blockade45
Movement7	Signal Communication.....26	Commerce Raiding45
Collisions8	Deep-Diving Submarines26	Neutrals45
Ramming8	Depth Bombs26	Amphibious Landings46
Gunfire9	Naval Bombardment28	Naval Bombardment47
Light Guns.....9	Shore Batteries28	Game Length and Victory47
Damage10	Nonexploding Rounds29	
Armor and Penetration12	Line of Sight29	Campaign Games48
Machineguns12	Interplanetary Ether Flyers31	Caribbean Sea Map48
Additional Rules12	Altitude and Hull Damage31	Colonial Backwater.....49
Ship Forms13	Movement31	A Rising Young Star50
Towing15	Ship Forms32	The Gunboat War51
Harbor15	War and Rumors of War35	South China Sea Map52
Torpedoes16	Land of Fire35	The Struggle for Oil53
Torpedo Nets16	Head to Head.....36	The Eastern Flank54
Depth17	Colonial Station36	Mediterranean Sea Map55
Submarines17	David vs. Goliath37	The Two-Front War56
	The Defense of Melbourne37	
Basic Rules: Aerial Flyers19	Battle of Hango38	Ship Design58
Movement19	Battle of Mindanao38	Naval Vessels58
Altitude19	Battle of the Mona Passage39	Aerial Vessels62
Collisions19	Action at Martinique39	Ether Flyers66
Towing19	Campaign Rules41	Design Reference Charts.....68
Fire Combat.....20	Referee41	
Damage20		Ships of the World70
Penetration20		Naval Vessels70
Ramming21		Aerial Vessels95
Zeppelins21		Blank Ship Forms99
Barrage Balloons22		Game Reference Charts104
Hale Rockets22		

Ironclads and Ether Flyers



WHEN THOMAS EDISON crash-landed on Mars in 1870 in the ether flyer of his own invention, it not only opened the portal to an ancient and exotic civilization, but also opened the lid of the Pandora's box of *lift-wood*, a tree indigenous to the Martian uplands which synthesizes an organic compound with antigravitic properties. Nineteen years later, the major naval powers of Earth have embarked upon ambitious aerial gunboat building programs, and the arms race has fueled international tensions and suspicions. Equipped with untried vessels and untested theories of aeronaval warfare, the fleets of Earth prepare themselves for the inevitable conflict.

Ironclads and Ether Flyers is a fast-paced game of aeronaval combat in and above the oceans of Earth. This rule book is intended as a sourcebook on 19th-century aeronaval combat, and serves as a freestanding set of miniatures combat rules.

WHY THIS GAME?

AS YOU LOOK through the ship listings contained in the back of this book, you will probably be struck by the amazing diversity of warship designs in service at this time. Primitive broadside ironclads (old ships of the line with iron plates bolted to their

hulls) served alongside sleek, new, turret battleships. Antique muzzle-loading smoothbore cannon served alongside modern, high-velocity, quick-firing, rifled breechloaders. Emerging technologies such as submarines, self-propelled torpedoes, and super-heavy guns with tremendous penetrating power were changing the face of naval warfare into an unfamiliar landscape through which designers hesitantly groped.

The result was a remarkable assortment of unusual vessels, ranging from the functional to the bizarre. Take for example the Italian battleships *Italia* and *Lepanto*. These were giant ships for their day, displacing well over 13,000 tons and slightly over 400 feet long. Each ship mounted four big guns, 17" monsters which fired one-ton shells at a muzzle velocity of over 1700 feet per second. But while these were exceptional features for their day, what makes them truly unique was that they were almost completely unarmored.

Naval combat was different as well. Most naval vessels had very little ability to elevate their main armament. This was partly due to engineering difficulties, but also due to the fact that there was very little need to do so. Without sophisticated range finders, long-range gunnery was more a matter of luck than science, and so there was little demand for high elevation of the guns. Instead, battles took place at relatively close quarters.

Most of these unusual, even baroque, designs never saw battle, as the latter part of the 19th century was a time of preparation for war, but not war itself. Now, however, you have the ability to pit them against one another and see which design theory

was best adapted to its day. With the design rules in this game you can test your own vision and imagination as well—the 19th century was a time when designers required artistry and imagination as well as technical expertise (unlike 20th-century naval architecture which is so scientific as to appear sterile and repetitive). Finally, the unique universe of **Space: 1889** adds enough science fiction elements to the game to add considerable spice: Aerial warships and deep-diving submarines add the vital third dimension to the game.

USING THESE RULES

THESE RULES are divided into several sections, and scenarios are available after each part of the rules has been finished. So, for example, after you've finished "Basic Rules: Naval Vessels," you can play any of the pure naval scenarios. After you've finished "Basic Rules: Aerial Flyers," you can play a number of aeronaval scenarios. After you've finished "Interplanetary Ether Flyers," you can play any scenario desired.

After the first four parts have been read and several scenarios have been played, players may wish to embark upon a campaign game. A campaign game allows players to command a fleet and maneuver it against the enemy through the course of several battles.

Complete campaign game rules are provided, and several campaign scenarios are in this rule book. The rules in "Ship Design" enable you to design your own naval vessels, aerial gunboats, and interplanetary ether flyers.

"Ships of the World" consists of a complete listing of the naval warships

in service on Earth in 1889, along with their ratings for the game. At the back of the ship listings, there are a number of ship record forms. It is a good idea to make a number of photocopies of these for use in the game and permission is hereby given to do so for your own personal use.

Charts containing necessary game information are provided at the very end of this book. It is suggested that players make copies of these charts for ease of reference. Permission is specifically given to make photocopies of these pages for personal use.

GLOSSARY

THE RULES, and the description of the environment in which the battles are fought, make repeated use of the following terms:

Aerial Flyers: Also called aerial gunboats, or just flyers, these are armed vessels held aloft by liftwood panels. Liftwood is a tree native to the Martian highlands with unique anti-gravity properties. (For a more complete description of liftwood, see **Sky Galleons of Mars**.)

Cables: A cable is a nautical unit of measure equal to 200 yards (one-tenth of a nautical mile, or 100 fathoms). It is the basic unit of measure used in this game. That is, all gun ranges are given in cables and all movement allowances are given in cables per turn.

Players may adapt the size of their game to their available table space by specifying different actual scale measurement lengths per cable. For example, if a scale of one foot per cable was used, a vessel with a movement rating of four could move up to four feet per turn, while use of two inches per cable would allow it

to move only eight inches per turn. For most games, six inches per cable is easy to measure and allows actions which can fit on a moderately sized table.

These rules are easily adaptable for play with both **Sky Galleons of Mars** and **Soldier's Companion**, also available from GDW. In **Sky Galleons of Mars**, a cable is exactly one hex; in **Soldier's Companion** it is exactly one foot.

Ether Flyers: Ether flyers are large spacecraft which travel through interplanetary space by means of ether propellers, but which rely on liftwood for atmospheric flight.

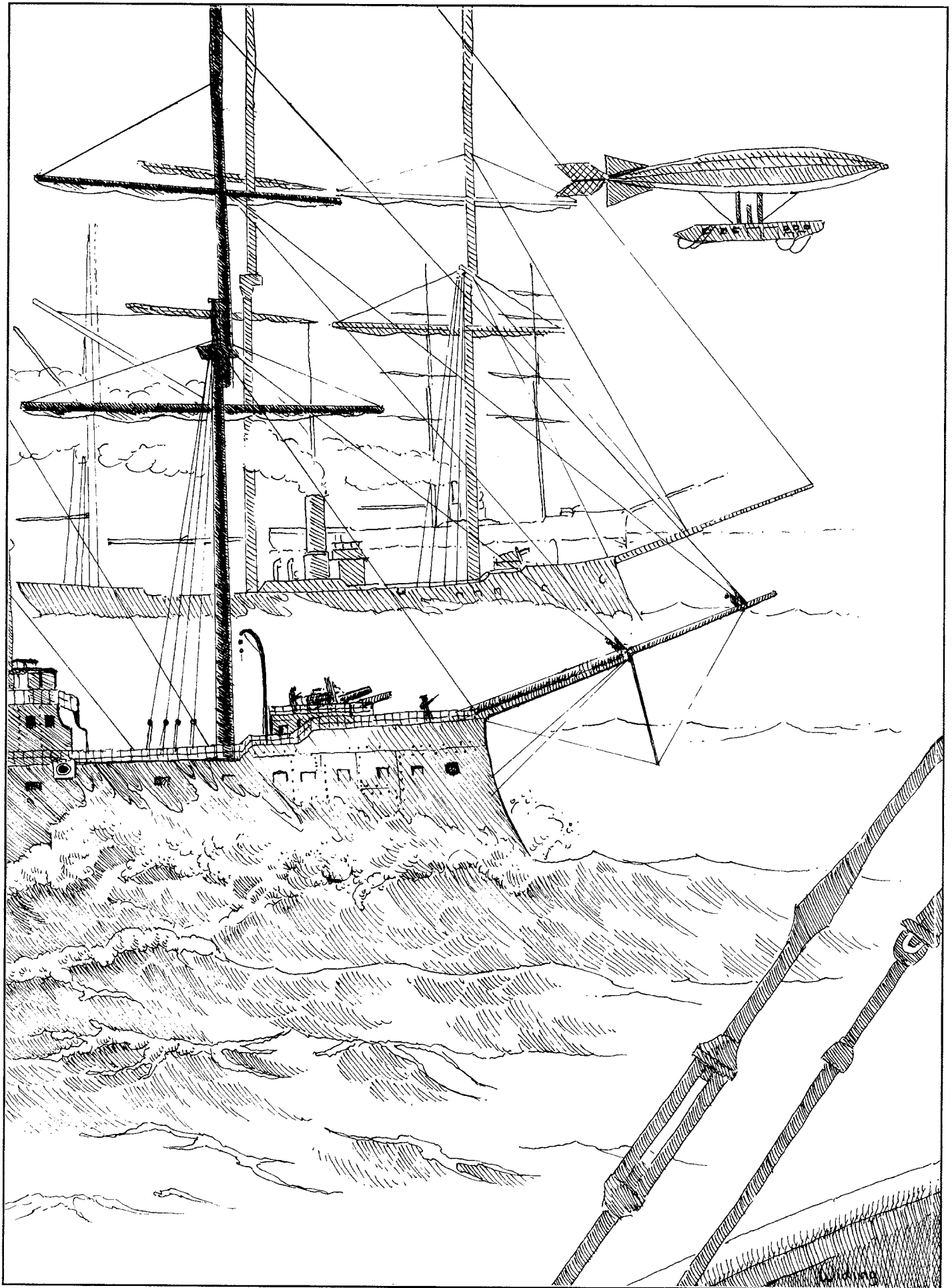
Ironclads: Armored naval vessels. Although threatened by the emerging aerial technology, they are still the heart of any terrestrial naval force.

Miniatures: This book's principal function is to serve as a complete set of miniatures rules. Players must provide their own miniatures. While GDW provides a line of aerial and naval vessels for use with these rules, players may also use vessels from other manufacturers, homemade miniatures, or cardboard markers.

Naval Vessels: Also called ships, these are steam-powered warships that float on the water.

Playing Surface: Any flat playing surface is suitable for playing **Ironclads**. A dark blue cloth covering will add to the surface's appearance, and coastlines may be made from colored paper or scenic terrain tiles.

Zeppelin: An aerial vessel held aloft by a large, rigid lifting bag filled with hydrogen gas. For those countries whose access to Martian liftwood is restricted, Zeppelins provide the only means of fielding an aerial force.



Basic Rules: Naval Vessels

IRONCLADS and Ether Flyers is played in turns, each of which represents about one minute of real time. There are three phases in a turn: the Initiative Phase, the First Player Movement Phase, and the Second Player Movement Phase.

In the Initiative Phase, each player rolls two dice and adds his squadron commander's leadership rating to the roll. The high die roll wins the initiative for that turn. The player who loses the initiative must plot his movement for the turn. After he has finished plotting his movement, the player who won the initiative conducts his Movement Phase. After that, the other player conducts his Movement Phase, but must carry out the moves he preplotted to the best of his ability. Note that the player with the initiative always moves first and does not have to preplot his movement.

Plotting for each ship is done using a simple shorthand system of three letters: F, P, S. *F* means forward, *P* means a turn to port (left), and *S* means a turn to starboard (right). For example, to plot a ship moving one cable forward, followed by a turn to port, followed by an additional one-cable move, plot "F-P-F." (If port and starboard are confusing, use right and left.)

In each Player Movement Phase,

one player (the moving player) moves all of his ships according to the rules of movement. After all of his movement is finished, both players may fire at the enemy. Each weapon may only fire once during the game turn, however, so weapons which fire at the end of the First Player Movement Phase may not fire again at the end of the Second Player Movement Phase. After all movement and fire is finished, the moving player makes all the damage repair rolls he is entitled to.

After both players have completed their Movement Phases, the turn is over and a new turn begins with its Initiative Phase.

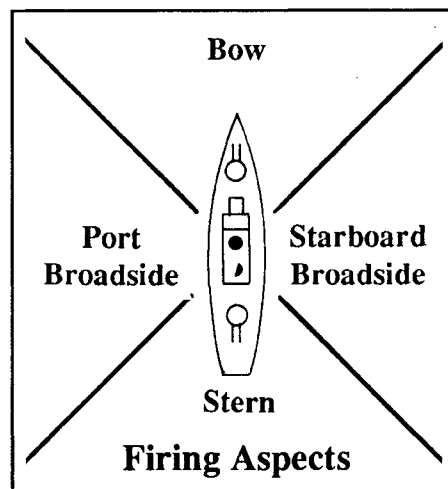
FACING

EACH VESSEL is always oriented in such a manner that its bow is facing one of the six compass headings (north, northeast, southeast, south, southwest, northwest). *Whenever a vessel moves, its first cable of movement must be in the direction it is facing at the start of its movement.*

Vessels may only change facing during movement, and the procedure for doing so is covered under Movement.

Facing also affects the ability of vessels to fire. Each vessel has four firing aspects which are determined

by its facing. Most weapons may only fire at targets in certain firing aspects, as explained in the rules on gunfire. The four firing aspects are illustrated below.



MOVEMENT

EACH SHIP has a movement allowance which is the number of movement points it may expend in a single turn. Each movement point spent allows a vessel to move one cable in the direction it is facing and change its facing by one compass heading. Ships which move one cable but do not change their facing still use one movement point. Vessels which do not move at all may also change their facing by one compass heading.

If two ships end a turn effectively in contact, their relative position is important, particularly for determining which guns bear in which direction. The player who moved last determines where his ship ends its move (and thus its relative position to the other nearby ship or ships). He then announces which of his firing aspects the other enemy ship is in and which firing aspect of it his ship is in. For example, he might say: "The enemy ship is in my broadside aspect; I am in its rear aspect."

COLLISIONS

WHENEVER A vessel comes within half a cable of another ship, there is a chance of a collision. Roll a die. A collision occurs on a roll of 1 or 2. Add one to the die roll if the moving vessel is pointed in either the same or the exact opposite compass heading as the nonmoving vessel. Subtract two from the die roll if the moving vessel attempts to turn while within half a cable of the nonmoving ship. Subtract one if either vessel has a hull size of 6 or more. (Subtract two if both vessels have a hull size of 6 or more.)

If there is a collision, the moving vessel immediately stops and may not move further that turn.

Ships which are targets of possible collisions may maneuver to avoid them. Ships attempting to avoid a collision expend half of their movement points (round fractions up) to do so and are turned to face away from the vessel threatening the collision. (If this would require turning the vessel more compass headings than it expended movement points, only turn it the actual number of compass headings equal to its expended movement points.)

If a ship is attempting to avoid a collision, add the number of movement points spent maneuvering to the die roll. Players need to remember the number of points spent so that the ship moves only half of its movement (round fractions down) in its own next phase. (This is true even if its next phase is in the next turn.)

Each vessel's record sheet includes a section for recording hull hits. This section has five rows, each with the same number of hull hit boxes. The number of hit boxes in any one row is equal to the vessel's mass. Each

player involved in a collision rolls a die.

If the result of the roll is equal to or less than the mass of the other player's ship, then the player who rolled the die will suffer a hull hit on his own ship.

If the other ship has a mass greater than 6, then one hit is automatically taken and a second is suffered if the die roll is less than or equal to the amount by which the mass exceeds six.

If the other ship's mass is greater than 12, then two hits are automatically taken and a third is rolled for, and so on. In other words, the bigger the ship you collide with, the more damage your own ship is likely to take.

In addition to the damage mentioned above, roll a die. On a die roll of 6 the smaller of the two ships suffers an uncontrolled flooding critical hit. If both ships have the same mass, then roll separately for each. The effects of uncontrolled flooding are explained in the damage rules section.

If two ships begin a phase in contact after a collision, the moving player's vessel may move away immediately but must roll for a collision again. If it collides it remains in the hex for the rest of its move and checks for collision damage again.

RAMMING

WHENEVER A vessel moves through the space occupied by another ship, it may attempt to ram it. Each ship attempting to ram is moved and makes its ramming attempt separately.

Ships which are targets of ramming attempts may maneuver to avoid the

ram. Ships attempting to avoid a ram expend half of their movement points (round fractions up) to do so and are turned to face toward the vessel attempting the ram. (If this would require turning the vessel more compass headings than it expended movement points, only turn it the actual number of compass headings equal to its expended movement points.)

Players need to remember the number of points spent so that the ship moves only half of its movement (round fractions down) in its own phase.

To attempt to ram an enemy vessel, a ship must either move through or end its movement in the space occupied by the target vessel. The player making the attempt then rolls a die. On a roll of 4 or less the attempt is successful.

If the enemy vessel was avoiding the attempt, subtract the number of movement points spent avoiding the attempt from the number which is needed to ram.

If the target of the ramming attempt is immobilized due to battle damage, the ramming attempt is automatically successful.

For example, a ship moves into contact with an enemy vessel. The enemy vessel has a speed of 5 and maneuvers to avoid the ramming attempt. Avoiding the attempt uses half of the vessel's movement allowance rounded up, or three movement points.

Normally, the ramming vessel would roll for a 4 to ram, but this is reduced to a 1 because of the target's avoidance maneuver.

● If a ram is successful, and the ramming ship was equipped with a

ram, the rammed ship immediately suffers hull damage equal to the mass of the ramming ship.

In addition, roll a die. If the result is a 4, 5, or 6, the rammed ship suffers an uncontrolled flooding critical hit. This die roll is modified as follows based on the mass of the two ships:

FLOODING ROLL MODIFIERS

<i>Mod.</i>	<i>Condition</i>
+2	Rammer three or more times the size of the rammed ship
+1	Rammer twice the size of the rammed ship
-1	Rammed ship twice the size of the rammer
-2	Rammed ship four times the size of the rammer

The ramming ship never suffers damage to itself.

● If the ram was successful, but the ramming vessel was not equipped with a ram, damage is resolved the same as a collision except that the speed of the ramming ship is added to its mass for purposes of calculating damage to the target vessel.

GUNFIRE

FIRING MAY take place at the end of each Movement Phase. Vessels of both players may fire at the end of each Movement Phase, but each weapon may fire only one time per turn.

Most weapons have a limited arc of fire, as shown on the vessel's status sheet. Each gun mount is shown on the picture at the top of the sheet. The picture is a stylized deck plan of the vessel showing the placement of its guns. Each gun is indicated by a box.

Each turret is indicated by a large circle.

The type of gun is noted in the box and its allowed field of fire is shown by the lines coming out of the box or circle. A gun with lines pointing to the bow, stern, and side, for example, can fire into the bow, stern and broadside (on that side of the ship) firing aspects. Twin lines coming out of the turret indicate that two weapons are mounted in the turret.

The number of shots that a weapon may take in a turn is called its rate of fire. Weapons with a rate of fire greater than one may take more than one shot in a turn, but all must be resolved at the same time and all must be directed at a single enemy vessel.

A weapon with a rate of fire of 3, for example, could fire three times in its turn. Weapons with a rate of fire expressed as a parenthetical number take that many turns between shots to reload. Thus a gun with a rate of fire of (2) could fire in turn 1, and then could not fire again until turn 4.

The chance of a shot hitting is determined by the range at which the gun is fired. The weapons charts on page 104 list the short range and long range of a gun in cables. The first (smaller) number listed under range for the gun is its close range.

Weapons with a close range of 0 conduct close range fire only when firing at targets at a range of a half cable or less. Each shot from a gun hits on a roll of 3, 4, 5, or 6 at close range, and on a roll of 5 or 6 at long range.

Add one to the chance of hitting if the target ship is stationary. Stationary ships include those ships which have had their movement allowance reduced to 0 by battle damage and

ships which are in harbor (either at anchor or dockside).

If there is a vessel within a half cable or less of the target, roll to hit normally. However, if the shot misses, roll a second time. If the second roll is a hit, then it hits the other vessel.

If several other vessels are within a half cable of the target, the second roll is made only once and the hit, if any, is as signed to one of the vessels by means of a random die roll.

Small fast vessels are more difficult to hit, and to reflect this, many small vessels have a die roll modifier called a target modifier to be hit. This number is added to the required hit number.

A ship's target modifier is its speed minus its hull size. All negative values are ignored. No ship may ever have a target modifier greater than 2. For example, if a ship had a target modifier of 1, it would be hit by gunfire on a roll of 6 at long range and 4, 5, or 6 at close range.

LIGHT GUNS

LIGHT GUNS include machineguns and quick-firing guns. Each vessel which has light guns simply has its total number of light guns, as well as their type, noted in the light guns section of the vessel's record sheet.

Firing aspects are not listed for light guns. Instead, each vessel may fire up to half of its machineguns and half of its quick-firing guns (round fractions up) into any firing aspect per turn.

The vessel may fire all of its light guns in a turn and may fire into as many firing aspects as desired, but may only fire each gun once and may not fire more than half into any one aspect.

DAMAGE

WHEN A GUNSHOT hits an enemy vessel, roll a die and consult the Hit Location Table to determine what type of damage was inflicted. Each gun has a damage value, which is the amount of damage it causes when it hits an enemy vessel. The damage value of the shot is the number of hits inflicted in that particular location. For example, if a gun with a damage value of 3 rolled a hull hit location, three hull hits would be recorded on the target.

Damage Types

TYPES OF DAMAGE include the following.

Gun: A gun hit destroys one gun. If the firing gun has a damage value greater than one, all additional hits are crew hits. The destroyed gun is selected randomly from those guns which can fire into the firing aspect from which the hit was taken. If no guns are present in that firing aspect, reroll the hit location and continue to reroll until a nongun hit is achieved. Furthermore, if a gun hit is suffered by a turret with two guns, the first two points of damage destroy the guns and all additional hits are crew hits. If the damage value is only 1, one gun is destroyed and the other still functions. A light gun hit kills one crewmember.

Hull: A hull hit causes hits to the hull boxes equal to the damage value of the gun. Hull hit boxes are arranged in rows with the number of boxes in each row equal to the mass value of the ship. Each time a complete row of hull hit boxes is marked off, the ship's movement allowance is reduced by 1. Once the ship's movement allowance is reduced to 0 or less,

it is "dead in the water" (and may not move). When all of the ship's hull hit boxes have been marked off, the ship capsizes and immediately sinks.

Crew: Each crew hit causes crew casualties equal to half of the damage value of the firing gun, rounding all fractions up. At the end of each Movement Phase, total the number of crew casualties suffered by each ship in that phase. If the number of crew casualties was greater than the ship's mass, the ship must check morale.

To check morale, roll two dice and add the number of crew casualties suffered in excess of the mass. If the result is 10 or less, the ship is unaffected. If the result is 11 or 12, the ship must attempt to move away from the closest enemy ship in its next Movement Phase and may not fire its guns until the end of that phase. If the result is 13 or 14, the ship must break off the action. In this case, it must attempt to move away from the closest enemy ship and leave the board. It may not fire. If the result is 15 or higher, the ship surrenders.

Critical: If a critical hit is rolled, roll two dice and consult the Critical Hit Table to determine the results. The following critical hits are possible:

Magazine: Each large gun is assumed to have its own magazine or shell locker, so detonation of a magazine will not necessarily destroy a ship. A detonation can do considerable damage, however. The ship automatically loses one gun with a damage value of 1 or greater (determined randomly). The gun is destroyed. The ship also takes hull hits equal to the damage value of the gun that was destroyed—not the gun that fired—and rolls for one additional critical hit. The additional critical hit

is resolved as if it was caused by a gun with a damage value equal to that of the destroyed gun.

If no gun with a damage value greater than 1 is mounted on the ship, treat this critical hit as a fire result.

Bridge: This counts as a crew hit, killing crewmembers equal to half the damage value of the round. In addition, the ship may not voluntarily change course in the next turn.

Fire: A fire is started onboard the ship. The initial fire level is equal to the damage value of the firing gun. Once a fire has started, it will eventually spread and consume the ship unless extinguished by the crew. At the beginning of each turn all fires presently burning are increased by one level. Any ship on fire receives an adverse die roll modification of -1 on all rolls to hit with gunfire, due to smoke interfering with the aim of the gunners.

At the start of a vessel's Movement Phase in which the level of the fire is greater than the vessel's hull size, the vessel takes one magazine critical hit. If the vessel has no magazines left, roll two dice. The number rolled is the number of crew casualties suffered instead.

Fires may be fought at the end of the player's own Movement Phase. Roll one die per hull size of the ship. For each die roll of 5 or 6, the fire is reduced one level.

Uncontrolled Flooding: Most ships sink due to uncontrolled flooding. The ship suffers hull hits equal to the damage value of the firing gun (as modified by armor). That number is also recorded, and the ship suffers that additional number of hull hits at the beginning of each of its Movement Phases until the flooding is controlled

or the ship sinks. If the flooding is caused by a collision or a ram, the number of hull hits caused by the collision or ram is the number of additional hits suffered each subsequent turn.

Flooding may be controlled at the end of the player's Movement Phase. Roll a die: If the result is greater than the amount of initial damage sustained, the flooding is halted; otherwise, it continues. However, a die roll of 6 will always control flooding, regardless of the initial damage level.

If a ship is suffering from more than one uncontrolled flooding critical hit at the same time, a separate die roll is made for each. Thus, it is possible to repair one damage result while the other continues to cause flooding.

Boiler: Roll a die: If the result is less than the damage value of the firing gun, the boiler blows up. If the boiler blows up, the ship sinks.

If the boiler does not blow up, the ship's speed is reduced by the damage value of the firing gun. However, this speed reduction is not permanent, and the amount of the reduction is decreased by one each subsequent turn (as the engine gang patches the boiler, wraps rags around split steam lines, etc.).

Screw: If the ship's screws (propellers) are hit, the ship's speed is permanently reduced by 1. If a vessel has its movement allowance reduced to 0 due to screw hits, it may jury-rig a temporary propeller. To jury-rig a propeller, roll a 6 during the repairs part of the Movement Phase. A jury-rig allows the vessel to move with a movement factor of 1. A vessel may not have more than one jury-rig at a time.

Rudder Jammed: The ship may not

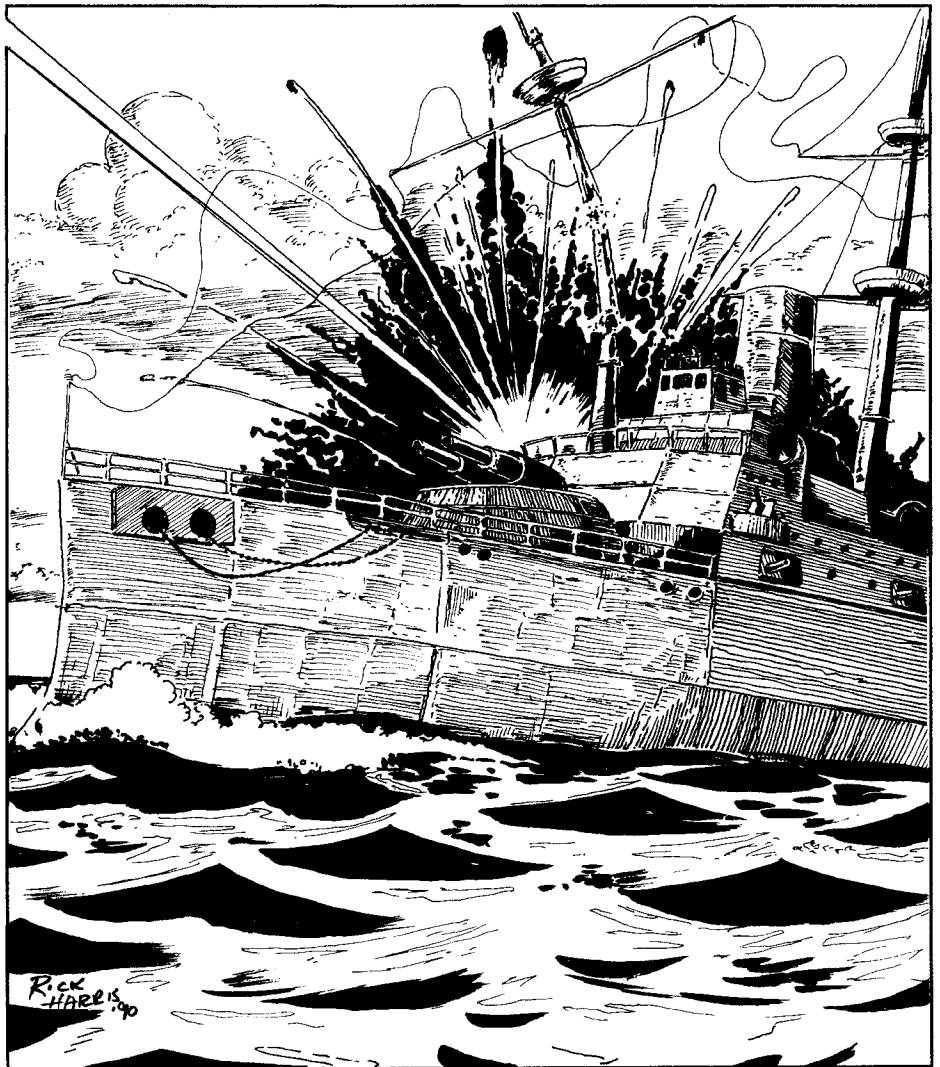
change course until the rudder is freed. To free the rudder, roll 1D6 for a number greater than the damage value of the firing gun.

If the hit result reads "rudder jammed right," the ship turns one compass heading to the right each cable it moves until the jam is cleared. If the hit result reads "rudder jammed left," the ship turns to the left until the jam is cleared. If the result merely says "rudder jammed," then the ship continues in a straight line until the jam is freed.

If a ship with a rudder already jammed suffers another jammed rudder result, add the damage value

of the new result to that already suffered to determine the number needed to free the jam. If the result says the rudder jams in a different position, it remains in its original position instead.

For example, if a ship already has a rudder jammed by a damage value of 2 and suffers one with a damage value of 1, the player must now roll greater than a 3 to free the rudder. However, a roll of 6 will always free the rudder, regardless of the damage value of the round. Attempts to free the rudder are made at the end of the Movement Phase, with all other repair attempts.



ARMOR AND PENETRATION

EACH GUN also has a penetration value which is important against armored targets. Usually, the gun has two values separated by a slash. The first (larger) value is its penetration at close range. The second (smaller) value is its penetration at long range.

If the armor value of a target exceeds the penetration of the gun, halve the gun's damage value. If this results in fractional hits, roll a die to determine if the hit takes effect, with a roll of 1-3 having no effect, and a roll of 4-6 causing a hit. For example, a gun with a normal damage value of 3, but which hit armor thicker than its penetration, would have a damage value of $1\frac{1}{2}$. If it caused a result that called for one hit per damage value, it would cause one hit automatically and a second hit on a roll of 4-6.

If the armor value of a target is more than twice the penetration of the firing gun, the gun has no effect.

For example, a gun with a damage value and a penetration of 3 would have a damage value of $1\frac{1}{2}$ against armor of 6, but would have no effect against armor of 7. Guns with a penetration of 0 do full damage against unprotected targets, half damage against targets with an armor value of 1, and have no effect on targets with an armor value of 2 or more.

Each Ship Form lists the armor value of the ship. Ships may have up to five armor values: the belt, deck, battery, bulkheads, and turrets.

The belt is a long, wide sheet of armor that extends along the waterline of the ship. It protects the ship against boiler hits, magazine hits, and uncontrolled flooding hits, provided

the shots were fired at close range by a naval vessel or shore battery. Overall, it protects the ship against all hull hits, regardless of the range.

Some ships are equipped with a short belt covering only the midships (which is called a "midships belt"). This protects against the same critical hits as a full belt, but only protects against hull hits suffered from a "1" result on the Hit Location Table. Hull hits which result from a roll of 2 are not altered by the midships belt, and thus have the normal effect.

The deck is not the deck of the vessel itself, but is instead a layer of horizontal armor roughly placed at waterline level to stop plunging fire, as from a gun firing at long range, or an aerial bomb. It protects the ship against boiler hits, magazine hits, and uncontrolled flooding hits, provided the shots were fired at long range by a naval vessel or shore battery, or at any range by an aerial vessel.

The battery (also referred to as the citadel) is the armored covering of the sides and central superstructure of the ship. It protects the ship against bridge hits and gun hits on any guns located inside the armored battery, unless the hits were the result of raking fire. Raking fire is fire delivered from directly ahead or directly astern of the ship.

The bulkheads are armored walls placed at the front and rear of the ship's central superstructure to guard against raking fire. They protect the ship against bridge hits and gun hits on any guns located inside the armored battery, provided the hits were caused by raking fire.

Turret armor protects the guns which are mounted inside a turret from gun hits.

MACHINEGUNS

ROLL FOR hit location once per machinegun, not once per hit. All of the hits caused by the machinegun affect the same part of the ship.

Machineguns have no penetration and a damage value of "P." This means they only affect the crew. Hull hits from machineguns have no effect. Crew hits cause crew casualties equal to the number of hits by the gun. Gun hits against unprotected guns become crew hits; gun hits against armored guns have no effect. Most critical hits have no effect. However, if a bridge hit is rolled and the bridge is not armored, the hit is resolved as a normal bridge hit with the number of crew casualties equal to the number of hits from the gun.

This concludes the basic rules. Ship Forms for Scenario 1 begin on page 32.

Play Scenario 1 now.

ADDITIONAL RULES

THESE RULES complete the section on ironclads. They are not necessary to play the first scenario, but add to the flavor of the game.

Ship Forms

IN EVERY GAME, each ship has its own Ship Form. The "Ships of the World" section lists the game information required for every ironclad in active naval service in the world in 1889, as well as for virtually all lightly armored and unarmored oceangoing warships. Before you can play any scenario, you will need to

The last column of a ship listing details the ship's armament. Most of these locations follow the format of "Location: Weapon." The abbreviations for the various weapon locations are listed at the beginning of the list of vessels.

The weapon notations will give the number of weapons in that location, their size, and whether they are modern rifled breechloaders (B), older rifled guns (o), or ancient muzzle-loading smoothbores (S). If the gun listed is in brackets, it is protected by whatever armor value covers that part of the ship. (Turret armor covers the turret; battery and bulkhead armor covers all other protected gun positions.) After the ship's main guns are listings for torpedo tubes (explained on page 16), followed by the number of quick-firing guns and machineguns.

Record the gun locations on the ship's overhead view by showing which firing aspect the weapons can fire into. The location of the gun determines which aspect it can fire into, as follows: Turret guns are mounted in large rotating armored turrets placed on the deck of the ship. There are three general types of turrets: centerline, offset, and corner.

Centerline turrets are, as the name indicates, placed along the centerline of the ship. The forward (F) turret can fire forward and to either broadside. The aft (A) turret can fire to the aft

and to either broadside. The midships (M) turret may only fire to the broadsides. Some ships have two midships turrets, in which case they are designated forward midships (FM) and aft midships (AM). Both can fire into both broadside aspects and neither can fire into the bow or stern aspect.

Offset turrets are placed to the right and left of the centerline in such a way that both turrets can fire both forward and aft. Only the port (P) turret can fire to the port (left) broadside, and only the starboard (S) turret can fire to the starboard (right) broadside.

Corner turrets are placed at the four corners of the central part of the ship. These four corners are designated by the letters "PF" (port forward), "SF" (starboard forward), "PA" (port aft), and "SA" (starboard aft). Each corner turret can fire into only two aspects: the bow or stern (depending on whether it is a forward or aft turret) and one broadside (port into the port broadside, starboard into the starboard broadside).

It is possible to find ships which have a variety of turret types. That is, some ships have both centerline and corner turrets, while others have centerline and offset turrets.

Guns not mounted in turrets have a more restricted arc of fire. Each ship can have forward sponsons (FS) and aft sponsons (AS). Sponsons always come in pairs, one on each side of the ship. A sponson is a pivoting corner

mount that has the same field of fire as a corner turret. The difference is that a sponson, if protected by armor, is protected by the battery and bulkhead armor, while a turret has its own armor level. Guns may be mounted in the bow or stern of the ship.

Bow guns fire only into the bow firing aspect, while stern guns fire only into the stern aspect. All remaining guns are mounted to fire to the broadside (BS). The number of guns listed as firing to broadside is the number which fire into each broadside aspect.

Record the turrets' positions with a circle and the position of all other guns with a box. Draw a barrel pointing in the direction of each firing aspect into which the weapon can fire. Record the type of weapon in or beside the box or circle. Draw a heavy black box around all guns mounted in the central battery which are thus protected by the battery and bulkhead armor. For example, the data listing for the British ship *Temeraire* is shown in the *Temeraire* Data Table.

The *Temeraire* is a turreted central battery ironclad which was completed in 1877. Each of its five rows of hull hit boxes can take 34 hits. It does not have a ram bow and has a top speed of 2 cables per turn. It has belt armor of 5, battery and bulkhead armor of 4, turret armor of 5, and deck armor of 1. It has a forward (F) and aft (A) turret, each with one old 11"

Temeraire Data Table

Name	Class	Year	MS	Ram	Spd	HS	Blt	Bty	Blk	Trt	Dck	Armament
<i>Temeraire</i>	TCBI	1877	34	N	2	6	5	4	4	5	1	F, A: [1o11], FS: [1o11], BS: [2o10], 3x4"B; 6QF, 13MG

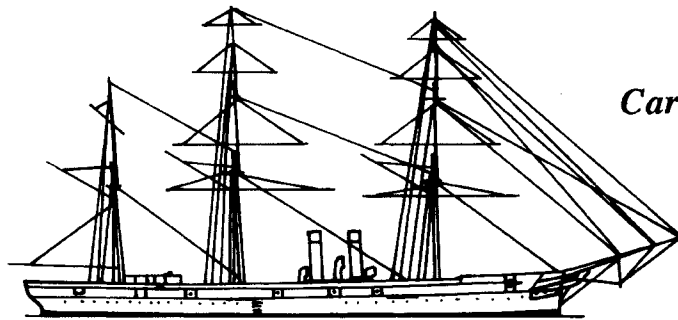
gun. It also has forward sponsons (one on each side), each of which also has an old 11" gun. These are armored sponsons and thus are protected by the battery and bulkhead armor. Firing from each broadside are two old 10" guns and three modern 4" breechloaders. Notice that the 10" guns are in the armored battery while the 4" guns are unprotected. Finally, the *Temeraire* has six quick-firing guns and 13 machineguns.

Towing

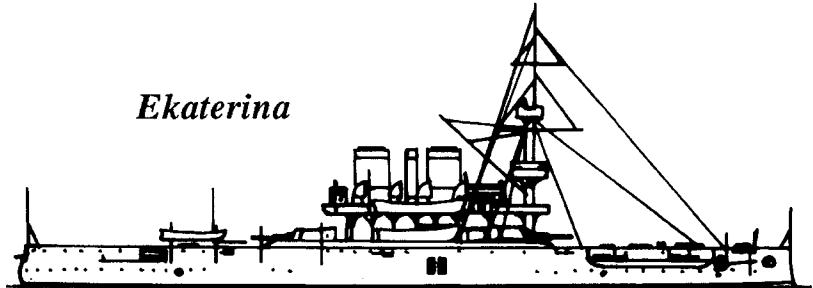
PLAYERS MAY want to tow friendly vessels which have been immobilized by battle damage. A vessel may not tow another vessel if the mass of the towed vessel is four or more times greater than that of the towing vessel. To be able to tow, the two vessels must be within a half cable of each other. (There is the normal risk of a collision.) They then spend the entirety of their Movement Phases with their crews rigging a tow cable. In his next Movement Phase, the towing player may begin to tow. All vessels are towed at a speed of 1.

Harbor

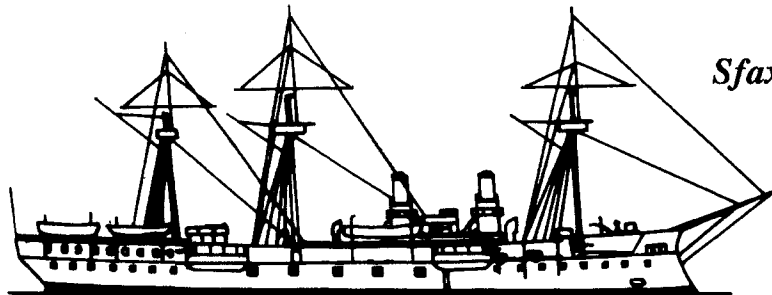
SOME SCENARIOS call for ships to begin the game at anchor or tied up at dockside. These ships may not fire until the crew is at battle stations and may not move until their steam is up. The owning player rolls a die once at the end of each of his Movement Phases (when repairs are conducted). One separate die roll is made for each ship at anchor or dockside. When the first 6 is rolled for a ship, its crew is at battle stations, and it may begin firing its guns. When the second 6 is rolled, it has its steam up and may begin to move.



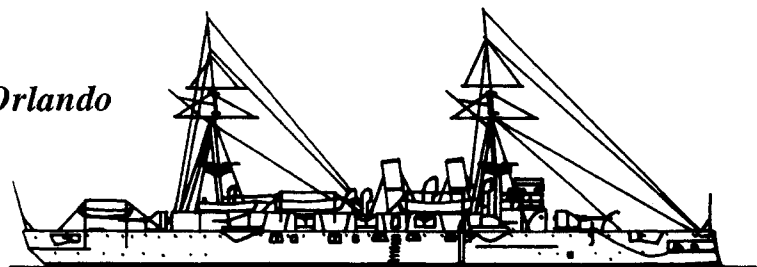
Carola



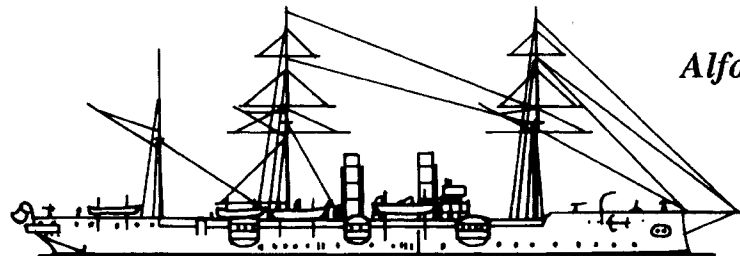
Ekaterina



Sfax



Orlando



Alfonso

Torpedoes

MANY SHIPS have launch tubes which can fire torpedoes. Torpedoes follow several special rules.

Firing Aspect: The ship listing will indicate whether the torpedoes are fired from bow tubes (BT), stern tubes (ST), midship tubes (MT), or deck tubes (DT). Bow tubes may only fire into the bow aspect, stern tubes into the stern aspect, and midship tubes into the broadside aspect. If a ship is listed as having midship tubes, the number listed is the number of tubes which faces *each* broadside. Deck tubes may fire into either the bow aspect or the forward half of either broadside aspect, but may not fire directly ahead down the compass bearing the ship is facing. The firing arc of deck tubes is illustrated below.

Torpedo Supply: Each launch tube type has a number following it which is the number of launch tubes (and torpedoes) that are available. When filling out the ship status sheet, note the firing aspect of its torpedo tubes in the torpedo section of the sheet. Then, black out all of the torpedo boxes after that launcher above the number carried. As many torpedoes may be fired per phase as desired (up to the total number carried). Each time a torpedo is fired a torpedo box is marked off. When the boxes are filled, the ship is out of torpedoes.

Occasionally, a torpedo listing will have an additional number following it with a plus, such as "DT-2+2." This means that two "reload" torpedoes are available. Reload torpedoes may be fired from any torpedo mount, not just the mount they are listed by.

For example, the British *Thornycroft-125* boat's listing reads "DT-4," indicating that it has four deck-

mounted launch tubes and a total of four torpedoes. The Russian *Batum*-class torpedo boat's listing reads "BT-2+2," indicating that it has two bow tubes and a total of four torpedoes.

Firing Torpedoes: Torpedoes may be fired in the friendly Movement Phase or the enemy Movement Phase, but may only be fired before movement, not after it. In order to hit a target, the firing player rolls a die and must roll a number equal to or less than the hull size of the target vessel. The hull size is shown in the large square box on the ship status sheet. However, before rolling the die, subtract the range in cables and the

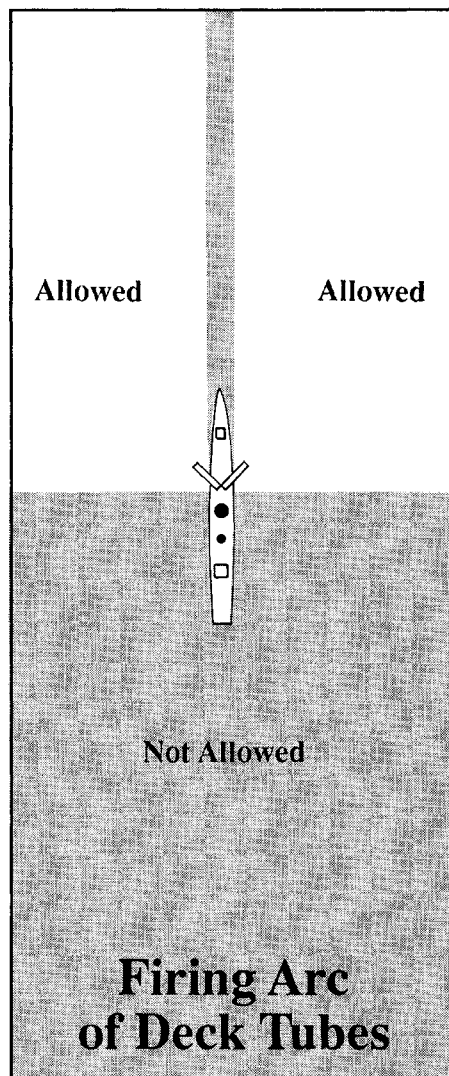
target's movement allowance from the hull size number. If the angle of the attack is exactly the same as the facing of the target ship (or its exact opposite), subtract an additional two.

For example, the *Thornycroft-125* is attacking the German battleship *Preussen* from a range of two cables. Usually, the British player would have to roll 6 or less (the *Preussen*'s hull size), but subtract the range (2) and the *Preussen*'s movement allowance (2), for a final modified hull size of 2. So, the torpedo will only hit on a roll of 1 or 2. If all four torpedoes were fired, the British player would roll four dice and each roll of a 1 or 2 would be a hit. If the *Thornycroft* were attacking from directly ahead or astern of the *Preussen*, it would have no chance of hitting it.

Torpedo Damage: All torpedo hits are hull hits. Torpedoes have a penetration of 6. Their damage value is variable. It is determined by rolling four dice. The sum of the four dice rolled is the damage value of the torpedo. All torpedo hits cause an uncontrolled flooding critical hit. To control the flooding, the player owning the damaged ship must roll a 4 or less.

Torpedo Nets

ONE DEFENSE against torpedo craft was torpedo netting. Torpedo nets were hung from booms alongside the ship and were intended to stop torpedoes from hitting the ship. Although they were reasonably successful, they reduced the speed of the ship considerably and could not protect against torpedo attacks from directly ahead or behind. Virtually all warships had torpedo nets available. All ships in the game are assumed to have them.



Ships may begin a game with their torpedo nets deployed (in the water) or recovered (on the ship). Ships with their nets deployed have their movement allowance reduced to 1. Ships with their nets deployed may only make torpedo attacks with their bow and stern tubes. All torpedo attacks against ships with their nets deployed are resolved normally, with one exception. The ship with nets deployed may make a saving throw against all torpedo hits. Roll the die once per torpedo hit: On a roll of 1-4 the nets stop the torpedo; on a roll of 5-6 the torpedo hits normally.

Torpedo attacks made from directly ahead and directly astern are not affected by torpedo nets.

A player may attempt to deploy or recover his nets during a game if he wishes. A player declares that he is deploying or recovering his nets at the end of his Movement Phase, when repair rolls are made. He rolls a die, and on a die roll of 5 or 6 succeeds. Otherwise, his ship is still deploying or recovering. Once a player begins to deploy or recover, he must continue to do so until he successfully rolls a 5 or 6. A ship in the process of deploying or recovering nets has its movement allowance reduced to 1, but receives no protection from the nets.

Depth

BEFORE THE game starts, the playing area must be divided into one or more of the following depths: Shallows, Shoals, Deep Coastal Water, and Deep Ocean Water. Shallows are closest to the coasts, and occur along beaches, reefs, and submerged rocks. Shoals are the boundary region between shallow water and the deeper, navigable water off the coast. Deep

Coastal Water and Deep Ocean Water are essentially the same for game purposes, except in the case of deep-diving submarines (see page 26). Deep Ocean Water is much deeper than Deep Coastal Water (at least 100 fathoms deep and often deeper).

Running Aground: Ships in Deep water have no chance of running aground. Ships in Shoals and Shallow water may run aground, depending on their draught (how deeply they ride in the water). For purposes of running aground, there are three types of vessels: deep-draught, medium-draught, and shallow-draught. To determine a ship's draught, compare its mass to its hull size. If its mass is more than twice its hull size, it is a deep-draught ship. If its mass is more than its hull size, but not twice as much, it is a medium-draught ship. If its mass is equal to or less than its hull size, it is a shallow-draught ship.

Submarines are medium-draught ships when surfaced and deep-draught ships when at Periscope Depth. A hydrofoil is a shallow-draught ship, unless it has lost one complete row of hull boxes or is moving at half speed or less, in which case it is a medium-draught ship.

Shallow-draught ships never run aground. Medium-draught ships run aground in Shallow water on a die roll of 4-6, but never run aground in shoals. Deep-draught ships always run aground in Shallows and run aground in Shoals on a roll of 4-6. Subtract one from the die roll if the ship only moved one cable. If the ship moves more than one cable, roll separately for each cable's worth of movement where the ship has a chance of running aground.

If the ship runs aground, it stops

moving until it breaks free. The owning player rolls a die at the end of each of his Movement Phases. To break free he must roll equal to or higher than twice the ship's movement allowance, unless the ship was only moving at a speed of 1 when it ran aground. In that case he breaks free on any roll higher than a 2.

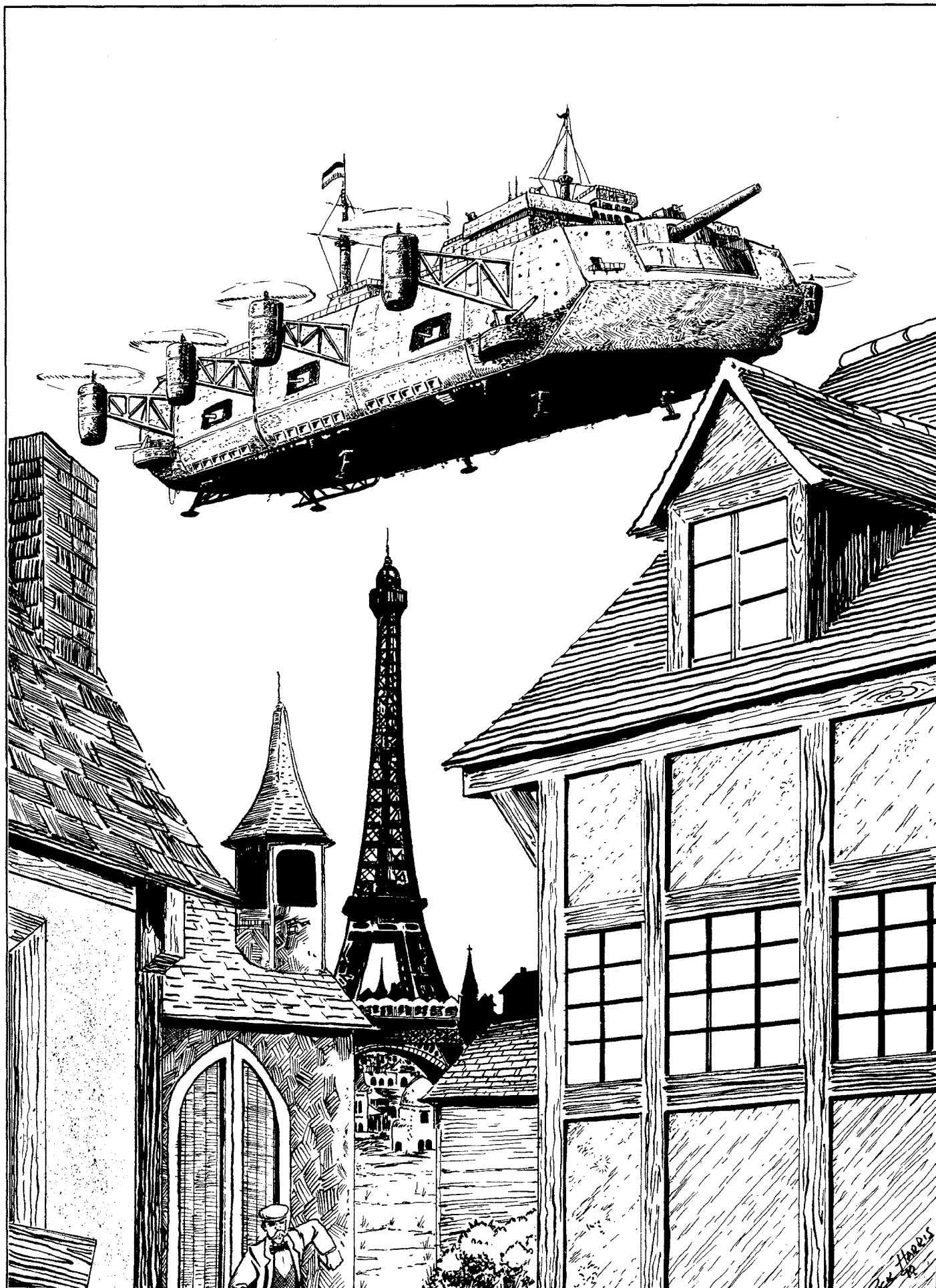
A friendly ship may rig a tow line and help the grounded ship attempt to break free. Rigging the tow line is explained in the rules on towing. For a friendly ship to help, it must have at least half the mass of the grounded ship. If it does, add one to the die roll. If the towing ship has a greater mass than the grounded ship, add two to the die roll. If the towing ship has twice the mass or more of the grounded ship, add three to the die roll.

Submarines

SUBMARINES MAY be surfaced or submerged (Periscope Depth). They may change their depth at the beginning of their Movement Phase. Submarines may fire torpedoes when on the surface or at Periscope Depth. If equipped with guns, they may only fire them while on the surface. They may not fire torpedoes or any other weapons during a turn in which they are changing depth.

Submarines may be fired at by guns while either surfaced or at Periscope Depth. Subtract two from the chances of hitting a submarine with gunfire while it is at Periscope Depth.

**Play
Scenarios
2 and 3
now.**



Basic Rules: Aerial Flyers

FLYERS FOLLOW many of the same rules as ships. This section of the rules, however, concentrates on how flyers differ from ships. If no exception is made to the rules on ships, assume that flyers follow the same rules.

MOVEMENT

FLYERS MOVE according to the same rules as ships, with the exception that they may change their facing before moving ahead a cable. This maneuver is called a power turn and costs one movement point per compass heading turned. It may be done in combination with normal movement. In addition, flyers are generally at a higher altitude than naval vessels.

ALTITUDE

THE SIX ALTITUDES in the game are Very High (VH), High (H), Medium (M), Low (L), Very Low (VL), and Surface (S). Mark the altitude of a flyer by placing an altitude marker of the correct type on its stand.

The maximum altitude of a flyer is noted on its ship status sheet. The hull hits section has several rows of boxes. The boxes on the left of the rows include an abbreviation for the various altitude levels. The highest level shown is the maximum altitude of the vessel.

All flyers may drop one altitude level per turn at no cost. Each altitude the flyer goes up costs two movement points. Each level the flyer goes down after the first costs one movement point. Thus, a flyer with a movement allowance of 5 could move five cables or move three cables and climb one level, or move one cable and climb two levels.

A flyer whose speed is reduced to 1 cable may still climb one level instead of moving. Each level of altitude change allows a one compass heading change in facing. This does not apply to the one free altitude drop per turn. A flyer may climb or descend during a turn; it may not do both.

Players who do not have the initiative in a turn must plot any altitude changes as part of movement by inserting the letter C (climb) or D (descend) at the appropriate point in the turn.

If a flyer involuntarily drops to the same altitude as the surface of the Earth, it crashes and is destroyed. If it voluntarily drops to the surface, it has landed. However, a flyer may only drop one altitude level and may only move one cable the turn it lands. If it moves more than one cable or drops more than one level, it crash-lands (the crew is safe, but the flyer is crippled and is removed from play).

COLLISIONS

IF A FLYER is within a half-cable of another flyer but is at a different altitude, then there is no possibility of a collision. If the flyer changes altitude, and thus both flyers are within a half-cable and are at the same altitude, there is the normal chance of a collision.

If two flyers collide, they take hull damage in the same way as ships. However, each does so based upon the hull size of the other ship, not its mass.

In addition, the ship with the smaller hull size has a chance of suffering a loss of trim. Roll one die: If the die roll result is less than or equal to half of the difference in hull size (round fractions down), the smaller ship suffers a loss of trim. (See the Damage section on page 20 for a description of the effects of loss of trim.)

TOWING

AERIAL VESSELS may only tow other aerial vessels. Tow lines are rigged in the same manner as for naval vessels. Flyers may be towed at speeds greater than 1, however, and the ability to tow is based on relative hull size rather than mass.

Divide the towed vessel's hull size by the hull size of the towing vessel, round all fractions down, and subtract the result from the towing vessel's speed.

For example, a towing vessel with a size 2 hull towing a ship with a size 5 hull would have its movement factor reduced by 2 ($5 \div 2 = 2.5$, rounded down to 2). The same size 2 hull towing a size 1 hull would not have its movement factor reduced at all.

FIRE COMBAT

ALTITUDE DIFFERENCES affect the chance of hitting the target as well. No vessel may fire at an enemy vessel if the difference in altitude (in levels) is greater than the range (in hexes). For example, a flyer cannot fire at an enemy ship or flyer two hexes away but three hexes lower.

If fire is possible at a higher target, add one to the range for every level higher the target is in relationship to the firing vessel. Thus, a target two hexes away and two levels higher would be fired at as if it were at a range of 4. Firing at targets at lower elevations does not add to the range.

All fire at targets at different altitudes is conducted with a die roll modification of -1 on the hit die roll. Thus, at close range shots would only hit on rolls of 4, 5, or 6 and at long range they would hit only on rolls of 6. When firing upon a vessel at a higher altitude, all crew hits become hull hits.

Ack-Ack Fire: All light guns on naval vessels may fire at flyers above them. This is called Ack-Ack fire. All aerial targets within range may be engaged, even those directly above the firing ship. (In other words, the restriction that the altitude difference cannot be greater than the range does not apply to light guns mounted on naval vessels. It does still apply to those mounted on flyers.) If a flyer is directly above a ship or within one cable of it, then all light guns on the ship may fire at it (not just half of the guns).

Ventral Gun Mounts: Some flyers have ventral gun mounts (located on the bottom of the flyer's hull). Ventral mounts fire the same as normal gun mounts with two exceptions.

First, a ventral gun may never fire at a target at a higher altitude. Second, a ventral gun firing at long range may only fire at targets at a lower altitude.

DAMAGE

A NUMBER OF hit results are unique to flyers, and some regular results affect flyers differently than naval vessels. These differences are explained below.

Hull Hit: Each flyer has a series of hull boxes arranged in rows. Each row has hull boxes equal to the flyer's hull size, and each row corresponds to one of the altitudes it can fly at. For example, a flyer with a hull size of 3 and a maximum altitude of High, would have four rows of boxes (one each for Very Low, Low, Medium, and High altitude) each with three boxes.

Always check hull hits off from the row of the highest remaining altitude. When that row of boxes is filled in, the ship's maximum altitude is reduced to the next lowest level. If the ship is at its current maximum altitude when this happens, it automatically drops one altitude in its next Movement Phase. This drop in altitude does not cost movement points. When all of the hull boxes are checked off, the ship crashes.

Crew Hit: Crew hits cause morale checks in the same manner as for naval ships, with one exception—the number of crew casualties suffered in a phase is compared to the flyer's hull size, as opposed to its mass (as is done with naval vessels).

Bridge Hit: In addition to the effects suffered by a naval vessel, an aerial gunboat may not voluntarily change altitude in its next move following the phase in which it suffers a bridge hit.

Loss of Trim: If the ship's trim controls are damaged, the ship suffers a sudden loss of trim. The owning player immediately attempts to recover trim by rolling greater than the damage value of the firing gun on 1D6. (If the loss of trim was caused by a collision, the player recovers by rolling greater than half the difference in hull sizes, rounding fractions down.) Ships with a hull size of 5 or larger have a +1 modification to the die roll. Ships with a hull size of 10 or larger have a +2 modification, etc.

A roll of 6 will always recover trim, regardless of the damage value of the firing gun or the die roll modifier in use.

If the ship recovers trim, it remains at its current altitude but may not voluntarily change altitude during its next Movement Phase. If the ship does not recover trim it immediately drops one altitude level, and the attempt to recover is repeated. This procedure is repeated until either the ship recovers trim or it crashes.

If the ship drops one or more altitude levels, the ship may not move, fire, fight fires, or change any crew assignments until the end of the next Movement Phase. (The crew is still stunned.) If boarded, the crew may defend itself.

Lifters Jammed: The ship's large lifting panels are temporarily jammed in place, and the ship may not change altitude until they are freed. Freeing jammed lifters is done the same way as freeing a jammed rudder.

PENETRATION

ALL GUNS use their close range penetration when firing upon a target at a lower altitude, regardless of the range.

RAMMING

AERIAL VESSELS may be rammed by other aerial vessels. These exceptions to the normal ramming rule apply:

If the ramming ship is equipped with a ram, the hull damage is half the hull size of the ramming ship. (If a fraction results, roll a die to decide if the extra damage point is received. It is received on a roll of 1-3.)

There is a chance that the rammed ship will suffer a loss of trim. Roll the die: If the result is less than the number of hull damage points sustained, the rammed ship suffers a loss of trim. (See the Damage section on page 20 for a description of the effects of loss of trim.)

If the ramming ship is not equipped with a ram, damage is resolved the same as for a collision, but if the ram-

ming ship is smaller than the rammed ship, there is no chance of it losing trim.

ZEPPELINS

ZEPPELINS ARE rigid airships held aloft by hydrogen gas. They are similar to flyers but obey the following special rules:

A Zeppelin may only turn one compass heading per turn (not once per cable moved).

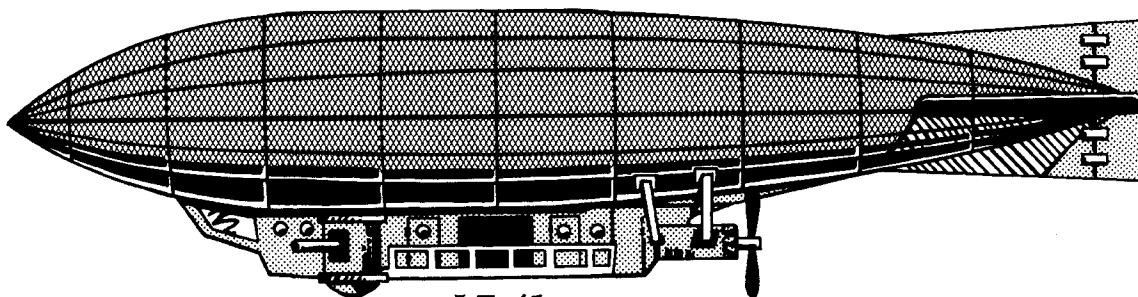
Hull hits on a Zeppelin are hits to its gas bag. Since the gas bag offers virtually no resistance to a naval shell, the round will not explode and thus will just pass through the bag, making a small hole.

Therefore, treat all hull hits as being caused by a gun with a damage value of 1, regardless of the actual damage

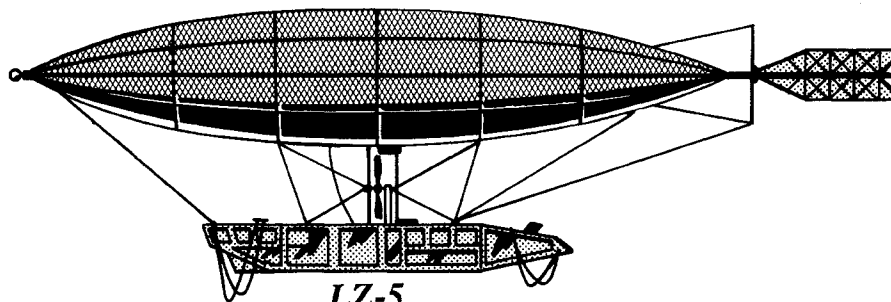
value of the gun.

Machinegun bullets are not deflected by the Zeppelin's fabric gas bags. Thus, instead of ignoring hull hits from machineguns, treat them as a normal hull hit with a damage value of 1.

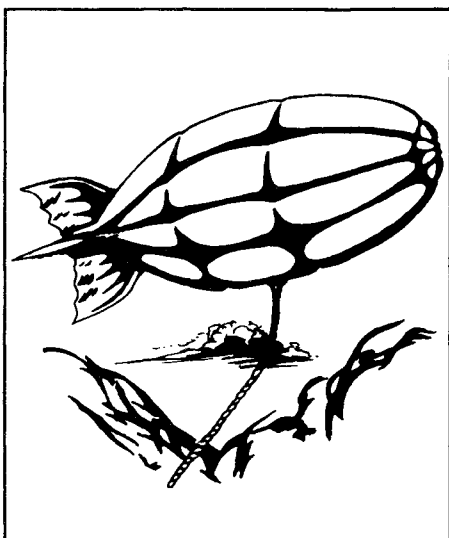
Hydrogen gas is extremely flammable, and fire is the Zeppelin's greatest enemy. There were no incendiary bullets available at this time (fortunately for the Zeppelins), but fire can occasionally be started from a conventional round's hit. Whenever a Zeppelin suffers a fire critical hit result, it explodes and burns. Whenever it suffers a hit from a rocket, it explodes on a roll of 4-6 (roll separately for each rocket hit). Whenever a fire is started by Martian fire (see *Sky Galleons of Mars*), it explodes.



LZ-41



LZ-5



BARRAGE BALLOONS

BARRAGE balloons are hydrogen-filled balloons attached to ships or shore batteries by stout cables. They are sent aloft to prevent aerial gunboats from flying directly over the ship below. Barrage balloons are only available on oceangoing ships and shore batteries; they may not be used on aerial gunboats.

Barrage balloons are suspended two altitude levels above the ship or battery which is deploying them. Any aerial vessel which moves above the ship at either one or two altitude levels above the ship with barrage balloons collides with them.

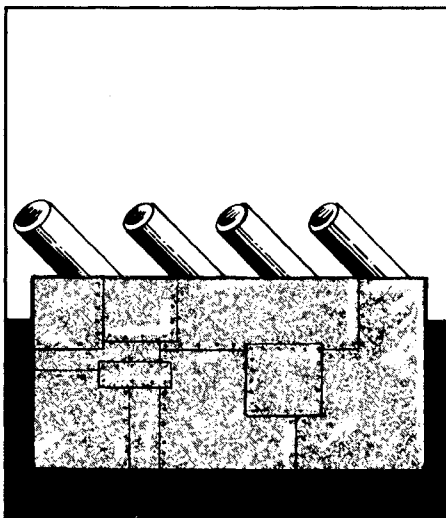
In the Initiative Phase of each turn, players commanding ships with barrage balloons must state if they intend to raise or lower them that turn. If they are lowered, they have no effect. If they are raised, they are fully operational.

Ships with barrage balloons raised may not move any faster than two cables per turn and may not avoid a ram. However, a player may announce at any time that he is cutting his barrage balloons loose, and then is free to attempt to avoid a ram or

move at any speed desired. Once cut free, the barrage balloons are lost.

When an aerial vessel collides with a barrage balloon, the balloon explodes. The aerial vessel suffers an automatic loss of trim critical hit. In addition, the player rolls a die. The result is the number of crew casualties taken and the level of fire started on the aerial vessel by the explosion. Barrage balloons are not affected by any hits, either while aloft or before being raised.

A barrage balloon may be raised or lowered one altitude level per turn. A barrage balloon may be released at any time. If released, the balloon will float away and poses no further threat to any aerial vessel.



HALE ROCKETS

It is VERY difficult to fire ordnance at a steep upward or downward angle from an aerial gunboat: The angular recoil destabilizes the boat and causes a loss of trim. This is not a problem with rockets since the thrust of the rocket can be vented in any direction required to maintain stability of the ship. The British often employ banks of Hale rockets on their aerial gunboats to fire at higher or lower targets.

Each Hale rocket battery on a vessel is a bank of rockets, all of which are fired in a single salvo at a target. As Hale rockets are scarcely more accurate than their ancestor the Congreve rocket, lack of accuracy is compensated for by volume of fire.

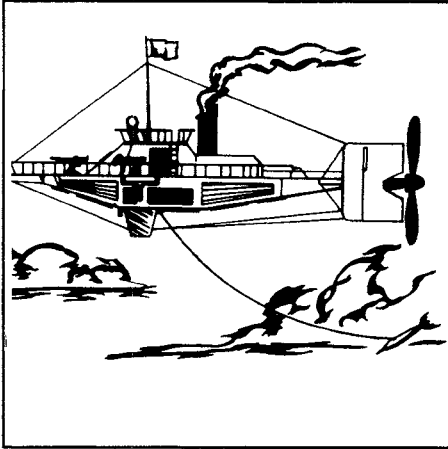
Each bank of rockets is directed to fire into one firing aspect and is angled either up or down. Batteries angled up may only fire at targets higher than the firing ship, while those angled down may only fire at lower ones. Hale rocket batteries may only fire at targets if the range to the target is equal to or less than the difference in altitude. For example, a target two cables away can only be fired at if the altitude difference is at least two levels. Hale rockets have a maximum range of four cables. Altitude does not count against the range of the rockets.

A Hale rocket battery is shown on the ship status sheet by a triangle with a tail. The triangle points in the direction the battery is faced. If the tail of the triangle is hollow, the battery is angled up; if it is filled in, the battery is angled down.

When a Hale rocket battery is fired, it is not necessary to see whether or not there was a hit. Instead, roll the die, and the number rolled is the number of rockets that hit. Hale rockets have a penetration of 0 and a damage value of 1. Once fired, the battery is empty and may not be reloaded during the course of the game.

Hale rocket batteries can be destroyed as a result of a gun hit. For purposes of determining the chance of a gun hit being on a Hale battery, count all Hale batteries onboard as a single gun. A hit destroys one Hale battery. Hale batteries can also suffer

magazine hits. If a Hale battery suffers a magazine hit, one battery detonates. Roll the die to determine how many hits are inflicted by them on their ship, and then roll hit locations for each one separately.



DROGUE TORPEDOES

A DROGUE TORPEDO is an explosive charge angled below a ship on a cable and equipped with a contact detonator. Drogue torpedoes are represented on the flyer status sheet by long ovals.

During the Initiative Phase of each turn, players commanding flyers with drogue torpedoes must state if they intend to raise or lower them that turn. If the drogue torpedoes are raised, they have no effect. If they are lowered, they are fully operational.

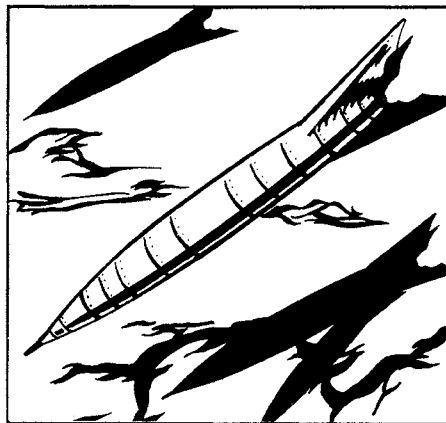
A flyer with its drogue torpedo lowered has its movement allowance reduced by one. The drogue torpedo hangs down one level below the flyer. Any flyer which passes below the flyer at the same altitude as the drogue torpedo, or changes altitude and arrives at the torpedo's altitude, collides with the torpedo on a roll of 5 or 6. Likewise, if the ship with the torpedo passes over or otherwise maneuvers so that another ship is at the same altitude as the torpedo, that ship collides on a roll of 5 or 6.

Collision with a drogue torpedo has exactly the same effect as collision with a tether mine, except that all drogue torpedoes have a damage value of 10.

Drogue torpedoes cannot be affected by anything except a magazine hit. If a magazine hit detonates the drogue torpedoes, every torpedo on board which is not lowered explodes. Roll hit locations for each drogue torpedo's damage separately.

AERIAL BOMBS AND TORPEDOES

SOME AERIAL vessels are equipped with bomb racks. These vessels have one or more bomb symbols printed on their status sheet. Each bomb rack carries one bomb and allows the vessel to make one bomb attack. Unlike other attacks, bomb attacks are made at any point during move-



ment. A ship may drop as many bombs in a Movement Phase as the owning player wishes. Bombs may be dropped at any point over which the aerial vessel moves.

For each bomb dropped on a target, the attacking player rolls a die. To hit the target he must roll a number higher than the difference between him and his target in altitude. For example, if he were one altitude level

above the target, he would have to roll higher than a 1.

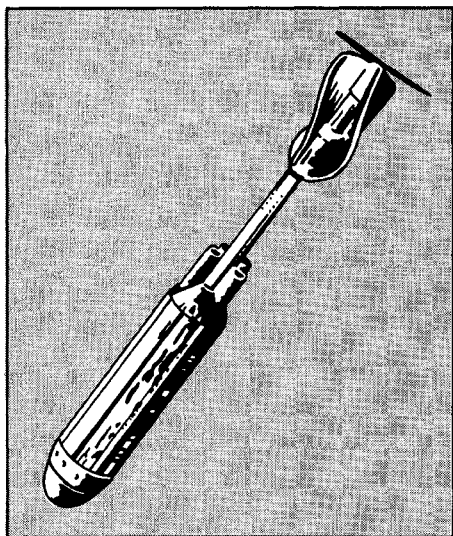
Add the speed of the bombing vessel and the target vessel to the number needed to hit. Add one to the hit number for every compass direction turn made by the aerial vessel in its move before dropping the bombs. Add one to the hit number if the aerial vessel has already dropped a bomb on one or more targets this Movement Phase.

For example, an aerial gunboat moving at a speed of 2 is two levels above a nonmoving target and has made one turn before dropping its bombs. The hit number is 5 ($2+2+1=5$). Because the player must roll higher than the hit number in order to hit the target, the aerial vessel would have to roll a 6. Note that in this case if the target were moving at all, the aerial vessel would have been unable to hit it.

If the bomb hits, it does damage as gunfire but with a penetration of 1 and a damage value of 6.

Bomb racks can be destroyed as a result of a gun hit. For purposes of determining the chance of a gun hit being on a bomb rack, count all bomb racks onboard as a single gun. A hit destroys one bomb rack. Bomb racks can also suffer magazine hits. If a bomb rack suffers a magazine hit, all remaining bombs on board explode. Resolve each bomb explosion exactly as a single hit from a bomb.

Aerial Torpedoes: Any flyer equipped with bomb racks may carry one torpedo in place of two loads of bombs. Aerial vessels may only fire torpedoes at ships which are directly ahead of them. Aerial vessels launch torpedoes in the same way as do ships, but can only launch them from Very Low altitude.



SMUTTS DISCHARGERS

A SMUTTS DISCHARGER is a steam-powered pneumatic launcher for Smutts Patent Aerial Torpedoes. These dischargers are only mounted on British steam-powered vessels and are always oriented to fire directly forward.

The Smutts Patent Aerial Torpedo is a finned projectile filled with dynamite, held aloft by means of liftwood vanes, and powered after launch by a propeller driven by a small flywheel. It also trails a cable with a small grapnel to snag vessels over which it passes.

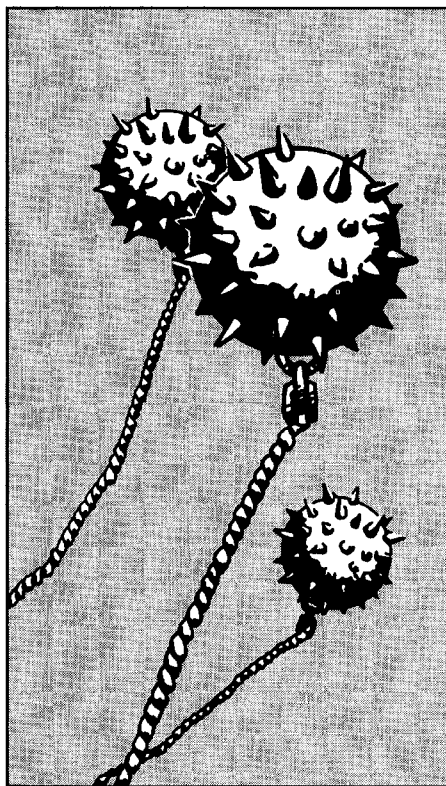
On the turn it is launched, it will move directly forward from the firing ship six cables, and does the same for the four subsequent turns. At the end of that time it detonates (to prevent capture by the enemy). If the Smutts torpedo passes through the space occupied by a vessel at the same altitude or one level lower than the torpedo, it will collide with it on a roll of 2 or higher. The target vessel may attempt to avoid the collision in the same manner as avoiding a ramming attempt.

If the Smutts torpedo hits, it deto-

nates. It has a penetration of 1 and a damage value of 12. In addition, the force of the detonation will cause an automatic loss of trim critical hit.

Each ship carries a limited number of Smutts aerial torpedoes. When these have all been used the discharger may not be fired again. The Smutts aerial torpedoes are represented by small triangles on the ship deck plan.

The Smutts discharger is treated as any other gun for purposes of gun hits, and has a magazine. If the Smutts discharger's magazine is detonated by a critical hit, all remaining Smutts aerial torpedoes on board blow up. Roll for each torpedo separately for hit location.



TETHER MINES

TETHER MINES are explosive charges equipped with contact detonators, attached to liftwood buoys, and tethered in place at a selected altitude by

a cable. Tether mines are shown on the ship status sheet by a circle with a cross superimposed on it.

During the Initiative Phase of each turn, players commanding ships with tether mines must state if they intend to raise or lower them that turn. If they are lowered they have no effect. If they are raised they are fully operational.

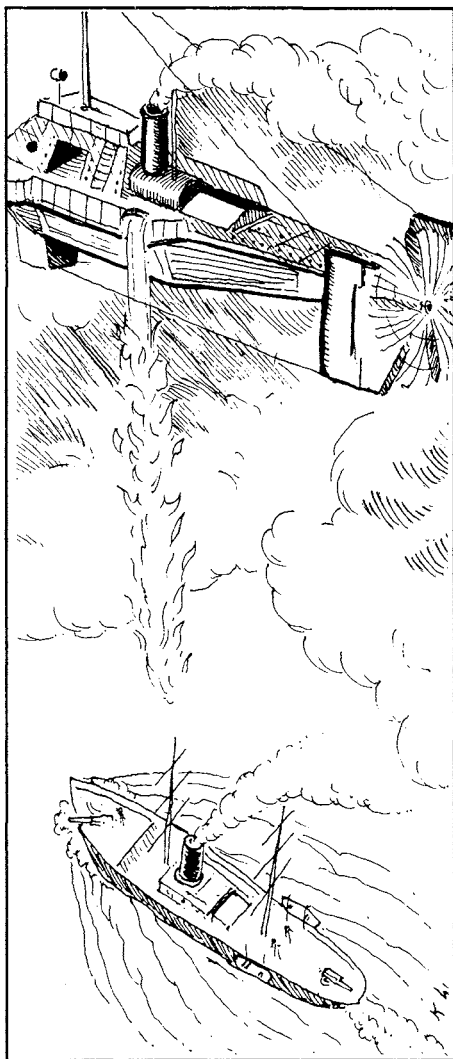
Ships with tether mines raised may not move any faster than three hexes per turn and may not avoid a ram. A player may announce at any time that he is cutting his mines loose and then is free to attempt to avoid a ram or move at any speed desired. Once cut free the tether mines are lost.

Tether mines are raised one altitude level higher than the owning vessel. If any ship passes over the ship at the same altitude as the mines, or drops to the same altitude as the mines, it automatically collides with them. If a vessel with tether mines raised moves below another vessel which is at the same altitude as the mines, or climbs so as to bring the tether mines to the same altitude as a ship, that ship collides with the tether mines on a roll of 6. If a ship begins its movement at the same altitude as raised tether mines, it may freely move away without colliding with the mines.

If a ship cuts its tether mines loose for any reason, they will collide with any vessel within a half cable and at a higher altitude on a die roll of 6. If a vessel collides with a tether mine, the mine detonates and is counted as a hit by a gun. Roll for hit location normally. All tether mines have a penetration of 0, but cause an automatic loss of trim critical hit in addition to any other damage. The damage value of the mine depends on the

type being used. Martian tether mines have a damage value of 4; British tether mines have a damage value of 6.

Tether mines cannot be affected by anything except a magazine hit. If a magazine hit detonates the tether mines, every mine on board and not raised explodes. Roll a hit location for each mine separately.



MARTIAN LIQUID FIRE

SOME VESSELS are equipped with one or more racks of Martian liquid fire, a chemical compound which ignites and burns fiercely once exposed to oxygen. Martian liquid fire is dropped on targets at lower alti-

tudes as the firing flyer passes overhead. This attack is carried out during movement, not at the end of movement.

No die roll is made to determine whether or not the fire hits the target; instead, a die is rolled to determine how much of it does. Roll one die and subtract one for each difference in altitude between the two vessels. For example, if the firing flyer is two levels higher, subtract two from the die roll. If the firing flyer is facing in the same compass heading as the target or if the target is stationary, add one to the die roll. The result is the level of fire started on the target ship. A modified die roll of 0 or less has no effect.

Each rack of Martian fire may be used only once per game. Once dropped, it is expended and may not be reloaded during the game.

Liquid fire may be destroyed by gun hits. If a magazine hit is made on a liquid fire rack, roll the die. The result is the level of fire that breaks out.

SPIKE DROPPERS

INVENTED BY MARTIANS, but soon copied by the European powers, the spike dropper is little more than a hopper full of short metal spikes or darts.

Attacks with spike droppers are made in exactly the same way as liquid fire racks, with the one exception being that all hits are scored as crew casualties instead of a fire.

Each hopper of spikes may be used once per game. Once dropped, a hopper is expended and may not be reloaded during the battle. Spike droppers may suffer gun hits but not magazine hits.



Advanced Rules

CREW QUALITY

QUITE OFTEN the quality of a ship's crew is more important than how well designed or armed the ship is. To take this into account, crews are divided into three general levels: Green, Trained, and Crack. Trained crews are the majority of ship crews, and all game rules are written around their capabilities. Green and Crack crews differ, as noted below.

Green crews subtract one from their chance of hitting with gunfire, ramming or avoiding a ram, and from their chance of recovering from a loss of trim.

Crack crews add one to their chances of hitting with gunfire, ramming or avoiding a ram, and their chance of recovering from a loss of trim.

SIGNAL COMMUNICATION (OPTIONAL)

EACH TURN covers a very short period of time and only a limited number of signals could be sent and read in this amount of time. If players wish to simulate this, incorporate the following rule. Each player on a team may hoist (send) one six-word message per turn. In the Initiative Phase, each player writes down his signal and then each reads it in turn.

The six words may include a specific ship name, or may be addressed to all who can read them.

Typical signals might read: "*Aphid* join action at once," "Form line to my stern," "Cease bombardment and break off action" etc. No ship may read signals from any ship on fire upwind of it (in this case the written signal should be passed to those players who could read it). As naval codes were widely used, players may simply wish to just allow friendly players to read written signals.

DEEP-DIVING SUBMARINES

DEEP-DIVING submarines are advanced models of submarines which are not yet in general service but which may be included in a scenario on an experimental basis. To do so, take an existing submarine and assign it deep-diving capability. These vessels may submerge to depths below periscope depth in areas of deep ocean water. The device reliability of the submarine times 100 is the maximum dive depth of the submarine in fathoms. Each 100 fathoms counts as one depth level. (Device reliability is a product of the invention rules in **Space: 1889**. For deep-diving submarines intended specifically for this game, the referee should either ran-

domly assign a reliability from 1 to 6 or roll a six-sided die.)

A deep-diving submarine may only change its depth by one level per turn, with one exception. It may "blow its tanks" at the beginning of any friendly Movement Phase, in which case it immediately surfaces. The submarine may not make any other movement or depth change during that Movement Phase or in its next Movement Phase.

Although the referee of a scenario need not disclose the depth of any part of the deep ocean area, a deep-diving submarine can see the bottom, if the bottom is one depth level below the submarine, through the use of searchlights and portholes. Thus, a deep-diving submarine can "chart" the depth of the deep ocean area by hugging the bottom, provided this does not require it diving below its maximum dive depth.

Because submarines below Periscope Depth can neither see nor communicate with surface vessels, a special game mechanic is used for them. When a deep-diving submarine dives below Periscope Depth, the owning player must plot each and every move the submarine will make until it returns to Periscope Depth. Depth can be made conditional upon the depth of the bottom. The submarine's model is taken off of the table and does not reappear until it returns to Periscope Depth.

Submarines may not fire torpedoes from deeper than periscope depth.

DEPTH BOMBS

ANY SHIP WHICH is capable of carrying torpedoes may carry two depth bombs instead. Any flyer with bomb racks may carry one depth bomb in

place of each bomb load. Depth bombs are dropped at any point during movement.

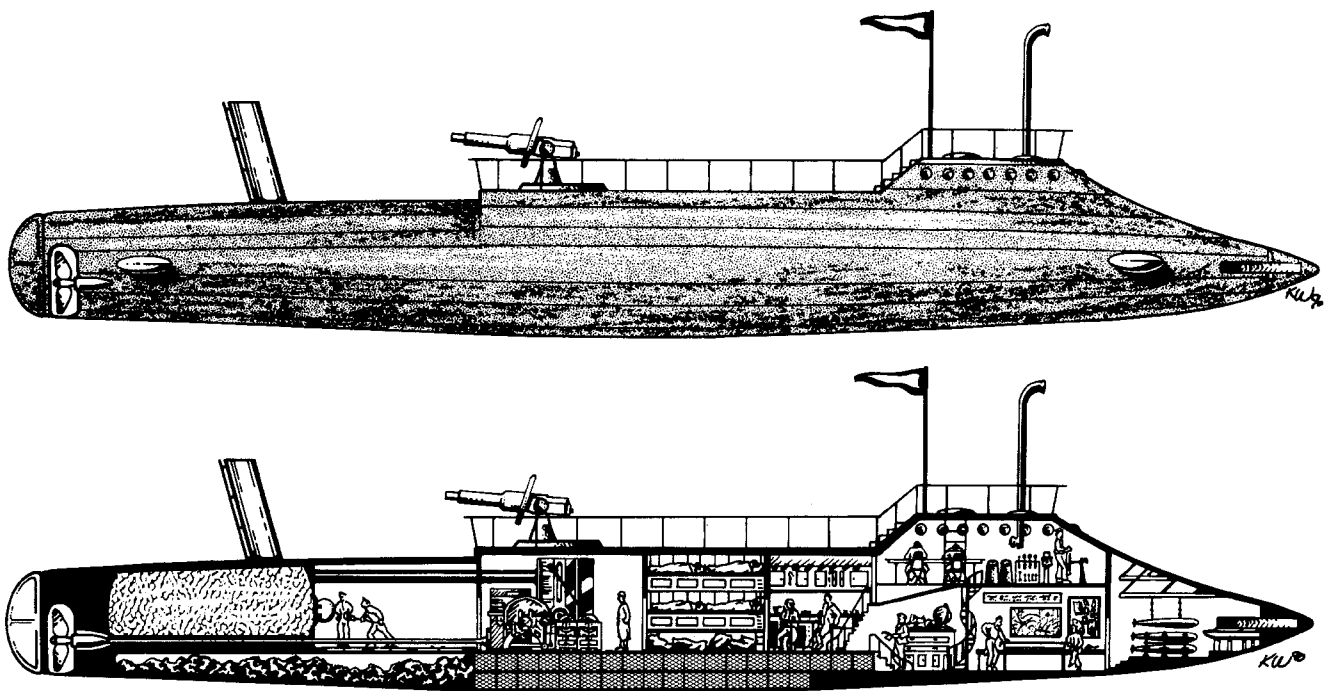
Flyers may only drop depth bombs from Very Low altitude. When a depth bomb is dropped, the dropping player announces the depth it is set

for (Periscope, 100 fathoms, 200 fathoms, 300 fathoms, etc.) If the bomb is dropped within a half-cable of a submarine and the depth setting is correct, the referee rolls a die and halves the result, rounding fractions down. The result is the number of hull

hits suffered by the submarine. If a 6 is rolled, the submarine suffers three hull hits and, in addition, an uncontrolled flooding critical result.

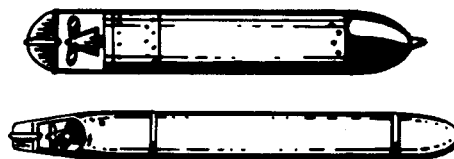
The result of the die roll should be kept secret from the player who dropped the depth bomb.

Deep-Diving Submarine



Side View and Cut-Away Plan
of a Prototype Deep-Diving Submarine

Enlarged View of Torpedoes
Used by Submarines



NAVAL BOMBARDMENT

NAVAL FORCES are sometimes called upon to bombard land targets, such as cities or fortresses. In the game this will be dealt with abstractly and will require a player to inflict a specified number of damage points on one or more locations in a city or fortress. The location must be fired at as if it were a ship. (Although the gun's shot will certainly come down somewhere in the general area indicated, that is no guarantee that it will damage anything important.) If a hit is achieved, the gun's damage value is the number of damage points inflicted.

SHORE BATTERIES

GROUND BATTERIES have the advantage of being able to fire at high angles. Heavy guns still require fairly

elaborate carriages to allow them to fire at high angles, and not all guns are so fitted. All light guns are mounted for high-angle (Ack-Ack) fire. All heavier batteries are identified in the scenario notes as being mounted for high-angle fire or just for surface fire.

Shore batteries mounted for surface fire fire in the same manner as a ship-mounted gun. When firing at a naval surface target, the shore battery receives a +1 to hit. When firing at aerial targets, shore batteries operate under the same limitations as ship-mounted guns and do not receive a +1 to hit.

Shore batteries mounted for high-angle fire may fire at any target above them, even if the difference in altitude is greater than the range. Such batteries are still limited by the range of

their guns, and still count each altitude level higher as +1 the range. Shore batteries mounted for high-angle fire may still fire at surface targets, but do not receive the +1 modifier to hit.

Many ground batteries are built into fortifications and so may have considerable armor. A ground battery is fired at the same as a ship, but hull hits have no effect. The gun crew and gun are both considered protected by armor. If a critical hit is made, only fire and magazine hits affect the battery; all other results are treated as no effect. A magazine critical hit destroys the battery.

Fire, either as a result of a critical hit or of Martian liquid fire dropped on the battery, puts it out of action temporarily. The level of the fire will



automatically go down each turn instead of up, and once it goes out, the battery will come back into action.

NONEXPLODING ROUNDS (OPTIONAL)

SOME ARMOR-PIERCING rounds may go completely through lightly armored or unarmored vessels without detonating. Likewise, Martian solid shot will do less damage if it just punches through both sides of a hull than if it hits more substantial resistance. To take this into account, use the following rule:

If a ship is hit by a gun which has a penetration more than twice the armor value of the ship, roll a die. On a result of 1-3, the hit is resolved normally. On a roll of 4-6, the round passes through the target without

exploding. Hit location is still rolled, and the round causes damage, but it is treated as if it had a damage value of 1, regardless of its size. Note that rounds which already have a damage value of 1 are unaffected by this rule.

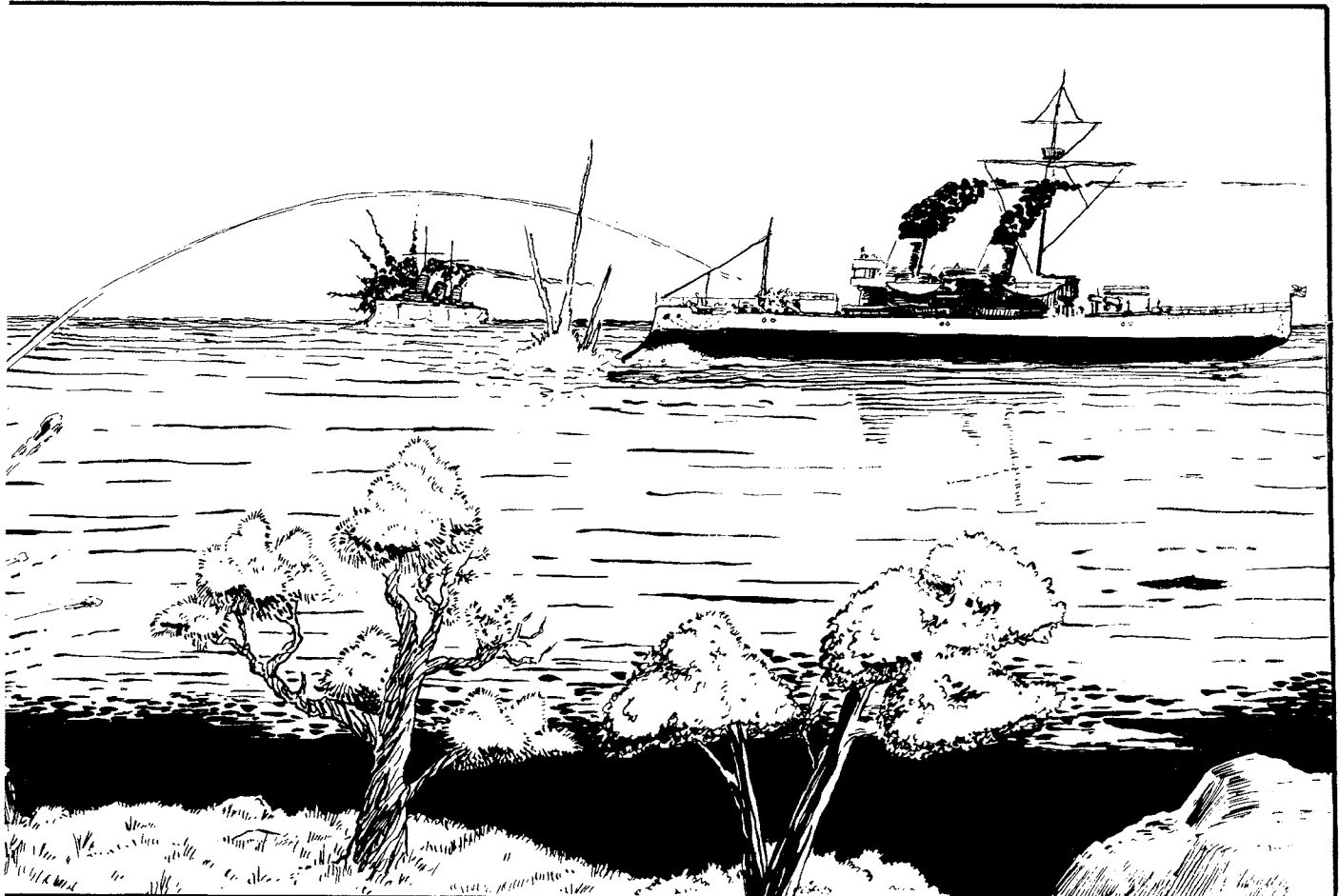
LINE OF SIGHT (OPTIONAL)

NO PROVISION is made in the basic rules for line of sight being blocked by another ship, but a player obviously cannot shoot through an intervening vessel. In a three-dimensional game, however, defining line of sight often becomes difficult. Some cases are very easy, such as when the firing ship, target ship, and intervening ship are all at the same altitude. In this case, the intervening ship blocks the line of sight if the line of sight passes

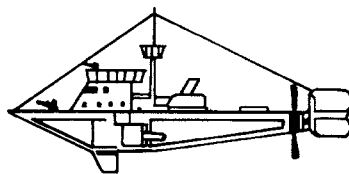
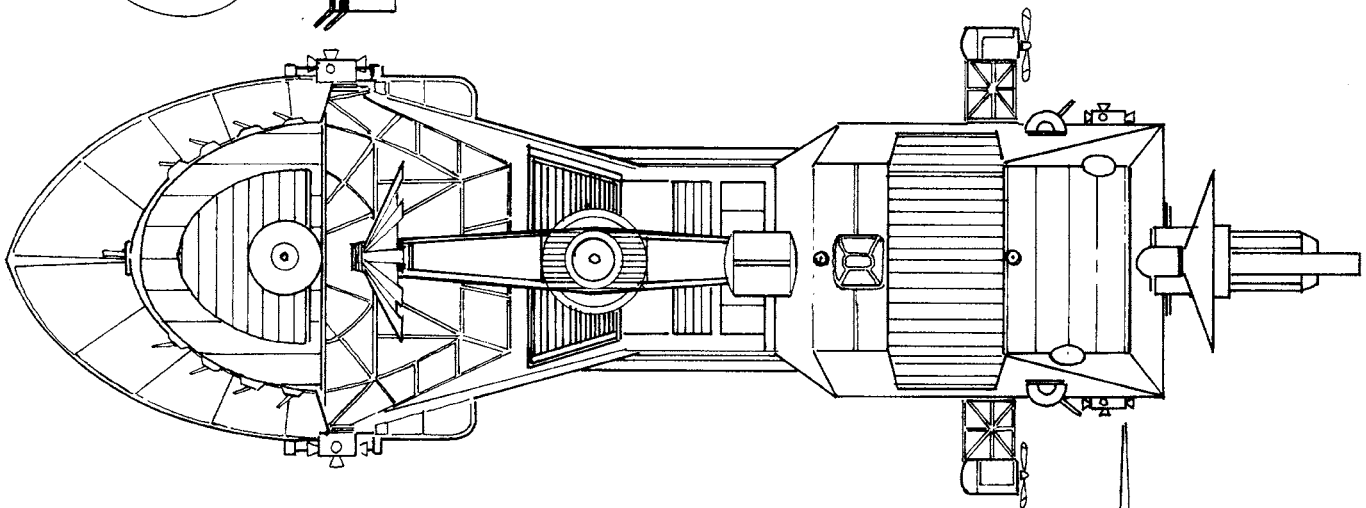
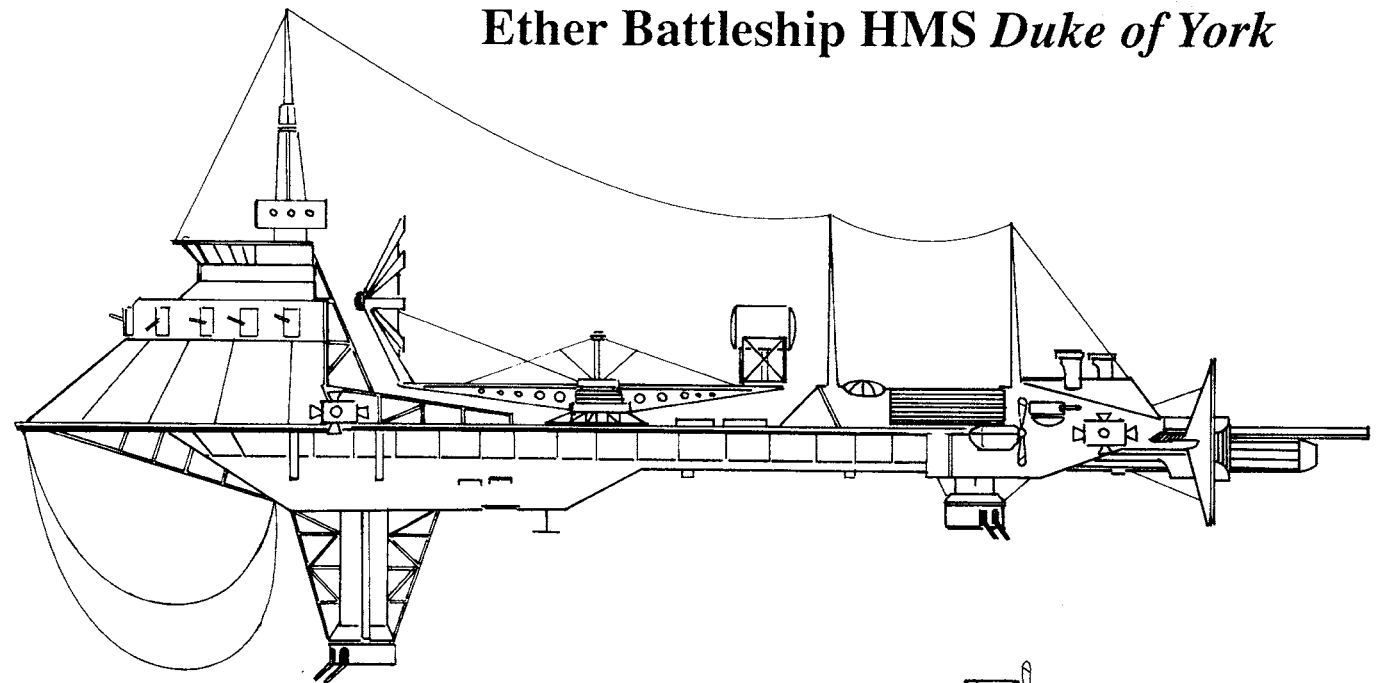
through the intervening ship.

If the vessels are at different altitudes, use the altitude gauge printed on the Game Reference Charts. Place the firing ship and the target ship at their respective altitudes and distances. Plot the location of any ship which might block the line of sight. After plotting the squares that all the ships occupy, trace the line of sight between the firing and target ships. If the line of sight passes through the bottom half of a box containing an intervening ship, it is blocked.

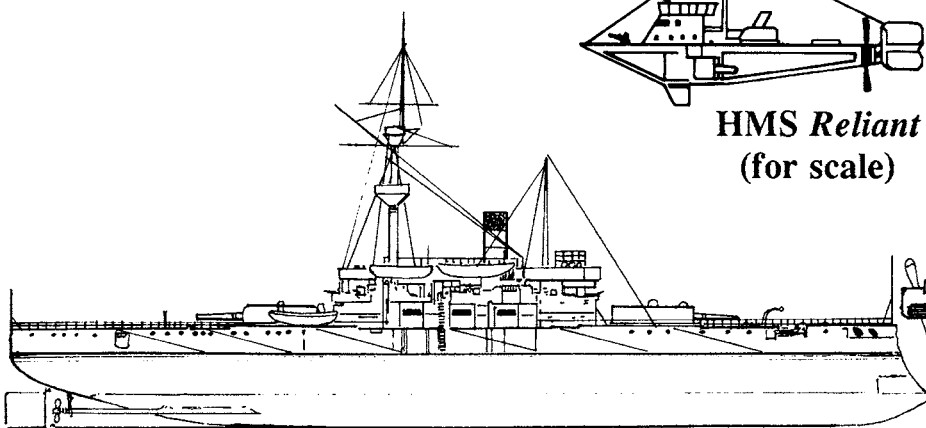
For example, in the diagram on page 108, ships A and B are exchanging fire. A ship in position 1 would block the line of fire between the two ships, as the line of sight passes through the bottom half of its box. A ship in position 2 would not block line of sight.



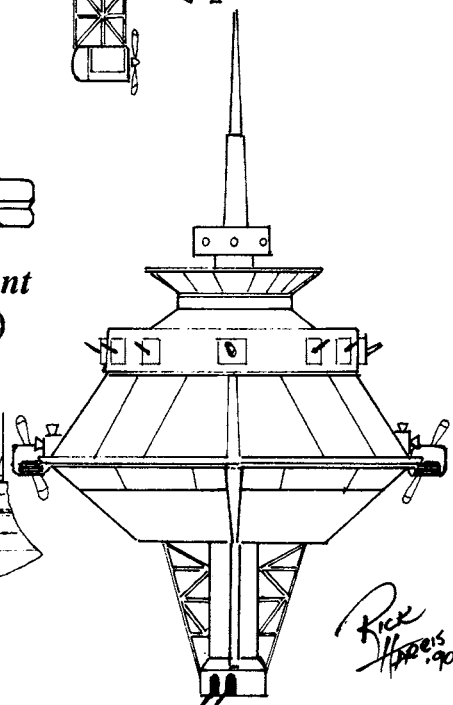
Ether Battleship HMS *Duke of York*



HMS *Reliant*
(for scale)



HMS *Trafalgar*
(for scale)



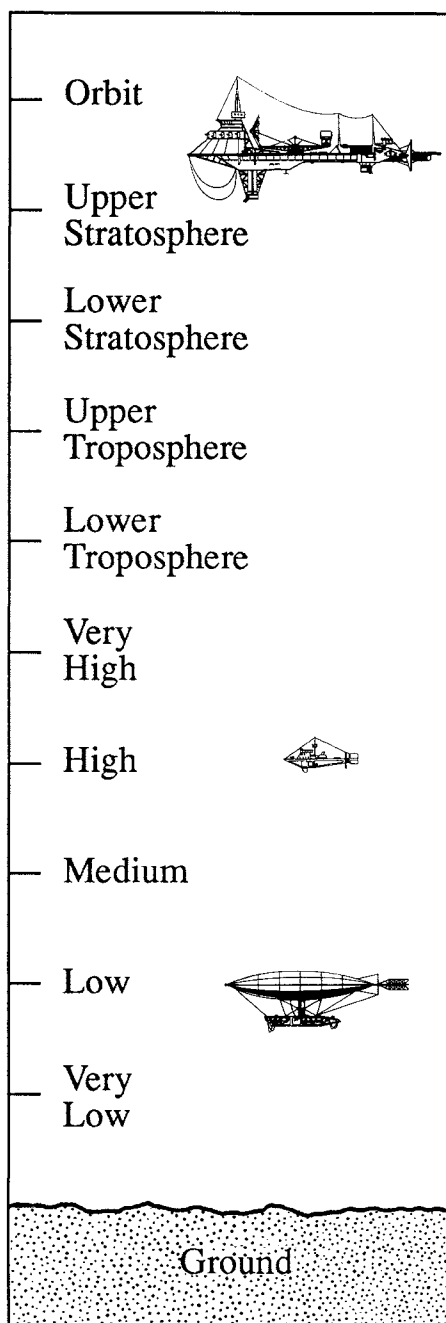
*Rich
Harris '90*

Interplanetary Ether Flyers

NAVAL CIRCLES have always been interested in ships that rely upon their speed as a protection from gunfire. Some small, swift vessels obtain a degree of safety from this source, as reflected in the target modifiers in the basic game. But it is effectively impossible for a conventional airship or naval vessel to obtain immunity from gunfire by sole virtue of its speed.

This is not the case with interplanetary ether flyers, as a simple examination of their performance indicates. Commercial ether flyers average between two and three million miles per day, and some military vessels are capable of even greater speeds. Even the slowest of interplanetary vessels can usually make one million miles per day. This lower figure reduces to somewhat over 41,000 miles per hour, or about 700 miles per minute. In comparison, this amounts to slightly over 60,000 feet per second, while the most powerful modern naval gun throws its shell at a velocity of only 2000 or so feet per second.

At these velocities it is virtually impossible to even detect an approaching vessel, let alone engage it with gunfire. Only when an ether flyer drops to planetary speeds and enters orbit around a planet, or dips into the atmosphere, is it vulnerable to enemy warships.



As all combat between interplanetary ether flyers must, by necessity, take place either in close orbit or deep within a planetary atmosphere, the normal rules for aerial vessels are used with only the following exceptions.

ALTITUDE AND HULL DAMAGE

ETHER PROPELLERS will not function in dense atmospheres, and so an ether flyer must rely on conventional propulsion and lift at lower altitudes. This means that, by design, all interplanetary ether flyers are capable of reaching altitudes which are considerably above the maximum ceiling of any other aerial vessel. To reflect this, ether flyers have five additional altitude levels above Very High: Lower Troposphere, Upper Troposphere, Lower Stratosphere, Upper Stratosphere, and Orbital.

These five higher altitudes represent considerably larger increments of height than do the five lower altitude bands. As a result, ether flyers at any of the higher altitudes may not attack or be attacked by vessels at different altitudes. In order to move to or from one of the higher altitude bands an ether flyer must spend *five turns* climbing or descending. If an ether flyer suffers sufficient hull damage to reduce its maximum ceiling below Orbital, it may not leave the Earth's atmosphere.

MOVEMENT

THE LARGE solar boilers on interplanetary ether flyers interfere with their maneuverability. Like Zeppelins, ether flyers may only make one compass heading turn per Movement Phase (not one per cable moved).



Ship Form

Name Almirante Brown

Type/Class Central Battery Ironclad

Nationality Argentina

Mass 17

Ram Y

Speed 2

HS 5

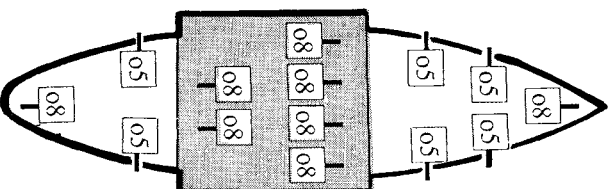
Target Mod 2

Armament Diagram

Bit	4
Bty	4
Blk	3
Trt	—
Dck	1

Armor

Hull



Ship Form

Name Patagonia

Type/Class Protected Cruiser

Nationality Argentina

Mass 6

Ram Y

Speed 2

HS 4

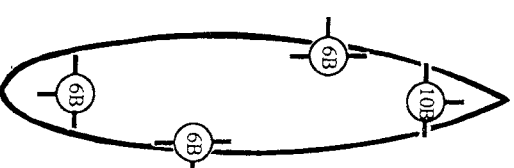
Target Mod 2

Armament Diagram

Bit	—
Bty	1
Blk	—
Trt	2
Dck	1

Armor

Hull





Ship Form

Name Parana

Type/Class Gunboat

Nationality Argentina

Mass 2

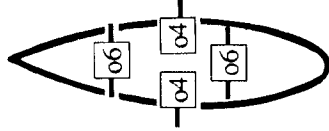
Ram N

Speed 2

HS 3

Target Mod 1

Armament Diagram



Armor

Blt	—
Bty	—
Blk	—
Trt	—
Dck	—

Hull

☐ ☐
☐ ☐
☐ ☐
☐ ☐
☐ ☐



Ship Form

Name Uruguay

Type/Class Gunboat

Nationality Argentina

Mass 2

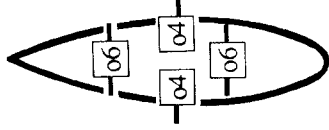
Ram N

Speed 2

HS 3

Target Mod 1

Armament Diagram



Armor

Blt	—
Bty	—
Blk	—
Trt	—
Dck	—

Hull

☐ ☐
☐ ☐
☐ ☐
☐ ☐
☐ ☐



Name Almirante Cochane

Name Almirante Cochane

Type/Class	Central Battery Ironclad
1	USS Monitor
2	USS Monitor
3	USS Monitor
4	USS Monitor
5	USS Monitor
6	USS Monitor
7	USS Monitor
8	USS Monitor
9	USS Monitor
10	USS Monitor
11	USS Monitor
12	USS Monitor
13	USS Monitor
14	USS Monitor
15	USS Monitor
16	USS Monitor
17	USS Monitor
18	USS Monitor
19	USS Monitor
20	USS Monitor
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89	USS Monitor
90	USS Monitor
91	USS Monitor
92	USS Monitor
93	USS Monitor
94	USS Monitor
95	USS Monitor
96	USS Monitor
97	USS Monitor
98	USS Monitor
99	USS Monitor
100	USS Monitor

Nationality Chile

Mass 13

Ram **Y**

Speed 2

HS 4

Target Mod 2

Torpedoes

BT 00

ST ☐

Quick-Firing

Guns

The diagram shows a 16-bit bus system. A central horizontal line represents the bus, with a vertical line intersecting it. On the left side of the vertical line, there are two 8-bit components, each labeled '8B'. On the right side, there are four 8-bit components, each labeled '8B'. The components are connected to the bus via small vertical lines. The entire system is enclosed in a rectangular frame with a pointed right side.

Armor

Bit	4
Bty	3
Blk	—
Trt	—
Dck	1

Fun



Name Esmeralda

Name Esmeralda

Type/Class	Protected Cruiser
1	
2	
3	
4	
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Nationality Chile

Mass 12

Ram

Speed 3

HS 5

Target Mod 2

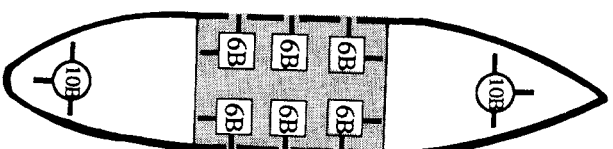
Torpedoes

BT ☐MT ☐

Gums ☐ ☐

Quick-Firing

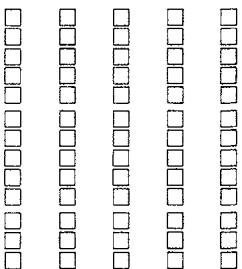
Armament Diagram



Armor

Bit	—
Bty	1
Bik	—
Tyt	1
Dck	2

Full



War and Rumors of War

THE DECADE leading up to 1889 was one of growing tensions fueled by small regional conflicts. Although the great powers managed to avoid a major confrontation, the shifting patterns of alliances and the unstable balance of global power led the world closer and closer to a major conflict. The following scenarios are drawn from the universe of **Space: 1889**, from wars that happened, and from wars that might have happened.

Land of Fire (Argentine vs. Chile)

1 WHILE the European powers met in Berlin to redraw the boundaries of Africa, the young South American nations struggled to change theirs by force of arms. While the armies of Chile and Argentina skirmished ineffectively in the high Andes, their fleets fought a deadly action south of Tierra del Fuego.

Battle Area: Open sea.

● **Argentinian Squadron:** (Leadership +0).

1 *Almirante Brown*-class central battery ironclad.

1 *Patagonia*-class protected cruiser.

2 *Parana*-class gunboats.

● **Chilean Squadron:** (Leadership +1).

1 *Almirante Cochrane*-class central battery ironclad.

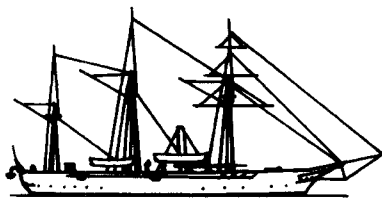
1 *Esmeralda*-class protected cruiser.

Setup: The Argentinian forces enter the battle from one side of the table.

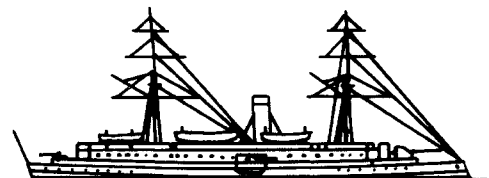
The Chileans enter from the opposite table edge.

Initial range is 15 cables.

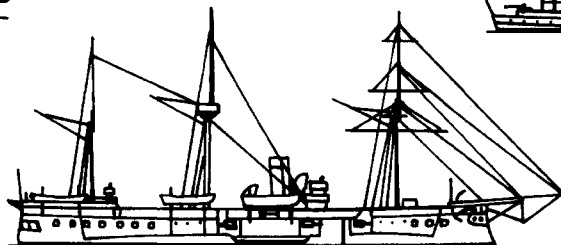
Victory: The last player who is left with a ship afloat on the map wins the confrontation.



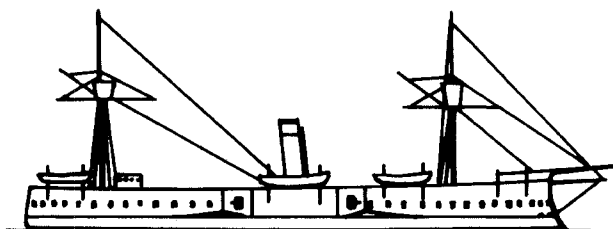
Parana



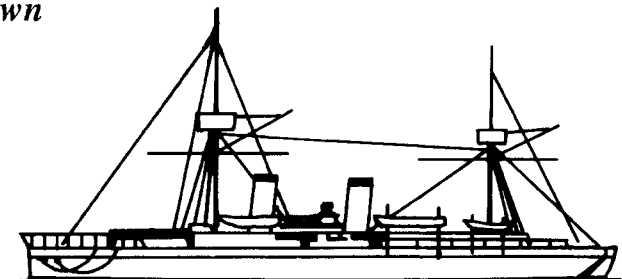
Patagonia



Almirante Brown



Almirante Cochrane



Esmeralda

Head to Head (Britain vs. France)

2

THE BRITISH and French are at war. The French Channel Squadron under Rear Admiral Boissoudy has broken out into the North Sea and is steaming north to raid British merchant shipping into the Baltic. It has been intercepted by a British battle squadron under Rear Admiral D'Arcy Irvine.

Battle Area: Open sea.

● **British Squadron:** (Leadership +2).

2 *Admiral*-class turret battleships.

2 *Orlando*-class armored cruisers.

● **French Squadron:** (Leadership +1).

3 *Ocean*-class central battery iron-clads.

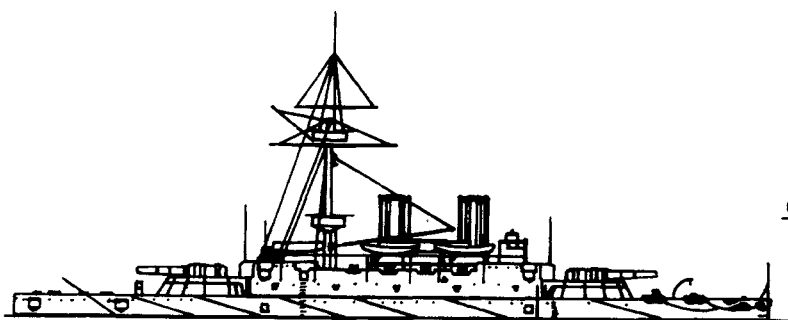
1 *Sfax*-class protected cruiser.

1 *Condor*-class torpedo gunboat.

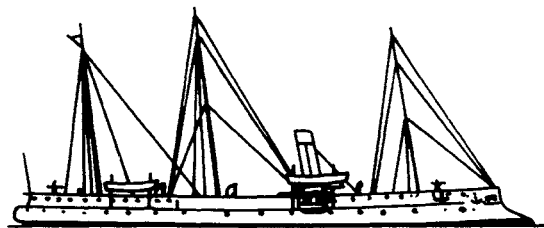
Setup: The British enter from one table edge; the French enter from the opposite edge. Initial range is 20 cables.

Victory: The French must exit at least one *Ocean*-class battleship under its own power off of the same edge from which the British entered.

If all three *Ocean*-class ships are sunk or dead in the water, then the British win the battle.



Admiral



Condor

Colonial Station (Britain vs. Germany)

3

THE BRITISH and Germans are at war. Off the coast of German East Africa a British scouting squadron out of Mombassa encounters two German warships raiding British merchant shipping.

Battle Area: Open sea.

● **German Squadron:** (Trained, Leadership +1).

1 *Irene*-class protected cruiser.

1 *Carola*-class corvette.

● **British Squadron:** (Crack, Leadership +0).

1 *Mersey*-class protected cruiser.

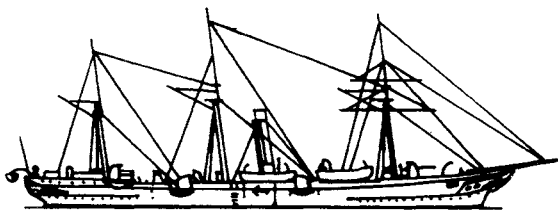
1 *Nymphe*-class sloop.

Setup: The British enter from one table edge.

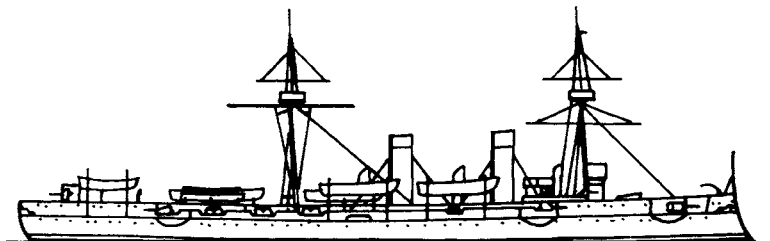
The Germans enter from the opposite edge.

Initial range is 15 cables.

Victory: The last player with a ship afloat on the map wins.



Nymphe



Irene

David vs. Goliath (Britain vs. Italy)

4 ITALY AND Great Britain are at war, and other commitments keep much of the Royal Navy busy outside the Mediterranean. Enough of a battle squadron is left to bottle up the bulk of the Italian fleet at Taranto. When a storm breaks off the coast of Italy, however, several Italian warships slip through the blockade. While the British pursuit ranges far to the east, covering the Alexandria naval base from attack, one Italian battleship and its escort steam undiscovered toward the British coaling station on Malta. All that stands in the path of the bombardment is a handful of torpedo vessels.

Battle Area: Open sea.

● **Italian Squadron:** (Trained, Leadership +0).

- 1 *Italia*-class turret battleship.
- 1 *Etna*-class protected cruiser.
- 1 *Flavio Gioia*-class corvette.

● **British Squadron:** (Crack, Leadership +1).

1 *Rattlesnake*-class torpedo gunboat.

1 *Grasshopper*-class torpedo gunboat.

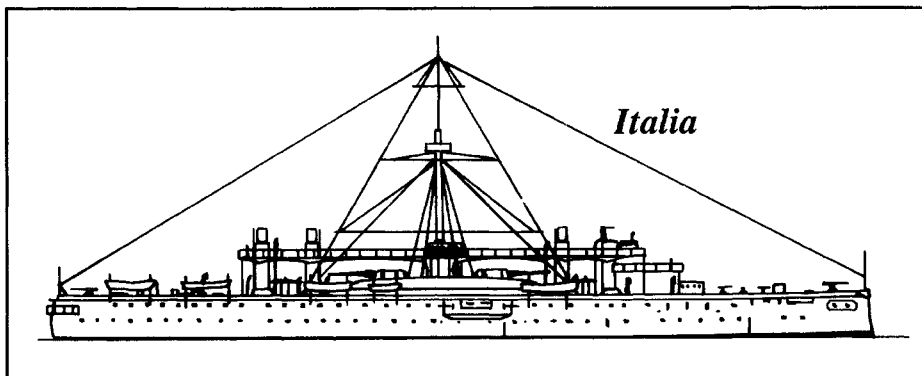
4 *Thornycroft 125*-class torpedo boats.

1 *Nordenfelt* submarine.

1 *Macefield*-class aerial gunboat.

Setup: The two squadrons enter from opposite table edges. Initial range is 20 cables.

Victory: The Italians must exit the battleship off the edge from which the British entered. If the *Italia*'s maximum speed is reduced to 1 due to hull hits and/or flooding it will automatically turn back, and the British win.



Defense of Melbourne (Britain vs. Russia)

5 RUSSIA AND Great Britain are at war. While major fleet actions occur in the Baltic, the Russian Pacific Squadron steams south to invade the Australian port city of Melbourne. With most of the British Pacific fleet recoaling at Singapore, the defense of Melbourne rests with one armored cruiser, the naval forces of Queensland (a coastal defense monitor and gunboats *Victoria* and *Albert*), and the huge interplanetary ether flyer *Duke of York*.

Battle Area: Melbourne Harbor.

● **Russian Squadron:** (Trained, Leadership +0).

1 *Kniaz Pjarski*-class central battery ironclad.

1 *Monomakh*-class armored cruiser.

1 *Nakhimov*-class armored cruiser.

2 *Kreiser*-class sloops.

2 *Czarina*-class aerial gunboats.

● **British and Australian Squadron:** (Trained, except where noted, Leadership +0).

- 1 *Nelson*-class armored cruiser (Crack).
- 1 *Cerberus*-class coastal defense monitor.

1 *Albert*-class gunboat (Australian).

1 *Victoria*-class gunboat (Australian).

1 *Duke of York*-class ether battleship (Crack).

1 shore battery (surface) with 1 10" breechloader and armor value of 6.

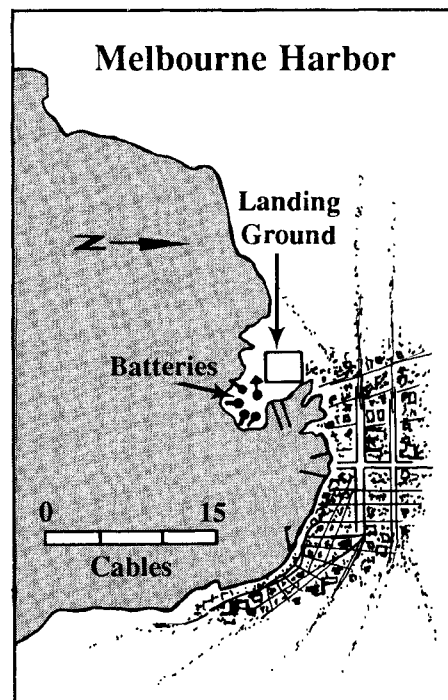
3 shore batteries (surface), each with 1 8" breechloader and an armor value of 4.

1 shore battery (high angle) with 1 4.7" quick-firing breechloader and an armor value of 4.

Setup: All British and Australian ships begin at anchor in any deep-water areas of Melbourne harbor. The British aerial gunboat begins landed on the landing ground of Melbourne. The Russians enter from the south edge of the table. Initial range is 10 cables.

Victory: The Russians must bombard Melbourne and inflict 15 points of damage on each of six locations. The British and Australians must prevent this. The *Duke of York* is not an expendable asset,

and damage to it will have serious consequences: If one full row of hull damage boxes is filled in on the *Duke of York* the British automatically lose.



Battle of Hango (Britain vs. Russia)

6

RUSSIA AND BRITAIN are at war, and naval actions rage throughout the Baltic and Black seas.

In the Baltic, the British launch a major naval operation intended to destroy the Russian naval base at Hango. But before the marines can be landed, the British have to overcome

the Russian coastal ironclads.

Battle Area: The open sea approaches to Hango Harbor. Initial range is 15 cables.

● **British Squadron:** (Crack, Leadership +0).

1 *Dreadnought*-class turret battleship.

1 *Admiral*-class turret battleship.

1 *Temeraire*-class central battery ironclad.

2 *Orlando*-class armored cruisers.

1 *Macefield*-class aerial gunboat.

● **Russian Squadron:** (Green, Leadership +2).

1 *Ad. Lazarev*-class coastal defense monitor.

3 *Bronenosetz*-class coastal defense monitors.

2 *Pervenetz*-class coastal defense monitor.

4 *Yalta*-class torpedo boats.

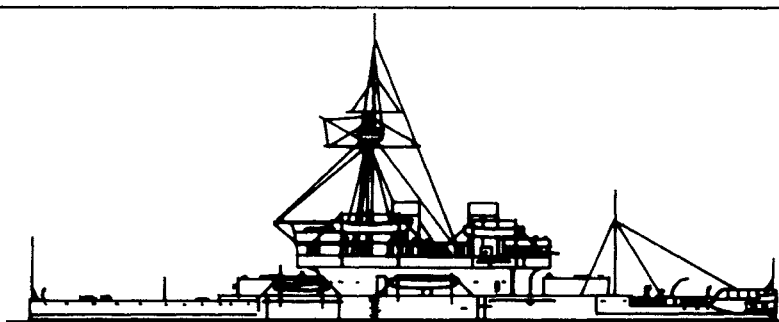
1 *Czarina*-class aerial gunboat.

Setup: The British enter on one table edge.

The Russians enter on the opposite edge.

Victory: The British win by exiting at least three naval vessels off of the map edge on which the Russians entered.

If the Russians prevent this they win.



Dreadnought

Battle of Mindanao (Spain vs. China)

7

FOLLOWING ANTI-CHINESE riots in the Philippines (a Spanish colonial possession), an Imperial Chinese squadron put to sea and bombarded several Philippine coastal villages in retaliation. South of the island of Mindanao the Spanish Pacific Squadron intercepted the Chinese, and a run-

ning battle ensued.

Battle Area: Open sea south of Mindanao.

● **Chinese Squadron:** (Green, Leadership +0).

1 *Ting Yuen*-class turret battleship.

1 *Ping Yuen*-class armored cruiser.

1 *Chao Yung*-class protected cruiser.

1 *Yuan Kai*-class sloop.

● **Spanish Squadron:** (Trained,

Leadership +1).

2 *Luzon*-class protected cruisers.

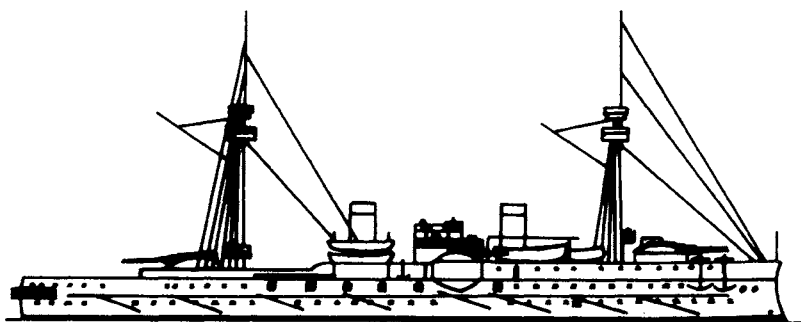
3 *Velasco*-class light cruisers.

1 *Destructor*-class torpedo gunboat.

2 *LZ5*-class Zeppelins (German).

Setup: The Chinese enter from one table edge; the Spanish enter from the other. Initial range is 15 cables.

Victory: The last player with one or more ships afloat on the map wins.



Pelayo

Battle of the Mona Passage (Brazil vs. USA)

8 WITH EUROPEAN powers occupied elsewhere, Brazil began an expansionist drive into the Caribbean, encountering unexpected resistance from the US Navy. Although Brazilian surface forces outclassed the American ships, U.S. trading concessions on Mars were paying a dividend in liftwood that gave them control of the skies. When a Brazilian battle squadron attempted to force its way through the Mona Passage, warning from aerial flyer patrols enabled the American Gulf Squadron to mass a blocking force.

Battle Area: Open sea in the Mona Passage between the islands of Hispaniola and Puerto Rico.

● **Brazilian Squadron:** (Green, Leadership +0).

- 1 *Riachuelo*-class turret battleship.
- 1 *Aquidaban*-class turret battleship.
- 1 *Almirante Barroso*-class corvette.
- 1 *Parnahyba*-class sloop.

● **United States Squadron:**
(Crack, Leadership +2).

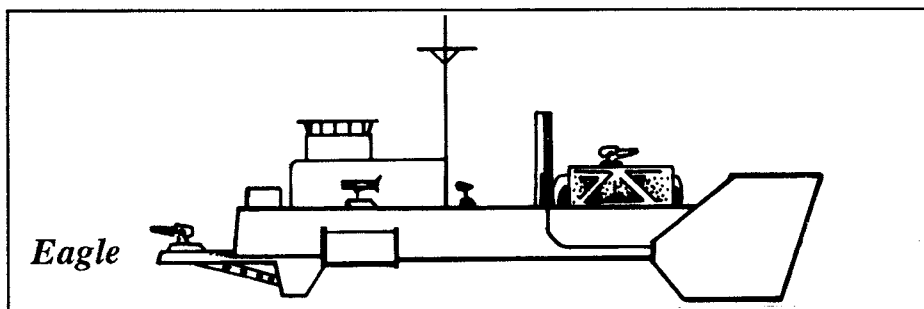
- 1 *Atlanta*-class protected cruiser.
- 1 *Chicago*-class protected cruiser.
- 1 *Brooklyn*-class corvette.
- 2 *Galena*-class sloops.
- 1 *Nautilus*-class submarine.
- 2 *Eagle*-class aerial rocket sloops.

Setup: The Brazilian squadron

enters on one table edge; the American squadron enters on the other. Initial range is 15 cables.

Victory: The Brazilians must exit at least one battleship off the map edge from which the Americans entered. Any battleship losing half its hull hits will break off the action and withdraw by its best remaining speed.

Special Rules: The sides of the table from which the two sides did not enter are rocks and shoals. Any vessel on one of those sides is sunk.



Action at Martinique (Britain vs. France)

9 THE BRITISH and French are at war—parts of France's Mediterranean Squadron have given the British blockading forces the slip. When the small British West Indies Squadron discovered this force coaling at Martinique, word was sent by aerial dispatch boat to the Atlantic Squadron. In the meantime, the West Indies Squadron will have to delay it.

Battle Area: The harbor at Martinique and the open sea approaches.

● **French Squadron:** (Crack, Leadership +2).

- 1 *Terrible*-class turret battleship.
- 1 *Colbert*-class central battery ironclad.
- 1 *Vauban*-class armored cruiser.
- 1 *Bayard*-class armored cruiser.
- 2 *Villars*-class light cruisers.
- 2 *Bisson*-class sloops.
- 1 *Gloire*-class aerial cruiser.

3 shore batteries (surface), each with 1 10" breechloader and with an armor value of 4.

● **British Squadron:** (Crack, Leadership +0).

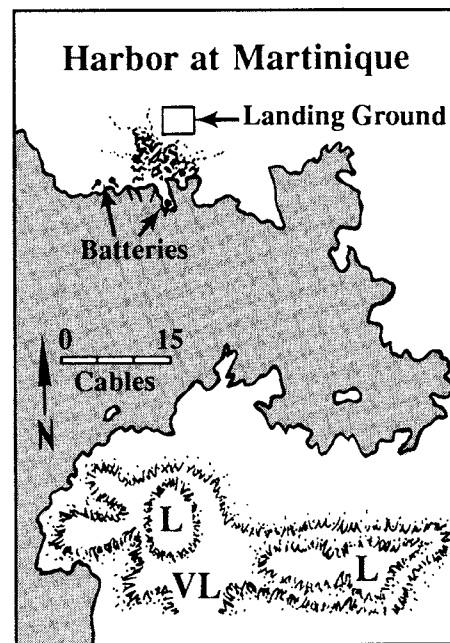
- 1 *Bellerophon*-class central battery ironclad.
- 2 *Emerald*-class corvettes.
- 1 *Satellite*-class corvette.
- 2 *Thornycroft-125*-class torpedo boats.
- 1 *Intrepid*-class aerial cruiser.
- 2 *Macefield*-class aerial gunboats.

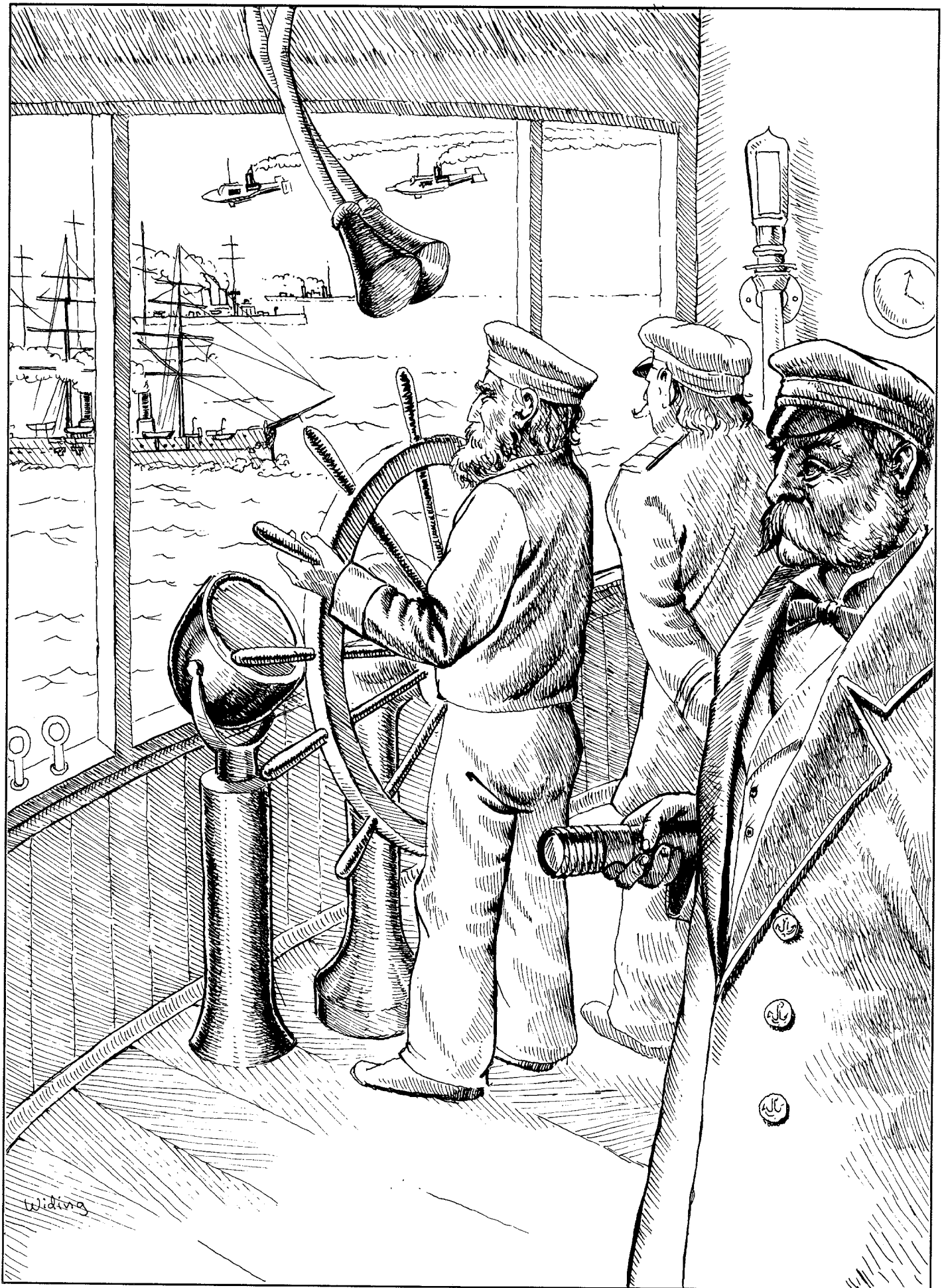
Setup: The French ships begin the game anchored in the harbor of Martinique and the aerial cruiser is landed on the landing ground. The British enter on the southwest edge of the table. Initial range is 20 cables.

Victory: The British win by sinking or crippling two of the three French heavy units (the battleship, central battery ironclad, aerial cruiser). Crippling is defined as putting a majority of a ship's guns out of commission or inflicting sufficient hull damage to lower the ship's speed to 1 or less (or the aerial cruiser's altitude to Low or less). Each two naval cruisers sunk or crippled count as one heavy unit, and so sinking all four French naval cruisers is sufficient for the British to win. Failing

this, the French win.

Special Rule: The French aerial cruiser is subject to the same rules as anchored ships. It may not fire until the crew comes to general quarters and may not move until the cruiser has its steam up.





Campaign Rules

ONCE YOU HAVE ABSORBED the basic and advanced rules of **Ironclads and Ether Flyers** and played the scenarios provided, you may want to move on to a campaign game.

A campaign allows you to pit one fleet against another. Several battles will be fought over the course of a campaign, and the results of early fights affect the forces available for the later ones.

REFEREE

ONE SPECIAL requirement for these campaigns is that a referee is needed. A referee does not play on either side, but instead adjudicates movement, spotting, and battles.

This is particularly important in the campaign games since much of the excitement comes from hidden movement and attempts to locate your opponent.

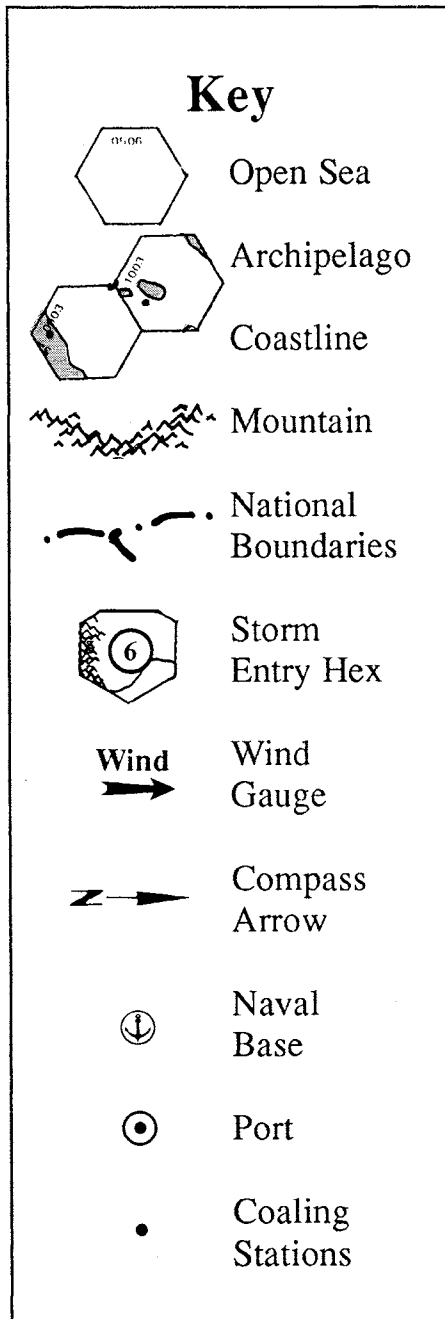
MAPS

ONE CAMPAIGN MAP is provided with each campaign.

Each of these maps has a hexagon grid for movement, and each hex of that grid represents 200 miles of distance.

The following terrain is marked on the map:

Open Sea: All full water hexes are open sea.



Archipelago: Any hex which contains two or more small islands is an archipelago hex.

Coastline: All hexes which are partially land and partially water, with the exception of archipelago hexes, are coastline hexes.

Mountain: Some hexsides are marked as mountain hexsides. Mountain hexsides affect flyer movement only.

National Boundaries: The boundaries between nations and colonies affect which ports are friendly, neutral, and hostile.

Storm Entry Hex: These numbered hexes around the edge of the map indicate where storms appear.

Wind Gauge: This shows the direction of the prevailing winds. Storms always move in the direction of the prevailing winds.

Compass Arrow: This shows the direction of north on the map.

Naval Base: A very large naval base facility with extensive shipyards and repair facilities.

Port: A large port where naval vessels can put in for coal and limited repairs.

Coaling Stations: Minor ports where ships can take on coal but cannot repair battle damage.

For the rest of these rules, the term *harbor* will be used as a collective term for all coaling stations, ports, and naval bases.

The referee of these campaigns will need to obtain a copy of the map. Additionally, each player in the campaign will need to have one or more copies.

GDW specifically gives you permission to photocopy these maps for personal use by the players and referee.

MOVEMENT

EACH TURN represents one day. All naval vessels move one hex per day at normal speed and two hexes at high speed. All flyers move three hexes per day. However, crossing a mountain hexside counts as an additional full hex of movement for flyers.

All movement is plotted in advance by each player. When a ship or group of ships leaves harbor, the owning player should plot all of its movement up until the time it arrives at another harbor. This is necessary because in 1889 admirals did not have radio or other effective means of quick communication with ships at sea. Record the movement of a squadron (a group of ships moving together) by recording the hex numbers it will enter each day. Players should give each squadron a general set of orders on what to do in case the enemy is sighted, what to do if attacked, and an alternate destination to go to in case of trouble.

Each turn, the referee examines the movement orders for the two sides and moves all ships. If he feels that a squadron has encountered a situation which its orders do not adequately cover, the referee will move the squadron as he thinks its local commander would react. The referee then compares the movement of the two sides and determines whether or not there have been any hostile ship sightings and subsequent battles.

Formations: When a player records the movement for a squadron, he must indicate if it is moving in a search line or concentrated for battle. To be in a search line there must be at least eight ships in the squadron. A squadron in line has a greater chance of contacting the enemy, but many of its ships will not be able to get to the

battle before it is decided. If the player has a large squadron, he may deploy part of it in a search line and part concentrated, as long as at least eight ships are in the search line.

Patrols: A squadron may be ordered to patrol instead of move. A squadron which patrols stays in the same hex but intensively searches for enemy ships. Flyers may be ordered to move one hex and patrol. It is possible for a naval squadron that has flyers attached to move one hex while the flyers patrol that hex for it.

Personal Command: Each player represents the commanding admiral of the fleet in the campaign, and should specify which ship he is on. The player does not have to plot in advance for the ship he is on, or any ships moving with it. Instead, he decides each turn the formation and movement of that squadron.

ENDURANCE

ENDURANCE REFERS to the number of days a ship can stay at sea without renewing its coal supply. For purposes of these rules, there are two types of vessels: coastal ships and oceangoing ships. Coastal ships include all coastal defense monitors, gunboats, torpedo boats, torpedo rams, and torpedo gunboats. Oceangoing ships are all others.

Coastal ships carry 10 units of coal each; oceangoing ships and all flyers carry 25. Ships consume one unit of coal per hex moved when at normal speed, and two units per hex at high speed. Flyers always consume one unit of coal per day spent travelling. Ships and flyers may replenish coal at coaling stations, ports, and naval bases. A flyer may replenish all its coal in one day. A ship may take on

10 units of coal per day. A maximum of four ships may take on coal at the same time at a coaling station; a maximum of eight ships may take on coal at the same time at a port; and a maximum of 12 ships may take on coal simultaneously at a naval base. Flyers do not count against these totals.

SIGHTING

ONCE THE REFEREE has finished moving all of the ships of both sides on his master map, he adjudicates sighting. Whenever ships or flyers are in or pass through the same hex, there is a chance that they will sight *each other*. Roll one die and consult the Strategic Sighting Table on page 43. Note that there are separate columns for flyers and for ships.

Add two to the die roll if patrolling. Add one to the die roll if steaming in a dispersed search line. Add three to the die roll if patrolling in a search line. Subtract one from the die roll if either side in the hex consists of a single flyer or ship. The die roll is made based on the chances of the player with the greatest possibility of sighting the enemy. If one side has both ships and flyers in the hex, roll on the flyer column only. When a side with flyers and ships successfully sights the enemy, the flyers are never required to engage the enemy ships. Instead, they can warn surface vessels of the location of the enemy vessels and direct them to safety. If the side with flyers and surface vessels elects to evade the enemy surface forces, the referee should reroll on the Strategic Sighting Table to see if the enemy finds it anyway. This roll is based on the normal chance of the enemy finding the force but is rolled with a -1 die roll modification.

STRATEGIC SIGHTING

<i>Roll</i>	<i>Ship</i>	<i>Flyer</i>
1	—	—
2	—	—
3	—	—
4	—	—
5	—	Sight
6	Sight	Sight

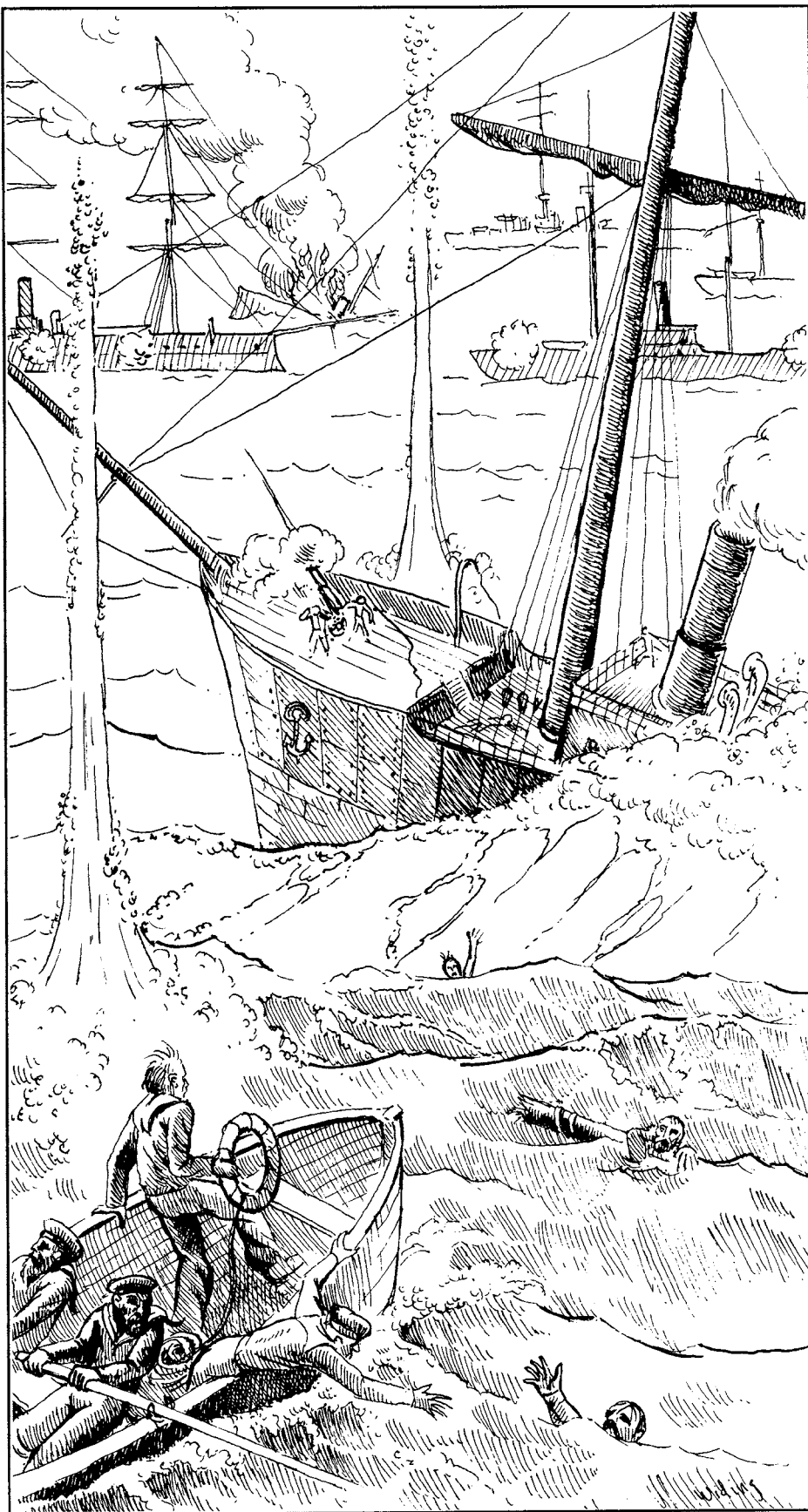
BATTLES

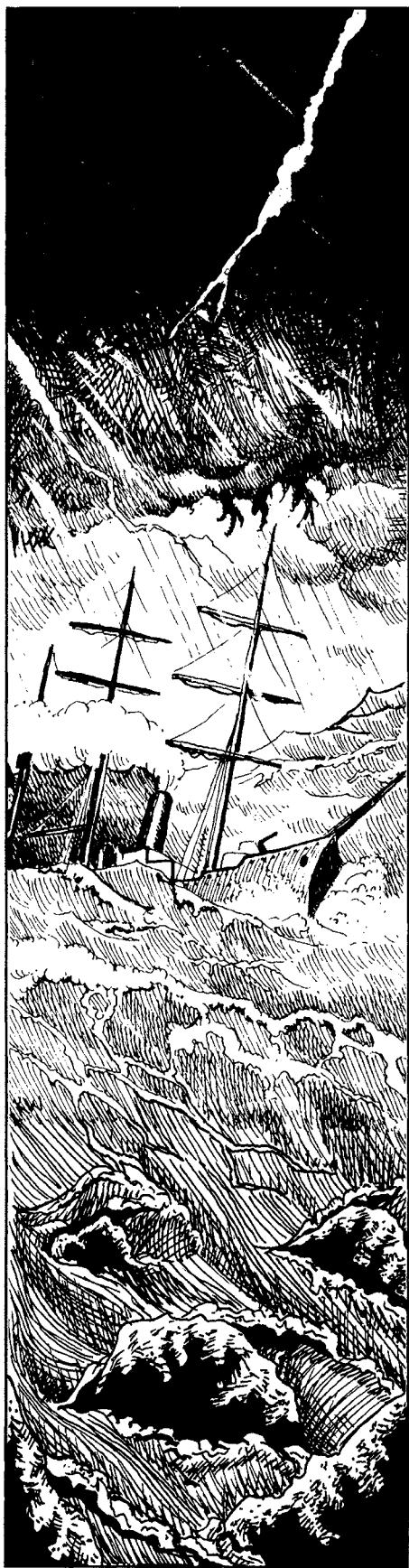
WHEN BATTLES take place, they are fought on the battle map using the normal game rules. The initial position of the ships is determined by the direction from which they entered the strategic map. For example, if one side was patrolling a hex and the other side entered the hex from the southwest, that side would enter from the southwest side of the map and the patrolling forces would enter from the opposite side.

Either side may attempt to break off the action at any time and retreat. The other side may pursue, however, and the battle continues until the referee decides that the fleeing ships are either safely beyond the reach of their pursuers or so hopelessly damaged and outnumbered, and with no hope of escape, that they will surrender.

If those forces on one side retreat, the map edge that they retreat off of determines the hex they must move into on the next turn as the first hex of their strategic movement.

If those forces on one side are in a coastal hex containing a friendly or neutral port or coaling station, and it lies in the direction in which they retreated, they may instead put into port. If they are in a coastal hex and movement in the indicated direction would cause them to move across land, the ships run aground and are scuttled (destroyed) by their crews.





WEATHER

WEATHER INVARIABLY plays a critical part in naval campaigns. It affects sightings, battles, and movement. At the start of each strategic turn while the players are determining their moves, the referee determines the weather situation for the turn. He does this in three steps: determine wind speed, move storms, generate new storms.

The referee determines the wind speed by rolling a die and consulting the Wind Speed Table on page 108. The wind speed is the number of hexes that all storms move, and may be 0, 1 or 2 hexes. Storms always move in the prevailing wind direction printed on the strategic map.

As the referee moves the storms, he notes (or remembers) which hexes were affected by a storm that turn. This is easy to reconstruct during the turn by simply recording the wind speed.

After all existing storms have moved, the referee determines whether or not a new storm appears. Roll a die and consult the Storm Appearance Table on page 108. Note that there are two separate columns: one for summer and one for winter.

The campaign notes will tell you which column to use in the campaign, but you may want to try the campaign in a different season to discover the difference it can make. If the table indicates that a storm or a large storm appears, the referee rolls 2D6 and places the storm marker in the storm entry hex that corresponds to the die roll.

No sightings or battles ever take place in a storm hex. In addition, storms affect movement of both flyers and ships.

Flyers which are plotted to enter a storm hex instead roll a die. On a 1-3, they detect the storm in time and stop before entering the hex. On a 4-6, they fail to detect the storm soon enough to avoid being hit by it. Subtract two from the die roll if the flyers are approaching the storm from upwind and add one to the die roll if they are approaching it from downwind.

All flyers which enter a storm hex have a chance of crashing. Zeppelins crash on a die roll of 5 or 6. Other flyers crash on a die roll greater than their hull size. Add two to all die rolls if the storm is a large storm.

All flyers which enter a storm hex and do not crash are not allowed to finish their planned move, but are instead placed one hex downwind from the storm. They may move normally next turn. Flyers which are on the ground at the start of a turn in a hex which a storm enters are safe, but may not take off until the storm moves away.

Naval ships which enter a storm hex must stop in that hex. Entering a storm hex counts as high speed steaming and thus consumes two units of coal. In addition, there is a chance that one or more ships will founder (sink) in the storm.

Roll the die once for each ship in the storm; the ship founders if the die roll is greater than the ship's hull size. If the storm is in a coastline or archipelago hex, subtract one from the die roll. If the storm is a major storm, add one to the die roll. Ships in port will not founder in a storm.

REPAIRS

FRIENDLY NAVAL BASES can conduct extensive repairs on ships, while

friendly ports can conduct more limited repairs. Certain types of damage are temporary in nature, such as jammed rudders and lifters, and are assumed to be repaired by the crew at the end of any battle.

Fire damage, likewise, has no permanent effects beyond the ability of the crew to repair, unless, of course, the fire has detonated a magazine. The three permanent types of damage which ports and naval bases can repair are gun hits, hull hits, and screw damage.

All repair work is calculated in terms of tasks. A task is the repair of one gun, the repair of one hull hit, or the replacement of a damaged screw. The rules below indicate which tasks can be undertaken at ports and which require a naval base. They also indicate how many work days it will take to complete each task. Each port does one work day per day; each naval base, because of its dry dock facilities and extensive repair yards, does the equivalent of three work days of work per day.

Damaged Gun: A damaged gun is defined as one which was put out of action by a weapon with a damage value of 1 (either normally or reduced to 1 by armor). Repairing a damaged gun takes one work day and can be done either in a port or a naval base.

Heavily Damaged Gun: A heavily damaged gun is one which was put out of action by a weapon with a damage value of 2 or more. Repairing a heavily damaged gun takes two work days and can only be done at a naval base.

Destroyed Gun: A destroyed gun is one which was put out of action by the explosion of its magazine. A destroyed gun may not be repaired

throughout the course of this game.

Flooded Hull: A flooded hull is defined as any hull hits caused exclusively by uncontrolled flooding. A flooded hull takes one work day to repair, and the repairs may be done at either a port or a naval base. One work day repairs all hull hits on the ship caused by flooding.

Hull Damage: Hull damage is defined as any hull hits inflicted by any cause other than uncontrolled flooding. Repairing hull damage takes one work day per hull hit repaired and can only be done at a naval base.

Damaged Screw: A damaged screw requires two work days to repair, and the work may be done at either a port or naval base.

Note: When a gun is put out of action it is necessary to record whether it was damaged, heavily damaged, or destroyed. Likewise, hull hit boxes marked off for flooding should be marked differently than those marked off due to regular battle damage.

BLOCKADE

A PLAYER who has a squadron in the same coastline hex as a port, naval base, or coaling station may blockade it. In order to maintain the blockade, he must have the squadron patrol the hex.

So long as the squadron is patrolling the hex, they automatically sight any ships attempting to enter or leave the port, naval base, or coaling station.

The only exception to this is that even a blockade will not sight ships in a storm; ships braving the storm may enter or leave the port without contacting the blockade.

COMMERCE RAIDING

A PLAYER may send one or more ships or squadrons to raid enemy commerce and coastal shipping. Whenever a ship is in an enemy coastal hex, assume that a lone enemy merchant vessel is present as well, and then roll for sighting as you normally would.

If the warship sights the merchantman, the merchant is automatically sunk.

The enemy player, however, is immediately informed of the presence of the commerce raider by the survivors of the merchant crew and/or friendly coast watchers. Each merchant vessel which is sunk gives a player five victory points, which may or may not be important, based on which campaign is currently being played.

NEUTRALS

A WARSHIP may freely enter any neutral harbor. In general, a ship may take on coal in a neutral harbor, but may not make repairs.

Exceptions are noted in the campaign notes.

A warship may only remain in a neutral harbor for seven days (turns). If warships of both sides are in a neutral harbor, the first ship to enter the harbor may leave at any time within the seven day limit, and the ship representing the opposing side may not leave until the next day.

If two different ships of one side entered the harbor on different days, and both of them arrived before the enemy vessels arrived, one could leave one day, followed by the second the next day, and the pursuing enemy ships could not leave until the third day.

AMPHIBIOUS LANDINGS

MOST OF THE CAMPAIGNS provide limited numbers of ground troops and naval transports. Each ground unit represents a battalion. Each naval transport can carry one battalion. Ground units may be landed by transports at enemy coaling stations and ports in order to capture them. Enemy naval bases may not be attacked. If there are no enemy shore batteries, ships, or flyers in the harbor, no tactical naval battle is fought. If there are ships, flyers, or batteries present, a tactical battle is fought in the harbor.

To successfully land its troops during a battle, a transport must move adjacent to a dock and remain stationary while the troops unload. At the end of each of its Movement Phases in which the transport does not move, roll a die. On a roll of 6 the battalion has finished unloading. If the transport is sunk before it finishes unloading, the battalion is destroyed. If the

transport fails a morale check due to crew casualties, it must leave the dock and may not attempt to land its troops again that day.

Once troops are landed in a harbor, the troops attack the harbor defenses. The attacker must have at least one battalion of troops ashore to attack.

The battle is resolved by both players rolling several dice. The attacker receives one die per attacking battalion ashore and one die per naval bombardment group.

A naval bombardment group is any two ships armed with 12" or larger guns, or any four ships armed with 8" or larger guns, or a combination of one ship with 12" and two with 8" or larger guns.

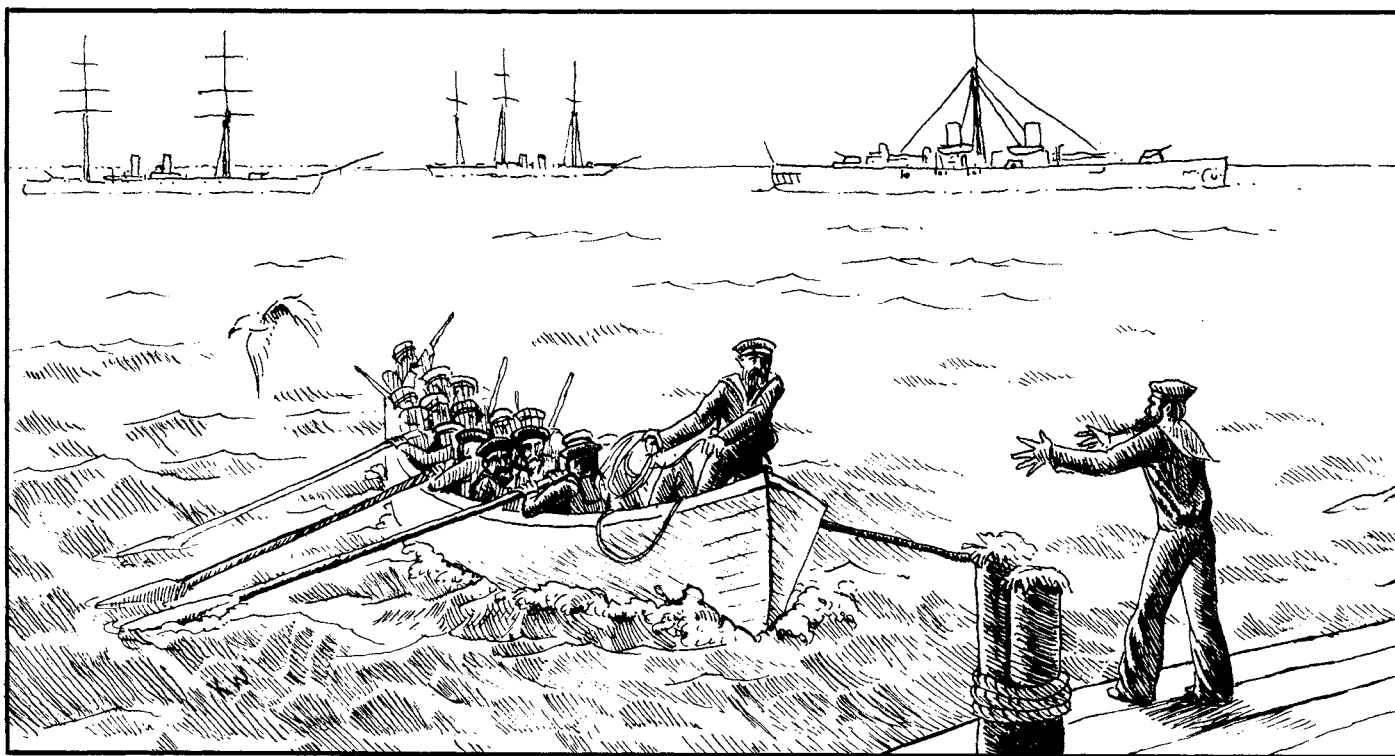
The defender rolls one die if defending a coaling station, two dice if defending a port, and one extra die for each battalion defending the harbor.

After the total number of dice is determined, both sides roll their dice

and add up their scores. The side with the highest total score wins. If the defender wins, the attacker loses one battalion, reembarks his remaining troops, and withdraws from the harbor. If the defender's score is twice that of the attackers, all attacking battalions are eliminated.

If the attacker wins, the harbor is now friendly to him and he may use its coaling and repair facilities. However, he must keep a garrison of at least one battalion in the harbor for the remainder of the game. All shore batteries are damaged, but may gradually be repaired if the harbor is a port.

The defender retreats any battalions present out of the harbor into the interior of the island or mainland. The surviving defending troops are still in the same strategic hex, but are outside of the harbor. They may be used in later turns to counterattack and recapture the harbor.



If the attacker's score is twice that of the defender, however, all defending troops are removed from play and all shore batteries are surrendered intact. The garrison requirement is, however, still in effect.

NAVAL BOMBARDMENT

NAVAL OR AERIAL bombardment of harbors can damage both the enemy's material ability to wage war as well as his will to resist. During the course of the campaign, players may send their squadrons in to bombard enemy harbors with the following effects:

Coaling Stations: A successful bombardment consists of inflicting at least 15 damage points on each of four separate locations in the town, as determined by the referee. A successful bombardment of a coaling station earns five victory points and reduces by one the number of ships that can take on coal at the same time. This reduction lasts for the rest of the game.

Ports: A successful bombardment consists of inflicting at least 15 damage points on each of six separate locations in the town. A successful bombardment earns 10 victory points.

It also reduces by one the number of ships that can take on coal at the same time and reduces the repair capacity of the port to one-half work day per day.

These reductions are in effect for the rest of the game.

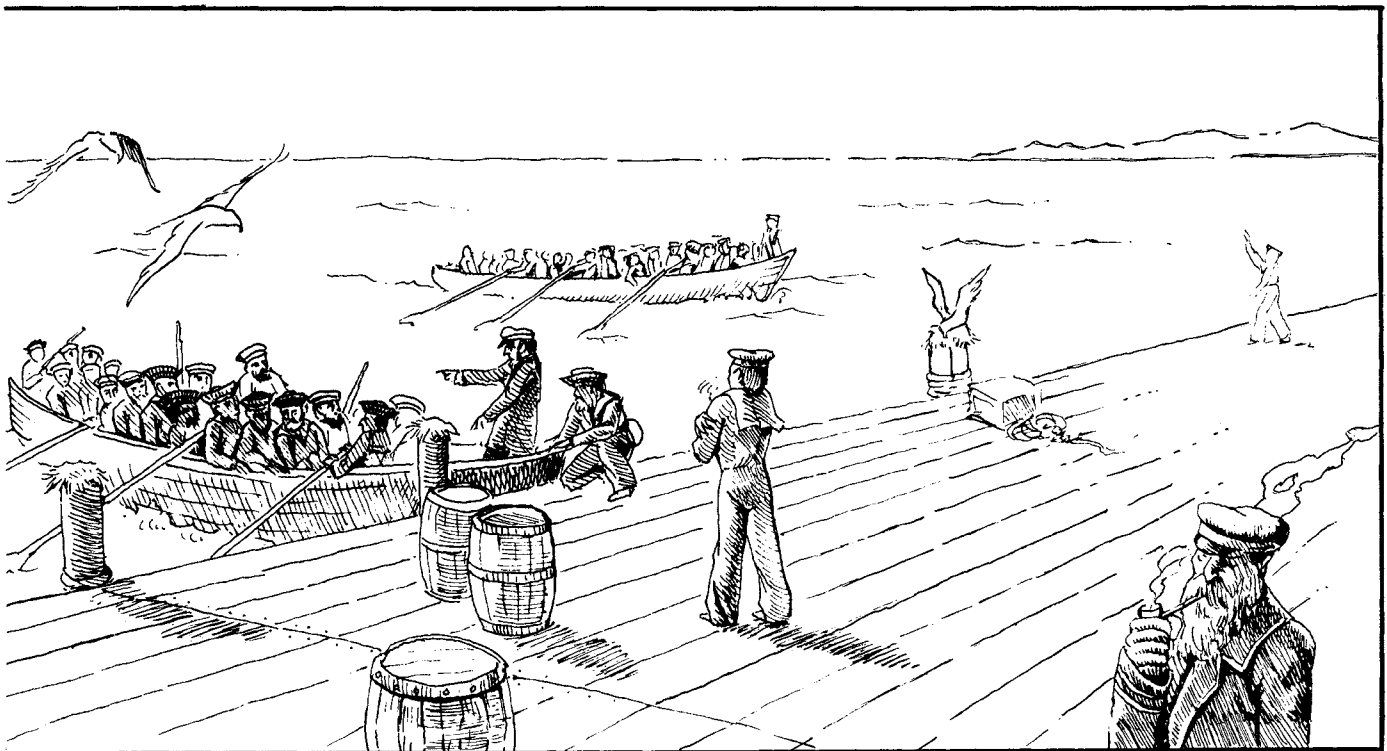
Naval Bases: A successful bombardment consists of inflicting at least 50 damage points on each of eight locations in the town. A successful bombardment earns 15 victory points. It also reduces by two the number of ships that can take on coal at the same time and reduces the repair capacity of the base to one work day per day. These reductions remain in effect for the rest of the game.

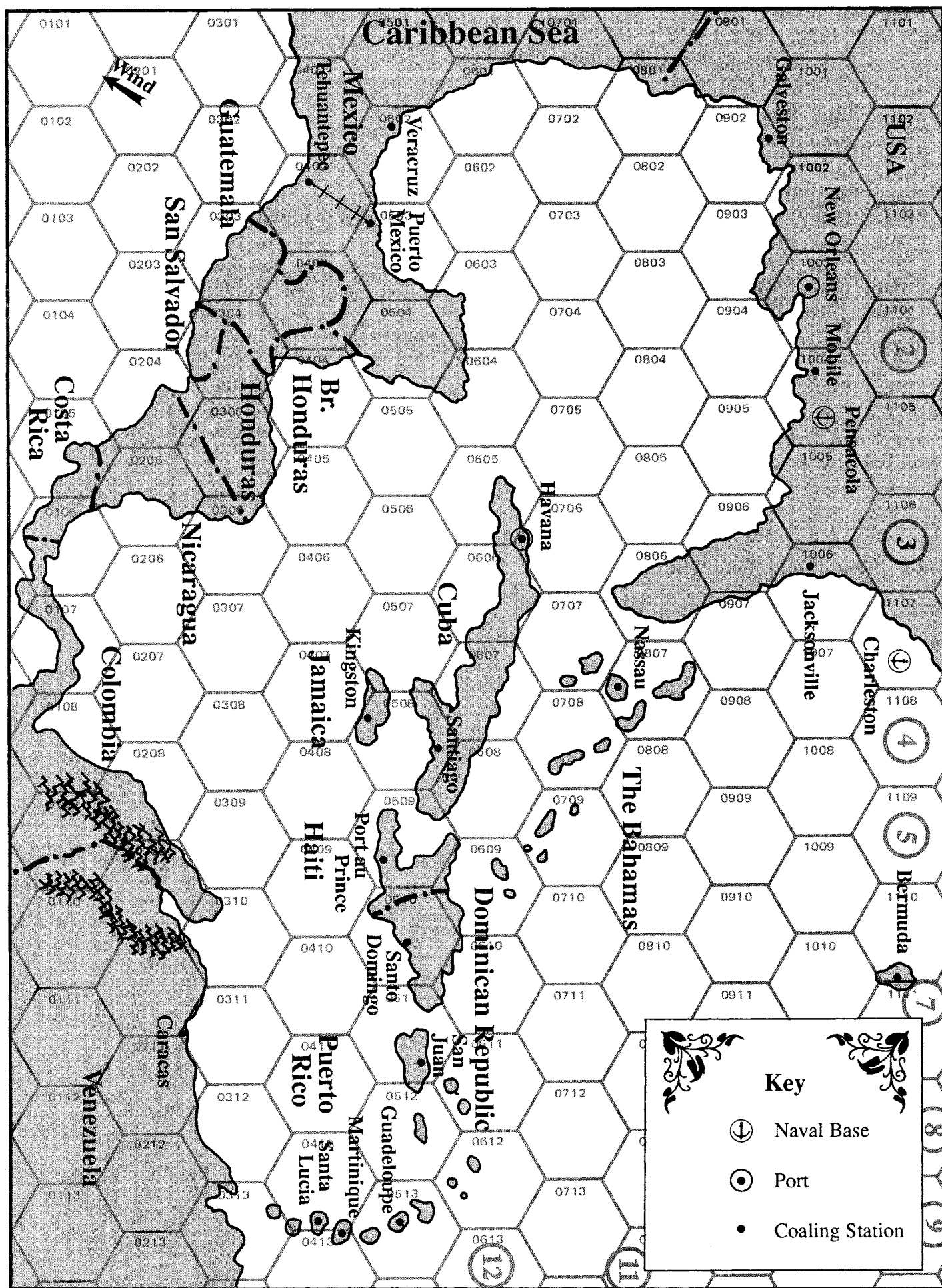
Multiple Bombardments: A player may bombard the same harbor more than once. The victory points awarded for a successful bombardment are only received the first time the harbor is bombarded, and the repair capacity of a port or base is never reduced any further after the first bombardment.

Each additional bombardment does, however, further reduce the number of ships that can take on coal at the harbor by the same amount as the first bombardment. The coaling capacity of a harbor is never reduced below half of its original level, though.

GAME LENGTH AND VICTORY

EACH CAMPAIGN sets out a game length in turns, a variety of objectives, and special victory point awards. At the end of the game, the player with the most victory points wins.





Campaign Games

Colonial Backwater (Britain vs. France)

1 BRITAIN AND France are at war.

While the British Home Fleet blockades the French Atlantic Fleet and while the two Mediterranean fleets are engaged in playing a deadly game of cat and mouse, the Caribbean squadrons fight their own war.

Although the ships in the Caribbean squadrons are smaller than are those in the Mediterranean, the stakes are still extremely high.

(As a case in point, British annual trade in the West Indies amounts to approximately \$21,000,000).

Both sides of the Caribbean battle raid each others' commerce and look for an opening to capture ports and coaling stations.

The Theater of War

COLONIAL BACKWATER is fought in the Caribbean Sea.

The campaign takes place in the summer.

The following harbors are friendly to the two belligerents.

All other harbors are considered to remain neutral.

Britain: Kingston (Jamaica), Santa Lucia, Nassau, and Bermuda.

France: Guadeloupe, Martinique.

Opposing Forces and Setup

● British Caribbean Squadron:

Any friendly harbor.

1 *Bellerophon*-class central battery ironclad.

2 *Emerald*-class corvettes.

1 *Satellite*-class corvette.

1 *Nymphe*-class sloop.

1 *Osprey*-class sloop.

1 *Frolic*-class gun vessel.

1 *Intrepid*-class aerial cruiser.

2 *Macefield*-class aerial gunboats.

4 *Thornycroft-125*-class torpedo boats.

4 transports.

1 Admiral +2.

1 Admiral +1.

In Bermuda:

2 *Viper*-class gunboats.

1 *Scorpion*-class coastal turret ironclad.

● **French Squadron:** Any friendly harbor.

1 *La Galissoniere*-class armored cruiser.

1 *Arethuse*-class light cruiser.

1 *Villars*-class light cruiser.

1 *Sane*-class light cruiser.

1 *Bourayne*-class light cruiser.

1 *Bisson*-class sloop.

4 *Balny*-class torpedo boats.

2 *Harpon*-class aerial gunboats.

4 transports.

1 Admiral +2.

1 Admiral +1

Harbor Defenses

HARBOR DEFENSES of the belligerents are as follows:

Kingston: 4×6B (armor 3), 6QF, 3 battalions.

Santa Lucia: 2QF, 1 battalion.

Bermuda: 2o6, 1 battalion.

Nassau: 2o6, 1 battalion.

Guadeloupe: 2o6, 1 battalion.

Martinique: 3×10B (armor 4), 5 battalions.

Note: All shore batteries are surface batteries except for the QF batteries at Kingston and one of the QF batteries at Santa Lucia.

All of the QF batteries are high angle.

Special Rules

THERE ARE NO special rules for this campaign.

Campaign Length and Victory

THE COLONIAL BACKWATER campaign lasts for 180 turns.

At the end of that time, hostilities are concluded due to events outside the scope of the campaign.

The player who has the most victory points at the end of the game wins.

In addition to victory points for raiding commerce and bombarding harbors, both players also receive points for sinking ships and capturing harbors.

Each enemy ship which is sunk during the campaign provides points equal to its mass divided by two (with fractions rounded down).

Armored ships sunk provide points equal to their mass.

The capture of Kingston or Martinique is worth 80 points.

The capture of any of the other harbors is worth 40.

A Rising Young Star (U.S.A. vs. Spain)

2 WITH TENSIONS over the revolts in Puerto Rico and Cuba, and Spanish efforts to suppress them, the United States and Spain come to blows. The Spanish raid U.S. commerce as the Americans look for openings to slip an army into Cuba or Puerto Rico to aid the rebels.

The Theater of War

A RISING YOUNG STAR is fought in the Caribbean Sea in the summer. These harbors are friendly to the two belligerents; all others are neutral.

United States: Galveston, New Orleans, Mobile, Pensacola, Jacksonville, Charleston.

Spain: Havana (Cuba), Santiago (Cuba), San Juan (Puerto Rico).

Opposing Forces and Setup

● United States Gulf Squadron:

In U.S. harbors, but no more than one transport and one coastal defense monitor per harbor.

1 *Charleston*-class protected cruiser.

1 *Brooklyn*-class corvette.

3 *Passaic*-class coastal defense monitors.

2 *Canonicus*-class coastal defense monitors.

2 *Galena*-class sloops.

2 *Enterprise*-class sloops.

2 *Eagle*-class aerial rocket sloops.

1 *Nautilus*-class submarine.

4 transports.

1 Admiral +1.

● United States Atlantic Squadron:

2 *Atlanta*-class protected cruisers.

1 *Hartford*-class corvette.

1 *Pensacola*-class corvette.

2 *Ossipee*-class sloops.

2 *Enterprise*-class sloops.

1 *Peacemaker*-class submarine.

2 transports.

1 Admiral +2.

● Spanish Caribbean Squadron:

1 *Reina Regente*-class protected cruiser.

1 *Tornado*-class corvette.

1 *Maria de Molina*-class corvette.

2 *Jorge Juan*-class sloops.

2 *Concha*-class gunboats.

1 *Lezo*-class gunboat.

1 *El Cano*-class gunboat.

4 torpedo boats (*Barcezo*, *Bus-tamente*, *Habana*, *Ejercito*).

1 Admiral +1.

● Spanish Atlantic Squadron:

1 *Pelayo*-class turret battleship.

1 *Luzon*-class protected cruiser.

2 *Velasco*-class light cruisers.

1 *Peral*-class submarine.

3 *LZ5*-class zeppelins (German).

4 transports carrying 4 battalions.

Harbor Defenses

HARBORS OF THE belligerents are defended as follows:

Galveston: 2o8, 2QF, 1 battalion.

New Orleans: 2x8B (armor 3), 4o6 (armor 1), 6QF, 6 battalions.

Mobile: 2o8 (armor 3), 2x6B (armor 4), 2QF, 2 battalions.

Pensacola: 2x8B (armor 3), 4QF, 1 battalion.

Jacksonville: 2o6, 2QF.

Charleston: 2x8B (armor 3), 4o6 (armor 1), 4QF, 4 battalions.

Havana: 4o8 (armor 2), 4QF, 3 battalions.

Santiago: 2o6 (armor 1), 2QF, 2 battalions.

San Juan: 2o8 (armor 2), 2QF, 2 battalions.

Note: All shore batteries are surface batteries except for the QF batteries, which are high angle.

Special Rules

HARBORS IN the United States may not be invaded; their garrisons are sufficiently strong to repulse a Spanish landing attempt, even if all the battalions listed in the forces above are moved away. The Atlantic squadrons of the two sides appear as reinforcements. The referee begins rolling for the U.S. squadron on turn 30 and for the Spanish squadron on turn 40. They appear the first turn that he rolls a 6. These rolls can be conducted before the game, if desired, but the results should be kept secret from the players until their squadrons enter the map. Both players should preplot the movements of the Atlantic squadrons from the time they enter the eastern map edge and should not know of their entry until their reinforcing squadron is sighted by friendly or enemy ships, or enters a harbor.

Campaign Length and Victory

THE CAMPAIGN automatically lasts for 100 turns. The referee then rolls a die at the end of every tenth turn. When he rolls a 6, the European powers impose a cease-fire and the game stops. The player with the most victory points wins.

In addition to victory points for raiding commerce and bombarding harbors, both players also receive points for sinking ships, and the American player gains points for capturing harbors.

Each enemy ship sunk provides points equal to its mass divided by two (with fractions rounded down). Armored ships sunk provide points equal to their mass.

The capture of Havana or San Juan is worth 80 points, while Santiago is worth 40.

The Gunboat War (U.S. and Haiti vs. C.S.A.)

3 IN THE LATE 1880s, a group of former Confederate expatriates living in Mexico hatched a wild scheme to conquer Haiti and reestablish the Confederacy. The group set up several dummy organizations and in 1888 managed to purchase the old British gun vessel HMS *Condor* (renaming it the CSS *Charleston Bay*), and three transports. The small fleet formed at Puerto Mexico in 1889, but shortly before it sailed, the American consul discovered the plan and alerted Washington. Washington warned Haiti and sent several patrol vessels south to intercept the invasion force. For the first time, Haiti's small navy put to sea in defense of its land.

The Theater of War

THE GUNBOAT WAR is fought in the Caribbean Sea. The campaign takes place in the summer. No harbors are friendly to the Confederate player. These harbors are friendly to the Haitian player; all others are neutral.

Haiti: Port au Prince (Haiti), Galveston, New Orleans, Mobile, Pensacola, Jacksonville, Charleston.

Opposing Forces and Setup

● **Confederate Fleet (Trained):**
In Puerto Mexico.

1 gun vessel (*Charleston Bay*—see statistics for the *Condor* in the Great Britain listings of "Ships of the World.")

3 transports carrying troops

● **Haitian Fleet:** In Port au Prince.

1 corvette (*Dessalines*)

1 gunboat (*1804*)

1 gunboat (*22 December*)

1 gunboat (*Saint Michael*)

1 gunboat (*Toussaint-Louverture*)

● **U.S. Patrol Squadron:** In any U.S. harbor.

1 *Petrel*-class patrol gunboat

1 *Eagle*-class aerial rocket sloop

Harbor Defenses

THE AMERICAN harbors are so well defended that if the Confederates enter any of them, they lose. Port au Prince is defended by 2o6 (armor 2) surface batteries.

Special Rules

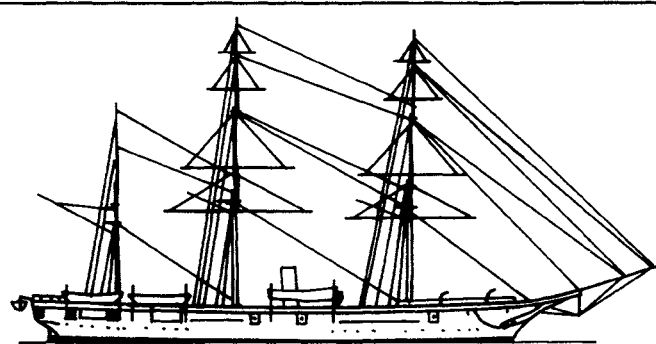
THE U.S. SHIP and flyer may not fire at Confederate ships until the Confederates fire at them or at a Haitian ship,

or move into a Haitian coastal hex.

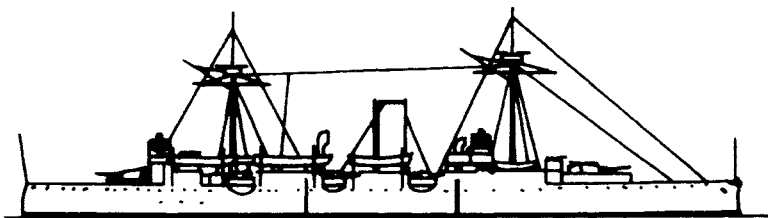
The Confederate invasion force may be landed anywhere on the Haitian coast. To do so, at least two Confederate transports must remain stationary in a Haitian coastline hex for one complete campaign turn. If they have not been sunk or driven off by the end of the turn, they have successfully landed the invasion force.

Campaign Length and Victory

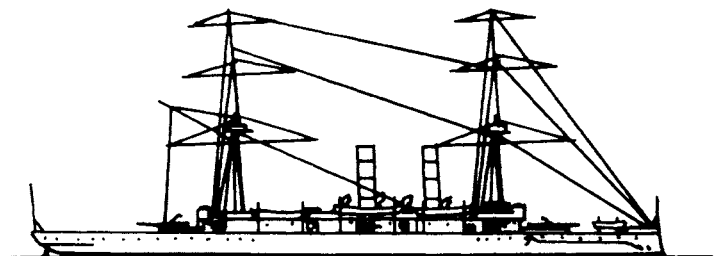
THE CAMPAIGN lasts for a maximum of 60 turns. If at the end of that time the Confederates have landed troops on Haiti, they win; otherwise the Haitians win.



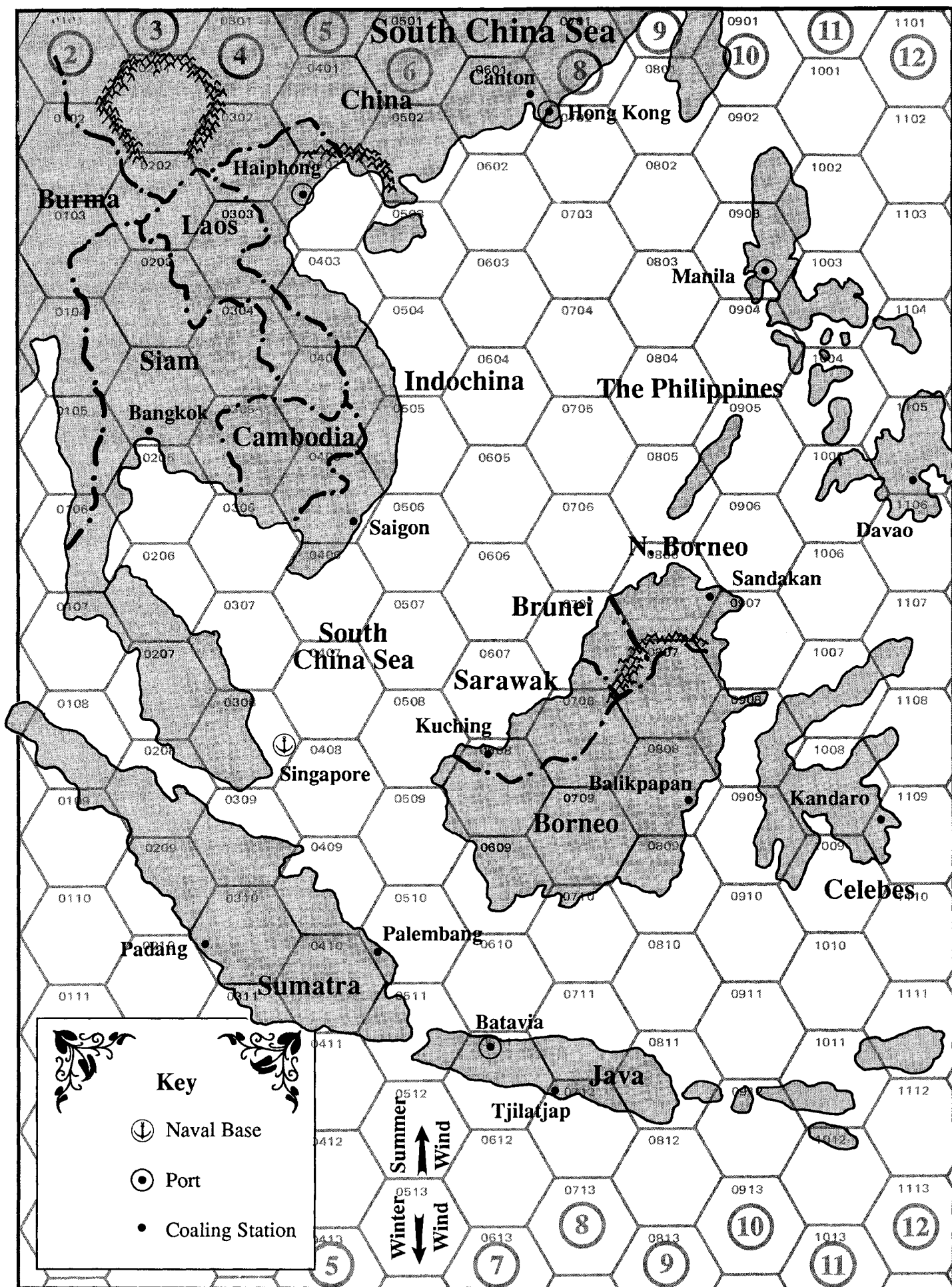
Ossipee



Charleston



Atlanta



The Struggle for Oil

(Spain vs. the Netherlands)

4 AS THE 1880s closed, petroleum as a strategic resource grew in importance. Spain, realizing her lack of oil and the weakness of the Dutch forces in the Dutch East Indies, tried to seize the Netherlands' resources in the Pacific.

The Theater of War

THE CAMPAIGN is fought on the South China Sea map in winter. These harbors are friendly to the two belligerents; all others are neutral.

Dutch: Batavia (Java), Tjilatjap (Java), Balikpapan (Borneo), Padang (Sumatra), Palembang (Sumatra), Kendaro (Celebes).

Spanish: Manila (The Philippines), Davao (The Philippines).

Opposing Forces and Setup

● **Spanish Pacific Squadron:** In Manila.

1 *Mendez Nuñez*-class central battery ironclad.

2 *Luzon*-class protected cruisers.

1 *Aragon*-class light cruiser.

5 *Velasco*-class light cruisers.

1 *Alfonso XII*-class light cruiser.

1 *Destructor*-class torpedo gunboat.

1 *Duero*-class gunboat.

4 torpedo boats (*Acevedo*, *Julian*, *Ordenez*, *Retamosa*, *Orion*).

4 LZ5-class zeppelins (German).

4 transports.

1 Admiral +2.

● **Dutch West Indies Squadron:**

Gunboats in any harbor, and at least one gunboat in each harbor. All non-gunboats in Batavia. (See Netherlands in "Ships of the World.")

4 *Atjeh*-class light cruisers.

6 *Djambi*-class corvettes.

8 *Batavia*-class gunboats.

2 *Suriname*-class gunboats.

2 *Pontianak*-class gunboats.

2 *Ceram*-class gunboats.

4 *Ardjoeno*-class torpedo boats.

1 *Locust*-class aerial gunboat (Great Britain).

2 transports.

2 Admirals +1.

Harbor Defenses

HARBORS OF THE belligerents are defended as follows:

Batavia: 2o8 (armor 2), 2o6 (armor 1), 2QF, 3 battalions.

Tjilatjap: 2o6 (armor 2), 2QF, 1 battalion.

Balikpapan: 2o6 (armor 2), 1 battalion.

Padang: 2o6 (armor 2).

Palembang: 2o6, 1 battalion.

Kendaro: 1o6.

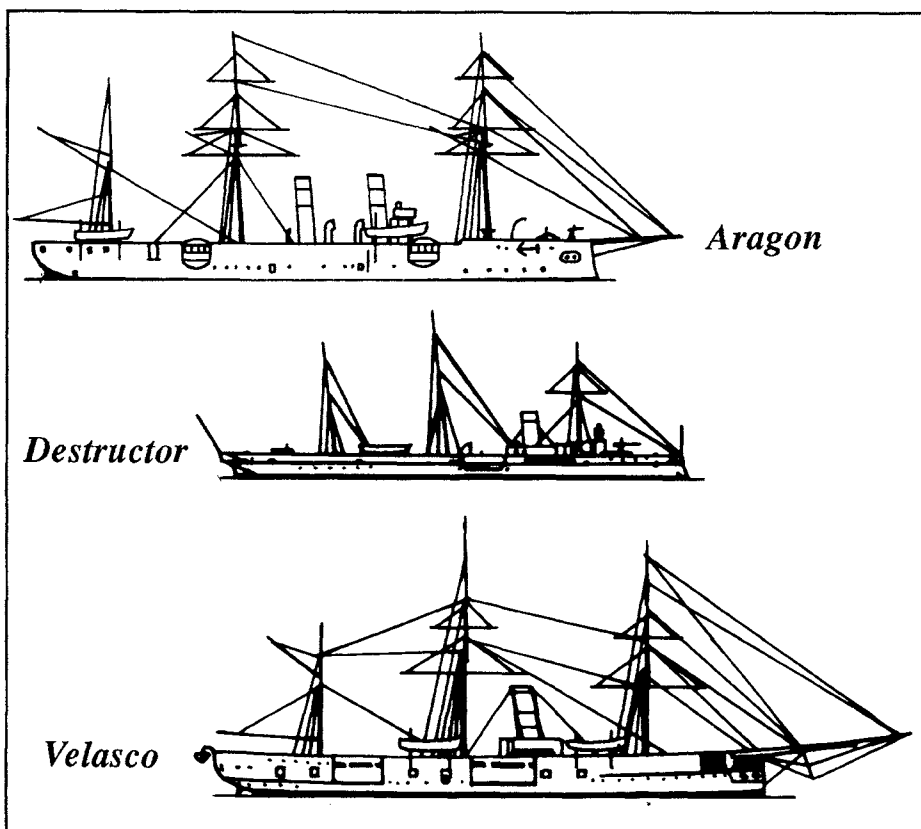
Manila: 2x8B, 2x6B, 4QF, 8 battalions.

Davao: 1o6, 2 battalions.

Note: All shore batteries are surface batteries except for the QF batteries, which are high angle.

Campaign Length and Victory

THE CAMPAIGN lasts 100 turns. The referee then rolls a die at the end of every tenth turn. When he rolls a 6, the European powers impose a cease-fire and the game stops. The player with the most victory points at the end of the game wins. Only the Dutch player gets victory points for commerce raiding and bombardment of harbors. Both players get points for sinking ships and capturing harbors. Each enemy ship sunk provides points equal to its mass divided by two (with fractions rounded down). Armored ships sunk provide points equal to their mass. The capture of Batavia or Manila is worth 80 points, while the other harbors are worth 40.



The Eastern Flank (Britain vs. France)

5 FRANCE AND Britain are at war. Their colonial squadrons in the Pacific struggle for control of the rich lands there.

The Theater of War

THE CAMPAIGN is fought on the South China Sea map in the summer. These harbors are friendly to the two belligerents; all others are neutral.

Britain: Singapore (Malaya), Hong Kong (China), Kuching (Sarawak), Sandakan (North Borneo).

France: Saigon (Indochina), Haiphong (Indochina).

Opposing Forces and Setup

● **French Indian Ocean Squadron:** Saigon.

- 1 *Lamperouse*-class light cruiser.
- 1 *Bourayne*-class light cruiser.
- 1 *Parseval*-class sloop.
- 1 *Bisson*-class sloop.
- 1 *Comete*-class gunboat.
- 1 *Harpon*-class aerial gunboat.
- 2 transports.
- 1 Admiral +1.

● **French China Squadron:** Haiphong.

- 1 *La Galissonniere*-class armored cruiser.
- 1 *Villars*-class light cruiser.
- 1 *Bisson*-class sloop.
- 1 *Crocodil*-class gunboat.
- 1 *Harpon*-class aerial gunboat.
- 2 transports.

● French Pacific Squadron:

- 1 *Dubourdieu*-class light cruiser.
- 1 *Infernet*-class light cruiser.
- 1 *Limier*-class light cruiser.
- 1 *Gloire*-class aerial cruiser.
- 1 *Charlemagne*-class aerial fortress.
- 2 transports.
- 1 Admiral +2.

● **British East Indies Squadron:** Singapore.

- 1 *Swiftsure*-class central battery ironclad.
- 2 *Archer*-class light cruisers.
- 1 *Bacchante*-class corvette.
- 1 *Emerald*-class corvette.
- 1 *Osprey*-class sloop.
- 2 *Mariner*-class sloops.
- 2 *Algerine*-class gun vessels.
- 1 *Condor*-class gun vessel.
- 1 *Intrepid*-class aerial cruiser.
- 1 *Duke of York*-class ether battleship.
- 2 transports.
- 1 Admiral +1.

● **British China Squadron:** Hong Kong.

- 1 *Imperieuse*-class armored cruiser.
- 1 *Scorpion*-class coastal defense monitor.
- 1 *Leander*-class protected cruiser.
- 1 *Mersey*-class protected cruiser.
- 2 *Satellite*-class corvettes.
- 1 *Comus*-class corvette.
- 1 *Archer*-class torpedo cruiser.
- 1 *Osprey*-class sloop.
- 1 *Dolphin*-class sloop.
- 2 *Linnet*-class gun vessels.
- 2 *Locust*-class aerial gunboats.
- 1 transport.

Harbor Defenses

HARBORS OF THE belligerents are defended as follows:

Singapore: 4×8B (armor 4), 6o6 (armor 2), 6QF, 2 battalions.

Hong Kong: 6×6B (armor 2), 6QF, 3 battalions.

Kuching: 2o6, 1 battalion.

Sandakan: 2o6, 1 battalion.

Saigon: 2o6 (armor 2), 2QF, 6 battalions.

Haiphong: 2o6, 2QF, 4 battalions.

Note: All shore batteries are surface batteries except for the QF batteries, which are high angle.

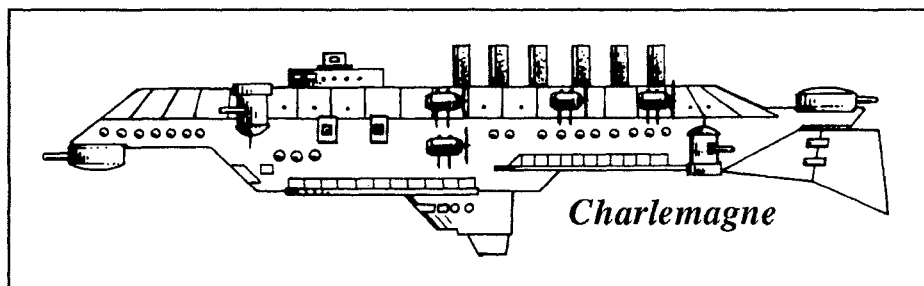
Special Rule

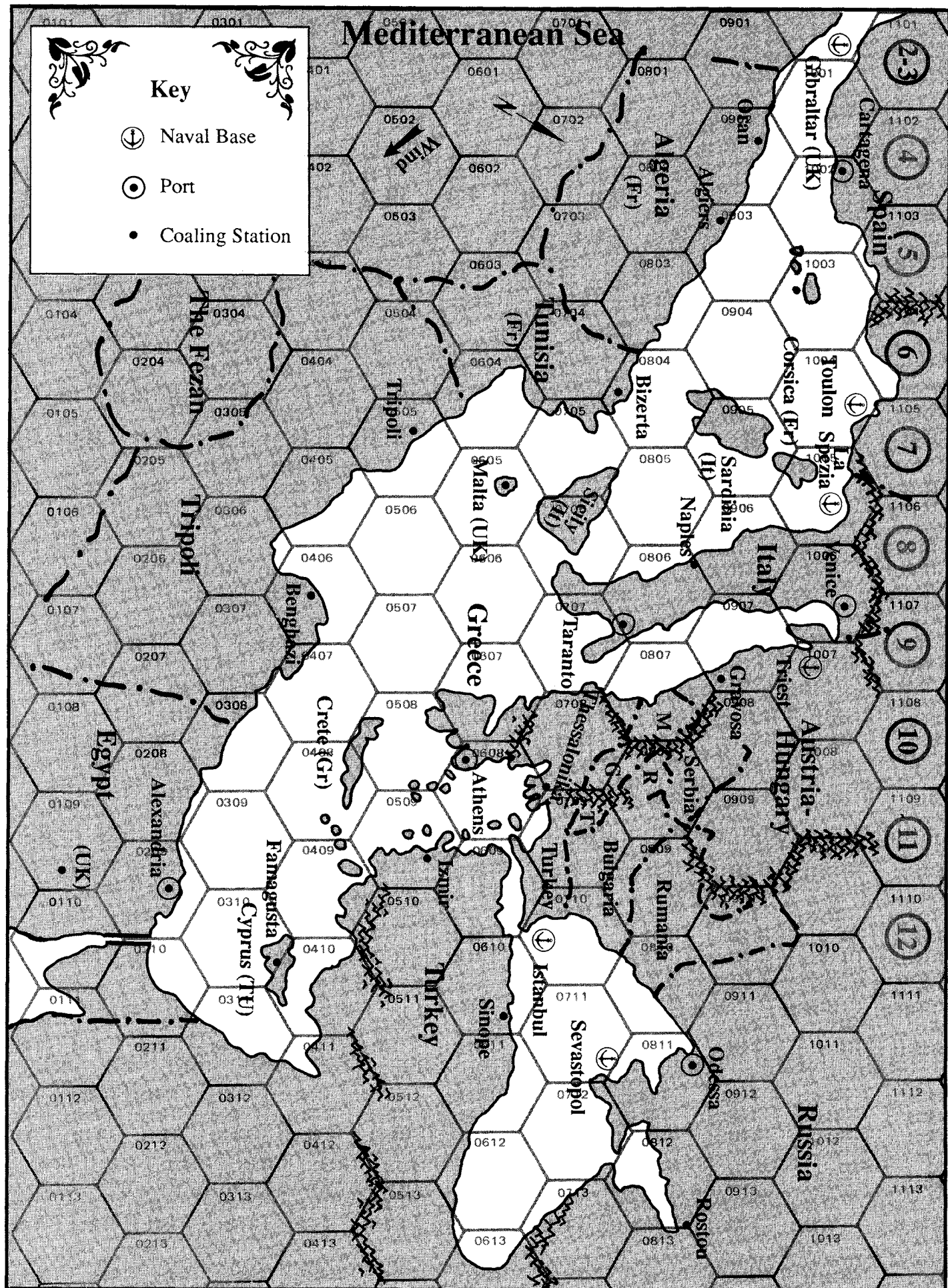
THE FRENCH Pacific Squadron arrives as a reinforcement after the game has started. The referee begins rolling on turn 10 and rolls once per turn until a 6 is rolled. The French Pacific Squadron enters the eastern edge of the map on that turn.

Campaign Length and Victory

THE EASTERN FLANK campaign lasts for 180 turns. Then, hostilities are concluded due to events outside the scope of the campaign. The player with the most victory points at the end of the game wins.

In addition to victory points for raiding commerce and bombarding harbors, both players also get points for sinking ships and capturing harbors. Each enemy ship sunk provides points equal to its mass divided by two (fractions rounded down). Armored ships sunk provide points equal to their mass. The capture of Singapore is worth 160 points, the capture of Hong Kong, Haiphong, and Saigon are worth 80 points each, and the other harbors are worth 40 points each.





The Two-Front War (Russia and Greece vs. Turkey)

6 RUSSIA AND Turkey are at war, as they were often in the 19th century. In this case, however, Greece has joined the war and its young navy distracts Turkey's attention from the Black Sea front.

The Theater of War

THE TWO-FRONT WAR is fought in the Mediterranean in winter. The following harbors are friendly to the belligerents; all others are neutral:

Russia: Odessa, Sevastopol, Rostov.

Turkey: Istanbul, Sinop, Izmir, Famagusta (Cyprus).

Greece: Athens, Salonika.

Opposing Forces and Setup

● **Turkish Fleet:** Istanbul and Izmir.

All Turkish ships listed in the "Ships of the World" section.

5 transports.

5 LZ5-class zeppelins (German).

● **Greek Fleet:** Athens and Salonika.

All Greek ships listed in the "Ships of the World" section.

4 transports.

● **Russian Black Sea Fleet:**

2 *Ekaterina II*-class turret battleships.

1 *Pamiat Merkuira*-class light cruiser.

3 *Kubanetz*-class gun vessels.

6 *Yalta*-class torpedo boats.

5 other torpedo boats (*Poti, Ghelendjik, Gagri, Izmail, Anakrie*).

2 *Czarina*-class aerial gunboats.

1 Admirals +1.

Harbor Defenses

THE TROOP STRENGTHS in the Russian harbors and those on the Turkish mainland are such that they may not be captured, even if all of the battalions listed as stationed there were removed. The Greek harbors and Famagusta (on Cyprus) may be captured. Istanbul has sufficiently strong defenses that no enemy ship

may enter the harbor. The other harbors of the belligerents are defended as follows:

Odessa: 2×8B, 2o6, 2QF.

Sevastopol: 4×10B, 2×8B, 4o6, 6QF.

Rostov: 2o6, 2QF.

Izmir: 2o6, 2QF, 8 battalions.

Sinop: 2o6, 2QF.

Famagusta: 2o4, 2QF, 1 battalion.

Athens: 2o6, 2QF, 4 battalions.

Salonika: 2o6, 4 battalions.

Note: All shore batteries are surface batteries except for the QF batteries, which are high angle.

Special Rules

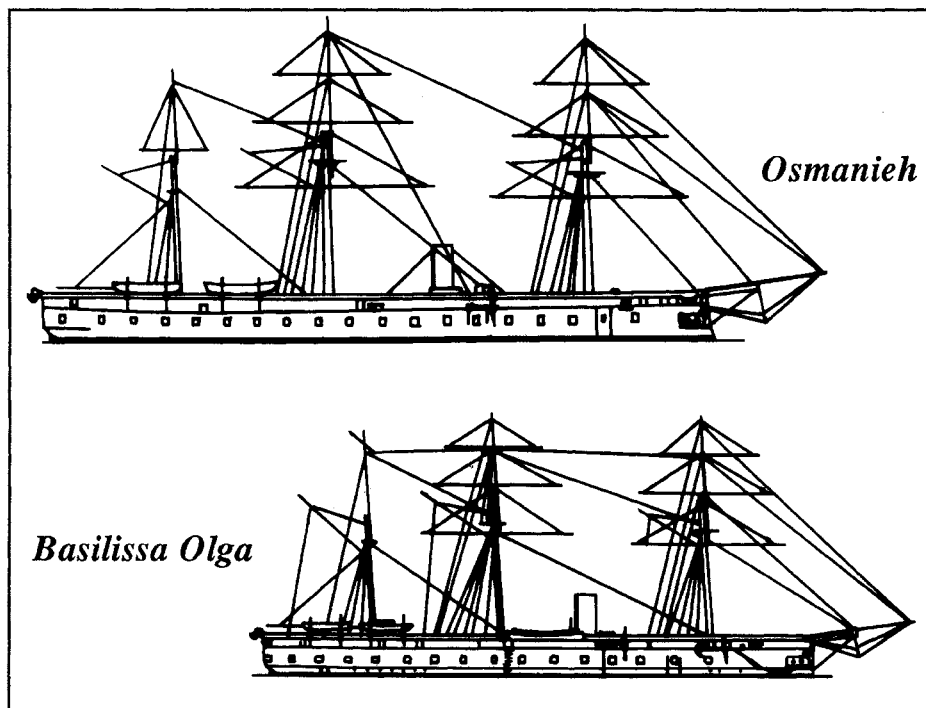
No RUSSIAN or Greek ship or flyer may enter the Istanbul hex. Mediterranean and Black Sea weather is mild; thus, storms do not pose the threat to navigation that they do elsewhere. Reduce the chance of a ship foundering in a storm by two.

Campaign Length and Victory

THE GAME lasts for at least 150 turns. At the end of that time the referee rolls a die at the end of every tenth turn. On the first turn in which he rolls a 6, the other European powers have imposed a peace. At that time, the player with the most victory points wins.

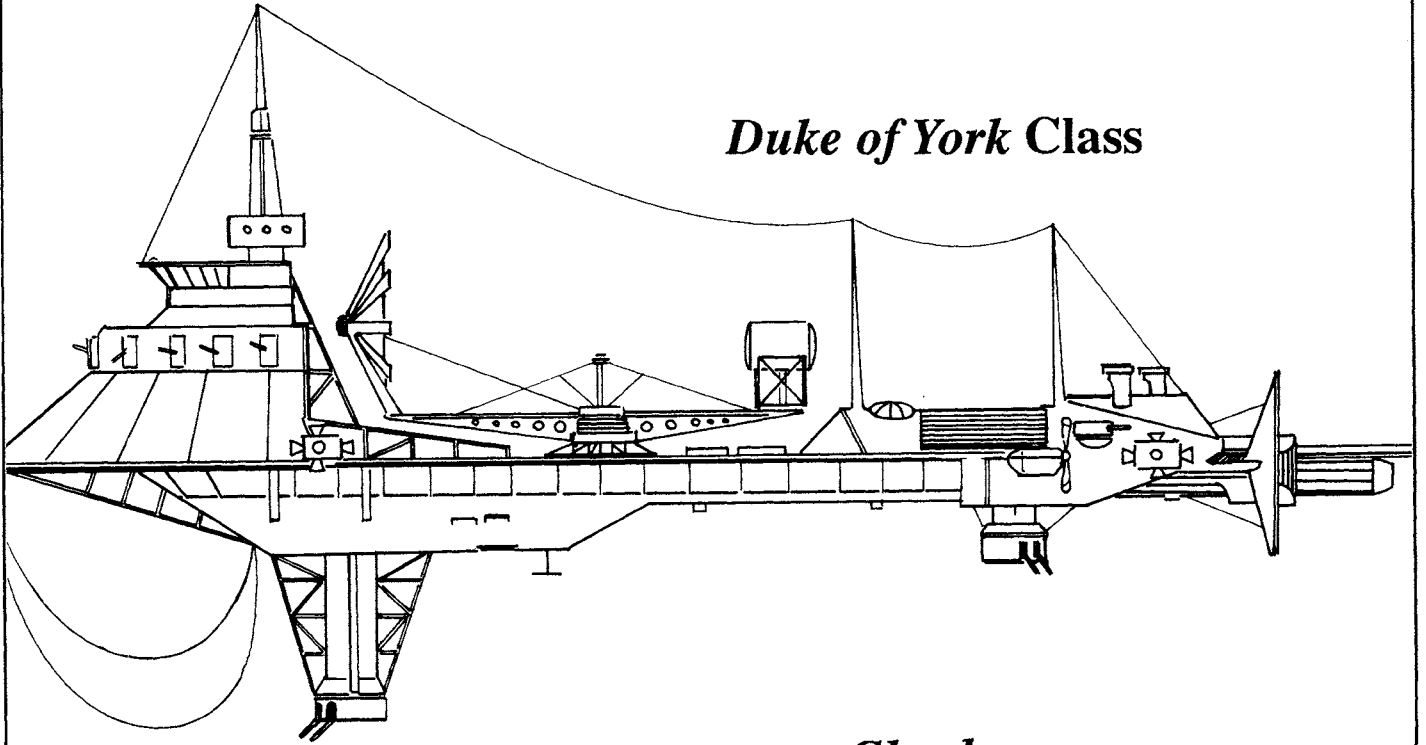
In addition to victory points for raiding commerce and bombarding harbors, both players also get points for sinking ships and capturing harbors. Each enemy ship sunk provides points equal to its mass divided by two (with fractions rounded down). Armored ships sunk provide points equal to their mass.

The capture of Athens or Famagusta is worth 80 points, while Salonika is worth 40.

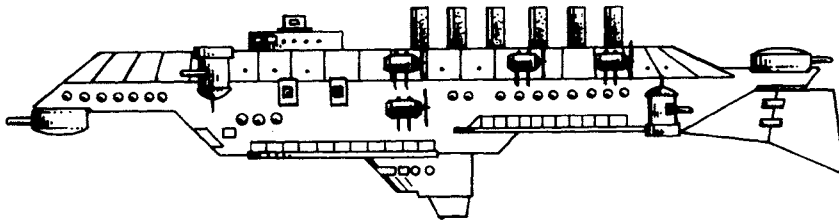


Comparative Views of the Largest Armed Aerial Vessels in Service

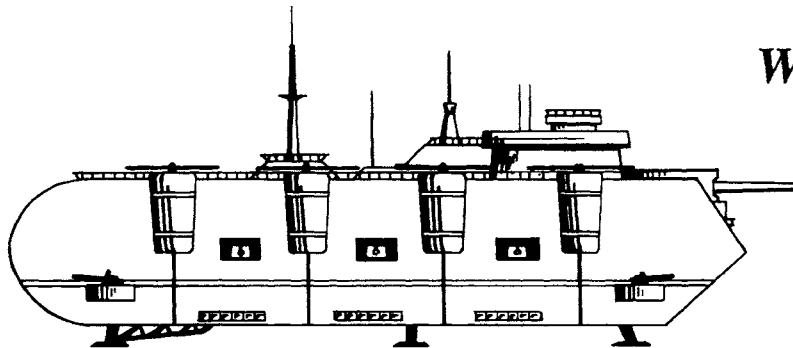
Duke of York Class



Charlemagne



Wotan



Ship Design

Naval Vessels

SHIP DESIGN consists of two general procedures: basic design and ship rating. The basic design is a simple six-step procedure that generates all the raw information about your ship. Rating enables you to determine the performance of the ship in game terms.

BASIC DESIGN

THE SIX STEPS of the ship's basic design determine its characteristics and performance.

Hull Size

SELECT A hull size (Hs), which can be any whole number. The size of the hull indicates its length, with each whole number of hull size representing 50 feet of length.

The largest warships of this era were about 400 feet long (hull size 8), but merchant ships were built that were longer than this, and longer warships could be built as well.

When the hull is selected, the designer also decides whether it will be fitted with a ram. If so, the ram weighs 10 tons per hull size.

Hulls cost £10,000 per hull size.

For example, the HMS *Trafalgar* is a ship with a size 7 hull, which costs £70,000.

Propulsion

SELECT AN ENGINE SIZE (Es). The size of the engine multiplied by 10 is its weight in tons. Starting in about 1885, steam engines of a new and more modern variety came into use—these were called forced-draught engines. These are much more compact and efficient than conventional engines, but are also more expensive. If building a vessel with forced-draught engines, all calculations are the same except that the weight of the engine is only five times its size number.

Conventional steam engines cost £1000 per size number. Forced-draught steam engines cost twice this amount.

Coal Bunker

SELECT A coal bunker size (Bs). The size of the bunker multiplied by 10 is its weight in tons. Multiply the bunker size by 10 and divide by the engine size to determine endurance in days ($E=10 \times Bs \div Es$). (Note: For purposes of this game, all ships should have a fuel bunker at least twice the size of their engine.) The coal bunker does not cost anything to install.

Armament

SELECT ONE OR MORE weapons from the tables provided at the end of this

section. At the same time determine placement of the weapon and its field of fire. Each ship may have one or more turret guns, one or more battery guns, and one or more light guns.

Turret guns are mounted in large rotating armored turrets placed on the deck of the ship. Turrets are arranged in one of three patterns: centerline, offset, or corner.

Centerline turrets are, as the name indicates, placed along the centerline of the ship. The forward (F) turret can fire forward and to either broadside. The aft (A) turret can fire to the aft and to either broadside. The midships (M) turret may only fire to the broadsides.

If a ship has two midship turrets they are designated the forward midship (FM) turret and the aft midship (AM) turret.

There is no functional difference between them, however, as both are capable of fire only to the two broadsides.

Offset turrets are placed to the right and left of the centerline in such a way that both turrets can fire both forward and aft. Only the port (P) turret can fire to the port (left) broadside, and only the starboard (S) turret can fire to the starboard (right) broadside.

Corner turrets are placed at the four corners of the central part of the ship. These four corners are designated port forward (PF), starboard forward (SF), port aft (PA), and starboard aft (SA).

Ships may be built with both centerline and offset turrets, or centerline and corner turrets, or corner and offset turrets. Ships may not be built with all three types. Ships which combine centerline turrets with another type may not have a midships (M) turret.

In addition to turrets, a ship may have a number of battery guns. Battery guns are mounted along the side of the ship. Subtract the total number of turrets installed on the ship from the ship's hull size and multiply the result by two. This number is the total number of battery guns which may be installed per side.

Some ships include an armored battery that encloses only part of the length of the ship. Not all of the battery guns need to be in the enclosed battery.

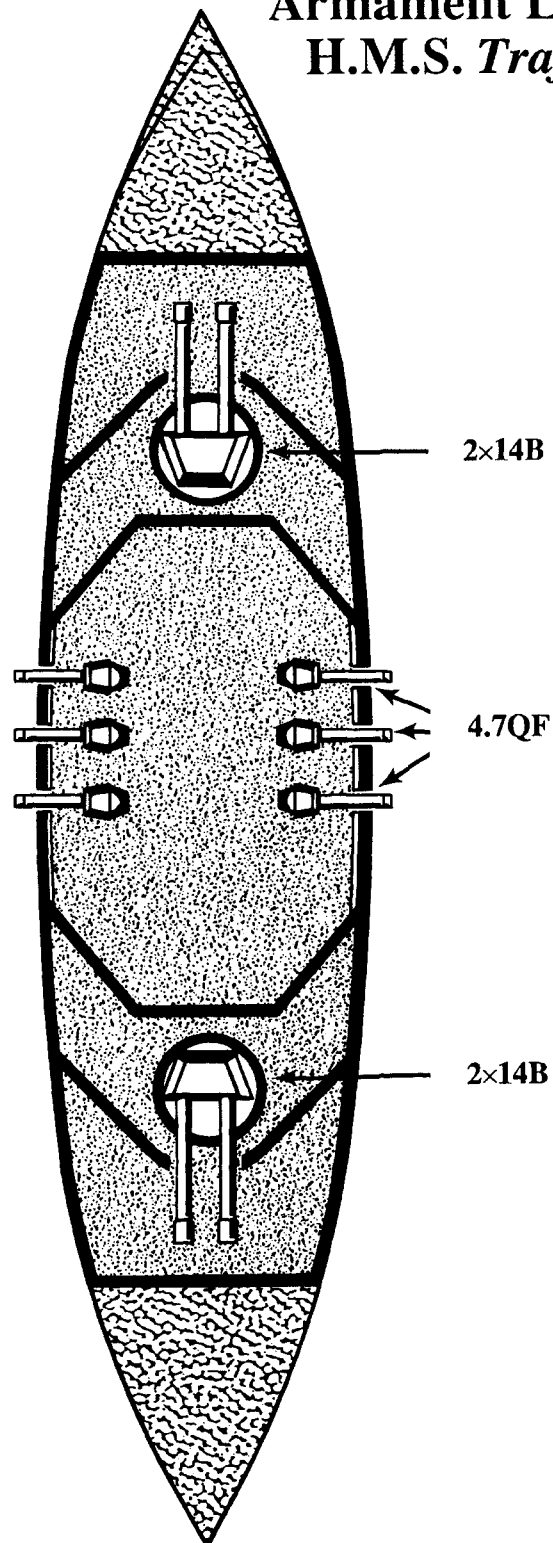
For example, a ship with a hull size of 3 and an enclosed armored battery of 1 (see Armored Battery, page 60) could have two guns per side in the armored battery and four guns per side in open mounts.

Most battery guns may fire only into the broadside aspect. Each side, however, may have either one wing sponson or two corner sponsons. A wing sponson fires into the bow and stern aspects as well as the broadside aspect. The forward corner sponson fires into the bow and broadside aspects while the aft corner sponson fires into the stern and broadside aspects.

Mounting a weapon in an armored turret increases its cost by 20%. Mounting a weapon in an armored sponson increases its cost by 10%. In addition to turret guns and battery guns, a ship may also have light guns. Light guns are defined as quick-firing guns (HRCs and Pom-Poms) and machineguns (Nordenfelts). A ship may have up to two light guns per hull size. Light guns are never armored.

For example, the *Trafalgar* has two 14" guns in each of its two turrets, six 4.7" guns in its battery, and 17 quick-firing guns.

Armament Location H.M.S. *Trafalgar*



Armor

EACH WARSHIP is armored to different levels of protection on different parts of the ship.

Belt: The armored belt of a ship protects it along its waterline and thus helps to prevent flotation (hull) hits. Either the entire waterline of a ship can be protected or merely its vital midship section, at your option. The weight of full-length belt armor is equal to its armor value times the hull size multiplied by 30 tons. The weight of midship belt armor is equal to its armor value times the hull size times two tons.

For example, the HMS *Trafalgar* has a full-length armored belt with an armor value of 9. Since the *Trafalgar* has a hull size of 7, its armored belt weighs 1890 tons.

Deck: Most larger warships of the day incorporated an armored deck to protect the boilers and magazines from overhead attacks or long-range plunging shells. The weight of an armored deck is equal to the hull size multiplied by the armor level times 50 tons.

For example, the HMS *Trafalgar* has a level 3 armored deck on a size 7 hull for a total weight of 1050 tons.

Turrets: Each ship may have a number of turrets, as described above under armament. The weight of the turret armor is based on the size of the gun. Each gun has a column labeled "Turret," which indicates how much space the gun takes up in the turret. The weight of the armor of a single gun turret is equal to the gun's turret size value multiplied by the armor level of the turret times five tons. A twin turret is more space efficient, and thus its weight of armor is equal to that of a single turret times 1.5. Both

guns in the turret must be of the same type.

For example, the HMS *Trafalgar* has two twin 14" breech-loading, rifled, guns. Each gun has a turret size of 6, and the armor value of the turret is 9, so each twin turret has an armor weight of 405 tons ($6 \times 9 \times 5 \times 1.5 = 405$).

Armored Battery: The armored battery is that part of the ship which contains guns under an armored superstructure. Some ships do not have an armored battery, and instead have open gun mounts. Other ships have their entire hull armored, and thus the entire length of the ship counts as an armored battery. Most armored ships fall between these two extremes. The maximum armored battery size is the ship's hull size minus the number of turrets. The battery size may be smaller than this, but it may not be larger. The battery size times two is the maximum number of guns that may be placed in the battery. The weight of the armored battery is equal to the battery size times the armor value multiplied by 50 tons.

For example, the HMS *Trafalgar* has a hull size of 7 and two turrets. It could have an armored battery of any size up to 5. It actually has a size 2 armored battery with level 9 armor for a total weight of 900 tons. Since a size 2 battery allows up to four guns per side, all six of its broadside 4.7" guns are mounted in the battery (three per side). Two guns are in forward sponsons, two in aft sponsons, and two fire to broadside only.

Bulkheads: The armored bulkheads are placed toward the bow and stern of the ship to protect the battery from raking fire (fire directed from directly ahead or astern). The total

weight of the bulkheads is equal to the hull size times the armor value times 10 tons.

For example, the HMS *Trafalgar* has armor level 9 bulkheads and a size 7 hull, for a total weight of 630 tons.

Total Weight: Add up the weight of the belt, deck, turrets, battery, and bulkheads to find the total weight of armor on the ship. For example, the HMS *Trafalgar* has a total armor weight of 5280 tons.

Armor costs £100 pounds per ton of weight. The armor on the HMS *Trafalgar* costs £528,000.

Exotic Weaponry

A PLAYER may install a variety of exotic weaponry, the use of which is described in the advanced rules. Several restrictions should be observed, however.

Torpedo tubes are installed in place of guns. The number of allowed battery guns is actually the combined number of allowed battery guns and torpedo tubes. There are two types of torpedo tubes: fixed tubes and trainable deck mounts. Each fixed torpedo tube fires into only one firing aspect. Deck tubes may be trained at different angles to engage targets. Fixed tubes (bow tubes, stern tubes, and midship tubes) cost £100 per tube. Deck tubes cost £200 per tube. Torpedo tubes weigh five tons. Space for a torpedo reload weighs five tons and costs £50 per reload.

Due to limited deck space, no ship may have more Hale rocket batteries, barrage balloons, and/or tether mines than its hull size number.

RATING

AFTER SHIPS are designed, they need to be rated for game purposes.

Speed

SPEED is a function of power to weight ratio (PW) and length of the hull. The higher the PW, and the longer the hull, the faster the ship. Multiply the engine size by 1000 and divide by the total tonnage of the ship to determine the ship's PW value. Consult the Ship Speed Table, and read off the speed corresponding to the PW value, rounding down to the next lowest value if it falls between two of the numbers listed on the table.

If the ship has a size 1 hull, subtract 4 from the resulting number. Otherwise, add the ship's hull size to the speed number listed to find the ship's speed in knots (nautical miles per hour).

For example, the HMS *Trafalgar* has a weight of 12,930 tons and an engine size of 96. Dividing 96,000 by 12,930 gives a PW value of 7.4, which will round down to 7. On the Ship Speed Table a PW value of 7 produces a speed number of 9 to which the *Trafalgar*'s hull size (7) is added to give a speed of 16 knots. (Actual speed was 16.5 knots.)

SHIP SPEED TABLE

PW	Speed	PW	Speed
1	3	14	12
2	4	18	13
3	5	24	14
4	6	40	15
5	7	60	16
6	8	80	17
7	9	100	18
8	10	150	19
10	11	151	20

Once you have determined the ship's speed in knots, you can determine the ship's game speed by dividing by five, and rounding fractions

down. The result is its movement allowance in cables.

For example, the HMS *Trafalgar* has a speed of 16 knots. Dividing this by five gives a result of three.

Mass

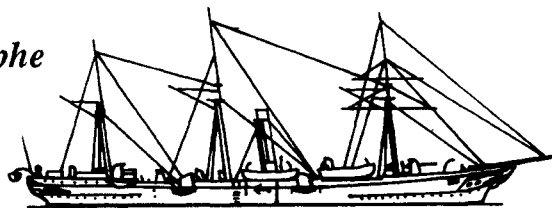
A SHIP'S MASS is its total tonnage divided by 250. For example, the HMS *Trafalgar* has a displacement of 12,930 tons, and thus a mass of 50. Each row of hull hit boxes has 50 boxes. Ships with a tonnage less than 250 have a parenthetical mass equal

to their tonnage divided by 50. A parenthetical mass number indicates the total number of hull hits which can be taken before the ship sinks.

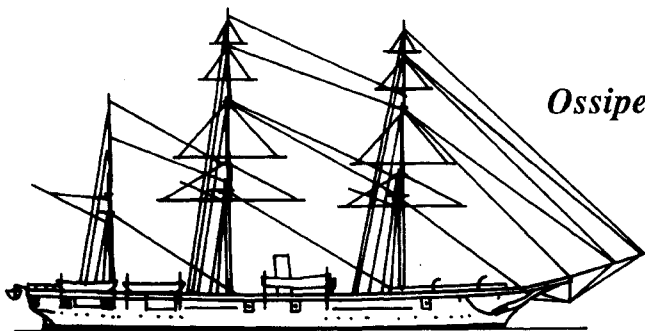
Background Data

THE FOLLOWING FACTS are not necessary for game purposes, but are sometimes handy to know. To determine the length of the vessel in feet, multiply its hull size number by 50. To determine the horsepower of the vessel's engines, multiply its engine size by 125.

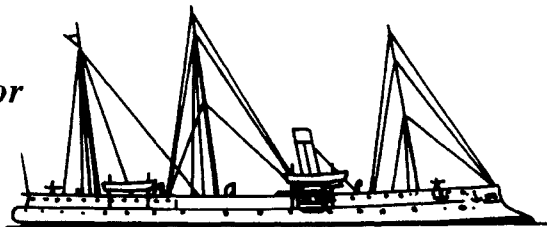
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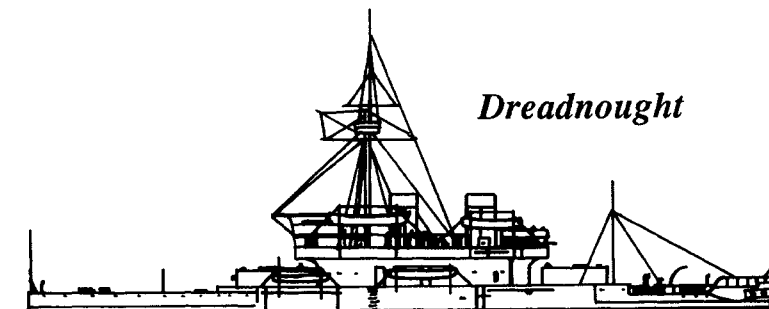
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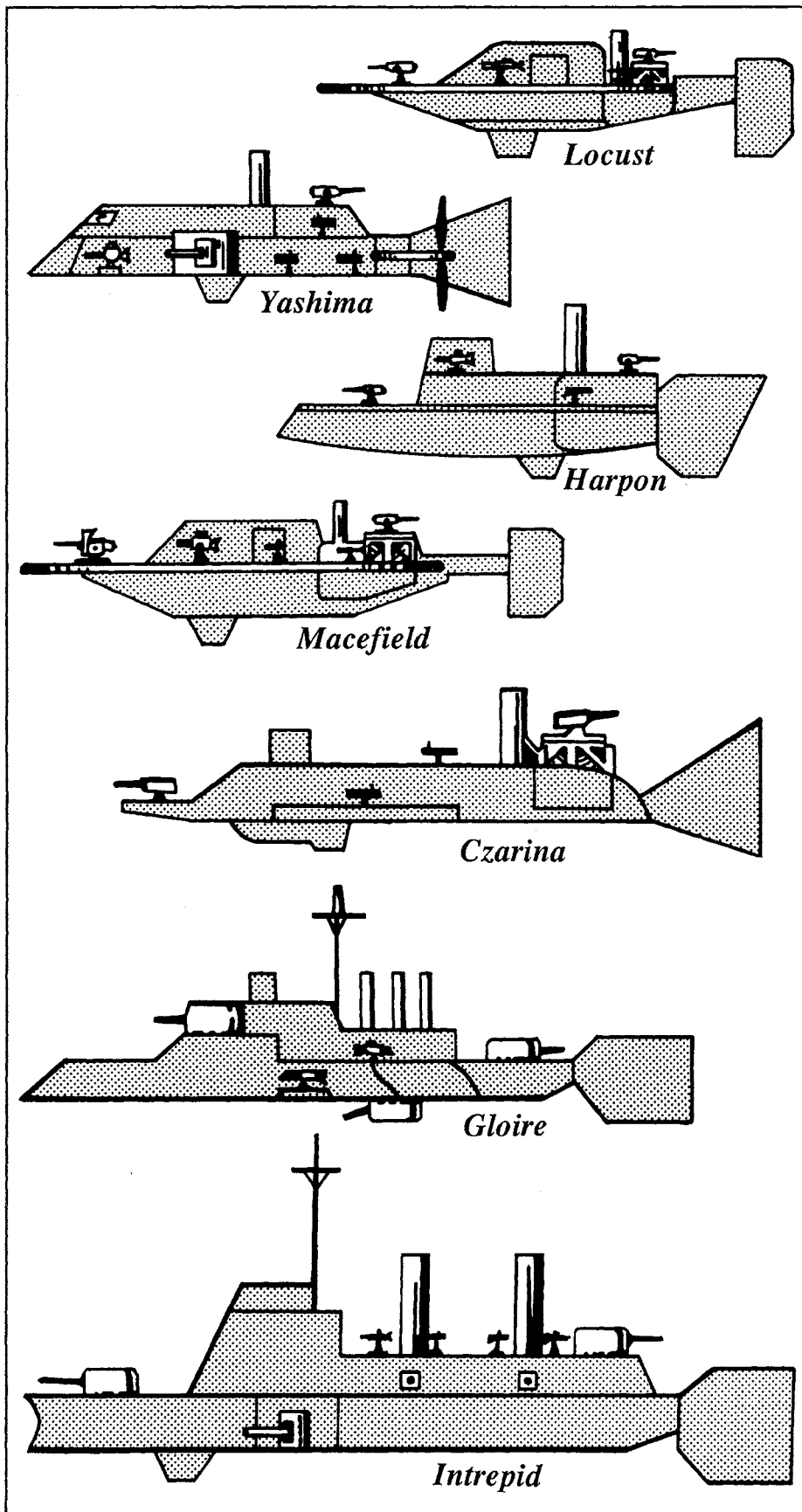


Condor



Dreadnought





Aerial Vessels

RULES FOR designing aerial vessels were included in *Sky Galleons of Mars*. For those players who do not have that game, however, they are repeated here, along with a number of additional embellishments. These embellishments for the most part add new equipment and design components to the ships, the uses of which are covered in "Basic Rules: Aerial Flyers." In addition, these design rules are somewhat simplified to remain compatible with the rules in *Ironclads* and *Ether Flyers*.

For example, individual crewmembers are not counted as casualties, nor are they important to the design process.

Flyer design consists of two general procedures: basic design and flyer rating. The basic design is a simple six-step procedure that provides all the raw information about your flyer. Evaluation enables you to determine the performance of the flyer in game terms.

BASIC DESIGN

THE SIX STEPS of the aerial vessel's basic design determine its characteristics and performance.

Hull Size

SELECT A hull size (Hs). Hull size is any whole number. The size of the hull indicates how much liftwood is used in its construction, thus indicating how much weight it may lift. Usually ships weigh about 100 tons per hull size number but may weigh up to 160 tons per hull size number.

It is a good idea to keep a running tally of the weight of your other components as you build your flyer to

make sure it isn't overloaded.

When the hull is selected, the designer also decides whether it will be fitted with a ram. If so, the ram weighs 10 tons per hull size. Hulls cost \$10,000 per hull size. Rams cost \$1000 per hull size.

Propulsion

FOR STEAM-POWERED vessels, select an engine size (Es). The size of the engine times 10 is its weight in tons. Multiply the engine size by six and divide the result by the hull size to determine the speed (S) ($S=6 \times Es \div Hs$).

Starting in about 1885, steam engines of a new and more modern variety came into use, called forced-draught engines. These are much more compact and efficient than conventional engines, but are also more expensive. For a vessel with a forced-draught engine, all calculations are the same except that the weight of the engine is only five times its size number.

Conventional steam engines cost \$1000 per size number; forced-draught steam engines cost twice this.

Coal Bunker

SELECT A coal bunker size (Bs). The size of the bunker times 10 is its weight in tons. Multiply the bunker size by 10 and divide by the engine size to determine its endurance (E) in days ($E=10 \times Bs \div Es$).

The coal bunker does not cost anything to install.

Armor

SELECT AN armor value (Av) for the flyer. The armor value is any whole number. An armor value of 0 is allowed and indicates that no armor is

affixed to the ship's basic structure. Determine the weight of the armor (Aw) in tons by multiplying the armor value by 10 times the hull size ($Aw=10 \times Av \times Hs$).

Armor plate costs \$10 per ton of weight.

Armament

SELECT ONE OR MORE weapons from the tables provided at the end of this section of the rules. At the same time determine placement of the weapon and its field of fire. Each flyer may have one forward mount, one stern tower mount, and two wing mount gun positions. The forward mount may fire forward and to either broadside. The stern tower may fire to the stern and to either broadside. The wing mounts may fire to one broadside, and to the forward and stern. (Port wing mount fires to port, bow, and stern. Starboard wing mount fires to starboard, bow, and stern.)

Each 180-degree pivot position listed above may be replaced by two side-by-side 90-degree pivot mounts. For example, the bow could have two gun mounts, one of which fires to bow and port, the other to bow and starboard. All additional guns beyond the pivot mounts listed above fire only to a single broadside. See the illustration on the next page.

If desired, the weapon may be placed in an enclosed armored mount (turret or sponson). This does not increase the weight of the gun if the gun fires only to one aspect. If the gun fires to more than one aspect (that is, it is in a pivot mount), it increases the weight of the gun by 10 percent per level of armor protection. The turrets may be a different armor value than the rest of the flyer. A gun normally

in a pivot position may be placed under armor at no extra weight if it is placed in a fixed mount. In this case the designer chooses which aspect the weapon will always fire into when the flyer is designed. Guns with a rate of fire greater than 1 (including Nordenfelts) must be placed in pivot-type mounts if they are to receive armor protection, even if they are sighted to fire into only one firing aspect.

In addition to the positions listed above, guns may be mounted in ventral position. Ventral positions are on the bottom of the flyer's hull. A flyer may have ventral guns in exactly the same positions as listed above or it may have a single ventral turret with all-around fire. Ventral mounts are exactly like conventional mounts with two exceptions. First, ventral guns may never fire at a target at a higher altitude. Second, ventral guns firing at long range may only fire at targets at a lower altitude.

Exotic Weaponry

A PLAYER MAY install a variety of exotic weaponry, the use of which is described earlier in this book. The numbers of exotic weapons installed are limited, however, by available deck space or internal space. The available deck space and internal space on all ships is determined by their hull numbers. Thus, a flyer with a hull size of 5 has five deck spaces and five internal spaces for exotic weapons. Weapons which take internal space do not count against deck space and vice versa.

Hale rockets, liquid fire racks, tether mines, bomb racks, and spike droppers each take one deck space. Smutts torpedoes each take one internal space.

RATING

ONCE YOU have finished designing a flyer, you need to evaluate it in terms of game statistics in order to apply its capabilities to the game. This is called "rating" the flyer.

Altitude

THE LIFT OF a hull is determined by its hull size. The extent to which the hull is overloaded or underloaded will determine its maximum altitude. To determine lift value (Lv), divide hull capacity (Hc) by total weight in tons ($Lv = Hc \div T$). If the lift value is 1.2 or higher, the craft's maximum altitude is Very High. If the lift value is 1 to 1.19, its maximum altitude is High. If the lift value is 0.8 to 0.99, the maximum altitude is Medium. If the lift value is 0.6 to 0.79, the maximum altitude is Low. Craft with a lift value of less than 0.6 may not fly.

Speed

MULTIPLY THE ENGINE SIZE by six and divide the result by the hull size to determine speed ($S = 6 \times Es \div Hs$). If the result is greater than 6, reduce it by half the amount by which it exceeds 6, rounding fractional speeds down. Thus a speed of 7 would reduce to 6; a speed of 8 or 9 would reduce to 6; a speed of 10 or 11 would reduce to 8, etc.

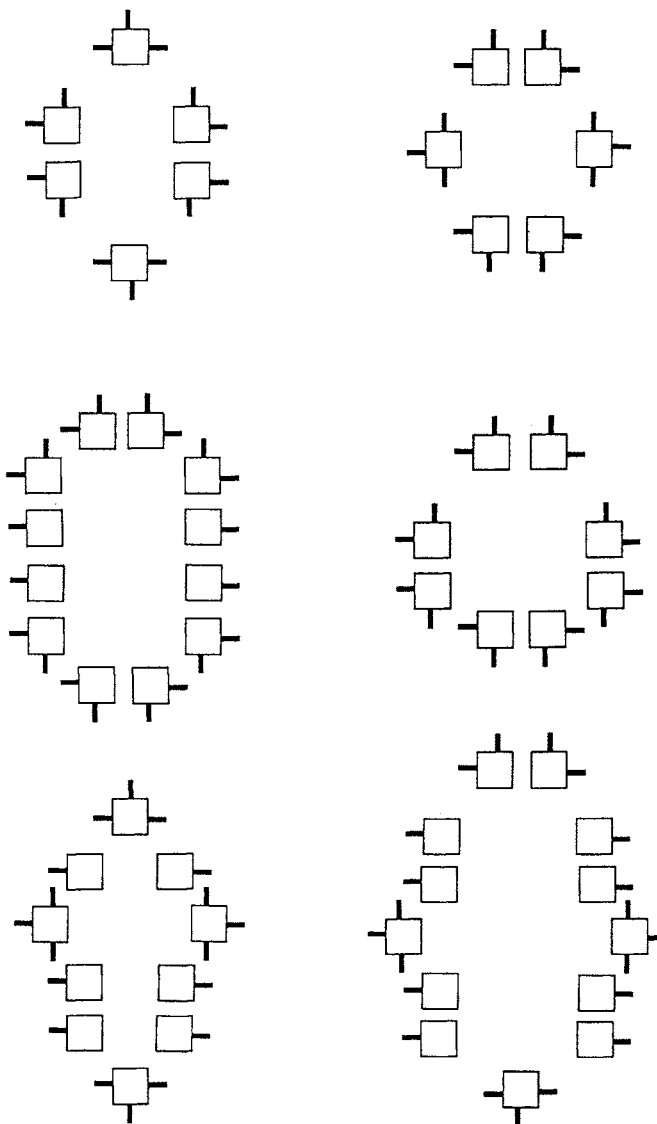
Hull Hits

EACH TIME flyer takes total hull hits equal to its hull size, its maximum altitude is reduced by one level. When its maximum altitude is reduced below Very Low, it crashes.

Background Data

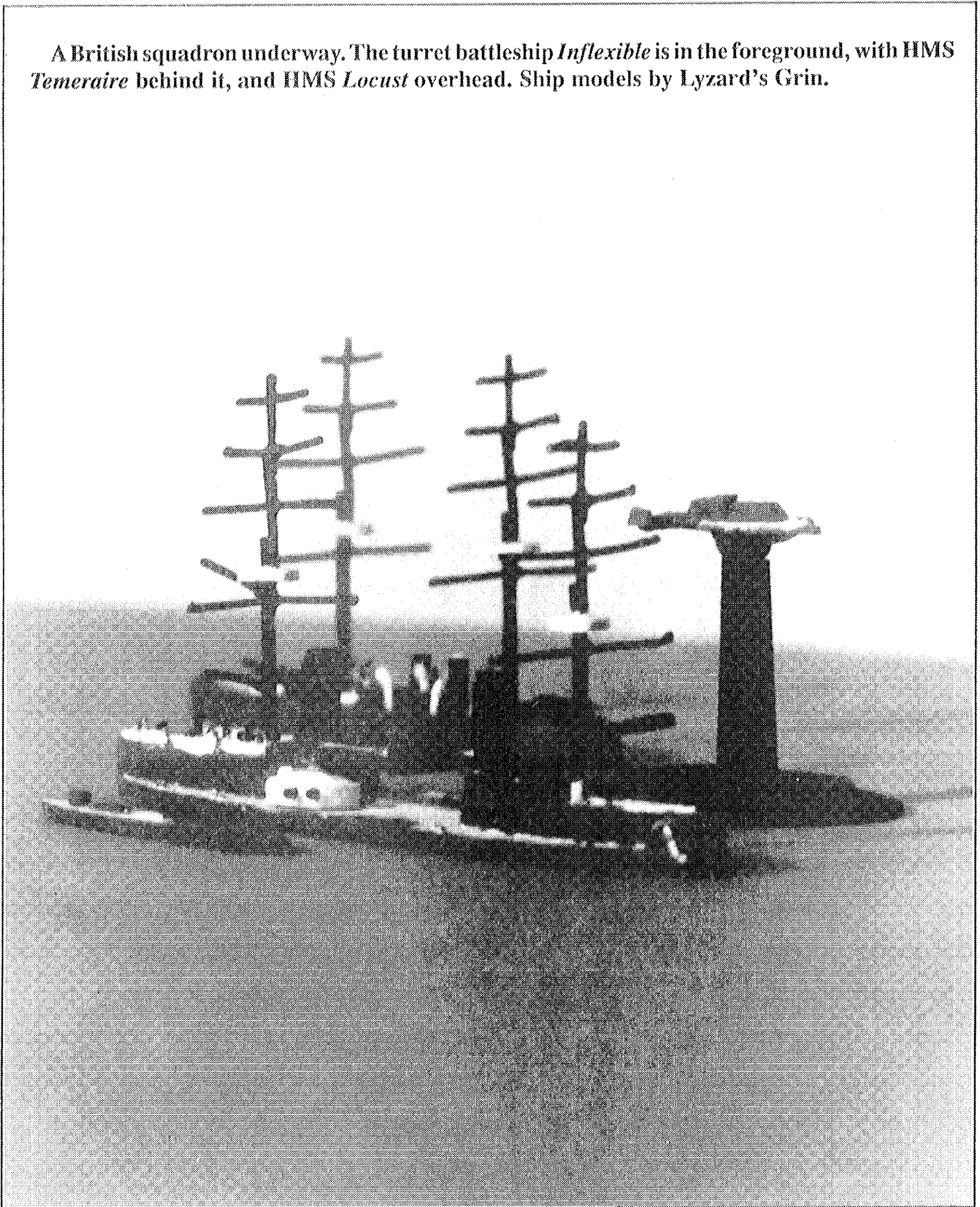
BACKGROUND DATA consists of information not directly used in the play

of the game, but which helps to more accurately describe the vessel and its capabilities. This data is unnecessary for game purposes but is sometimes handy for players or the referee to know. To determine the speed of the vessel in knots, multiply its speed number by five. To determine the horsepower of the vessel's engine, multiply its engine size by 125.



Possible Armament Configurations

A British squadron underway. The turret battleship *Inflexible* is in the foreground, with HMS *Temeraire* behind it, and HMS *Locust* overhead. Ship models by Lyzard's Grin.



Ether Flyers

ETHER FLYER DESIGN consists of two general procedures: basic design and vessel rating. The basic design is a simple seven-step procedure that generates all the raw information about the vessel.

Rating enables you to determine the performance of the vessel in game terms.

BASIC DESIGN

THE SEVEN STEPS of the vessel's basic design determine its characteristics and performance.

Hull Size

SELECT A HULL SIZE (Hs). Hull size is any whole number.

The size of the hull determines the maximum weight of the vessel, and thus how much hydrogen or liftwood is required to lift it. The hull size times 100 is the maximum weight in tons of the finished vessel.

The cost of the hull includes both the structural members and outer skin as well as the hydrogen lifting bag or liftwood lifting panels, and cost is dependent on the type of lift selected.

Liftwood hulls cost £20,000 per hull number while hydrogen-lifted hulls cost £5000 per hull size number.

Hulls in excess of hull size 2 may not be built with hydrogen lift except in German yards, which can build hulls up to size 10 using hydrogen lift.

Ether Propeller

THERE ARE THREE TYPES of ether propellers available: the Edison Patent, the Armstrong Patent, and the Zeppelin Patent.

Each propeller has a different ef-

ficiency rating (0.25 for the Edison, 0.2 for the Armstrong, and 0.15 for the Zeppelin) and a different price per power level.

In addition, the Zeppelin propeller *may only be purchased at power level 4 or less.*

The differences in costs and capabilities are summarized on the Ether Propeller Table.

Select a propeller power level (PL) and propeller type. The propeller power level times the efficiency of that type of propeller divided by the hull size determines the vessel's interplanetary speed in millions of miles per day.

Warships should have an interplanetary speed of at least 1.

**ETHER PROPELLER
TABLE**

Type	Efficiency	Wt/PL	£/PL
Edison	0.25	1	1000
Armstrong	0.20	1	500
Zeppelin	0.15	1	100

Solar Boiler

ONLY LIMITED AMOUNTS of oxygen can be carried in an interplanetary vessel, and this amount is insufficient to support continuous combustion of coal.

As a result, interplanetary ether flyers rely on solar boilers to supply power.

The solar boiler's power level must be equal to the propeller power level. The boiler's weight is twice its power level, and its cost is £500 times its power level.

Atmospheric Propulsion

ETHER PROPELLERS will not function in an atmosphere and solar boilers are usually very inefficient at

lower altitudes. As a result, the ether flyer must also have a conventional boiler and an airscrew for maneuvering at low altitudes.

Select an engine size (Es). The size of the engine times five is its weight in tons.

Steam engines cost £2000 per engine size.

Coal Bunker

SELECT A coal bunker size (Bs). The size of the bunker times 10 is its weight in tons.

Multiply the bunker size by 10 and divide by the engine size to determine atmospheric powered endurance in days ($E=10 \times Bs \div Es$).

For purposes of the game, all ether flyers should have a coal bunker at least twice the size of their engine.

The coal bunker does not cost anything to install.

Armor

SELECT AN ARMOR VALUE for the hull of the vessel. The armor value is any whole number. An armor value of 0 is allowed and indicates no armor affixed to the ship's hull.

Determine the weight of the armor (Aw) in tons by multiplying the armor value by 10 times the hull size ($Aw=10 \times Av \times Hs$).

Armor costs £100 per ton.

Armament

SELECT ONE OR MORE weapons from the tables provided at the end of the design rules. At the same time determine placement of the weapon and its field of fire.

All armament available to aerial flyers is available to ether flyers and is installed in exactly the same manner.

RATING

AFTER SHIPS are designed, they need to be rated for game purposes.

Interplanetary Speed

TO DETERMINE the interplanetary speed, multiply propeller power (Pp) by the listed efficiency of the propeller and divide by the hull size. Round all fractions to the nearest tenth. The result is the flyer's interplanetary speed value.

Atmospheric Speed

MULTIPLY the engine size by six and divide the result by the hull size to determine speed ($S=6 \times Es + Hs$). If the calculated speed of the ship is greater than 6, reduce it by half the amount by which it exceeds 6, rounding fractional speeds down.

For example, a calculated speed of 7 would reduce to $6\frac{1}{2}$, rounded down to 6. A calculated speed of 9 would reduce to $7\frac{1}{2}$, rounded down to 7.

Hull Hits

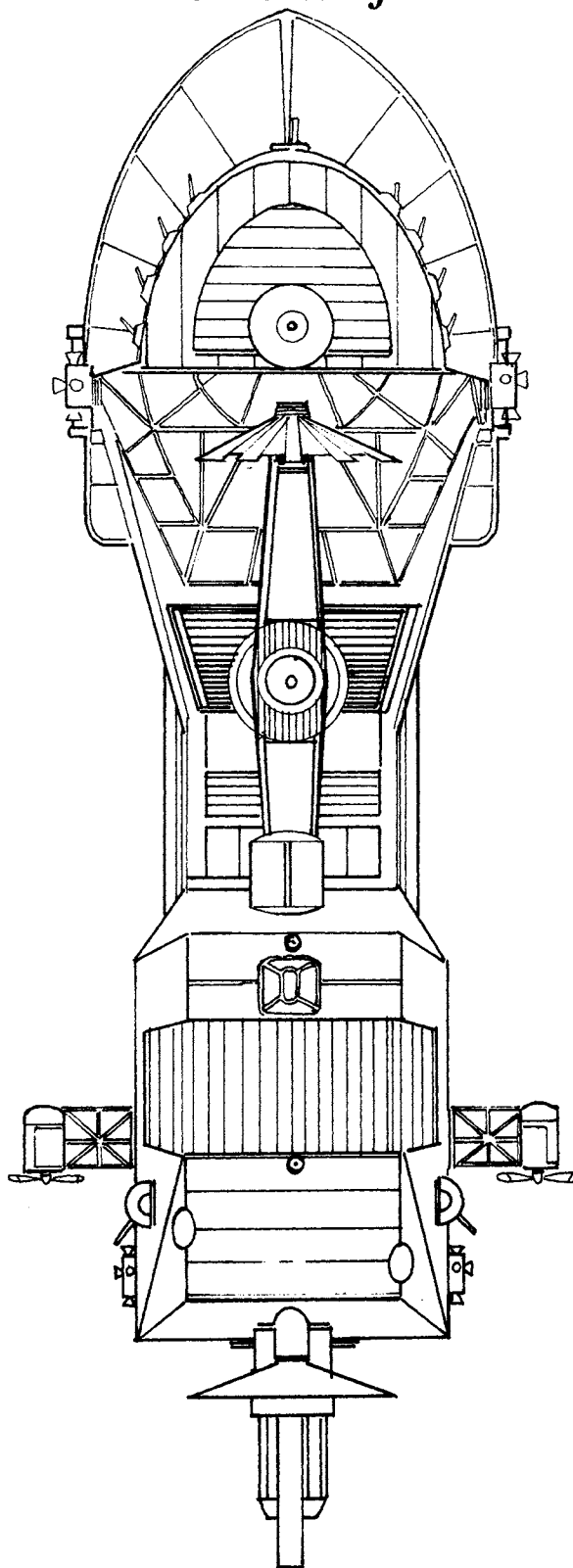
EACH TIME the flyer takes hits equal to its hull size, its maximum altitude is reduced by 1. All ether flyers have a starting maximum altitude of Orbital.

Background Data

THIS DATA is not necessary for the game but it is sometimes handy to know. To determine the interplanetary speed of the vessel in millions of miles per day, multiply its speed value by one million.

To determine its airspeed in knots (nautical miles per hour), multiply its atmospheric speed number by five. To determine the horsepower of either of its engines, multiply their power value by 125.

Overhead View of Ether Battleship *HMS Duke of York*



NOTE

NAVAL ORDNANCE can be divided into several broad categories, the most important of which is that of modern breech-loading guns. These guns are the most common type currently in production, although large numbers of older, less powerful, guns remain in service. The main criteria for inclusion in this category is that a gun be rifled, breech-loading, and have a muzzle velocity in excess of 1700' per second. These modern guns are characterized by excellent range and superior penetration.

Several special guns are worth noting. The 4.7" quick-firing gun is the first of a new breed of naval guns which have hydraulic recoil cylinders that allow these guns to slide back in recoil and then return easily to their original firing positions. This allows for quicker delivery of aimed fire. The 4" gun listed here is usually referred to as the 4" long gun to distinguish it from its lower-velocity twin, the 4" short gun (or 20-pounder gun). That weapon is detailed in the table covering lower-powered ordnance.

Finally, some mention should be made of the diminutive Hotchkiss 2-pounder breechloader. To represent the small size of its projectile, it is allowed to fire only shell, not shrapnel. It is much prized by the United States Army for its portability, as it can be taken almost anywhere that a horse can travel (a definite benefit in the American West).

The second important category of guns we call "old" guns, but "low-powered guns" would be more accurate. These are modern, rifled guns but with a muzzle velocity less than 1700' per second. Some of these are muzzle-loading guns, but many breechloaders fall into this category as well. Virtually all of the Krupp guns, for example, are low-powered breechloaders.

Much older than any of the above weapons, smoothbore guns date back to the first half of the century. Although now obsolete, many of these guns are still found in the arsenals of the lesser

EXOTIC NAVAL WEAPONS

<i>Weapon</i>	<i>Weight</i>	<i>Pen</i>	<i>DV</i>	<i>ROF</i>	<i>Range</i>	<i>Cost</i>	<i>Requires</i>
Hale Rockets	5	0	1	D6	—/4	50	Deck
Tether Mine	—	0	6	—	—	200	Deck
Drogue Torp.	10	0	10	—	—	20	—
Smutts Dschgr	200	—	—	(1)	—	1000	—
Smutts Dschgr+	100	—	—	(1)	—	1500	—
Smutts Torpedo	—	1	12	—	30	500	Interior
Power Grapnel	20	—	—	(2)	0/1	200	—
Bomb Rack	—	—	—	1	—	50	Deck
Bomb	5	1	6	1	—	10	—
Spike Dropper	5	—	P	D6	—	150	Deck
Liquid Fire	20	—	F	D6	—	200	Deck
Deck Tube	5	6	4D6	(1)	6	200	Gun Space
Fixed Tube	5	6	4D6	(1)	6	100	Gun Space
Torpedo Reload	5	—	—	—	—	50	—
Depth Bomb	5	—	D6/2	(1)	—	20	Rack or Tube

MACHINEGUNS (MG)

<i>Weapon</i>	<i>Weight</i>	<i>Pen</i>	<i>DV</i>	<i>ROF</i>	<i>Trt</i>	<i>Range</i>	<i>Cost</i>
0.5" Gatling	3	—	P	3/5	1	1/2	40
Mitrailleuse	5	—	P	3	1	1/2	60
Nord 5-B	5	—	P	5	1	1/2	100
Nord 3-B	3	—	P	3	1	1/2	60

Abbreviations: *Nord*: Nordenfelt 3-B, 5-B: 3-barrel, 5-barrel.

MODERN BREECH-LOADING GUNS (B)

<i>Weapon</i>	<i>Weight</i>	<i>Pen</i>	<i>DV</i>	<i>ROF</i>	<i>Trt</i>	<i>Range</i>	<i>Cost</i>
18"	3400	18/9	20	(4)	8	14/28	30,000
17"	2800	17/9	18	(3)	7	13/26	27,000
16"	2250	16/8	16	(2)	6	10/20	24,000
14"	1300	14/7	14	(1)	6	9/18	12,000
12"	900	12/6	12	(1)	5	8/16	9000
11"	800	11/5	11	(1)	5	8/16	8000
10"	600	10/5	10	(1)	4	7/14	6000
9"	400	9/5	9	(1)	4	7/14	4000
8"	300	9/5	8	(1)	3	6/12	3000
7"	200	7/3	7	(1)	3	6/12	2000
6"	100	5/3	6	1	2	5/10	1000
5"	80	4/2	4	1	2	5/10	800
4.7" QF	100	4/2	3	2	2	4/8	1000
4" (long)	40	3/2	2	1	2	4/8	400
3"	25	2/1	1	1	2	3/6	260
2-pdr gun	5	0/0	1	1	2	2/4	100

Abbreviations: *QF*: Quick-firing *Pdr*: Pounder.

OLD (O) LOW-POWERED RIFLED GUNS

Weapon	Weight	Pen	DV	ROF	Trt	Range	Cost
18"	2000	14/7	18	(4)	8	9/18	24,000
17"	1800	13/6	17	(4)	7	8/16	20,000
16"	1600	12/6	16	(3)	6	8/16	18,000
15"	1400	11/5	15	(3)	6	7/14	16,000
14"	1000	10/5	14	(2)	6	7/14	12,000
13"	750	9/4	13	(1)	6	6/12	10,000
12"	500	8/4	12	(1)	5	6/12	8000
11"	450	7/3	11	(1)	4	6/12	7000
10"	400	7/3	10	(1)	4	6/12	6000
9"	250	6/3	9	(1)	3	5/10	3000
8"	200	5/2	8	(1)	3	5/10	2000
7"	140	4/2	7	(1)	3	5/10	1000
6"	80	4/2	6	(1)	2	4/8	800
5"	60	3/1	4	1	2	4/8	700
4.7"	50	3/1	3	1	2	4/8	600
4"	30	2/1	2	1	2	3/6	300
3"	20	1/1	1	1	2	3/6	240
9-pdr	10	1/0	1	1	2	3/6	220
6-pdr	10	0/0	1	1	2	2/4	100

Abbreviations: *Pdr*: Pounder.

SMOOTHBORE (SB) GUNS

Weapon	Weight	Pen	DV	ROF	Trt	Range	Cost
15"	300	4/2	7	(2)	4	4/8	6000
11"	150	3/1	5	(1)	3	3/6	3500
10"	80	2/1	4	(1)	3	2/4	2000
68-pdr	80	2/1	3	1	2	3/6	1500
9"	60	1/1	3	1	2	2/4	1000
32-pdr	60	1/1	2	1	2	3/6	1000
24-pdr	40	1/0	2	1	2	2/4	800
12-pdr	30	1/0	1	1	2	2/4	400
9-pdr	25	0/0	1	1	2	2/3	200
6-pdr	20	0/0	1	1	2	1/2	100

Abbreviations: *Pdr*: Pounder.

QUICK-FIRING (QF) MACHINE CANNON

Weapon	Weight	Pen	DV	ROF	Trt	Range	Cost
6-pdr HRC	15	1/0	1	3	1	3/6	220
3-pdr HRC	10	1/0	1	3	1	2/4	180
1-pdr HRC	10	0/0	1	3	1	2/4	160
1-pdr Pom-Pom	10	0/0	1	4	1	2/4	250
1" Gatling	5	0/0	1	3/4	1	1/2	70

Abbreviations: *HRC*: Hotchkiss Revolving Cannon *Pdr*: Pounder.

powers and on some of the older vessels of the United States Navy. These weapons are considerably inferior to more modern guns in terms of range and effectiveness of ammunition.

The last category of terrestrial artillery is perhaps the most interesting: quick-firing machine cannon. These rapid-fire, small-caliber guns were originally developed for shipboard use to provide large vessels with an effective means of defense against small, fast torpedo boats. Since most aerial vessels are small, machine cannon serve as very effective secondary armament on many of these vessels, and as primary armament on a few of the smaller ships. Recently there has been considerable interest in mounting these weapons on field carriages for use against various heavy vehicles and to provide ground troops with an effective means of defense against low-flying aerial vessels. As most of these guns have fairly high muzzle velocities, they have impressive penetration for their size.

Most of these guns have multiple rotating barrels which fire in succession. The Gatling 1" is nothing more than a scaled up version of the ubiquitous .50-caliber Gatling gun.

The Hotchkiss revolving cannons (often called revolvers for short) are based on a slightly more advanced mechanical principle, but externally they appear almost identical to a Gatling gun.

Of special interest, however, is the Maxim-Nordenfelt 1-pounder Pom-Pom. Only recently offered for sale, this weapon has a slightly better rate of fire than Hotchkiss revolvers and uses the same mechanical principle as Mr. Maxim's famous machinegun.

Due to limited space, the different types of machine cannon in the ship listings are combined under the general heading "quick-fires" and fire with the characteristics of a 3-pounder revolver. In designing your own vessels, you are free to pick the types of machine cannon you wish.

Ships of the World

ABBREVIATIONS

THE FOLLOWING abbreviations are used in the "Ships of the World" tabular listings for **Ironclads and Ether Flyers**.

Data: *MS*: Mass *Spd*: Speed (parenthetical values are submerged speeds) *Hs*: Hull Size *Blt*: Belt Armor

Bty: Battery Armor *Blk*: Bulkhead Armor *Trt*: Turret Armor *Dck*: Deck Armor.

Ship Classes: *BSI*: Broadside Ironclad *CBI*: Central Battery Ironclad *TBS*: Turret Battleship *CDM*: Coastal Defense Monitor *AC*: Armored Cruiser *PC*: Protected Cruiser *LC*:

Light Cruiser *FG*: Frigate *CV*: Corvette *SL*: Sloop *TB*: Torpedo Boat *TGB*: Torpedo Gunboat *AGB*: Armored Gunboat *GV*: Gun Vessel *GB*: Gunboat *TR*: Torpedo Ram *S*: Submarine.

Gun Mounts: *F*: Forward Turret *M*: Midship Turret *MF*: Midship Forward Turret *MA*: Midship Aft Turret *A*: Aft Turret *P*: Port Turret *S*: Starboard Turret *PF*: Port Forward Turret *SF*: Starboard Forward Turret *PA*: Port Aft Turret *SA*: Starboard Aft Turret *FS*: Forward Sponson *WS*: Wing Sponson *AS*: Aft Sponson *Bow*: Bow *Strn*: Stern *BS*: Broadside.

Torpedo Mounts: *BT*: Bow Tube *MT*: Midship Tube *ST*: Stern Tube *DT*: Deck Tube.

ARGENTINA

Crews: Green

A. Central Battery Ironclad (1 total)

Name	Class	Year	MS	Ram	Spd	Hs	Blt	Bty	Blk	Trt	Dck	Armament
<i>Almirante Brown</i>	CBI	1880	17	Y	2	5	4	4	3	—	1	Bow: [4o8], 1o8, BS: 3o5, Strn: [2o8], 1o8

B. Coastal Defense Monitors (2 total)

Name	Class	Year	MS	Ram	Spd	Hs	Blt	Bty	Blk	Trt	Dck	Armament
<i>La Plata (Los Andes)</i>	CDM	1874	6	N	1	4	2	3	3	4	—	F: [2o8], BS: [1o4]; 2QF, 4MG

C. Protected Cruiser (1 total)

Name	Class	Year	MS	Ram	Spd	Hs	Blt	Bty	Blk	Trt	Dck	Armament
<i>Patagonia</i>	PC	1885	6	Y	2	4	—	1	—	2	1	F: [1x10B], P, S, A: [1x6B]

D. Gunboats (6 total)

Name	Class	Year	MS	Ram	Spd	Hs	Blt	Bty	Blk	Trt	Dck	Armament
<i>Parana (Uruguay)</i>	GB	1873	2	N	2	3	—	—	—	—	—	MF, MA: 1o6, BS: 1o4
<i>Pilcomayo</i>	GB	1875	2	N	1	2	—	—	—	—	—	Bow: 1o11, MF, MA: 1x3B

(*Burmejo, Republica, Constitution*)

E. Torpedo Boats (5 total)

Name	Class	Year	MS	Ram	Spd	Hs	Blt	Bty	Blk	Trt	Dck	Armament
<i>Ferre</i>	TB	1880	(1)	N	3	2	—	—	—	—	—	BT-2+2, 2MG

(*Enrique, Py, Centelle, Alerta*)

AUSTRALIA

Crews: Trained

A. South Australia (1 total)

Name	Class	Year	MS	Ram	Spd	Hs	Blt	Bty	Blk	Trt	Dck	Armament
<i>Protector</i>	GB	1884	4	N	2	4	—	—	—	—	—	Bow: 1x8B; 4QF, 5MG

B. Queensland (2 total)

<i>Name</i>	<i>Class</i>	<i>Year</i>	<i>MS</i>	<i>Ram</i>	<i>Spd</i>	<i>Hs</i>	<i>Blt</i>	<i>Bty</i>	<i>Blk</i>	<i>Trt</i>	<i>Dck</i>	<i>Armament</i>
<i>Gayundah</i>	GV	1884	2	N	2	2	—	—	—	—	—	Bow: 1×8B; 2QF, 2MG
<i>Paluma</i>	GV	1884	2	N	2	2	—	—	—	—	—	2Q, 2MG

C. Victoria (2 total)

<i>Name</i>	<i>Class</i>	<i>Year</i>	<i>MS</i>	<i>Ram</i>	<i>Spd</i>	<i>Hs</i>	<i>Blt</i>	<i>Bty</i>	<i>Blk</i>	<i>Trt</i>	<i>Dck</i>	<i>Armament</i>
<i>Albert</i>	GV	1883	2	N	2	2	—	—	—	—	—	Bow: 1×8B; 2QF, 2MG
<i>Victoria</i>	GV	1884	1	N	2	3	—	—	—	—	—	Bow: 1×10B, BS:1×3B; 2MG

AUSTRIA-HUNGARY

Crews: Trained

Armored Ships**A. Central Battery Ironclads (8 total)**

<i>Name</i>	<i>Class</i>	<i>Year</i>	<i>MS</i>	<i>Ram</i>	<i>Spd</i>	<i>Hs</i>	<i>Blt</i>	<i>Bty</i>	<i>Blk</i>	<i>Trt</i>	<i>Dck</i>	<i>Armament</i>
<i>Lissa</i>	CBI	1871	28	N	2	6	3	2	2	—	—	Bow: 2o4, Strn: 2o4, BS: [6o9], 1×3B; 3QF, 2MG
<i>Custoza</i>	CBI	1875	30	N	2	6	4	3	3	—	—	FS: [2o10], BS: [2o10], 3o4; BT-1, ST-1, MT-1, 9QF, 2MG
<i>Albrecht</i>	CBI	1874	24	N	2	6	4	3	3	—	—	FS: [2o9], BS: [2o9], 3o4; BT-1, ST-1, MT-1, 9QF, 2MG
<i>Kaiser</i>	CBI	1873	23	N	2	5	3	2	2	—	—	WS: [1o9], BS: [4o9], 6×3B; 7QF, 4MG
<i>Kaiser Max</i> (<i>Don Juan, Prinz Eugen</i>)	CBI	1876	14	N	2	5	4	2	2	—	—	FS: [1o8], BS: [3o8], 2o4, Bow: 2o4; BT-1, ST-1, MT-1, 9QF, 2MG
<i>Tegetthoff</i>	CBI	1881	30	N	3	6	7	7	5	—	—	FS, AS: [1o11], BS: [1o11], 2o4, Bow: 2o4; 9QF, 2MG

B. Turret Battleships (2 total)

<i>Name</i>	<i>Class</i>	<i>Year</i>	<i>MS</i>	<i>Ram</i>	<i>Spd</i>	<i>Hs</i>	<i>Blt</i>	<i>Bty</i>	<i>Blk</i>	<i>Trt</i>	<i>Dck</i>	<i>Armament</i>
<i>Stefani</i>	TBS	1889	20	N	3	6	4	—	—	5	—	PF, SF: [1×12B], BS: 3×6B; BT-1, ST-1, MT-1, 11QF
<i>Rudolf</i>	TBS	1889	27	N	3	6	6	—	5	5	—	PF, SF, A: [1×12B], BS: 3×6B; BT-1, ST-1, MT-1, 9QF

C. Protected Cruisers (2 total)

<i>Name</i>	<i>Class</i>	<i>Year</i>	<i>MS</i>	<i>Ram</i>	<i>Spd</i>	<i>Hs</i>	<i>Blt</i>	<i>Bty</i>	<i>Blk</i>	<i>Trt</i>	<i>Dck</i>	<i>Armament</i>
<i>Panther (Leopard)</i>	PC	1885	6	N	3	5	—	—	—	—	1	WS: 1×5B; BT-1, ST-1, MT-1, 10QF

Unarmored Warships**A. Light Cruiser (1 total)**

<i>Name</i>	<i>Class</i>	<i>Year</i>	<i>MS</i>	<i>Ram</i>	<i>Spd</i>	<i>Hs</i>	<i>Blt</i>	<i>Bty</i>	<i>Blk</i>	<i>Trt</i>	<i>Dck</i>	<i>Armament</i>
<i>Tiger</i>	PC	1888	7	N	3	5	—	—	—	—	—	BS, SS: 1×5B; BT-1, ST-1, MT-1, 10QF

B. Corvette (1 total)

<i>Name</i>	<i>Class</i>	<i>Year</i>	<i>MS</i>	<i>Ram</i>	<i>Spd</i>	<i>Hs</i>	<i>Blt</i>	<i>Bty</i>	<i>Blk</i>	<i>Trt</i>	<i>Dck</i>	<i>Armament</i>
<i>Saida</i>	CV	1879	11	N	2	5	—	—	—	—	—	Bow: 1o6, BS: 5o6

C. Sloops (5 total)

<i>Name</i>	<i>Class</i>	<i>Year</i>	<i>MS</i>	<i>Ram</i>	<i>Spd</i>	<i>Hs</i>	<i>Blt</i>	<i>Bty</i>	<i>Blk</i>	<i>Trt</i>	<i>Dck</i>	<i>Armament</i>
<i>Helgoland</i>	SL	1869	7	N	2	5	—	—	—	—	—	MF, MA: 1o7
<i>Fasana</i>	SL	1871	10	N	2	4	—	—	—	—	—	BS: 2o6
<i>Aurora</i>	SL	1874	5	N	2	4	—	—	—	—	—	BS: 2o6, 2MG

(Frundsberg, Zrinyi)

D. Torpedo Boats (54 total)

<i>Name</i>	<i>Class</i>	<i>Year</i>	<i>MS</i>	<i>Ram</i>	<i>Spd</i>	<i>Hs</i>	<i>Blt</i>	<i>Bty</i>	<i>Blk</i>	<i>Trt</i>	<i>Dck</i>	<i>Armament</i>
<i>II class</i> (26 boats total)	TB	1885	(1)	N	3	2	—	—	—	—	—	BT-2, 1QF
<i>III class</i> (4 boats total)	TB	1880	(1)	N	3	2	—	—	—	—	—	BT-2
<i>Adler (Falke)</i>	TB	1884	(2)	N	4	3	—	—	—	—	—	BT-2, 2QF
<i>Sperber (Habicht)</i>	TB	1884	(2)	N	3	3	—	—	—	—	—	BT-2, 2QF
<i>Kukuk</i> (20 boats total)	TB	1888	(2)	N	3	3	—	—	—	—	—	BT-1, DT-1, 2QF

BRAZIL

Crews: Green

A. Turret Battleships (2 total)

<i>Name</i>	<i>Class</i>	<i>Year</i>	<i>MS</i>	<i>Ram</i>	<i>Spd</i>	<i>Hs</i>	<i>Blt</i>	<i>Bty</i>	<i>Blk</i>	<i>Trt</i>	<i>Dck</i>	<i>Armament</i>
<i>Riachelo</i>	TBS	1883	24	Y	3	6	5	5	—	5	2	P, S: [2×9B], FS, AS, BS: 1×6B; BT-2, MT-1, ST-1, 15QF
<i>Aquidaban</i>	TBS	1885	20	Y	3	6	5	5	—	5	2	P, S: [2×9B], FS, AS: 1×6B; BT-1, MT-1, ST-1, 13QF

B. Coastal Defense Monitors (4 total)

<i>Name</i>	<i>Class</i>	<i>Year</i>	<i>MS</i>	<i>Ram</i>	<i>Spd</i>	<i>Hs</i>	<i>Blt</i>	<i>Bty</i>	<i>Blk</i>	<i>Trt</i>	<i>Dck</i>	<i>Armament</i>
<i>Bahia</i>	CDM	1865	4	Y	2	3	2	—	—	2	—	M: [207]; 2QF
<i>Sete de Stmbr.</i>	CDM	1874	9	N	2	4	2	2	—	—	—	FS, AS: [109]; 1QF
<i>Javary (Solimoes)</i>	CDM	1874	14	N	2	5	5	2	—	5	3	MF, MA: [2010]; 2QF

C. Corvettes (2 total)

<i>Name</i>	<i>Class</i>	<i>Year</i>	<i>MS</i>	<i>Ram</i>	<i>Spd</i>	<i>Hs</i>	<i>Blt</i>	<i>Bty</i>	<i>Blk</i>	<i>Trt</i>	<i>Dck</i>	<i>Armament</i>
<i>Guanabara</i>	CV	1877	8	N	2	4	—	—	—	—	—	Bow: 106, BS: 406, 104
<i>Almirante Barrozo</i>	CV	1882	8	N	2	5	—	—	—	—	—	Bow: 2×5B, BS: 3×5B

D. Sloops (3 total)

<i>Name</i>	<i>Class</i>	<i>Year</i>	<i>MS</i>	<i>Ram</i>	<i>Spd</i>	<i>Hs</i>	<i>Blt</i>	<i>Bty</i>	<i>Blk</i>	<i>Trt</i>	<i>Dck</i>	<i>Armament</i>
<i>Trajano</i>	SL	1873	6	N	2	4	—	—	—	—	—	BS: 305
<i>Parnahyba</i>	SL	1878	3	N	2	3	—	—	—	—	—	BS: 305
<i>Prmr de Marco</i>	SL	1881	3	N	1	3	—	—	—	—	—	Bow: 105, BS: 3×5B

E. Torpedo Boats (5 total)

<i>Name</i>	<i>Class</i>	<i>Year</i>	<i>MS</i>	<i>Ram</i>	<i>Spd</i>	<i>Hs</i>	<i>Blt</i>	<i>Bty</i>	<i>Blk</i>	<i>Trt</i>	<i>Dck</i>	<i>Armament</i>
<i>N. 1-5</i>	TB	1882	(1)	N	4	2	—	—	—	—	—	BT-2+2

CHILE

Crews: Trained

Armored Ships (4 Total)

<i>Name</i>	<i>Class</i>	<i>Year</i>	<i>MS</i>	<i>Ram</i>	<i>Spd</i>	<i>Hs</i>	<i>Blt</i>	<i>Bty</i>	<i>Blk</i>	<i>Trt</i>	<i>Dck</i>	<i>Armament</i>
<i>Almirante Cochrane</i> (Valparaiso)	CBI	1874	13	Y	2	4	4	3	—	—	1	Bow: [2×8B], FS, AS: [1×8B]; BT-2, ST-1, 9QF
<i>Huascar</i>	TBS	1865	8	Y	2	4	2	1	—	3	—	M: [2×8B], BS: 2×5B; 5QF
<i>Esmeralda</i>	PC	1883	12	Y	3	5	—	1	—	1	2	F, A: [1×10B], FS, AS: [1×6B], BS: [1×6B]; BT-1, MT-1, 2QF

Unarmored Warships and Torpedo Vessels (4 Total)

Name	Class	Year	MS	Ram	Spd	Hs	Blt	Bty	Blk	Trt	Dck	Armament
<i>Abtao</i>	CV	1865	6	N	2	4	—	—	—	—	—	M: 1o6, BS: 2o5
<i>Chacabuco</i>	CV	1866	4	N	2	4	—	—	—	—	—	F, M, A: 1o8, BS: 1o6, 2o5
<i>Magallanes</i>	GB	1872	4	N	2	4	—	—	—	—	—	MF: 1o7, MA: 1o6, F, A: 1o4
<i>Sgt. Aldea</i>	TB	1886	(2)	N	4	2	—	—	—	—	—	BT-2, 2MG

CHINA

Crews: Green

Armored Ships

A. Turret Battleships (2 total)

Name	Class	Year	MS	Ram	Spd	Hs	Blt	Bty	Blk	Trt	Dck	Armament
<i>Ting Yuen</i> (<i>Chen Yuan</i>)	TBS	1881	29	N	3	6	7	4	—	7	3	MF, MA: [2o12], F, A: [1o6]; DT-3

B. Armored Cruisers (3 total)

Name	Class	Year	MS	Ram	Spd	Hs	Blt	Bty	Blk	Trt	Dck	Armament
<i>King Yuan (Lai Yuan)</i>	AC	1887	12	Y	3	5	4	2	—	4	2	F: [2x8B], WS: 1x5B; BT-1, ST-1, MT-1
<i>Ping Yuen</i>	AC	1889	9	N	2	4	4	2	—	2	2	F: [1x10B], WS: 1x6B; BT-1, ST-1, MT-1

C. Protected Cruisers (5 total)

Name	Class	Year	MS	Ram	Spd	Hs	Blt	Bty	Blk	Trt	Dck	Armament
<i>Chi Yuan</i>	PC	1883	9	N	3	5	—	1	—	7	4	F: [2x8B], BS: [2x3B], A: [1x6B]; BT-1, ST-1, DT-2
<i>Chao Yung</i> (<i>Yang Wei</i>)	PC	1880	6	N	3	4	—	—	—	1	1	F, A: [1o10], FS, AS: 1o5
<i>Chih Yuan</i>	PC	1886	9	N	3	5	—	—	—	1	2	F: [2x8B], WS: [1x6B], A: [1x8B]; BT-1, ST-1, MT-1, 8QF

D. Armored Gunboat (1 total)

Name	Class	Year	MS	Ram	Spd	Hs	Blt	Bty	Blk	Trt	Dck	Armament
<i>Tiong Sing</i>	AGB	1875	(4)	N	2	2	1	—	—	1	—	F: [1o7]

Unarmored Warships and Torpedo Boats

A. Light Cruisers (6 total)

Name	Class	Year	MS	Ram	Spd	Hs	Blt	Bty	Blk	Trt	Dck	Armament
<i>Kai Che</i>	LC	1882	8	Y	2	5	—	—	—	—	—	FS: 1x7B, BS: 2o5, AS: 1oF, A: 1o5
<i>Huan T'ai</i> (<i>King Ch'ing</i>)	LC	1886	8	Y	2	5	—	—	—	—	—	FS: 1x7B, BS: 2x5B, AS: 1x5B, A: 1x7B, Bow: 1x5B; MT-1
<i>Nan Thin</i> (<i>Nan Shuin</i>)	LC	1883	9	Y	3	5	—	—	—	—	—	F, A: 1x5B, FS: 1x8B, BS: 2x5B, AS: 1x5B; BT-1, 10MG
<i>Pao Min</i>	LC	1883	6	N	2	4	—	—	—	—	—	F, A: 1x6B, BS: 3x5B; 2QF

B. Frigate (1 total)

Name	Class	Year	MS	Ram	Spd	Hs	Blt	Bty	Blk	Trt	Dck	Armament
<i>Hai An</i>	FG	1872	10	N	2	6	—	—	—	—	—	BS: 1o8, 2o6, 1o5

C. Sloops (5 total)

<i>Name</i>	<i>Class</i>	<i>Year</i>	<i>MS</i>	<i>Ram</i>	<i>Spd</i>	<i>Hs</i>	<i>Blt</i>	<i>Bty</i>	<i>Blk</i>	<i>Trt</i>	<i>Dck</i>	<i>Armament</i>
<i>Fu Po</i>	SL	1870	5	N	2	4	—	—	—	—	—	FS, AS: 1×4B, M: 1×5B
<i>Yuan Kai</i> (<i>T'ai An, Teng Ying Chen</i>)	SL	1874	5	N	2	4	—	—	—	—	—	FS, AS: 1×4B, BS: 1×4B
<i>Chao Wu</i>	SL	1878	4	N	2	4	—	—	—	—	—	FS: 1×6B, BS: 2×5B, AS: 1×5B, A: 1×5B

D. Gunboats (8 total)

<i>Name</i>	<i>Class</i>	<i>Year</i>	<i>MS</i>	<i>Ram</i>	<i>Spd</i>	<i>Hs</i>	<i>Blt</i>	<i>Bty</i>	<i>Blk</i>	<i>Trt</i>	<i>Dck</i>	<i>Armament</i>
<i>Tien Tsiw</i>	GB	1863	2	N	1	3	—	—	—	—	—	BS: 2o5, M: 1o6
<i>Kwang Tung</i> (<i>Shang Tung</i>)	GB	1868	2	N	1	3	—	—	—	—	—	F, A: 1o4, BS: 2o5
<i>Mei Yuan</i>	GB	1869	2	N	1	3	—	—	—	—	—	F, A: 1o5, M: 1o6
<i>Peng Chao Hai</i>	GB	1869	2	N	2	4	—	—	—	—	—	FS: 1o5, AS: 1o4
<i>Chen Hai</i> (<i>Ching Yuan</i>)	GB	1871	2	N	2	3	—	—	—	—	—	F, A: 1o6, FS, AS: 1o5, BS: 1o4
<i>Ts'ao Chiang</i>	GB	1876	2	N	1	3	—	—	—	—	—	F, A, BS: 1o6

E. Torpedo Boats (8 total)

<i>Name</i>	<i>Class</i>	<i>Year</i>	<i>MS</i>	<i>Ram</i>	<i>Spd</i>	<i>Hs</i>	<i>Blt</i>	<i>Bty</i>	<i>Blk</i>	<i>Trt</i>	<i>Dck</i>	<i>Armament</i>
<i>Vulcan</i> (total of 6 boats)	TB	1883	(1)	N	3	2	—	—	—	—	—	BT-2+1, 2QF
<i>Fu Lung</i>	T	1885	(2)	N	4	3	—	—	—	—	—	BT-2+2, 2QF
<i>Tso I</i>	TB	1887	(1)	N	4	2	—	—	—	—	—	BT-2+2, DT-1, 2QF

DENMARK

Crews: Trained

A. Broadside Ironclads (3 total)

<i>Name</i>	<i>Class</i>	<i>Year</i>	<i>MS</i>	<i>Ram</i>	<i>Spd</i>	<i>Hs</i>	<i>Blt</i>	<i>Bty</i>	<i>Blk</i>	<i>Trt</i>	<i>Dck</i>	<i>Armament</i>
<i>Dannebrog</i>	BSI	1863	12	N	1	4	2	2	—	—	—	BS: [8o6]
<i>Peder Skram</i>	BSI	1864	14	N	2	4	2	2	—	—	—	BS: [3o8, 6o5]
<i>Danmark</i>	BSI	1864	19	N	1	5	2	2	—	—	—	BS: [6o8, 6o5]

B. Coast Defense Monitors (6 total)

<i>Name</i>	<i>Class</i>	<i>Year</i>	<i>MS</i>	<i>Ram</i>	<i>Spd</i>	<i>Hs</i>	<i>Blt</i>	<i>Bty</i>	<i>Blk</i>	<i>Trt</i>	<i>Dck</i>	<i>Armament</i>
<i>Rolf Krake</i>	CDM	1863	5	N	1	4	2	—	—	2	—	F, A: [1o8], WS: 1×3B; 4QF
<i>Lindorman</i>	CDM	1868	8	N	2	4	2	—	—	2	—	F: [2o9]; 4QF
<i>Gorm</i>	CDM	1870	9	N	2	5	3	—	—	3	—	F: [2o10], BS: 2×3B; 4QF
<i>Odin</i>	CDM	1872	13	Y	2	5	3	3	—	—	—	BS: [2o10], 2×3B; 4QF
<i>Helgoland</i>	CDM	1878	22	N	2	5	4	5	—	5	—	F: [1o12], FS, AS: [1o10], BS: 2o5, A: 1o5
<i>Hvitfeldt</i>	CDM	1886	14	N	3	5	M5	—	—	4	—	F, A: [1×10B], FS, AS: 1×5B; MT-1, DT-1, 12QF

C. Torpedo Ram (1 total)

<i>Name</i>	<i>Class</i>	<i>Year</i>	<i>MS</i>	<i>Ram</i>	<i>Spd</i>	<i>Hs</i>	<i>Blt</i>	<i>Bty</i>	<i>Blk</i>	<i>Trt</i>	<i>Dck</i>	<i>Armament</i>
<i>Tordenskjold</i>	TR	1880	10	Y	2	4	—	—	—	4	1	F: [1o14], AS, BS: 1o5; BT-1, DT-3, 8QF

D. Protected Cruiser (1 total)

Name	Class	Year	MS	Ram	Spd	Hs	Blt	Bty	Blk	Trt	Dck	Armament
Valkyrien	PC	1888	12	N	3	5	—	1	—	1	2	F, A: [1×8B], FS, AS: [1×6B], BS: [1×6B]; BT-1, MT-2, 12QF

E. Light Cruiser (1 total)

Name	Class	Year	MS	Ram	Spd	Hs	Blt	Bty	Blk	Trt	Dck	Armament
Fyen	LC	1882	11	Y	2	4	—	—	—	—	—	FS, AS: 1×6B, BS: 7o6; DT-2, 8QF

F. Corvette (1 total)

Name	Class	Year	MS	Ram	Spd	Hs	Blt	Bty	Blk	Trt	Dck	Armament
St. Thomas	CV	1871	6	N	2	5	—	—	—	—	—	FS, AS: 1o6, M: 1o8

G. Sloop (1 total)

Name	Class	Year	MS	Ram	Spd	Hs	Blt	Bty	Blk	Trt	Dck	Armament
Dagmar	SL	1861	5	N	2	3	—	—	—	—	—	BS: 4o5; 2QF

H. Torpedo Boats (7 total)

Name	Class	Year	MS	Ram	Spd	Hs	Blt	Bty	Blk	Trt	Dck	Armament
Svaerdfiskin (Delfinen, Hvalrossen)	TB	1881	(1)	N	3	2	—	—	—	—	—	BT-2, 1QF
Storen (Solven, Narhvalen, Havnesten)	TB	1887	(2)	N	3	3	—	—	—	—	—	BT-2, DT-2, 2QF

I. Gunboats (6 total)

Name	Class	Year	MS	Ram	Spd	Hs	Blt	Bty	Blk	Trt	Dck	Armament
Absalon (Snare)	GB	1862	2	N	2	3	—	—	—	—	—	F, M, A: 1o6
Fylla (Diana)	GB	1862	2	N	2	3	—	—	—	—	—	F, M, A: 1o6
Falster	GB	1873	1	N	2	2	—	—	—	—	—	F, A: 1o4, M: 1o10; 2QF
Möew	GB	1875	2	N	2	2	—	—	—	—	—	F, A: 1o4, M: 1o10; 2QF

FRANCE

Crews: Crack

Armored Ships

A. Central Battery Ironclads (10 total)

Name	Class	Year	MS	Ram	Spd	Hs	Blt	Bty	Blk	Trt	Dck	Armament
Ocean (Marengo, Suffren)	CBI	1870	31	Y	2	6	3	3	—	—	—	FS, AS: 1o9, BS: [2o11, 1o6], 2o6; DT-4, 12QF
Friedland	CBI	1876	35	N	2	6	3	3	—	—	—	WS: 1o11, BS: [3o11], 4o6; DT-4, 8QF
Richelieu	CBI	1876	36	Y	2	6	3	3	—	—	—	FS, AS: [1o9], Bow: 1o9, BS: [3o11], 5o5; DT-4, 8QF
Colbert (Trident)	CBI	1877	35	Y	2	6	3	3	2	—	—	Bow: 1o9, A: 1o9, FS: 1o11, BS: [3o11], 3o6; DT-4, 14QF
Redoutable	CBI	1878	37	N	2	6	5	4	—	—	2	Bow: 1×11B, P, S, A: 1×11B, FS, AS: [1×9B], BS: 3×4B; DT-2, 12QF
Courbet	CBI	1886	42	N	3	6	6	4	—	—	2	FS, AS: [1o14], P, S, A: 1o9, BS: 3o5
Devastation	CBI	1882	42	N	3	6	6	4	—	—	2	FS, AS: [1o11], Bow: 1o9, P, S, A: 1o9, BS: 3o4

B. Turret Battleships (7 total)

Name	Class	Year	MS	Ram	Spd	Hs	Blt	Bty	Blk	Trt	Dck	Armament
<i>Duperre</i>	TBS	1883	44	N	2	6	8	1	—	6	—	P, S, M, A: [1×14B], Bow: 1×6B, BS: 7×6B; MT-2, 16QF
<i>Terrible</i> (<i>Caiman, Requin, Indomptable</i>)	TBS	1887	30	N	2	5	9	1	—	9	—	F, A: [1016], FS, AS: 1×4B; MT-2, 16QF
<i>Baudin (Formidable)</i>	TBS	1888	47	Y	3	7	10	2	—	8	4	F, M, A: [1×14B], FS, AS: 1×6B, BS: 4×5B; DT-4, 12QF

C. Coastal Defense Monitors (10 total)

Name	Class	Year	MS	Ram	Spd	Hs	Blt	Bty	Blk	Trt	Dck	Armament
<i>Cerber</i> (<i>Belier, Tigre, Bouledogne</i>)	CDM	1868	14	Y	2	4	3	—	—	3	—	F: [209]; 4QF
<i>Tonnere (Fulminant)</i>	CDM	1879	23	N	2	5	5	6	—	6	2	F: [2011]; 8QF
<i>Tempete (Vengeur)</i>	CDM	1879	19	N	2	5	5	6	—	6	2	F: [2011]; 4QF
<i>Tonnant</i>	CDM	1884	20	N	2	5	6	—	—	7	—	F, A: [1×14B]; 8QF
<i>Furieux</i>	CDM	1887	24	N	2	5	6	2	—	9	—	F, A: [1×14B]; DT-2, 14QF

D. Armored Gunboats (5 total)

Name	Class	Year	MS	Ram	Spd	Hs	Blt	Bty	Blk	Trt	Dck	Armament
<i>Acheron</i>	AGB	1888	7	N	2	4	4	—	—	4	—	F: [1×11B], WS: 1×4B, Strm: 1×4B; 6QF
<i>Fusee</i> (<i>Flamme, Grenade, Mitraille</i>)	AGB	1885	4	N	2	3	4	—	—	4	—	F: [1×9B], A: 1×3B; 4QF

E. Armored Cruisers (7 total)

Name	Class	Year	MS	Ram	Spd	Hs	Blt	Bty	Blk	Trt	Dck	Armament
<i>La Galissonniere</i> (<i>Triomphante, Victorieuse</i>)	AC	1874	18	Y	2	5	3	2	—	2	—	P, S: [109], Bow: 107, BS: [209], 305; DT-4, 4QF
<i>Bayard (Turenne)</i>	AC	1882	24	Y	2	5	4	—	—	4	2	F, M, A: [1×9B], Bow, Strm: 107, BS: 3×5B; 12QF
<i>Vauban (Duguesclin)</i>	AC	1882	24	Y	2	5	4	—	—	4	2	F, M, A: [1×9B], Bow: 107, BS: 3×5B; 12QF

F. Protected Cruiser (1 total)

Name	Class	Year	MS	Ram	Spd	Hs	Blt	Bty	Blk	Trt	Dck	Armament
<i>Sfax</i>	PC	1887	18	Y	3	6	—	—	—	—	2	FS, AS: 1×6B, Bow: 2×6B; BT-1, DT-4, 12QF

Unarmored Warships and Torpedo Vessels**A. Light Cruisers (42 total)**

Name	Class	Year	MS	Ram	Spd	Hs	Blt	Bty	Blk	Trt	Dck	Armament
<i>Talisman</i>	LC	1863	6	N	2	4	—	—	—	—	—	F, A: 104, BS: 206; 4QF
<i>Desaix</i>	LC	1868	6	N	2	5	—	—	—	—	—	F: 105, BS: 205
<i>Limier</i> (<i>D'Estrees, Hamelin, L'Hermitte, Volta</i>)	LC	1868	5	N	2	4	—	—	—	—	—	F: 106, A: 105, BS: 205; 2QF
<i>Chateaurenault</i>	LC	1869	7	N	2	5	—	—	—	—	—	F: 106, BS: 306; 4QF
<i>Linois</i>	LC	1868	5	N	2	4	—	—	—	—	—	F, A: 106, BS: 206, 206; DT-2, 2QF
<i>Infernet</i> (<i>Champlain, Laclocheterie, Dupetit-Thouars</i>)	LC	1871	8	N	2	5	—	—	—	—	—	Bow, Strm: 106, BS: 406; 4QF

Name	Class	Year	MS	Ram	Spd	Hs	Blt	Bty	Blk	Trt	Dck	Armament
<i>Sane</i> (<i>Fabert, Seignelay</i>)	LC	1872	8	N	2	5	—	—	—	—	—	Bow, Strm: 1o6, BS: 3o6
<i>Bourayne</i> (<i>Beautemps-Beaupre, Duchaffault, Hugon, Kerguelen, Kersaint, Segond, Vaudreul</i>)	LC	1870	5	N	2	4	—	—	—	—	—	F: 1o6, A: 1o5, BS: 2o5; 4QF
<i>Hirondelle</i>	LC	1873	5	N	3	5	—	—	—	—	—	DT-2, 8QF
<i>Genouilly (Eclaireur)</i>	LC	1878	7	Y	3	5	—	—	—	—	—	Bow, Strm: 1o6, BS: 3o6; 6QF
<i>Dugay-Trouin</i>	LC	1879	14	Y	3	6	—	—	—	—	—	FS, AS, Bow: 1o7, Strm: 1o5, BS: 2o5; DT-2, 10QF
<i>Tourville</i>	LC	1877	22	Y	3	6	—	—	—	—	—	FS, AS, Bow: 1o7, BS: 1o7, 7o6; 8QF
<i>Duquesne</i>	LC	1878	24	Y	3	6	—	—	—	—	—	FS, AS, Bow: 1o7, BS: 1o7, 7o6; 8QF
<i>Lamperouse</i> (<i>D'Estaing, Neilly, Primauguet</i>)	LC	1880	9	Y	3	5	—	—	—	—	—	Bow: 2o6, A: 1o6, BS: 6o6; 8QF
<i>Villars</i> (<i>Farfait, Magon, Rolland</i>)	LC	1880	10	Y	2	5	—	—	—	—	—	Bow: 2o6, A: 1o6, BS: 6o6; 8QF
<i>Iphigenie</i>	LC	1883	13	N	2	5	—	—	—	—	—	Bow: 2o6, Strm: 2o5, BS: 8o5; DT-1, 8QF
<i>Arethuse</i>	LC	1885	14	Y	3	5	—	—	—	—	—	FS, AS: 1x6B, Bow, Strm: 1x5B, BS: 10x5B; 8QF
<i>Dubordieus</i>	LC	1886	15	N	2	5	—	—	—	—	—	FS, AS: 1x6B, Strm: 2x5B, BS: 5x5B; DT-2, 10QF
<i>Milan</i>	LC	1885	7	Y	3	6	—	—	—	—	—	F, A, BS: 1x4B; DT-2, 12QF

B. Sloops (11 total)

Name	Class	Year	MS	Ram	Spd	Hs	Blt	Bty	Blk	Trt	Dck	Armament
<i>Parseval (Bouvet)</i>	SL	1879	3	Y	2	4	—	—	—	—	—	F, MF, MA, A: 1o5; 6QF
<i>Bisson</i> (<i>Chasseur, D'Urville, Hussard, Voltigeur, Labourdonnais</i>)	SL	1874	4	Y	2	4	—	—	—	—	—	F, MF, MA, A: 1o5; 6QF
<i>Inconstant</i> (<i>Fulton, Papin</i>)	SL	1887	3	Y	2	4	—	—	—	—	—	F, MF, MA: 1x5B, A: 1x4B; 5QF

C. Gunboats (12 total)

Name	Class	Year	MS	Ram	Spd	Hs	Blt	Bty	Blk	Trt	Dck	Armament
<i>Crocodil</i> (<i>Lutin, Lynx, Aspic, Capricorne, Sagitaire, Vipere</i>)	GB	1874	2	N	2	3	—	—	—	—	—	F, A: 1o4, MF, MA: 1o5; 4QF
<i>Comete</i> (<i>Gabes, Lion, Meteor, Scorpion</i>)	GB	1884	2	N	2	3	—	—	—	—	—	F, A: 1o4, MF, MA: 1o5; 3QF

D. Torpedo Cruisers (4 total)

Name	Class	Year	MS	Ram	Spd	Hs	Blt	Bty	Blk	Trt	Dck	Armament
<i>Condor</i> (<i>Epervier, Faucon, Vautour</i>)	TGB	1886	5	Y	3	4	—	—	—	—	—	Bow: 2x4B, WS: 1x4B, A: 1x4B; DT-4, 10QF

E. Torpedo Boats (16 total)

Name	Class	Year	MS	Ram	Spd	Hs	Blt	Bty	Blk	Trt	Dck	Armament
<i>Balny class</i> (total of 10 boats)	TB	1886	(1)	N	3	3	—	—	—	—	—	BT-2, 2QF
<i>Ouragan class</i> (total of 5 boats)	TB	1887	(2)	N	3	3	—	—	—	—	—	DT-4, 2QF
<i>Coureur</i> (total of 1 boat)	TB	1888	(2)	N	4	3	—	—	—	—	—	BT-2, 2QF

F. Torpedo Gunboats (5 total)

Name	Class	Year	MS	Ram	Spd	Hs	Blt	Bty	Blk	Trt	Dck	Armament
Bombe	TGB	1883	2	Y	3	4	—	—	—	—	—	DT-2, 7QF
(Couleuvrine, Dague, Dragonne, Fleche)												

(Couleuvrine, Dague, Dragonne, Fleche)

G. Submarine (1 total)

<i>Name</i>	<i>Class</i>	<i>Year</i>	<i>MS</i>	<i>Ram</i>	<i>Spd</i>	<i>Hs</i>	<i>Blt</i>	<i>Bty</i>	<i>Blk</i>	<i>Trt</i>	<i>Dck</i>	<i>Armament</i>
<i>Gymnate</i>	S	1889	(1) N	2	(1)	1	—	—	—	—	—	BT-2

GERMANY
Crews: Trained
Armored Ships

A. Central Battery Ironclads (6 total)

<i>Name</i>	<i>Class</i>	<i>Year</i>	<i>MS</i>	<i>Ram</i>	<i>Spd</i>	<i>Hs</i>	<i>Blt</i>	<i>Bty</i>	<i>Blk</i>	<i>Trt</i>	<i>Dck</i>	<i>Armament</i>
<i>Friedrich Carl</i>	CBI	1867	27	N	2	6	2	2	—	—	—	BS: [8o8]; 6QF
<i>Kronprinz</i>	CBI	1867	25	N	2	6	2	2	—	—	—	BS: [8o8]; 6QF
<i>Konig Wilhelm</i>	CBI	1868	42	N	2	7	3	4	—	—	2	Bow: 1o8, BS: 2o8, 9o9
<i>Kaiser</i> (Deutschland)	CBI	1875	35	N	2	6	5	4	4	—	2	FAS: [1o10], Bow: 1o6, BS: [2o10], 3x6B; 4QF, 12MG
<i>Oldenburg</i>	CBI	1884	23	N	2	5	M5	5	4	2	—	FAS: [1o9], BS: [1o9], 1o9, 2o6, 4x3B

B. Turret Battleships (6 total)

<i>Name</i>	<i>Class</i>	<i>Year</i>	<i>MS</i>	<i>Ram</i>	<i>Spd</i>	<i>Hs</i>	<i>Blt</i>	<i>Bty</i>	<i>Blk</i>	<i>Trt</i>	<i>Dck</i>	<i>Armament</i>
<i>Preussen</i> (<i>Friedrich Der Grosse</i>)	TBS	1873	30	N	2	6	3	—	—	4	—	P, S: [2o10], Bow: 1o7, Strm: 1o7
<i>Sachsen</i> (<i>Bayern, Baden, Wurtemberg</i>)	TBS	1877	31	N	2	6	M5	5	4	4	2	F: [2o10], PF, SF, PA, SA: [1o10], BS: 2x3B; 8QF

C. Coastal Defense Monitors (11 total)

Name	Class	Year	MS	Ram	Spd	Hs	Blt	Bty	Blk	Trt	Dck	Armament
Wespi	AGB	1876	5	N	1	3	4	—	—	—	—	Bow: 1x12B; 2MG <i>(Basilisk, Biene, Camaeleon, Crocodil, Hummel, Muecke, Natter, Salamander, Scorpion, Viper)</i>

D. Protected Cruisers (2 total)

<i>Name</i>	<i>Class</i>	<i>Year</i>	<i>MS</i>	<i>Ram</i>	<i>Spd</i>	<i>Hs</i>	<i>Blt</i>	<i>Bty</i>	<i>Blk</i>	<i>Trt</i>	<i>Dck</i>	<i>Armament</i>
<i>Irene</i> (<i>Prinzess Wilhelm</i>)	PC	1888	20	N	3	7	—	1	—	—	3	Bow: [2×6B], FS, AS: [1×6B], BS: [4×6B]; BT-1, MT-1, 6QF

Unarmored Warships

A. Light Cruisers (6 total)

<i>Name</i>	<i>Class</i>	<i>Year</i>	<i>MS</i>	<i>Ram</i>	<i>Spd</i>	<i>Hs</i>	<i>Blt</i>	<i>Bty</i>	<i>Blk</i>	<i>Trt</i>	<i>Dck</i>	<i>Armament</i>
<i>Blitz (Pfeil)</i>	LC	1883	6	N	3	5	—	—	—	—	—	Bow: 1o5, BS: 2x3B; BT-1+2
<i>Greif</i>	LC	1887	9	N	3	7	—	—	—	—	—	Bow: 1o4, Strm: 1o4; 10QF
<i>Wacht</i>	LC	1887	6	N	3	6	—	—	—	—	—	FS, AS: 1x3B; BT-1, DT-2
<i>Schwalbe (Sperber)</i>	LC	1888	5	N	2	4	—	—	—	—	—	FS, AS: 1o4; 5QF

B. Corvettes (18 total)

<i>Name</i>	<i>Class</i>	<i>Year</i>	<i>MS</i>	<i>Ram</i>	<i>Spd</i>	<i>Hs</i>	<i>Blt</i>	<i>Bty</i>	<i>Blk</i>	<i>Trt</i>	<i>Dck</i>	<i>Armament</i>
<i>Ariadne</i> (<i>Luise, Freya</i>)	CV	1872	8	N	2	4	—	—	—	—	—	BS: 1o5, 3o6; 4QF

Name	Class	Year	MS	Ram	Spd	Hs	Blt	Bty	Blk	Trt	Dck	Armament
Leipzig (Adalbert)	CV	1877	18	N	3	6	—	—	—	—	—	BS: 6o7; BT-2, 4QF
Bismarck	CV	1878	12	N	2	5	—	—	—	—	—	BS: 8o6
(Bluecher, Stosch, Moltke, Gneisenau, Stein)												
Carola	CV	1881	9	N	2	5	—	—	—	—	—	Bow: 2x3B, BS: 5o6; 6QF
(Olga, Marie, Sophie)												
Alexandrine (Arcona)	CV	1886	10	N	2	5	—	—	—	—	—	Bow: 2o4, BS: 5o6; 6QF
Charlotte	CV	1886	15	N	2	5	—	—	—	—	—	Bow: 2x3B, Strn: 2x3B, BS: 6x3B, 6o6

C. Gunboats (10 total)

Name	Class	Year	MS	Ram	Spd	Hs	Blt	Bty	Blk	Trt	Dck	Armament
Albatros (Nautilus)	GB	1871	3	N	2	4	—	—	—	—	—	F, A: 1o5, MF, MA: 1o6
Cyclop	GB	1874	2	N	2	3	—	—	—	—	—	F, A: 1o4, MF, MA: 1o5; 2QF
Wolf (Hyaene, Iltis)	GB	1878	2	N	1	3	—	—	—	—	—	F, A: 1o4, MF, MA: 1o5; 2QF
Habicht	GB	1879	4	N	2	4	—	—	—	—	—	FS, AS: 1o5, M: 1o5; 5QF

(Moewe, Adler)

Eber	GB	1887	3	N	2	3	—	—	—	—	—	F, M, A: 1o4; 4QF
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D. Torpedo Boats (78 total)

Name	Class	Year	MS	Ram	Spd	Hs	Blt	Bty	Blk	Trt	Dck	Armament
Schutze	TB	1883	(1)	N	3	2	—	—	—	—	—	BT-2+2, 1QF
(Flink, Scharf, Tapfer, Kuehn, Woerwarts, Sicher)												
Jaeger	TB	1883	(3)	N	3	2	—	—	—	—	—	BT-2, 1QF
W1	TB	1884	(2)	N	3	2	—	—	—	—	—	BT-2+2, 2QF
(W1-W6, S1-S6, 12 boats total)												
V1	TB	1884	(1)	N	3	2	—	—	—	—	—	BT-2+2, 2QF
(V1-V10, Th1, Y, G, K, 14 boats total)												
A	TB	1889	(2)	N	3	2	—	—	—	—	—	BT-1, DT-2+2, 2QF
(Wilhelmshaven, Danzig)												
S7	TB	1885	(2)	N	4	3	—	—	—	—	—	BT-1, DT-2+2, 2QF
(S7-S42, 36 boats total)												
D1	TB	1887	1	N	4	4	—	—	—	—	—	BT-1, DT-2+2, 6QF
(D1-D4, 4 boats total)												
D5	TB	1889	2	N	4	4	—	—	—	—	—	BT-1, DT-2+2, 6QF
(D5-D6, 2 boats total)												

GREAT BRITAIN

Crews: Crack

Armored Ships

A. Broadside Ironclads (3 total)

Name	Class	Year	MS	Ram	Spd	Hs	Blt	Bty	Blk	Trt	Dck	Armament
Minotaur	BSI	1867	42	N	2	3	3	2	—	—	—	Bow: [2o9], Strn: [1o9], BS: [7o9]; 14MG
(Agincourt, Northumberland)												

B. Central Battery Ironclads (14 total)

Name	Class	Year	MS	Ram	Spd	Hs	Blt	Bty	Blk	Trt	Dck	Armament
Bellerophon	CBI	1866	30	N	2	6	3	3	2	—	—	Bow: 2x6B, Strn: 2x6B, BS: [5x8B], 2x4B; DT-2, 4QF, 12MG

<i>Name</i>	<i>Class</i>	<i>Year</i>	<i>MS</i>	<i>Ram</i>	<i>Spd</i>	<i>Hs</i>	<i>Blt</i>	<i>Bty</i>	<i>Blk</i>	<i>Trt</i>	<i>Dck</i>	<i>Armament</i>
<i>Hercules</i>	CBI	1868	35	N	2	6	4	3	3	—	—	Bow: [1o9], 2o7, Strn: [1o9], 2o7, BS: [4o10]; 7QF, 12MG
<i>Penelope</i>	CBI	1868	18	N	2	5	3	3	2	—	—	BS: [4o8]; 4QF, 11MG
<i>Audacious</i> (<i>Invincible, Iron Duke</i>)	CBI	1869	24	N	2	6	3	3	2	—	—	Bow: 2x4B, Strn: 2x4B, FS, AS: [1o9], BS: [3o9], 2x4B; DT-4, 10QF, 5MG
<i>Sultan</i>	CBI	1871	37	N	2	6	4	4	3	—	—	Bow: [2o9], AS: [2o9], BS: [4o10], 3x4B; 4QF, 13MG
<i>Swiftsure</i> (<i>Triumph</i>)	CBI	1872	28	N	2	6	4	3	2	—	—	Bow: 2x4B, Strn: 2x4B, FS, AS: [1o9], BS: [3o9], 2x4B; DT-4, 8QF, 11MG
<i>Temeraire</i>	TCBI	1877	34	N	2	6	5	4	4	5	1	F, A: [1o11], FS: [1o11], BS: [2o10], 3x4B; 6QF 13MG
<i>Alexandra</i>	CBI	1877	38	N	3	6	4	6	4	—	1	FS, AS: [1o11], BS: [4o10], 3x4B; MT-2, 14QF, 6MG
<i>Belleisle (Orion)</i>	CBI	1878	19	Y	2	5	5	4	3	—	3	FS, AS: [1o12]; BT-2, 6QF, 9MG
<i>Superb</i>	CBI	1880	39	N	2	7	6	6	5	—	1	FS, AS: [1o10], BS: [4o10]; BT-2, MT-1, 14QF, 6MG

C. Turret Battleships (18 total)

<i>Name</i>	<i>Class</i>	<i>Year</i>	<i>MS</i>	<i>Ram</i>	<i>Spd</i>	<i>Hs</i>	<i>Blt</i>	<i>Bty</i>	<i>Blk</i>	<i>Trt</i>	<i>Dck</i>	<i>Armament</i>
<i>Monarch</i>	TBS	1869	33	N	2	7	3	3	2	4	—	Bow: [2o7], Strn: [1o7], FM, AM: [2o12]
<i>Devastation</i> (<i>Thunderer</i>)	TBS	1873	7	N	2	6	8	5	8	8	3	F, A: [2o12]; 6QF, 12M
<i>Dreadnought</i>	TBS	1875	44	N	2	6	7	6	7	6	3	F, A: [2o13]; 6QF, 16MG
<i>Inflexible</i>	TBS	1881	47	N	2	6	M18	10	8	3		P, S: [2o16], BS: 3x4B; BT-2, MT-1, 5QF, 15MG
<i>Conqueror (Hero)</i>	TBS	1882	25	Y	3	5	6	4	5	6	2	F: [2x12B], BS: [2x6B]; BT-2, ST-2, MT-1, 6QF, 12MG
<i>Agamemnon (Ajax)</i>	TBS	1883	34	N	3	6	M9	9	8	8	3	P, S: [2o13], F, A: 1x6B; MT-1, 6QF, 13MG
<i>Collingwood</i>	TBS	1886	38	N	3	7	M9	—	8	6	3	F, A: [2x12B], BS: 3x6B; MT-2, 20QF, 7MG
<i>Colossus (Edinburgh)</i>	TBS	1886	38	N	3	6	M9	9	8	8	3	P, S: [2x12B], BS: [2x6B]; MT-1, 4QF, 15MG
<i>Admiral class</i> (<i>Anson, Camperdown, Howe, Rodney</i>)	TBS	1888	42	N	3	7	M9	—	8	6	3	F, A: [2x14B], BS: 3x6B; MT-2, 19QF, 7MG
<i>Benbow</i>	TBS	1888	42	N	3	7	M9	—	8	6	3	F, A: [1x16B], BS: 5x6B; MT-2, 19QF, 7MG
<i>Trafalgar</i>	TBS	1889	50	N	3	7	9	9	9	9	3	F, A: [2x14B], BS: [3x4.7B]; BT-1, ST-1, MT-1, 17QF, 4MG

D. Coastal Defense Monitors (13 total)

<i>Name</i>	<i>Class</i>	<i>Year</i>	<i>MS</i>	<i>Ram</i>	<i>Spd</i>	<i>Hs</i>	<i>Blt</i>	<i>Bty</i>	<i>Blk</i>	<i>Trt</i>	<i>Dck</i>	<i>Armament</i>
<i>Scorpion</i> (<i>Wivern</i>)	CTI	1865	11	N	2	4	2	—	—	4	—	FM, AM: [2o9]
<i>Prince Albert</i>	CTI	1866	15	N	2	5	2	—	—	4	—	F, A, FM, AM: [1o9]; 6MG
<i>Abyssinia</i>	CDM	1870	12	N	1	4	3	—	—	4	1	F, A: [2o10]
<i>Cerberus (Magdali)</i>	CDM	1870	13	N	2	4	4	—	—	5	1	F, A: [2o10]

Name	Class	Year	MS	Ram	Spd	Hs	Blt	Bty	Blk	Trt	Dck	Armament
<i>Cyclops</i> (<i>Gorgon, Hecate, Hydra</i>)	CDM	1871	14	N	2	4	4	—	—	5	1	F, A: [2o10]; 4QF, 5MG
<i>Hotspur</i>	ICR	1871	17	Y	2	5	5	—	—	4	2	F: [2o12], AS: 2x6B
<i>Glatton</i>	CDM	1872	20	N	2	5	6	—	—	7	3	F: [2o11]; 3QF, 4MG
<i>Rupert</i>	ICR	1874	22	Y	2	5	5	—	—	7	3	F: [2o10], AS: 2x6B; 4QF

E. Armored Cruisers (11 total)

Name	Class	Year	MS	Ram	Spd	Hs	Blt	Bty	Blk	Trt	Dck	Armament
<i>Shannon</i>	AC	1877	23	N	2	5	4	4	4	—	2	FS: [1o10], A: 1o10, BS: 3o10
<i>Nelson</i>	AC	1880	30	N	2	6	4	—	4	—		FS, AS: [1o10], BS: [4o9]
<i>Imperieuse</i> (<i>Warspite</i>)	AC	1886	34	N	3	6	M5	—	4	4	4	F, A, P, S: [1x9B], FS, AS: 1x6B, BS: 3x6B; BT-2, ST-2, MT-1, 4QF
<i>Orlando</i> (<i>Aurora, Australia, Galatea, Immortalite, Narcissus, Undaunted</i>)	AC	1889	22	N	3	6	5	—	8	—	3	A, Z: 1x9B, FS, AS: 1x6B, BS: 3x6B; BT-2, ST-2, MT-1, 16QF, 7MG

F. Protected Cruisers (12 total)

Name	Class	Year	MS	Ram	Spd	Hs	Blt	Bty	Blk	Trt	Dck	Armament
<i>Leander</i> (<i>Amphion, Arethusa, Phaeton</i>)	PC	1885	17	N	3	6	—	1	—	—	2	FS, AS: [1x6B], BS: 3x6B; BT-4, 4QF, 12MG
<i>Mersey</i> (<i>Severn, Thames, Forth</i>)	PC	1887	16	N	3	6	—	1	—	1	3	F, A: [1x8B], FS, AS: [1x6B], BS: 3x6B; MT-1, DT-2, 6QF, 9MG
<i>Medea</i> (<i>Marathon, Magicienne, Medusa</i>)	PC	1889	11	N	4	5	—	2	—	—	1	FS, AS: [1x6B], BS: [1x6B]; MT-2, DT-2, 6QF, 3MG

G. Torpedo Ram (1 total)

Name	Class	Year	MS	Ram	Spd	Hs	Blt	Bty	Blk	Trt	Dck	Armament
<i>Polyphemus</i>	TR	1882	11	Y	3	5	—	—	—	—	3	BT-1, MT-2+13, 6QF

H. Armored Gunboats (2 total)

Name	Class	Year	MS	Ram	Spd	Hs	Blt	Bty	Blk	Trt	Dck	Armament
<i>Viper (Vixen)</i>	AGB	1865	5	Y	1	3	2	2	2	—	—	FS:[1o7], BS:[1o4]

Unarmored Warships**A. Light Cruisers (8 total)**

Name	Class	Year	MS	Ram	Spd	Hs	Blt	Bty	Blk	Trt	Dck	Armament
<i>Scout (Fearless)</i>	LC	1885	6	N	3	4	—	1	—	—	—	FS, AS: [1x5B]; BT-1, DT-2, 8QF, 2MG
<i>Archer</i> (<i>Brisk, Cossack, Porpoise, Raccoon, Serpent</i>)	LC	1888	7	N	3	4	—	1	—	—	—	FS, AS: [1x6B], BS: [1x6B]; BT-1, DT-2, 8QF, 2MG

B. Corvettes (30 total)

Name	Class	Year	MS	Ram	Spd	Hs	Blt	Bty	Blk	Trt	Dck	Armament
<i>Volage (Active)</i>	CV	1870	12	N	3	5	—	—	—	—	—	Bow: 2o6, Strm: 2o6, BS: 3o7
<i>Rover</i>	CV	1875	14	N	2	6	—	—	—	—	—	Bow: 2o7, Strm: 2o6, BS: 7o6
<i>Emerald</i> (<i>Garnet, Opal, Ruby, Tourmaline, Turquoise</i>)	CV	1878	8	N	2	4	—	—	—	—	—	Bow: 2o6, Strm: 2o6, BS: 5o6
<i>Bacchante</i> (<i>Boadicea, Euralyus</i>)	CV	1878	16	N	3	6	—	—	—	—	—	Strm: 2o7, BS: 6o7; DT-2
<i>Comus</i>	CV	1878	10	N	2	4	—	—	—	—	—	Bow: 2o6, BS: 16B, 4o6; DT-2, 8MG

<i>Name</i>	<i>Class</i>	<i>Year</i>	<i>MS</i>	<i>Ram</i>	<i>Spd</i>	<i>Hs</i>	<i>Blt</i>	<i>Bty</i>	<i>Blk</i>	<i>Trt</i>	<i>Dck</i>	<i>Armament</i>
<i>Carysfort</i> (<i>Champion, Cleopatra, Conquest, Curacao, Constance</i>)	CV	1878	10	N	2	4	—	—	—	—	—	Bow: 2o7, BS: 6o6
<i>Canada (Cordelia)</i>	CV	1878	10	N	2	4	—	—	—	—	—	Bow: 2x6B, BS: 4x6B; DT-2, 6MG
<i>Satellite (Rapid)</i>	CV	1882	6	N	2	4	—	—	—	—	1	Bow: 2x6B, BS: 5x5B; 4MG
<i>Royalist</i> (<i>Heroine, Hyacinth</i>)	CV	1884	6	N	2	4	—	—	—	—	1	Bow: 2x6B, BS: 3x6B; 4MG
<i>Caroline (Pylades)</i>	CV	1885	6	N	2	4	—	—	—	—	1	Bow: 2x5B, BS: 6x5B; 8MG
<i>Calypso (Calliope)</i>	CV	1883	11	N	2	5	—	—	—	—	—	FS, AS: 1x6B, BS: 5x5B; DT-2, 10MG

C. Sloops (26 total)

<i>Name</i>	<i>Class</i>	<i>Year</i>	<i>MS</i>	<i>Ram</i>	<i>Spd</i>	<i>Hs</i>	<i>Blt</i>	<i>Bty</i>	<i>Blk</i>	<i>Trt</i>	<i>Dck</i>	<i>Armament</i>
<i>Osprey</i> (<i>Cormorant, Pelican, Wild Swan, Penguin, Dragon, Espeigel, Gannet, Kingfisher, Miranda, Mutine, Pegasus, Phoenix</i>)	SL	1876	5	N	2	3	—	—	—	—	—	FS, AS: 1o6, BS: 1o7
<i>Dolphin (Wanderer)</i>	SL	1882	4	N	2	3	—	—	—	—	—	FS: 1x6B, AS: 1x5B; 3MG
<i>Mariner</i> (<i>Icarus, Melita, Racer, Reindeer</i>)	SL	1884	4	N	2	3	—	—	—	—	—	FS, AS: 1x5B, BS: 2x5B; 8MG
<i>Nymphe</i> (<i>Buzzard, Daphne, Swallow</i>)	SL	1889	5	N	2	4	—	—	—	—	—	FS, AS: 1x5B, BS: 2x5B; 8MG
<i>Beagle (Basilisk)</i>	SL	1889	5	N	2	4	—	—	—	—	—	FS, AS: 1x5B, BS: 2x5B; 8MG

D. Gun Vessels (15 total)

<i>Name</i>	<i>Class</i>	<i>Year</i>	<i>MS</i>	<i>Ram</i>	<i>Spd</i>	<i>Hs</i>	<i>Blt</i>	<i>Bty</i>	<i>Blk</i>	<i>Trt</i>	<i>Dck</i>	<i>Armament</i>
<i>Frolic</i> (<i>Kestrel, Ready, Rifleman</i>)	GV	1872	2	N	2	3	—	—	—	—	—	F: 1o7, A: 1o6, MF, MA: 1o4
<i>Condor</i> (<i>Falcon, Flamingo, Griffon</i>)	GV	1876	3	N	2	3	—	—	—	—	—	F: 1o7, A, M: 1o6
<i>Linnet (Swift)</i>	GV	1879	3	N	2	3	—	—	—	—	—	F, A: 1o7, FS, M: 1o4
<i>Algerine</i> (<i>Rambler, Ranger</i>)	GV	1880	3	N	2	3	—	—	—	—	—	F: 1o7, M, A: 1o6
<i>Curlew (Landrail)</i>	GV	1886	4	N	2	(4)	4	—	—	—	—	F: 1x6B, MF, MA, A: 1x5B; BT-1, DT-2, 7MG

E. Torpedo Gunboats (4 total)

<i>Name</i>	<i>Class</i>	<i>Year</i>	<i>MS</i>	<i>Ram</i>	<i>Spd</i>	<i>Hs</i>	<i>Blt</i>	<i>Bty</i>	<i>Blk</i>	<i>Trt</i>	<i>Dck</i>	<i>Armament</i>
<i>Rattlesnake</i>	TGB	1887	2	N	3	4	—	—	—	—	1	F: 1x5B; BT-2, ST-2, DT-4, 3QF
<i>Grasshopper</i> (<i>Sandfly, Spider</i>)	TGB	1888	2	N	3	4	—	—	—	—	1	F: 1x5B; BT-1+1, ST-1+1, DT-2+2, 3QF

F. Torpedo Boats (88 total)

<i>Name</i>	<i>Class</i>	<i>Year</i>	<i>MS</i>	<i>Ram</i>	<i>Spd</i>	<i>Hs</i>	<i>Blt</i>	<i>Bty</i>	<i>Blk</i>	<i>Trt</i>	<i>Dck</i>	<i>Armament</i>
<i>Lightning</i> (total of 20 boats)	TB	1876	(1)	N	3	2	—	—	—	—	—	BT-1+1
<i>Thornycroft-113</i> (total of 4 boats)	TB	1884	(1)	N	4	2	—	—	—	—	—	BT-2, DT-1, 2QF
<i>Thornycroft-125</i> (total of 54 boats)	TB	1885	(1)	N	4	3	—	—	—	—	—	DT-4, 2MG

Name	Class	Year	MS	Ram	Spd	Hs	Blk	Bty	Blk	Trt	Dck	Armament
Yarrow-100 (2 boats)	TB	1885	(1)	N	4	2	—	—	—	—	—	BT-1+1, 2MG
Yarrow-130 (6 boats)	TB	1884	(2)	N	4	3	—	—	—	—	—	DT-4, 2MG
Yarrow-135 (1 boat)	TB	1887	(2)	N	4	3	—	—	—	—	—	BT-1, DT-4, 2QF
Swift (1 boat)	TB	1887	(3)	N	4	3	—	—	—	—	—	BT-1, DT-4, 3QF

G. Aerial Gunboat Tender (1 total)

Name	Class	Year	MS	Ram	Spd	Hs	Blk	Bty	Blk	Trt	Dck	Armament
Vulcan	AGT	1889	26	N	4	7	—	—	—	—	4	F, A: 1×4.7B, FS, AS: 1×4.7B, BS: 1×4.7B

H. Submarine (1 total)

Name	Class	Year	MS	Ram	Spd	Hs	Blk	Bty	Blk	Trt	Dck	Armament
Nordenfelt	S	1887	1	N	2	(1)	3	1	—	—	1	BT-2+2

GREECE

Crews: Green

A. Broadside Ironclad (1 total)

Name	Class	Year	MS	Ram	Spd	Hs	Blk	Bty	Blk	Trt	Dck	Armament
Basilissa Olga	BSI	1869	8	N	2	5	2	1	—	—	—	Bow, Strm: 1o7, BS: 2×7B; 4QF

B. Central Battery Ironclad (1 total)

Name	Class	Year	MS	Ram	Spd	Hs	Blk	Bty	Blk	Trt	Dck	Armament
Basileos Georgios	CBI	1867	7	N	2	4	2	2	—	—	—	FS: [1×8B], AS: [1o4]

C. Light Cruiser (1 total)

Name	Class	Year	MS	Ram	Spd	Hs	Blk	Bty	Blk	Trt	Dck	Armament
Miaoulis	LC	1879	7	Y	2	5	—	—	—	—	—	FS, M: 1×7B, Strm: 1o7; BT-1, MT-1, 6QF

D. Sloop (1 total)

Name	Class	Year	MS	Ram	Spd	Hs	Blk	Bty	Blk	Trt	Dck	Armament
Hellas	SL	1861	7	N	1	4	—	—	—	—	—	BS: 6×6B; 4QF

E. Gunboats (3 total)

Name	Class	Year	MS	Ram	Spd	Hs	Blk	Bty	Blk	Trt	Dck	Armament
Ambrakia (Akteon)	GB	1881	2	N	2	3	—	—	—	—	—	Bow: 1×10B; 4QF
Achelaos	GB	1884	2	N	2	3	—	—	—	—	—	F, A: 1×4B; 3QF

F. Torpedo Boats (16 total)

Name	Class	Year	MS	Ram	Spd	Hs	Blk	Bty	Blk	Trt	Dck	Armament
Chios	TB	1881	1	N	4	2	—	—	—	—	—	BT-2, 2QF
(Cyprus, Kos, Mytelene, Rhodes, Samos)												
Kalitheia	TB	1881	1	Y	3	2	—	—	—	—	—	BT-2
(Pherinika, Persephone, Terpsithea)												
VII (VII-VI6)	TB	1885	2	N	3	2	—	—	—	—	—	BT-2, DT-1, 1QF, 1MG

HAITI

Crews: Green

All Vessels (5 total)

Name	Class	Year	MS	Ram	Spd	Hs	Blk	Bty	Blk	Trt	Dck	Armament
Dessalinas	CV	1883	5	N	3	4	—	—	—	—	—	F: 1×4B, BS: 1×5B, 1×4B
1804	GB	1875	2	N	2	3	—	—	—	—	—	FS, BS, AS: 1o4

<i>Name</i>	<i>Class</i>	<i>Year</i>	<i>MS</i>	<i>Ram</i>	<i>Spd</i>	<i>Hs</i>	<i>Blt</i>	<i>Bty</i>	<i>Blk</i>	<i>Trt</i>	<i>Dck</i>	<i>Armament</i>
<i>22 Decembre</i>	GB	1860	4	N	1	4	—	—	—	—	—	FS, AS: 1o5
<i>St. Michael</i>	GB	1875	3	N	2	3	—	—	—	—	—	M: 1o4, BS: 2o4
<i>Toussaint-Louverture</i>	GB	1886	2	N	2	3	—	—	—	—	—	F, A: 1x5B, M: 1x6B

ITALY

Crews: Trained

Armored Ships

A. Broadside Ironclads (5 total)

<i>Name</i>	<i>Class</i>	<i>Year</i>	<i>MS</i>	<i>Ram</i>	<i>Spd</i>	<i>Hs</i>	<i>Blt</i>	<i>Bty</i>	<i>Blk</i>	<i>Trt</i>	<i>Dck</i>	<i>Armament</i>
<i>Maria Pia</i> (<i>San Martino, Ancona, Castelfidardo</i>)	BSI	1864	17	Y	2	5	2	2	—	—	—	Bow: 2o5, Strm: 1o5, BS: [4o6, 1o5]
<i>Roma</i>	BSI	1869	22	N	2	5	2	2	—	—	—	Bow: 1o8, BS: [4o8]

B. Old Central Battery Ironclads (2 total)

<i>Name</i>	<i>Class</i>	<i>Year</i>	<i>MS</i>	<i>Ram</i>	<i>Spd</i>	<i>Hs</i>	<i>Blt</i>	<i>Bty</i>	<i>Blk</i>	<i>Trt</i>	<i>Dck</i>	<i>Armament</i>
<i>Amedeo (Palestro)</i>	CBI	1874	23	N	2	5	3	2	—	—	—	Bow: [1o11], BS: [3o10]

C. Turret Battleships (7 total)

<i>Name</i>	<i>Class</i>	<i>Year</i>	<i>MS</i>	<i>Ram</i>	<i>Spd</i>	<i>Hs</i>	<i>Blt</i>	<i>Bty</i>	<i>Blk</i>	<i>Trt</i>	<i>Dck</i>	<i>Armament</i>
<i>Affondatore</i>	TBS	1865	16	Y	2	5	2	—	—	2	2	F, A: [1o10], BS: 3o5; 12QF
<i>Duilio (Dando)</i>	TBS	1880	44	N	3	7	10	8	7	8	2	P, S: [2o18]; BT-1, MT-1
<i>Italia (Lepanto)</i>	TBS	1885	55	N	3	8	—	—	—	9	4	P, S: [2x17B], FS, AS: 1x6B, BS: 2x6B; BT-1, ST-1, MT-1, 4QF
<i>Lauria (Morosini)</i>	TBS	1888	39	N	3	6	8	7	—	7	3	P, S: [2x17B], F, A: 1x6B, FS, AS: 1o5; MT-1

D. Protected Cruisers (10 total)

<i>Name</i>	<i>Class</i>	<i>Year</i>	<i>MS</i>	<i>Ram</i>	<i>Spd</i>	<i>Hs</i>	<i>Blt</i>	<i>Bty</i>	<i>Blk</i>	<i>Trt</i>	<i>Dck</i>	<i>Armament</i>
<i>Goito</i> (<i>Monzambano, Montebello</i>)	PC	1888	4	N	3	4	—	—	—	—	1	BT-1, DT-4, 6QF
<i>Bausan</i>	PC	1885	13	N	3	5	—	—	—	—	1	F, A: 1o10, FS, AS: 1x6B, BS: 1x6B; DT-2, 10QF, 2MG
<i>Etna</i> (<i>Vesuvio, Stromboli, Fieramosca</i>)	PC	1887	15	N	3	6	—	—	—	—	1	F, A: 1o10, FS, AS: 1x6B, BS: 1x6B; DT-2, 10QF, 2MG
<i>Dogali</i>	PC	1887	8	N	3	5	—	2	—	2	2	F, A: [2x6B], P, S: [1x6B]; MT-2, 9QF, 6MG
<i>Piemonte</i>	PC	1889	10	N	4	6	—	2	—	2	3	F, A: [2x6B], P, S: [1x6B], FS, AS: [1x4.7B], BS: [1x4.7B]; DT-2, 9QF, 2MG

Unarmored Warships and Torpedo Vessels

A. Corvettes (3 total)

<i>Name</i>	<i>Class</i>	<i>Year</i>	<i>MS</i>	<i>Ram</i>	<i>Spd</i>	<i>Hs</i>	<i>Blt</i>	<i>Bty</i>	<i>Blk</i>	<i>Trt</i>	<i>Dck</i>	<i>Armament</i>
<i>Colombo</i>	CV	1875	9	N	3	5	—	—	—	—	—	BS: 4o5
<i>Flavio Gioia</i>	CV	1883	10	N	2	5	—	—	—	—	—	BS: 4o6
<i>Vespucci</i>	CV	1884	10	N	2	5	—	—	—	—	—	BS: 4o6

B. Torpedo Cruisers (2 total)

<i>Name</i>	<i>Class</i>	<i>Year</i>	<i>MS</i>	<i>Ram</i>	<i>Spd</i>	<i>Hs</i>	<i>Blt</i>	<i>Bty</i>	<i>Blk</i>	<i>Trt</i>	<i>Dck</i>	<i>Armament</i>
<i>Tripoli</i>	TC	1886	4	N	3	4	—	—	—	—	1	F: 1o5; BT-1, DT-4, 11QF
<i>Folgore</i>	TC	1887	2	N	3	4	—	—	—	—	—	BT-1, DT-2, 6QF

C. Gun Vessels (4 total)

<i>Name</i>	<i>Class</i>	<i>Year</i>	<i>MS</i>	<i>Ram</i>	<i>Spd</i>	<i>Hs</i>	<i>Blt</i>	<i>Bty</i>	<i>Blk</i>	<i>Trt</i>	<i>Dck</i>	<i>Armament</i>
<i>Scilla</i>	GV	1876	4	N	2	4	—	—	—	—	—	4QF
<i>Cariddi</i>	GV	1876	4	N	2	4	—	—	—	—	—	F, A: 1o5, M: 1o7
<i>Provana (Veniero)</i>	GV	1885	3	N	2	3	—	—	—	—	—	F, A: 1o5; 4MG

D. Torpedo Boats (75 total)

<i>Name</i>	<i>Class</i>	<i>Year</i>	<i>MS</i>	<i>Ram</i>	<i>Spd</i>	<i>Hs</i>	<i>Blt</i>	<i>Bty</i>	<i>Blk</i>	<i>Trt</i>	<i>Dck</i>	<i>Armament</i>
<i>Nibbio</i>	TB	1881	(1)	N	3	2	—	—	—	—	—	BT-2
<i>Aquila (Gabbiano)</i>	TB	1881	(1)	N	4	2	—	—	—	—	—	BT-2, 1MG
<i>Clio</i>	TB	1882	(1)	N	3	2	—	—	—	—	—	BT-2
<i>Aldebaran</i>	TB	1882	(1)	N	4	2	—	—	—	—	—	BT-1, 1MG
(total of 29 boats)												
<i>Schichau</i>	TB	1886	(2)	N	4	3	—	—	—	—	—	BT-2, 2QF
(total of 40 boats)												

JAPAN

Crews: Trained

Armored Ships**A. Central Battery Ironclad (1 total)**

<i>Name</i>	<i>Class</i>	<i>Year</i>	<i>MS</i>	<i>Ram</i>	<i>Spd</i>	<i>Hs</i>	<i>Blt</i>	<i>Bty</i>	<i>Blk</i>	<i>Trt</i>	<i>Dck</i>	<i>Armament</i>
<i>Fuso</i>	CBI	1878	15	N	2	4	3	4	3	—	—	FS, AS: [1o9], BS: 1o7, 3x3B; 1MG

B. Armored Corvettes (2 total)

<i>Name</i>	<i>Class</i>	<i>Year</i>	<i>MS</i>	<i>Ram</i>	<i>Spd</i>	<i>Hs</i>	<i>Blt</i>	<i>Bty</i>	<i>Blk</i>	<i>Trt</i>	<i>Dck</i>	<i>Armament</i>
<i>Kongo (Hiei)</i>	AC	1878	9	N	2	4	2	—	—	—	1	FS: 1o7, A: 1o7, BS: 3o6; BT-2, 4QF

C. Protected Cruisers (2 total)

<i>Name</i>	<i>Class</i>	<i>Year</i>	<i>MS</i>	<i>Ram</i>	<i>Spd</i>	<i>Hs</i>	<i>Blt</i>	<i>Bty</i>	<i>Blk</i>	<i>Trt</i>	<i>Dck</i>	<i>Armament</i>
<i>Naniwa (Takachiho)</i>	PC	1885	15	N	3	6	—	1	—	1	3	F, A: [1o10], BS: [3o6]; MT-2, 2QF, 14MG

Unarmored Warships**A. Corvettes (7 total)**

<i>Name</i>	<i>Class</i>	<i>Year</i>	<i>MS</i>	<i>Ram</i>	<i>Spd</i>	<i>Hs</i>	<i>Blt</i>	<i>Bty</i>	<i>Blk</i>	<i>Trt</i>	<i>Dck</i>	<i>Armament</i>
<i>Tsukuba</i>	CV	1854	8	N	2	4	—	—	—	—	—	BS: 3o4, 1x32SB, 1x24SB
<i>Nisshin</i>	CV	1869	6	N	2	3	—	—	—	—	—	BS: 3o5
<i>Kaimon (Tenryu)</i>	CV	1884	5	N	2	4	—	—	—	—	—	F: 1o7, Strm: 1x3B, BS: 3o5; 4MG
<i>Katsuragi</i>	CV	1887	6	N	2	4	—	—	—	—	—	FS: 1o7, BS: 2o5, A: 1o5; BT-2, 4MG
(Musashi, Yamato)												

B. Light Cruiser (1 total)

<i>Name</i>	<i>Class</i>	<i>Year</i>	<i>MS</i>	<i>Ram</i>	<i>Spd</i>	<i>Hs</i>	<i>Blt</i>	<i>Bty</i>	<i>Blk</i>	<i>Trt</i>	<i>Dck</i>	<i>Armament</i>
<i>Takao</i>	CL	1889	7	N	3	5	—	—	—	—	—	FS, AS: 1o6, Aft: 1o5; BT-2, 1QF, 2MG

C. Sloop (1 total)

<i>Name</i>	<i>Class</i>	<i>Year</i>	<i>MS</i>	<i>Ram</i>	<i>Spd</i>	<i>Hs</i>	<i>Blt</i>	<i>Bty</i>	<i>Blk</i>	<i>Trt</i>	<i>Dck</i>	<i>Armament</i>
<i>Amagi</i>	SL	1878	4	N	2	4	—	—	—	—	—	Bow: 1o7, Strm: 1o3, BS: 2o5, 1o3; 3MG

D. Gunboats (4 total)

<i>Name</i>	<i>Class</i>	<i>Year</i>	<i>MS</i>	<i>Ram</i>	<i>Spd</i>	<i>Hs</i>	<i>Blt</i>	<i>Bty</i>	<i>Blk</i>	<i>Trt</i>	<i>Dck</i>	<i>Armament</i>
<i>Banjo</i>	GB	1880	3	N	2	3	—	—	—	—	—	MF: 1o6, MA: 1o5; 2QF, 3MG

Name	Class	Year	MS	Ram	Spd	Hs	Blt	Bty	Blk	Trt	Dck	Armament
Maya	GB	1887	2	N	2	3	—	—	—	—	—	MF: 1o8, MA: 1o5

(Chokai, Atago)

E. Torpedo Boat (1 total)

Name	Class	Year	MS	Ram	Spd	Hs	Blt	Bty	Blk	Trt	Dck	Armament
Kotaka	TB	1888	(4)	N	3	3	—	—	—	—	—	BT-2, DT-4, 4QF

MEXICO

Crews: Green

All Ships (1 total)

Name	Class	Year	MS	Ram	Spd	Hs	Blt	Bty	Blk	Trt	Dck	Armament
Democrata	GB	1875	2	N	1	3	—	—	—	—	—	F, A: 1o4, MF, MA: 1o6

THE NETHERLANDS

Crews: Trained

A. Turret Battleships (2 total)

Name	Class	Year	MS	Ram	Spd	Hs	Blt	Bty	Blk	Trt	Dck	Armament
Prins Heinrich	TBS	1866	13	N	2	5	2	—	—	4	—	MF, MA: [2o9], BS: 2o5; 10QF
Konig	TBS	1874	21	N	2	6	3	—	—	4	—	MF, MA: [2o11], BS: 2o5; 6QF

B. Coastal Defense Monitors (17 total)

Name	Class	Year	MS	Ram	Spd	Hs	Blt	Bty	Blk	Trt	Dck	Armament
Heligerlee (Krokodil, Tijger)	CDM	1868	6	N	1	4	2	2	—	4	—	M: [2o9]; 2QF
Bloedhond (Cerberus)	CDM	1869	6	N	1	4	2	2	—	4	—	M: [2o9]; 2QF
Adder (Haai, Hyena, Luipaard, Panter, Wesp)	CDM	1871	6	Y	1	4	2	2	—	4	—	M: [2o9]; 2QF
Draak	CDM	1877	9	Y	1	4	3	—	—	4	—	F: [2o11]; 2QF
Matador	CDM	1878	8	Y	1	4	2	—	—	4	—	F: [2o11]; 2QF
Buffel (Guinea)	CDM	1868	9	Y	2	4	2	—	—	3	—	M: [2o9], BS: 2o5
Schorpioen (Stier)	CDM	1868	9	Y	2	4	2	2	—	4	—	M:[2o9]; 2QF

C. Light Cruiser (1 total)

Name	Class	Year	MS	Ram	Spd	Hs	Blt	Bty	Blk	Trt	Dck	Armament
Atjeh	LC	1876	14	N	2	6	—	—	—	—	—	FS, AS: 1o7, BS: 1o7, 4o5; 6QF

D. Corvettes (8 total)

Name	Class	Year	MS	Ram	Spd	Hs	Blt	Bty	Blk	Trt	Dck	Armament
Djambi (Willem, Zoutman, Curacao, Metallen Kruis, Zilveren Kruis, Leeuwarden, Van Galen)	CV	1860	8	N	1	4	—	—	—	—	—	BS: 7o6

E. Sloops (5 total)

Name	Class	Year	MS	Ram	Spd	Hs	Blt	Bty	Blk	Trt	Dck	Armament
Watergeus (Marnix)	SL	1864	6	N	2	4	—	—	—	—	—	BS: 3o6
Alkmaar	SL	1874	4	N	2	3	—	—	—	—	—	M: 1o6, BS: 3o5
Sommelsdijk	SL	1882	4	N	2	3	—	—	—	—	—	M: 1o6, BS, A: 1o5; 2QF
Java	SL	1885	5	N	2	4	—	—	—	—	—	M: 1o6, BS, A: 1o5; 2QF

F. Gunboats (17 total)

<i>Name</i>	<i>Class</i>	<i>Year</i>	<i>MS</i>	<i>Ram</i>	<i>Spd</i>	<i>Hs</i>	<i>Blt</i>	<i>Bty</i>	<i>Blk</i>	<i>Trt</i>	<i>Dck</i>	<i>Armament</i>
<i>Banda</i> (<i>Riouw</i>)	GB	1872	3	N	1	3	—	—	—	—	—	F, A: 1o5, M: 1o6
<i>Pontianak</i> (<i>Bandjermasin</i>)	GB	1873	3	N	1	3	—	—	—	—	—	F, A: 1o5, M: 1o7
<i>Aruba</i>	GB	1873	3	N	1	3	—	—	—	—	—	F, A: 1o5, M: 1o6
<i>Batavia</i> (<i>Benkoelen, Macassar, Madura, Samarang, Bali, Bonaire, Padang</i>)	GB	1876	3	N	1	3	—	—	—	—	—	FS, A: 1o5, M: 1o6; 2QF
<i>Suriname</i> (<i>Eustat</i>)	GB	1877	3	N	1	3	—	—	—	—	—	FS, A: 1o5, M: 1o6; 2QF
<i>Ceram (Flores)</i>	GB	1887	2	N	2	3	—	—	—	—	—	FS, A: 1o5; 2QF

G. Torpedo Boats (2 total)

<i>Name</i>	<i>Class</i>	<i>Year</i>	<i>MS</i>	<i>Ram</i>	<i>Spd</i>	<i>Hs</i>	<i>Blt</i>	<i>Bty</i>	<i>Blk</i>	<i>Trt</i>	<i>Dck</i>	<i>Armament</i>
<i>Ardjoeno</i>	TB	1886	(2)	N	4	2	—	—	—	—	—	BT-2, 2QF
<i>Cerberus</i>	TB	1888	(2)	N	4	2	—	—	—	—	—	BT-2, DT-1, 2QF

NORWAY

Crews: Trained

A. Coastal Defense Monitors (4 total)

<i>Name</i>	<i>Class</i>	<i>Year</i>	<i>MS</i>	<i>Ram</i>	<i>Spd</i>	<i>Hs</i>	<i>Blt</i>	<i>Bty</i>	<i>Blk</i>	<i>Trt</i>	<i>Dck</i>	<i>Armament</i>
<i>Skorpionen</i> (<i>Mjolner, Thrudvang</i>)	CDM	1866	6	N	1	4	2	2	—	5	—	F: [2o10]; 2QF
<i>Thor</i>	CDM	1872	8	N	1	4	3	3	—	6	—	F: [2o10]; 2QF

B. Corvette (1 total)

<i>Name</i>	<i>Class</i>	<i>Year</i>	<i>MS</i>	<i>Ram</i>	<i>Spd</i>	<i>Hs</i>	<i>Blt</i>	<i>Bty</i>	<i>Blk</i>	<i>Trt</i>	<i>Dck</i>	<i>Armament</i>
<i>Nordstjerna</i>	CV	1862	6	N	2	4	—	—	—	—	—	BS: 3o6, 5x32SB

C. Gunboats (8 total)

<i>Name</i>	<i>Class</i>	<i>Year</i>	<i>MS</i>	<i>Ram</i>	<i>Spd</i>	<i>Hs</i>	<i>Blt</i>	<i>Bty</i>	<i>Blk</i>	<i>Trt</i>	<i>Dck</i>	<i>Armament</i>
<i>Sleipner</i>	GB	1877	2	N	2	3	—	—	—	—	—	MF: 1o10, MA: 1o6
<i>Uller (Vale)</i>	GB	1874	1	N	1	2	—	—	—	—	—	M: 1o10; 2QF
<i>Brage (Nor)</i>	GB	1878	1	N	1	2	—	—	—	—	—	M: 1o10; 2QF
<i>Vidar</i>	GB	1881	1	N	1	2	—	—	—	—	—	M: 1o10; 2QF
<i>Gor (Tyr)</i>	GB	1885	1	N	2	2	—	—	—	—	—	M: 1o10; 2QF

PERSIA

Crews: Green

All Ships (1 total)

<i>Name</i>	<i>Class</i>	<i>Year</i>	<i>MS</i>	<i>Ram</i>	<i>Spd</i>	<i>Hs</i>	<i>Blt</i>	<i>Bty</i>	<i>Blk</i>	<i>Trt</i>	<i>Dck</i>	<i>Armament</i>
<i>Persepolis</i>	GV	1885	5	Y	2	4	—	—	—	—	—	BS: 2x3B

PERU

Crews: Green

All Ships (1 total)

<i>Name</i>	<i>Class</i>	<i>Year</i>	<i>MS</i>	<i>Ram</i>	<i>Spd</i>	<i>Hs</i>	<i>Blt</i>	<i>Bty</i>	<i>Blk</i>	<i>Trt</i>	<i>Dck</i>	<i>Armament</i>
<i>Lima</i>	LC	1881	7	N	3	5	—	—	—	—	—	F, A: 1x6B; BT-2, MT 1, 6QF

PORTUGAL

Crews: Trained

A. Coastal Defense Monitor (1 total)

Name	Class	Year	MS	Ram	Spd	Hs	Blt	Bty	Blk	Trt	Dck	Armament
<i>Vasco de Gama</i>	CDM	1876	10	N	2	4	3	4	—	—	—	WS: [1o10], A: 1o6, BS: 2o4

B. Sloops (4 total)

Name	Class	Year	MS	Ram	Spd	Hs	Blt	Bty	Blk	Trt	Dck	Armament
<i>Terceira</i>	SL	1864	6	N	1	4	—	—	—	—	—	BS: 4o6
<i>Mindello</i> (<i>Rainha De Portugal</i>)	SL	1875	4	N	2	3	—	—	—	—	—	MF, MA: 1o7, BS: 3o5
<i>Alfonso</i>	SL	1884	4	N	2	4	—	—	—	—	—	MF, MA: 1x6B, F: 1x5B, BS: 2x5B; 2QF

C. Gunboats (13 total)

Name	Class	Year	MS	Ram	Spd	Hs	Blt	Bty	Blk	Trt	Dck	Armament
<i>Tejo</i> (<i>Douro</i>)	GB	1869	2	N	2	3	—	—	—	—	—	F, A: 1o5, M: 1o6
<i>Quanza</i> (<i>Rio Lima</i>)	GB	1875	2	N	2	3	—	—	—	—	—	F, A: 1o5, M: 1o7, BS: 1o5
<i>Tamega</i> (<i>Sado</i>)	GB	1875	2	N	2	3	—	—	—	—	—	F, A: 1o5, M: 1o7, BS: 1o5
<i>Bengo</i> (<i>Mandovi</i>)	GB	1879	2	N	2	2	—	—	—	—	—	F, A: 1o4, M: 1x6B
<i>Zambezi</i>	GB	1880	2	N	2	3	—	—	—	—	—	F, A: 1x4B, M: 1x6B
<i>Vouga</i>	GB	1882	2	N	2	3	—	—	—	—	—	F, A: 1x4B, M: 1x6B, WS: 1x4B
<i>Liberal (Zaire)</i>	GB	1884	2	N	1	3	—	—	—	—	—	F, A: 1x4B, M: 1x6B; 1QF
<i>Diuth</i>	GB	1889	2	N	2	3	—	—	—	—	—	F, A: 1x4B, M: 1x6B

ROMANIA

Crews: Green

All Ships (4 total)

Name	Class	Year	MS	Ram	Spd	Hs	Blt	Bty	Blk	Trt	Dck	Armament
<i>Elisabeta</i>	PC	1888	5	Y	3	9	—	—	—	—	2	FS, AS: 1x7B; BT-2, MT-1, 6QF
<i>Naluca</i> (<i>Sborul, Smeul</i>)	TB	1888	(1)	N	3	2	—	—	—	—	—	BT-2, 2QF

RUSSIA

Crews: Trained

Armored Ships

A. Old Central Battery Ironclad (1 total)

Name	Class	Year	MS	Ram	Spd	Hs	Blt	Bty	Blk	Trt	Dck	Armament
<i>Kniaz Pojarski</i>	CBI	1870	18	N	2	5	2	2	—	—	—	FS, AS: [1o4], BS: [4o8], Bow: 1o6, Strm: 1o6; MT-1, 10QF

B. Turret Battleships (3 total)

Name	Class	Year	MS	Ram	Spd	Hs	Blt	Bty	Blk	Trt	Dck	Armament
<i>Petr Veliki</i>	TBS	1876	42	N	2	7	5	6	4	6	2	F, A: [2o11], BS: [2o6], 6QF
<i>Ekaterina II</i> (<i>Tchesma</i>)	TBS	1889	44	N	3	7	7	6	6	2	2	FP, FS, A: [2x12B], FS, AS: 1o6, BS: 1o6, Strm: 1o6; BT-1, MT-3, 12QF

C. Coastal Defense Monitors (20 total)

<i>Name</i>	<i>Class</i>	<i>Year</i>	<i>MS</i>	<i>Ram</i>	<i>Spd</i>	<i>Hs</i>	<i>Blt</i>	<i>Bty</i>	<i>Blk</i>	<i>Trt</i>	<i>Dck</i>	<i>Armament</i>
<i>Pervenetz</i> (<i>Kreml, Netron Menya</i>)	BSI	1864	13	Y	2	4	2	2	2	—	—	Bow: 2o6, Strn: 1o6, BS: [3o8, 3o6, 2o4]; 5QF
<i>Bronenosetz</i> (<i>Edinorog, Koldun, Latnik, Lava, Stryeletz, Tifon, Uragan, Vyeshtchun</i>)	CDM	1866	8	N	1	4	3	—	1	4	—	F: [2o9]
<i>Perun</i>	CDM	1866	8	N	1	4	3	—	1	4	1	F: [2o9]
<i>Smerch</i>	CDM	1865	6	N	1	4	2	—	1	2	1	F, A: [1o9]; 4QF
<i>Charodeika</i> (<i>Russalka</i>)	CDM	1868	8	N	1	4	2	2	1	3	—	F, A: [2o9], BS: [2x3B]; 4QF
<i>Ad. Lazarev</i> (<i>Ad. Greig</i>)	CDM	1869	15	N	2	5	2	—	—	2	—	F, M, A: [1o11], Bow: 1o4, Strn: 1o4; 3QF
<i>Ad. Chichagov</i> (<i>Ad. Spiridov</i>)	CDM	1870	16	N	2	5	3	—	—	3	—	F, A: [1o11], Bow: 2o4, Strn: 2o4; 5QF

D. Armored Cruisers (6 total)

<i>Name</i>	<i>Class</i>	<i>Year</i>	<i>MS</i>	<i>Ram</i>	<i>Spd</i>	<i>Hs</i>	<i>Blt</i>	<i>Bty</i>	<i>Blk</i>	<i>Trt</i>	<i>Dck</i>	<i>Armament</i>
<i>Minin</i>	AC	1878	25	N	2	6	3	—	—	—	1	FS, AS: 1o8, Bow: 2o6, Strn: 2o6, BS: 4o6; BT-2, 8QF
<i>General Admrl.</i> (<i>Herzog Edinburgski</i>)	AC	1875	20	N	2	6	2	—	—	—	1	Bow: 1o6, Strn: 1o6, FS, AS: 1o8, BS: 1o8, 2x3B; MT-1, 8QF
<i>Monomakh</i>	AC	1885	22	N	3	6	3	—	2	—	3	FS, AS: [1o8], BS: [4o8], 2o6, 2x3B; BT-1, MT-1, 12QF
<i>Donskoi</i>	AC	1885	25	N	3	6	3	—	—	1	3	P, S: [1o8], BS: 7o6, Bow: 2x3B, Strn: 2x3B; BT-1, MT-2, 14QF
<i>Nakhimov</i>	AC	1888	34	N	3	7	M5	—	—	4	3	F, A, P, S: [2o8], BS: 5o6, Bow: 2x3B, Strn: 2x3B; BT-1, MT-1, 10QF

E. Protected Cruisers (3 total)

<i>Name</i>	<i>Class</i>	<i>Year</i>	<i>MS</i>	<i>Ram</i>	<i>Spd</i>	<i>Hs</i>	<i>Blt</i>	<i>Bty</i>	<i>Blk</i>	<i>Trt</i>	<i>Dck</i>	<i>Armament</i>
<i>Vitiaz (Rynda)</i>	PC	1886	14	N	3	5	—	—	—	—	1	FS, AS: 1o6, BS: 3o6; BT-1, MT-1, 8QF
<i>Kornilov</i>	PC	1888	23	Y	3	7	—	1	—	—	2	FS, AS: [1o6], BS: [5o6]; MT-3, 10QF

Unarmored Warships**A. Light Cruiser (1 total)**

<i>Name</i>	<i>Class</i>	<i>Year</i>	<i>MS</i>	<i>Ram</i>	<i>Spd</i>	<i>Hs</i>	<i>Blt</i>	<i>Bty</i>	<i>Blk</i>	<i>Trt</i>	<i>Dck</i>	<i>Armament</i>
<i>Pamiat Merkuria</i>	LC	1881	12	Y	3	6	—	—	—	—	—	Bow: 1o6, Strn: 1o6, FS, AS: 1o6; DT-2, 8QF

B. Sloops (8 total)

<i>Name</i>	<i>Class</i>	<i>Year</i>	<i>MS</i>	<i>Ram</i>	<i>Spd</i>	<i>Hs</i>	<i>Blt</i>	<i>Bty</i>	<i>Blk</i>	<i>Trt</i>	<i>Dck</i>	<i>Armament</i>
<i>Kreiser</i> (<i>Djigit, Navezdnik, Razboinik, Plastun, Stryelok, Opritchnik, Vyeshtnik</i>)	SL	1876	6	N	2	4	—	—	—	—	—	F, M, A: 1o6, BS: 2o4; DT-1, 6QF

C. Gun Vessels (7 total)

<i>Name</i>	<i>Class</i>	<i>Year</i>	<i>MS</i>	<i>Ram</i>	<i>Spd</i>	<i>Hs</i>	<i>Blt</i>	<i>Bty</i>	<i>Blk</i>	<i>Trt</i>	<i>Dck</i>	<i>Armament</i>
<i>Sivuch (Bobr)</i>	GV	1885	5	N	2	4	—	—	—	—	—	Bow: 1o9, A: 1o6, BS: 3o4; 4QF
<i>Korietz (Mandjur)</i>	GV	1887	5	Y	2	4	—	—	—	—	—	FS: 1o8, A: 1o6, BS: 2o4; DT-1, 7QF
<i>Kubanetz</i> (<i>Teretz, Uraletz</i>)	GV	1888	5	N	2	4	—	—	—	—	—	FS: 1o8, A: 1o6; DT-2, 6QF

D. Torpedo Gunboat (1 total)

<i>Name</i>	<i>Class</i>	<i>Year</i>	<i>MS</i>	<i>Ram</i>	<i>Spd</i>	<i>Hs</i>	<i>Blt</i>	<i>Bty</i>	<i>Blk</i>	<i>Trt</i>	<i>Dck</i>	<i>Armament</i>
<i>Ilin</i>	TGB	1887	3	N	4	5	—	—	—	—	—	BT-4+11, ST-1, 12QF

E. Torpedo Boats (28 total)

<i>Name</i>	<i>Class</i>	<i>Year</i>	<i>MS</i>	<i>Ram</i>	<i>Spd</i>	<i>Hs</i>	<i>Blt</i>	<i>Bty</i>	<i>Blk</i>	<i>Trt</i>	<i>Dck</i>	<i>Armament</i>
<i>Vzruiv</i>	TB	1877	(3)	N	2	2	—	—	—	—	—	BT-2, 2QF
<i>Batum</i>	TB	1880	(1)	N	4	2	—	—	—	—	—	BT-2+2, 1QF
<i>Sukhum</i>	TB	1883	(1)	N	3	2	—	—	—	—	—	BT-2, 2QF
(<i>Gagri, Kotlin</i>)												
<i>Poti</i>	TB	1883	(1)	N	3	2	—	—	—	—	—	BT-2, 2QF
(<i>Ghelendjik</i>)												
<i>Viborg</i>	TB	1886	(3)	N	4	3	—	—	—	—	—	BT-2, DT-1+3, 2QF
<i>Abo</i>	TB	1886	(2)	N	3	2	—	—	—	—	—	BT-2+4, 4QF
(<i>Vindava, Libava</i>)												
<i>Yalta</i>	TB	1886	(2)	N	4	2	—	—	—	—	—	BT-2+4, 2QF
(<i>Novorossisk, Tchardak, Kodor, Kilia, Reni</i>)												
<i>Izmail</i>	TB	1886	(2)	N	3	2	—	—	—	—	—	BT-2, 2QF
(<i>Lakhta, Luga, Narva</i>)												
<i>Sveaborg</i>	TB	1886	(2)	N	3	3	—	—	—	—	—	BT-2, DT-1, 2QF
(<i>Revel</i>)												
<i>Sutchena</i>	TB	1887	(2)	N	3	2	—	—	—	—	—	BT-2, 2QF
(<i>Yantchikhe</i>)												
<i>Anakrie</i>	TB	1889	(2)	N	4	2	—	—	—	—	—	BT-1, DT-1, 2QF
<i>Sungari</i>	TB	1889	(4)	N	4	3	—	—	—	—	—	BT-1, MT-1, 3QF
(<i>Ussuri</i>)												

SAN DOMINGO

Crews: Green

All Ships (1 total)

<i>Name</i>	<i>Class</i>	<i>Year</i>	<i>MS</i>	<i>Ram</i>	<i>Spd</i>	<i>Hs</i>	<i>Blt</i>	<i>Bty</i>	<i>Blk</i>	<i>Trt</i>	<i>Dck</i>	<i>Armament</i>
<i>El Presidente</i>	GB	1873	2	N	3	4	—	—	—	—	—	M: 1o4; 1QF

SIAM

Crews: Green

All Ships (2 total)

<i>Name</i>	<i>Class</i>	<i>Year</i>	<i>MS</i>	<i>Ram</i>	<i>Spd</i>	<i>Hs</i>	<i>Blt</i>	<i>Bty</i>	<i>Blk</i>	<i>Trt</i>	<i>Dck</i>	<i>Armament</i>
<i>Phichaiathep</i>	GB	1867	2	N	2	3	—	—	—	—	—	M: 1o6, BS: 2o4
<i>Ran Ruk</i>	GB	1879	3	N	2	2	—	—	—	—	—	FS, AS: 1o5; BT-1, MT-1, 1QF

SPAIN

Crews: Trained

Armored Ships**A. Broadside Ironclad (1 total)**

<i>Name</i>	<i>Class</i>	<i>Year</i>	<i>MS</i>	<i>Ram</i>	<i>Spd</i>	<i>Hs</i>	<i>Blt</i>	<i>Bty</i>	<i>Blk</i>	<i>Trt</i>	<i>Dck</i>	<i>Armament</i>
<i>Numancia</i>	BSI	1863	29	Y	2	6	2	2	—	—	—	MF: 2o8, MA: 1o8, Bow: 1o9, BS: [4o10, 2o8]

B. Central Battery Ironclads (3 total)

Name	Class	Year	MS	Ram	Spd	Hs	Blt	Bty	Blk	Trt	Dck	Armament
<i>Vitoria</i>	CBI	1865	29	Y	2	6	2	2	—	—	—	Bow: 1o8, BS: [4o9, 1o8]
<i>Zaragosa</i>	CBI	1867	22	N	1	6	2	2	—	—	—	Bow: 1o7, BS: [2o9, 4o6], 1o7
<i>Mendez Nuñez</i>	CBI	1869	14	N	1	5	2	2	—	—	—	BS: [1o8, 2o9]

C. Turret Battleship (1 total)

Name	Class	Year	MS	Ram	Spd	Hs	Blt	Bty	Blk	Trt	Dck	Armament
<i>Pelayo</i>	TBS	1887	39	Y	3	7	8	2	—	7	2	F, A: [1x12B], P, S: [1x11B], BS: [6x5B]; BT-1, MT-3, 5QF, 14MG

D. Protected Cruisers (3 total)

Name	Class	Year	MS	Ram	Spd	Hs	Blt	Bty	Blk	Trt	Dck	Armament
<i>Luzon (Cuba)</i>	PC	1866	4	N	(2)	4	—	2	—	—	2	FS, AS: 1x5B, BS: 1x5B; BT-1, DT-2, 4QF, 4MG
<i>Reina Regente</i>	PC	1887	19	Y	4	6	—	1	—	1	4	FP, FS, AF, AS: [1x8B], FS, AS: [1x5B], BS: [1x5B]; BT-2, MT-1, ST-1, 6QF, 6MG

Unarmored Warships and Torpedo Vessels**A. Light Cruisers (13 total)**

Name	Class	Year	MS	Ram	Spd	Hs	Blt	Bty	Blk	Trt	Dck	Armament
<i>Aragon</i> (<i>Navarra, Castilla</i>)	CL	1879	13	Y	3	4	—	—	—	—	—	FS, AS: 1x6B, BS: 1x5B, 1o4, F, A: 1x3B
<i>Velasco</i> (<i>Infanta Isabel, Isabel II, Colon, Don Juan, Uloa, Venadito</i>)	CL	1881	5	N	2	4	—	—	—	—	—	FS, AS: 1x5B; DT-2, 4QF, 1MG
<i>Alfonso XII</i> (<i>Reina Cristina, Reina Mercedes</i>)	CL	1887	12	N	3	5	—	—	—	—	—	FS, AS: 1x6B, BS: 1x6B; BT-2, MT-1, ST-1, 4QF

B. Corvettes (2 total)

Name	Class	Year	MS	Ram	Spd	Hs	Blt	Bty	Blk	Trt	Dck	Armament
<i>Tornado</i>	CV	1865	8	N	2	4	M2	—	—	—	—	M: 1o8, BS: 1o6, 1o5
<i>Maria de Molina</i>	CV	1868	7	N	1	4	—	—	—	—	—	BS: 5o6

C. Sloops (2 total)

Name	Class	Year	MS	Ram	Spd	Hs	Blt	Bty	Blk	Trt	Dck	Armament
<i>Jorge Juan</i> (<i>Barcaiztegui</i>)	SL	1876	4	N	2	4	—	—	—	—	—	F, M, A: 1o6, WS: 1x3B

D. Gunboats (5 total)

Name	Class	Year	MS	Ram	Spd	Hs	Blt	Bty	Blk	Trt	Dck	Armament
<i>Duero</i>	GB	1875	2	N	2	3	—	—	—	—	—	F, A: 1x3B, M: 1o6; 1MG
<i>Concha</i> (<i>Mallaganas</i>)	GB	1883	2	N	2	3	—	—	—	—	—	F, M, A: 15B; 3MG
<i>Lezo</i>	GB	1885	2	N	2	3	—	—	—	—	—	F, A: 1x5B, M: 1x6B; DT-1, 2MG
<i>El Cano</i>	GB	1885	2	N	2	3	—	—	—	—	—	F, A: 1x5B, M: 1x6B; DT-2, 5MG

E. Torpedo Gunboats (2 total)

Name	Class	Year	MS	Ram	Spd	Hs	Blt	Bty	Blk	Trt	Dck	Armament
<i>Destructor</i>	TGB	1886	1	N	4	4	—	—	—	—	—	F: 1x4B; BT-2, ST-1, DT-2, 6QF
<i>Temerario</i>	TGB	1889	2	N	3	4	—	—	—	—	—	WS: 1x5B; BT-2, 4QF, 1MG

F. Torpedo Boats (12 total)

<i>Name</i>	<i>Class</i>	<i>Year</i>	<i>MS</i>	<i>Ram</i>	<i>Spd</i>	<i>Hs</i>	<i>Blt</i>	<i>Bty</i>	<i>Blk</i>	<i>Trt</i>	<i>Dck</i>	<i>Armament</i>
<i>Acevedo</i> (<i>Julian Ordonez</i>)	TB	1885	(1)	N	4	2	—	—	—	—	—	BT-2; 2MG
<i>Retamosa</i>	TB	1885	(1)	N	4	2	—	—	—	—	—	BT-2+2; 2MG
<i>Orion</i>	TB	1885	(2)	N	4	2	—	—	—	—	—	BT-2+2; 2MG
<i>Barcezo</i>	TB	1886	(1)	N	4	2	—	—	—	—	—	BT-2; 2MG
<i>Bustamente</i>	TB	1887	(1)	N	4	2	—	—	—	—	—	BT-2; 2QF
<i>Habana</i>	TB	1886	(1)	N	4	3	—	—	—	—	—	BT-2; 1MG
<i>Azor (Halcon)</i>	TB	1887	(2)	N	4	3	—	—	—	—	—	BT-2+2; 3QF
<i>Ariete (Rayo)</i>	TB	1887	(2)	N	5	3	—	—	—	—	—	BT-2+2; 4QF
<i>Ejercito</i>	TB	1887	(1)	N	5	2	—	—	—	—	—	BT-2; 1QF

G. Submarine (1 total)

<i>Name</i>	<i>Class</i>	<i>Year</i>	<i>MS</i>	<i>Ram</i>	<i>Spd</i>	<i>Hs</i>	<i>Blt</i>	<i>Bty</i>	<i>Blk</i>	<i>Trt</i>	<i>Dck</i>	<i>Armament</i>
<i>Peral</i>	S	1888	(3)	N	2	(1)	2	—	—	—	—	BT-2+2

SWEDEN

Crews: Trained

A. Coastal Defense Monitors (6 total)

<i>Name</i>	<i>Class</i>	<i>Year</i>	<i>MS</i>	<i>Ram</i>	<i>Spd</i>	<i>Hs</i>	<i>Blt</i>	<i>Bty</i>	<i>Blk</i>	<i>Trt</i>	<i>Dck</i>	<i>Armament</i>
<i>Ericsson</i> (<i>Thordon, Tirfing</i>)	CDM	1865	6	N	1	4	2	2	—	4	—	F: [2×15SB]
<i>Loke</i>	CDM	1871	6	N	1	4	2	2	—	6	—	F: [209]
<i>Svea (Thule)</i>	CDM	1886	13	N	3	5	M5	—	—	5	—	F: [2×10B], FS, AS: 16B; DT-2, 6QF

B. Armored Gunboats (7 total)

<i>Name</i>	<i>Class</i>	<i>Year</i>	<i>MS</i>	<i>Ram</i>	<i>Spd</i>	<i>Hs</i>	<i>Blt</i>	<i>Bty</i>	<i>Blk</i>	<i>Trt</i>	<i>Dck</i>	<i>Armament</i>
<i>Berserk</i> (<i>Bjorn, Folke, Gerda, Hildur, Solver, Ulf</i>)	AGB	1874	2	N	1	3	1	1	—	6	—	F: [109]

C. Corvette (1 total)

<i>Name</i>	<i>Class</i>	<i>Year</i>	<i>MS</i>	<i>Ram</i>	<i>Spd</i>	<i>Hs</i>	<i>Blt</i>	<i>Bty</i>	<i>Blk</i>	<i>Trt</i>	<i>Dck</i>	<i>Armament</i>
<i>Balder</i>	CV	1870	7	N	2	4	—	—	—	—	—	F, MF, MA, A: 106

D. Gunboats (7 total)

<i>Name</i>	<i>Class</i>	<i>Year</i>	<i>MS</i>	<i>Ram</i>	<i>Spd</i>	<i>Hs</i>	<i>Blt</i>	<i>Bty</i>	<i>Blk</i>	<i>Trt</i>	<i>Dck</i>	<i>Armament</i>
<i>Blenda (Disa)</i>	GB	1874	2	N	2	3	—	—	—	—	—	F: 1010, A: 105
<i>Urd</i> (<i>Skagul, Skaggald, Rota</i>)	GB	1877	2	N	2	3	—	—	—	—	—	F: 1010, A: 105
<i>Edda</i>	GB	1885	2	N	2	4	—	—	—	—	—	F: 1×10B, A: 1×6B

E. Torpedo Boats (4 total)

<i>Name</i>	<i>Class</i>	<i>Year</i>	<i>MS</i>	<i>Ram</i>	<i>Spd</i>	<i>Hs</i>	<i>Blt</i>	<i>Bty</i>	<i>Blk</i>	<i>Trt</i>	<i>Dck</i>	<i>Armament</i>
<i>No. 1-4</i>	TB	1884	(1)	N	3	2	—	—	—	—	—	BT-2, 2MG

TURKEY

Crews: Green

Armored Ships**A. Broadside Ironclads (4 total)**

<i>Name</i>	<i>Class</i>	<i>Year</i>	<i>MS</i>	<i>Ram</i>	<i>Spd</i>	<i>Hs</i>	<i>Blt</i>	<i>Bty</i>	<i>Blk</i>	<i>Trt</i>	<i>Dck</i>	<i>Armament</i>
<i>Osmanieh</i> (<i>Mahmudieh, Azizieh, Orkanieh</i>)	BSI	1864	26	Y	2	6	2	2	—	—	—	Bow: [206], BS: [708, 5×9SB], A: 109

B. Central Battery Ironclads (11 total)

<i>Name</i>	<i>Class</i>	<i>Year</i>	<i>MS</i>	<i>Ram</i>	<i>Spd</i>	<i>Hs</i>	<i>Blt</i>	<i>Bty</i>	<i>Blk</i>	<i>Trt</i>	<i>Dck</i>	<i>Armament</i>
<i>Assari Tewfik</i>	CBI	1870	19	Y	2	5	3	3	—	2	—	P, S: [1o9], BS: [3o9]
<i>Assari Shevket</i> (<i>Nijmi Shevket</i>)	CBI	1869	8	Y	2	4	2	2	—	2	—	BS: [2o7], M: [1o9]
<i>Avni Illah</i> (<i>Muin-I-Zaffer</i>)	CBI	1869	9	Y	2	4	2	2	—	—	—	FS, AS: [1o9]
<i>Fethi Bulend</i> (<i>Mukaddami, Khair</i>)	CBI	1870	11	Y	2	5	4	3	—	—	—	Bow: [2o9], Strn: [2o9]
<i>Idjalieh</i>	CBI	1870	9	Y	2	4	3	2	—	2	—	BS: [1o9, 1o7], M: [1o7]
<i>Messudieh</i>	CBI	1874	39	Y	2	7	5	4	—	—	—	Bow: [2o10], 2o7, Strn: [2o10], 1o7, BS: [4o10], 3o4
<i>Hamidieh</i>	CBI	1885	26	Y	2	6	4	3	—	—	—	Bow: [2o6], 2o9, BS: [3o6], AS: [1o6]

C. Coastal Defense Monitor (1 total)

<i>Name</i>	<i>Class</i>	<i>Year</i>	<i>MS</i>	<i>Ram</i>	<i>Spd</i>	<i>Hs</i>	<i>Blt</i>	<i>Bty</i>	<i>Blk</i>	<i>Trt</i>	<i>Dck</i>	<i>Armament</i>
<i>Rahman</i>	CDM	1868	10	Y	2	4	2	1	—	2	1	MF: [2o8], MA: [2o7]

Unarmored Warships and Torpedo Vessels**A. Sloops (11 total)**

<i>Name</i>	<i>Class</i>	<i>Year</i>	<i>MS</i>	<i>Ram</i>	<i>Spd</i>	<i>Hs</i>	<i>Blt</i>	<i>Bty</i>	<i>Blk</i>	<i>Trt</i>	<i>Dck</i>	<i>Armament</i>
<i>Sed-el-Bar</i> (<i>Beirut, Zuhaf, Atarid, Iskenderieh, Merikh</i>)	SL	1860	2	N	2	3	—	—	—	—	—	MF, MA: 1o5; 4QF
<i>Sinub</i> (<i>Edirneh, Brussah, Mansurah, Muzaffer</i>)	SL	1860	3	N	2	3	—	—	—	—	—	F, A: 1o5, MF, MA: 1o6; BT-1, 3QF

B. Torpedo Boats (10 total)

<i>Name</i>	<i>Class</i>	<i>Year</i>	<i>MS</i>	<i>Ram</i>	<i>Spd</i>	<i>Hs</i>	<i>Blt</i>	<i>Bty</i>	<i>Blk</i>	<i>Trt</i>	<i>Dck</i>	<i>Armament</i>
<i>Mahabet (Sarvet)</i>	TB	1886	(2)	N	3	2	—	—	—	—	—	BT-2
<i>Giljom</i> (<i>Siki, Tiri Zaffer, Seifi Bahri, Vesitehi Nusret</i>)	TB	1886	(2)	N	4	2	—	—	—	—	—	BT-2, 2QF
<i>Wasir (Fatih, Nusret)</i>	TB	1887	(2)	N	4	2	—	—	—	—	—	BT-2, 2QF

UNITED STATES

Crews: Crack

A. Protected Cruisers (4 total)

<i>Name</i>	<i>Class</i>	<i>Year</i>	<i>MS</i>	<i>Ram</i>	<i>Spd</i>	<i>Hs</i>	<i>Blt</i>	<i>Bty</i>	<i>Blk</i>	<i>Trt</i>	<i>Dck</i>	<i>Armament</i>
<i>Atlanta (Boston)</i>	PC	1886	13	N	2	6	—	—	—	1	1	F, A: [1x8B], Bow: 1x6B, Strn: 1x6B, BS: 2x6B; 6QF
<i>Chicago</i>	PC	1889	18	N	2	7	—	—	—	—	1	FS, AS: 1x8B, BS: 4x6B, Strn: 2x5B; 4QF
<i>Charleston</i>	PC	1889	15	N	3	6	—	—	—	1	2	F, A: [1x8B], FS, AS: 1x6B, BS: 1x6B; 4QF

B. Coastal Defense Monitors (14 total)

<i>Name</i>	<i>Class</i>	<i>Year</i>	<i>MS</i>	<i>Ram</i>	<i>Spd</i>	<i>Hs</i>	<i>Blt</i>	<i>Bty</i>	<i>Blk</i>	<i>Trt</i>	<i>Dck</i>	<i>Armament</i>
<i>Passaic</i> (<i>Camanche, Catskill, Lehigh, Montauk, Nahant, Nantucket, Sangamon</i>)	CDM	1862	7	N	1	4	2	—	—	4	1	F: [1x15SB, 1x11SB]
<i>Canonicus</i> (<i>Mahopac, Manayunk, Manhattan, Saugus, Tippecanoe</i>)	CDM	1864	8	N	1	4	2	—	—	4	1	F: [2x15SB]

C. Corvettes (5 total)

<i>Name</i>	<i>Class</i>	<i>Year</i>	<i>MS</i>	<i>Ram</i>	<i>Spd</i>	<i>Hs</i>	<i>Blt</i>	<i>Bty</i>	<i>Blk</i>	<i>Trt</i>	<i>Dck</i>	<i>Armament</i>
<i>Brooklyn</i>	CV	1858	10	N	1	5	—	—	—	—	—	M: 1×10SB, BS: 10×9SB
<i>Hartford</i>	CV	1858	10	N	1	5	—	—	—	—	—	BS: 10×9SB
<i>Lancaster</i>	CV	1858	13	N	1	5	—	—	—	—	—	BS: 12×9SB
<i>Richmond</i>	CV	1860	10	N	1	5	—	—	—	—	—	M: 1o6, BS: 10×9SB
<i>Pensacola</i>	CV	1859	12	N	1	5	—	—	—	—	—	M: 1×11S, BS: 8×9SB

D. Sloops (13 total)

<i>Name</i>	<i>Class</i>	<i>Year</i>	<i>MS</i>	<i>Ram</i>	<i>Spd</i>	<i>Hs</i>	<i>Blt</i>	<i>Bty</i>	<i>Blk</i>	<i>Trt</i>	<i>Dck</i>	<i>Armament</i>
<i>Ossipee</i> (<i>Juniata</i>)	SL	1862	8	N	1	4	—	—	—	—	—	FM: 1o5, AM: 1o8, BS: 3×9SB
<i>Galena</i> (<i>Marion, Mohican, Quinnebaug, Swatara, Vandalia</i>)	SL	1872	8	N	2	4	—	—	—	—	—	FM: 1o5, AM: 1o8, BS: 3×9SB
<i>Enterprise</i> (<i>Adams, Alliance, Nipsic, Essex</i>)	SL	1874	6	N	2	4	—	—	—	—	—	FM: 1o5, AM: 1×11S, BS: 2×9SB

E. Patrol Gunboats (2 total)

<i>Name</i>	<i>Class</i>	<i>Year</i>	<i>MS</i>	<i>Ram</i>	<i>Spd</i>	<i>Hs</i>	<i>Blt</i>	<i>Bty</i>	<i>Blk</i>	<i>Trt</i>	<i>Dck</i>	<i>Armament</i>
<i>Yorktown</i>	GB	1889	7	N	3	5	—	—	—	—	—	FS, AS: 1×6B, P, S: 1×6B; 6QF
<i>Petrel</i>	GB	1889	3	N	2	4	—	—	—	—	—	FS, AS: 1×6B; 4QF

F. Submarines (2 total)

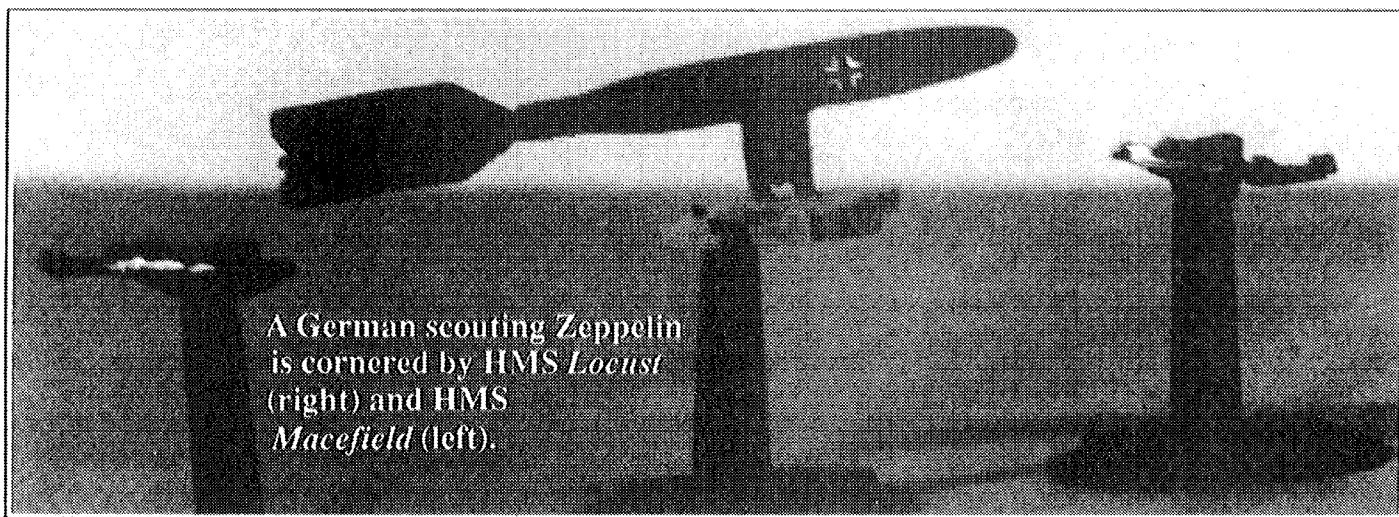
<i>Name</i>	<i>Class</i>	<i>Year</i>	<i>MS</i>	<i>Ram</i>	<i>Spd</i>	<i>Hs</i>	<i>Blt</i>	<i>Bty</i>	<i>Blk</i>	<i>Trt</i>	<i>Dck</i>	<i>Armament</i>
<i>Nautilus</i>	S	1889	(4)	Y	2	(1)	2	1	—	—	1	BT-1+1
<i>Peacemaker</i>	S	1889	(2)	N	2	(1)	—	—	—	—	—	BT-2+2

URUGUAY

Crews: Green

All Ships (4 total)

<i>Name</i>	<i>Class</i>	<i>Year</i>	<i>MS</i>	<i>Ram</i>	<i>Spd</i>	<i>Hs</i>	<i>Blt</i>	<i>Bty</i>	<i>Blk</i>	<i>Trt</i>	<i>Dck</i>	<i>Armament</i>
<i>Grl. Suarez</i>	GB	1862	2	N	1	2	—	—	—	—	—	BS: 2o3
<i>Malvinas</i>	GB	1870	2	N	1	3	—	—	—	—	—	2QF
<i>Grl. Artigas</i>	GB	1883	1	N	2	2	—	—	—	—	—	MF, MA: 1o5
<i>Grl. Rivera</i>	GB	1884	1	N	2	2	—	—	—	—	—	MF: 1o6, MA: 1×3B



A German scouting Zeppelin is cornered by HMS *Locust* (right) and HMS *Macefield* (left).

AERIAL VESSELS

FEWER THAN 100 steam-powered aerial warships are in service with all the great powers of Earth, but their effect on military strategy has been profound. The small number in service makes it possible to examine the most important of them in detail.

Great Britain

GREAT BRITAIN has more experience with aerial combat than any other Earth nation but has been building gunboats for less than a decade. Its first experience with aerial warfare was in the Gorovaangian War (1878-79), or First War of the Parhooni Succession. British officers and men, largely from the Royal Artillery, served alongside Parhooni cloud sailors in Parhoon's small fleet, manning modern machineguns and field guns lashed to the decks of screw galleys.

The defense of the Martian territories demanded aerial vessels, so it was some time before liftwood was available for construction on Earth. Inventors and aerial enthusiasts obtained limited supplies of liftwood and produced experimental vessels of some historical interest but little practical military value. The first military use of aerial vessels on Earth was in 1885 during the Sudan campaign, and, ironically, they were produced by a private citizen, not the government.

Quick to realize the impact aerial vessels would have on naval warfare, the Royal Navy lobbied for control of the aerial service. By the close of 1885 this was granted, and all projects in work by the services were officially turned over to the navy. The result was a more efficient and productive program, which produced the

first *Locust*-class vessel in 1886, the very powerful *Macefield* gunboats in 1888, and the *Intrepid*-class cruisers in 1889. (Of these, one *Locust*-class boat has been sold to the Dutch and is stationed in the Dutch East Indies.)

Aerial gunboats were small, lightly armored vessels until recently, when a number of large armored airships have been launched. The first of these was the *Intrepid*, launched January 1, 1889, although it has since been joined by larger vessels in French and German service.

Finally, Britain has, until recently, enjoyed a monopoly on the ether battleship. These are extremely large interplanetary ether flyers, armored and equipped with heavy naval guns. Although interplanetary combat is not possible given existing travel speeds and target tracking techniques, ether battleships provide a means of shifting aerial combat vessels between different planets as needed, as well as controlling the close orbital space around a world.

The first vessel of this type was the *Duke of York*, launched in 1886. In addition to its impressive armament, it contains quarters for a battalion of troops. It has since been joined by two additional ships in this class, and similar vessels are nearing completion in France, Germany, and Russia.

France

THE FRENCH COLONY ON Mars consists of the city-state of Idaeus Fons and considerable expanses of the broad steppe leading to the foothills of the Tempe Mountains. Fast-moving columns have repeatedly fought their way into the heart of the Tempe Range. Although they have been unable to suppress the Tempe High Mar-

tians or establish a permanent foothold, they have brought out considerable liftwood. On Mars the French operate a fleet of locally built ships, mostly screw galleys in the 300- to 500-ton range. Much of the liftwood brought out of the Tempes, however, has been shipped back to Earth and has been used to form a powerful aerial squadron.

The *Harpon* is the main class of aerial vessel in French naval service. It is lightly armed, but it is a fine performance boat with excellent speed and altitude. Vessels of this class currently serve on every major French naval station, and an uncertain number (rumored to be as high as four vessels) are under construction.

The *Gloire* was designed in response to a naval requirement for a long-range heavy aerial unit capable of operating independently of surface naval units. It was also decided that the ship should have better armor protection than any aerial vessel built to date. The result is a controversial ship among French naval experts. The *Gloire* has exceptional range and is very well protected. On the other hand, it is sluggish and has a limited ceiling, and its armament is less impressive than the title *cruiser* might suggest.

One point of interest is the arrangement of the armament. Three of the 4" guns are located in upper deck turrets: two side-by-side forward and one aft. The remaining gun is mounted in a ventral turret with all-around fields of fire. This weapon is of considerable value for use in bombarding ground targets, but it cannot engage other ships at higher altitudes than the *Gloire*. While this sort of armament mounting is com-

monplace on ether flyers, it remains a novelty on conventional atmospheric flyers.

Finally, the *Charlemagne* is the largest aerial warship in service, actually classed as a flying fortress by the French. Capable of staying aloft for a month and carrying a complete battalion of marines, vessels such as this undoubtedly represent the face of naval warfare in the future.

Germany

THE GERMAN *Luftschifferabteilung* (airship detachment) was formed as a separate branch of service in 1887—its uniform being the same as that for the sappers of the Guard with the addition of a yellow metal “L” on the red shoulder straps. The airship detachment is formed as a four-battalion regiment (recently expanded from three) for administrative purposes, but personnel are drawn from various companies and battalions. Most aerial vessels in German service are hydrogen-filled rigid airships; these ships are called *Zeppelins* after their inventor, Count von Zeppelin.

After experimental models, early production was standardized in 1883 with the *LZ (Luft Zeppelin) 5*. This lightly armed scouting airship was produced in large numbers, extensively exported, and is still in active service in the German fleet as well as in a number of European navies.

The largest non-German users are Spain (8 units in service), Austria-Hungary (6), Italy (6), and Turkey (5), although most European and some other navies have one or two.

A new, more powerful battle Zeppelin, the *LZ-41*, was launched in 1887, and German production has concentrated on this class since. Export negotiations are underway, and this type may soon appear in the fleets of Germany's closest allies, Italy and Austria-Hungary.

Limited liftwood has been obtained

from the trading station in Western Dioscuria and used to construct small experimental vessels.

These provided practical design and construction experience, and allowed testing of a number of radical engineering theories, recently culminating in the launch of the *LS (Luft Stellung, or aerial fortress) Wotan* and its sister ship *Thor*. These are very large displacement vessels, similar in size to the French *Charlemagne*, but using a combination of lifting means to minimize reliance on liftwood.

In addition to a conventional liftwood array, they use several hydrogen gas cells for additional buoyancy. Most interesting are the eight large gimble-mounted propellers capable of providing either forward motion or lift.

Russia

THE FIRST RUSSIAN EXPEDITIONS to Mars in 1883 landed in Cebrenia, near the city-state of Hecates Lacus. That city-state was, at the time, under pressure from its closest neighbors (Herculis to the north and Styx to the south) and was in the grips of a complex and bloody struggle of succession. The Russians sided with one of the factions—tipping the balance in their favor in the dynastic struggle, and discouraging any would-be invading armies—by the shipment of Gatling guns and trained crews. (In Russian service, the Gatlings are known as Gorloff guns.) Although Russia does not rule Hecates Lacus, the treaties of friendship and protection that exist between the two states give Russia privileges in the area and a strong say in the city-state's foreign policy. With a fairly secure lodgement on Mars, the Russians soon began the construction of aerial gunboats.

The only major class of aerial warships built by the Russians is the *Czarina*. Costs listed are average for those built at the Kronshtadt naval yard on Earth. The examples on Mars were un-

doubtedly much more expensive. As Russia does not have a proper Martian naval yard for construction of armored steam vessels, components were shipped from Earth and assembled by hand at Hecates Lacus.

The United States

THE RESPONSIBILITIES of the U.S. Navy have, for many years, been confined to coastal defense, and most of its ships have been coastal defense monitors left over from the civil war, supplemented by a few old, wooden-hulled, oceangoing, steam-assisted sailing vessels. This is changing, and a number of modern ships are entering service.

Although the United States is far from being a major naval power, it has become an important force in the western hemisphere.

To support the growing U.S. force, the Americans have built a number of aerial rocket sloops. These are small vessels loaded with rockets for bombardment of surface naval vessels. They are not intended to fight heavily armed aerial gunboats.

Nevertheless, they are valuable in the aerial scouting role and have a better bombardment ability than larger ships.

The *Eagle* is an unusual class, recognizable by its large outrigger-like racks of rocket batteries.

Normally a small vessel of this type would be unable to accommodate more than a quarter of the rockets carried on the *Eagle*, but its ingenious design (and a 50% inflation of the vessel's cost) enables it to carry an intimidating ordnance load.

The disadvantage of the design is the likelihood that an explosion will set off a chain reaction of detonating rocket batteries.

Recently the U.S. launched its first conventional aerial gunboat, the *Kearsarge*. This is an unusual design, with a single 6" gun in a fixed mount in the bow supplemented by other light armament.

ABBREVIATIONS USED

Ship Data: *HS*: Hull Size *AV*: Armor Value *Bs*: Boiler Size *End*: Endurance (in days) *Spd*: Speed (parenthetical values are interplanetary speeds) *Alt*: Maximum Altitude.

Ship Classes: *AGB*: Aerial Gunboat *AC*: Aerial Cruiser *ARS*: Aerial Rocket Sloop *AF*: Aerial Fortress *KZ*: Kampf Zeppelin *LF*: Luft Festung.

Gun Mounts: *F*: Forward Turret *M*: Midship Turret *MF*: Midship Forward Turret *MA*: Midship Aft Turret *A*: Aft Turret *P*: Port Turret *S*: Starboard Turret *V*: Ventral Turret *VF*: Ventral Forward Turret *VA*: Ventral Aft Turret *PF*: Port Forward Turret *SF*: Starboard Forward Turret *PA*: Port Aft Turret *SA*: Starboard Aft Turret *FS*: Forward Sponson *WS*: Wing Sponson *AS*: Aft Sponson *Bow*: Bow *Strn*: Stern *BS*: Broadside.

Exotic Weapons: *RU*: Rocket Up *RD*: Rocket Down *DG*: Drogue Torpedo *BR*: Bomb Rack *TM*: Tether Mine *SD*: Smutts Discharger *BR-10+10*: 10 bomb racks plus 10 reloads *BR-10+10T+10D*: 10 bomb racks plus 10 torpedos plus 10 depth bombs *LF*: Liquid Fire *SD*: Spike Dropped.

SPECIAL FLYER RULES

THESE RULES apply only to specific classes of flyers listed, and reflect certain peculiar aspects of their design.

Eagle-Class Rocket Sloops

WHENEVER an *Eagle*-class aerial rocket sloop suffers a magazine hit, all remaining rockets, bombs, and gun magazines detonate, the boiler blows up, and the vessel is destroyed in a spectacular explosion.

Wotan-Class Aerial Fortress

THE *WOTAN* AND *THOR* can pivot their propellers and trade speed for lift. For every voluntary reduction in maximum speed by two, add one to the maximum altitude. Each ship can adjust its maximum speed by two and its maximum altitude by one per turn in the Initiative Phase. Neither speed nor altitude may be reduced below 0, and speed may not be increased above 6. Changing maximum altitude does not necessarily change altitude; that must be done during the Movement Phase and by paying the normal costs.

Because the *Thor* and *Wotan* use hydrogen lifting cells, they are susceptible to fire (not to the extent of a regular Zeppelin). Each turn they are on fire the fire level increases by two instead of one. The ship suffers hull hits each turn equal to the level of the fire.

FRANCE

Crews: Crack

Aerial Gunboats (5 total)

Class	Type	Year	Hs	AV	Bs	End	Spd	Alt	Armament
<i>Harpon</i>	AGB	1887	3	2	3	20	6	VH	F, A: 1o4; 2QF, 2MG, RU-1, RD-1
(Hallebarde, Hache, Javeline, Mousqueton)									

Aerial Cruisers (2 total)

Class	Type	Year	Hs	AV	Bs	End	Spd	Alt	Armament
<i>Gloire</i>	AC	1887	10	4	5	40	3	H	PF, SF: [1×4B], A: [1×4B], V: [1×4B]; 4QF, BR-5, RU-4, TM-1, DG-1
(Invincible)									

Aerial Fortress (1 total)

Class	Type	Year	Hs	AV	Bs	End	Spd	Alt	Armament
<i>Charlemagne</i>	AF	1889	60	3	30	30	3	H	F, A: [1×10B], FS, AS: [1×6B], BS: [2×4B]; 8QF, 10MG, DG-3, BR-10+10+10T+10D, TM-6, RU-10, RD-10, LF-5

GERMANY

Crews: Crack

Kampf Zeppelins (17 total)

Class	Type	Year	Hs	AV	Bs	End	Spd	Alt	Armament
<i>LZ-5</i>	KZ	1883	8	0	—	10	6	VH	1QF, 2MG, BR-2+2, DG-1
(total of 12 in service)									
<i>LZ-41</i>	KZ	1887	12	0	—	20	4	VH	3QF, 4MG, BR-4+4+4T
(total of 5 in service)									

Luft Stellung (2 total)

<i>Class</i>	<i>Type</i>	<i>Year</i>	<i>Hs</i>	<i>AV</i>	<i>Bs</i>	<i>End Spd</i>	<i>Alt</i>	<i>Armament</i>	
<i>Wotan (Thor)</i>	LS	1889	30	5	30	20	6	M	B: [SD-20], F, A: [1×8B], FS, AS: [1×5B], BS: [4×3B]; 10QF, 10MG, BR-10+40+10T+20D, DG-5, TM-5

GREAT BRITAIN

Crews: Crack

Aerial Gunboats (10 total)

<i>Class</i>	<i>Type</i>	<i>Year</i>	<i>Hs</i>	<i>AV</i>	<i>Bs</i>	<i>End Spd</i>	<i>Alt</i>	<i>Armament</i>	
<i>Locust</i> (<i>Dragonfly, Tse Tse, Yellow Jacket, Grasshopper</i>)	AGB	1886	2	1	2	20	6	VH	F, A:1o4; 2QF, 2MG, RU-1, RD-1
<i>Macefield</i> (<i>St. John, Raglan, Ponsonby, Uxbridge</i>)	AGB	1888	5	2	5	20	6	H	F: 1x4.7B, A: 1x4B; 4QF, 2MG, RU-2, RD-2, DG-1, TM-1

Aerial Cruisers (2 total)

<i>Class</i>	<i>Type</i>	<i>Year</i>	<i>Hs</i>	<i>AV</i>	<i>Bs</i>	<i>End Spd</i>	<i>Alt</i>	<i>Armament</i>	
<i>Intrepid</i> (<i>Indominable</i>)	AC	1889	16	3	11	30	4	H	F, A: [1×6B], WS: [1×4.7B], BS: [2×4B]; 4QF, 4MG, TM-2, BR-5

Ether Battleships (3 total)

<i>Class</i>	<i>Type</i>	<i>Year</i>	<i>Hs</i>	<i>AV</i>	<i>Bs</i>	<i>End Spd</i>	<i>Alt</i>	<i>Armament</i>
<i>Duke of York</i> (<i>Duke of Cambridge, Duke of Clarence</i>)	EBS	1886	100	3	50	20	3(1) Orb	VF, VA:[2×12B], FS, AS: [1×4B], BS: [4×3B]; BR-8+8

JAPAN

Crews: Crack

Aerial Gunboats (2 total)

<i>Class</i>	<i>Type</i>	<i>Year</i>	<i>Hs</i>	<i>AV</i>	<i>Bs</i>	<i>End Spd</i>	<i>Alt</i>	<i>Armament</i>	
<i>Yashima</i> (<i>Fuji</i>)	AGB	1888	3	2	2	20	4	VH	WS:[1×3B]; 4QF, 4MG

RUSSIA

Crews: Trained

Aerial Gunboats (8 total)

<i>Class</i>	<i>Type</i>	<i>Year</i>	<i>Hs</i>	<i>AV</i>	<i>Bs</i>	<i>End Spd</i>	<i>Alt</i>	<i>Armament</i>
<i>Czarina</i> (<i>Anakria, Ekenes, Rotchensalm, Gapsal, Kotka, Seskar, Kronshlot</i>)	AGB	1886	4	3	4	20	6	VH F: 1×3B, A: 1×3B; 2QF, 2MG, DG-1

UNITED STATES OF AMERICA

Crews: Crack

Aerial Rocket Sloops (4 total)

<i>Class</i>	<i>Type</i>	<i>Year</i>	<i>Hs</i>	<i>AV</i>	<i>Bs</i>	<i>End Spd</i>	<i>Alt</i>	<i>Armament</i>	
<i>Eagle</i> (<i>Valley Forge, Saratoga, Ticonderoga</i>)	ARS	1887	4	2	4	10	6	H	F, A: 1×3B; 2QF, 4MG, RU-4, RD-12, BR-2+2

Aerial Gunboat (1 total)

<i>Class</i>	<i>Type</i>	<i>Year</i>	<i>Hs</i>	<i>AV</i>	<i>Bs</i>	<i>End Spd</i>	<i>Alt</i>	<i>Armament</i>	
<i>Kearsarge</i>	AGB	1889	10	3	10	20	6	VH	Bow: [1×6B], F: 1×4B; 1QF, BR-4+12



Name

Type/Class

Nationality

Mass _____

Armament Diagram

Ram

Speed

SH

Target Mod

Torpedoes Quick-Firing

BT □□□□□□

MT

[illegible]

555

Armor

B14

	Bty

263	264
-----	-----

Trt	
Dim	

III	Def
-----	-----

Hull

[illegible]

Ship Form

Name

Type/Class

Nationality

Mass _____

Ram

Speed

HS

Target Mod

Torpedoes Quick-Firing

BT

MT

DT

T

Armor

RI

Rfv	
Brv	

Buy	
Buy	

Tot	
DIN	

III	III
-----	-----

Hill

[illegible]



Name _____

Type/Class

Nationality

Mass

Armament Diagram

Ram

Speed

HS

Target Mod

Armor

[illegible]

H:

M:

L:

VL:



Name _____

Type/Class

Nationality

Mass _____ Armament Diagram

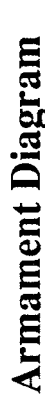
Ram

Speed _____

HS

Target Mod _____

Armor



Hull

[illegible]

H:

M:

L:

VL:



Name _____

Type/Class

Nationality

Mass _____

Armament Diagram

Ram

Speed

HS

Target Mod

Armor

[illegible][illegible]

H:

M:

1.

VI:



Name _____

Type/Class

Nationality

Mass _____

Armament Diagram _____

Ram

Speed

HS

Target Mod

Armor

VII:

[illegible][illegible]

M:

[illegible]

VII:



VL:

MODERN BREECH-LOADING GUNS (B)

Weapon	Pen	DV	ROF	Range
18"	18/9	20	(4)	14/28
17"	17/9	18	(3)	13/26
16"	16/8	16	(2)	10/20
14"	14/7	14	(1)	9/18
12"	12/6	12	(1)	8/16
11"	11/5	11	(1)	8/16
10"	10/5	10	(1)	7/14
9"	9/5	9	(1)	7/14
8"	9/5	8	(1)	6/12
7"	7/3	7	(1)	6/12
6"	5/3	6	1	5/10
5"	4/2	4	1	5/10
4.7" QF	4/2	3	2	4/8
4" (long)	3/2	2	1	4/8
3"	2/1	1	1	3/6
2-pdr gun	0/0	1	1	2/4

Abbreviations: *QF*: Quick-Firing *Pdr*: Pounder.

EXOTIC NAVAL WEAPONS

Weapon	Pen	DV	ROF	Range
Hale Rockets	0	1	D6	—/4
Tether Mine	0	6	—	—
Drogue Torp.	0	10	—	—
Smutts Dschgr	—	—	(1)	—
Smutts Dschgr+	—	—	(1)	—
Smutts Torpedo	1	12	—	30
Power Grapnel	—	—	(2)	0/1
Bomb Rack	—	—	1	—
Bomb	1	6	1	—
Spike Dropper	—	P	D6	—
Liquid Fire	—	F	D6	—
Deck Tube	6	4D6	(1)	6
Fixed Tube	6	4D6	(1)	6
Torpedo Reload	—	—	—	—
Depth Bomb	—	D6/2	(1)	—

MACHINEGUNS (MG)

Weapon	Pen	DV	ROF	Range	Cost
0.5" Gatling	—	P	3/5	1/2	40
Mitrailleuse	—	P	3	1/2	60
Nord 5-barrel	—	P	5	1/2	100
Nord 3-barrel	—	P	3	1/2	60

Abbreviations: *Nord*: Nordenfelt.

Note: Unless specified, MGs fire as 5-barrel Nordenfelts.

SMOOTHBORE (SB) GUNS

Weapon	Pen	DV	ROF	Range
15"	4/2	7	(2)	4/8
11"	3/1	5	(1)	3/6
10"	2/1	4	(1)	2/4
68-pdr	2/1	3	1	3/6
9"	1/1	3	1	2/4
32-pdr	1/1	2	1	3/6
24-pdr	1/0	2	1	2/4
12-pdr	1/0	1	1	2/4
9-pdr	0/0	1	1	2/3
6-pdr	0/0	1	1	1/2

Abbreviations: *Pdr*: Pounder.

QUICK-FIRING (QF) MACHINE CANNON

Weapon	Pen	DV	ROF	Range
6-pdr HRC	1/0	1	3	3/6
3-pdr HRC	1/0	1	3	2/4
1-pdr HRC	0/0	1	3	2/4
1-pdr Pom Pom	0/0	1	4	2/4
1" Gatling	0/0	1	3/4	1/2

Abbreviations: *HRC*: Hotchkiss revolving cannon.

Note: Unless specified, all QF guns fire as 3-pdr HRCs.

OLD (O) LOW-POWERED RIFLED GUNS

Weapon	Pen	DV	ROF	Range
18"	14/7	18	(4)	9/18
17"	13/6	17	(4)	8/16
16"	12/6	16	(3)	8/16
15"	11/5	15	(3)	7/14
14"	10/5	14	(2)	7/14
13"	9/4	13	(1)	6/12
12"	8/4	12	(1)	6/12
11"	7/3	11	(1)	6/12
10"	7/3	10	(1)	6/12
9"	6/3	9	(1)	5/10
8"	5/2	8	(1)	5/10
7"	4/2	7	(1)	5/10
6"	4/2	6	(1)	4/8
5"	3/1	4	1	4/8
4.7"	3/1	3	1	4/8
4"	2/1	2	1	3/6
3"	1/1	1	1	3/6
9-pdr	1/0	1	1	3/6
6-pdr	0/0	1	1	2/4

Abbreviations: *Pdr*: Pounder.

COLLISIONS

<i>Roll Modifiers</i>	<i>Roll</i>	<i>Effects</i>
<i>From Bow or Stern:</i> +1	1, 2	Flyers: Hull hit if roll less than other ship's size. Smaller ship suffers loss of trim if it rolls less than half the difference in hull sizes (rounding down). Ships: Hull hits=1/6 of other ship's mass. Roll die for fractional hits. Smaller ship suffers flooding on roll of 6.
<i>If Turning:</i> -2		
<i>If Hull Size 6+:</i> -1		
<i>To Avoid:</i> +1/2 speed		

RAMMING

<i>Roll Modifiers</i>	<i>Roll</i>	<i>Effects</i>
<i>To Avoid:</i> +1/2 speed	1, 2, 3, 4	Flyers: If ram mounted, rammed ship suffers hull hits equal to half the hull size of the ramming ship (round up). Rammed ship suffers trim loss if it rolls less than half the hull size of ramming ship (round up). If no ram mounted, same effect as in a collision, but ramming ship never suffers trim loss. Ships: If ram mounted, rammed ship suffers hull hits equal to mass of ramming ship and suffers flooding on roll of 4, 5, or 6 (as modified by the Flooding Roll Modifiers Table below). If ram not mounted, same as collision, but add speed of ramming ship to its mass for purposes of damage calculation.

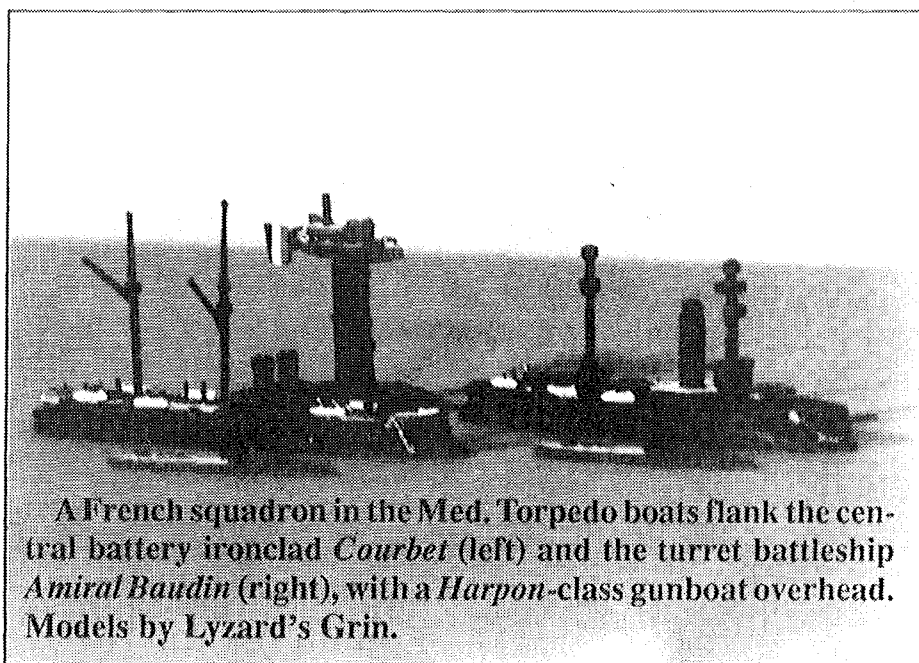
TORPEDOES

<i>Modifiers</i>	<i>Roll</i>	<i>Effects</i>
<i>Bow/Stern Attack:</i> -2	Hs-R-MA	Roll 4D6 to determine number of hull hits. Penetration value of 6. Uncontrolled flooding on roll of 6 (no modifiers).
<i>Torpedo Nets:</i> Save on roll of 1-4.		

Abbreviations: *HS*: Target ship's hull size *R*: Range to target ship *MA*: Target ship's movement allowance.

FLOODING ROLL MODIFIERS

<i>Modifier</i>	<i>Condition</i>
+2	Rammer three or more times the size of the rammed ship
+1	Rammer twice the size of the rammed ship
-1	Rammed ship twice the size of the rammer
-2	Rammed ship four times the size of the rammer



HIT ROLL

<i>Range</i>	<i>Hit Number</i>
Close	3,4,5,6
Long	5,6

MODIFIERS TO HIT NUMBER

<i>Condition</i>	<i>Modifier</i>
Different Altitude	-1
Green Crew	-1
Burning	-1
Crack Crew	+1

HIT LOCATION

<i>Roll</i>	<i>Location</i>
1	Hull
2	Hull
3	Crew
4	Crew
5	Gun
6	Critical

CRITICAL HIT TABLE

<i>Roll</i>	<i>Flyer Result</i>	<i>Ship Result</i>
2	Magazine	Magazine
3	Bridge	Boiler
4	Boiler	Rudder Jammed Right
5	Trim Damage	Rudder Jammed
6	Rudder Jammed	Flooding
7	Fire	Fire
8	Lifters Jammed	Bridge
9	Screw/Mast	Screw
10	Magazine	Rudder Jammed Left
11	Bridge	Magazine
12	Boiler	Boiler

TURN SEQUENCE**1. Initiative Phase**

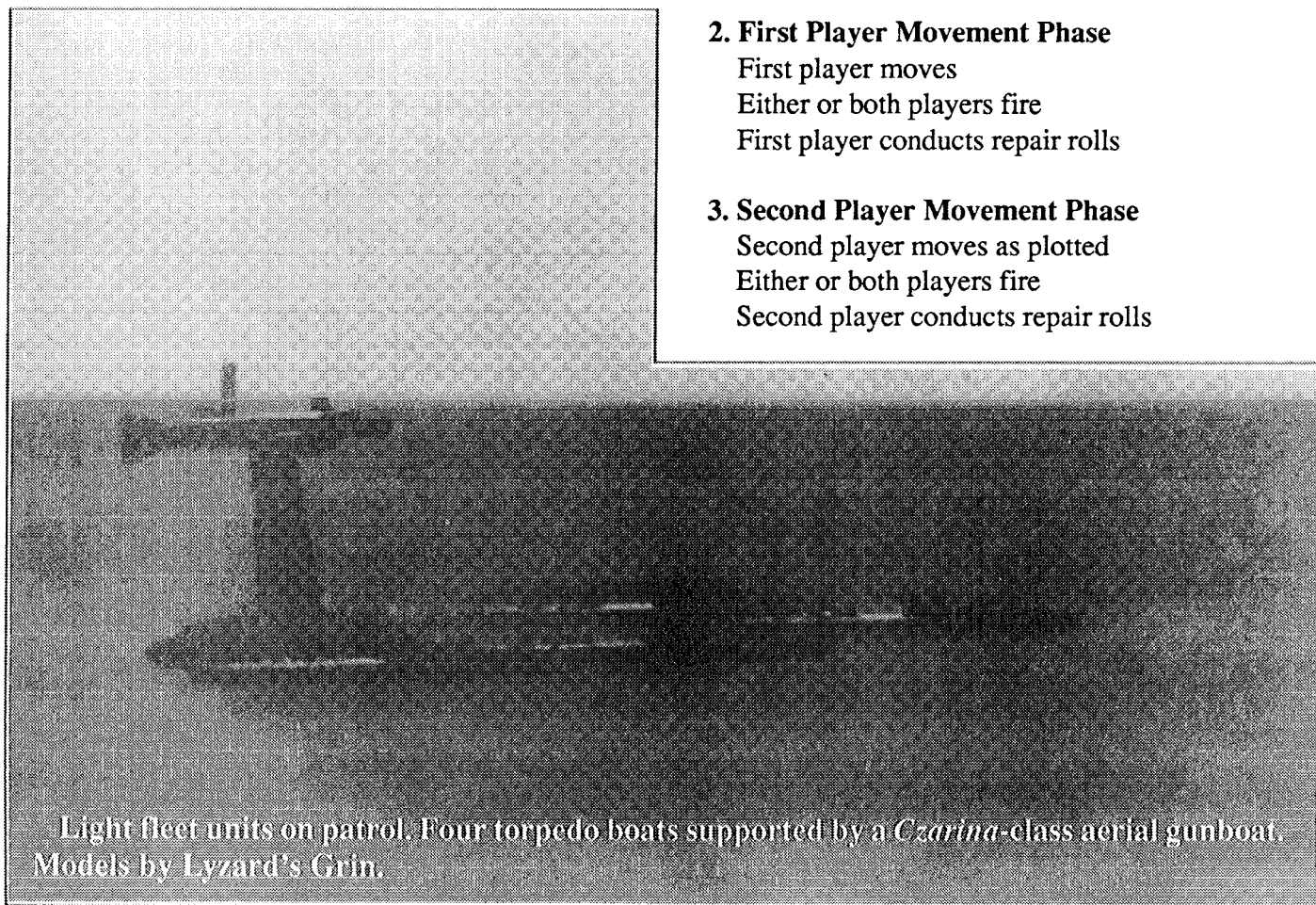
Increase all fires
Roll for initiative
Noninitiative player plots movement

2. First Player Movement Phase

First player moves
Either or both players fire
First player conducts repair rolls

3. Second Player Movement Phase

Second player moves as plotted
Either or both players fire
Second player conducts repair rolls



Light fleet units on patrol. Four torpedo boats supported by a *Czarina*-class aerial gunboat. Models by Lyzard's Grin.

HIT LOCATIONS

Gun: A gun hit destroys one gun. If the firing gun has a damage value greater than 1, all additional hits are crew hits. The destroyed gun is selected randomly from those guns which can fire into the firing aspect from which the hit was taken. If no guns are present in that firing aspect, reroll the hit location and continue to reroll until a nongun hit is achieved.

Hull: A hull hit causes hits to the hull boxes equal to the damage value of the gun. Hull hit boxes are arranged in rows with the number of boxes in each row equal to the hull size of the ship. Each time that a complete row of hull hit boxes is marked off, the ship's movement allowance is reduced by one. When all of the ship's hull hit boxes have been marked off, the ship capsizes and immediately sinks.

Crew: Each crew hit causes crew casualties equal to half of the damage value of the firing gun, rounding all fractions up. At the end of each Movement Phase, total the number of crew casualties suffered by each ship in that phase. If the number of crew casualties was greater than the ship's mass, the ship must check morale. To check morale, roll two dice and add the number of crew casualties suffered in excess of the mass. If the result is 10 or less, the ship is unaffected. If the result is 11 or 12, the ship must attempt to move away from the closest enemy ship in its next Movement Phase and may not fire its guns until the end of that phase. If the result is 13 or 14, the ship must break off the action. It must attempt to move away from the closest enemy ship and exit the map. It may not fire. If the result is 15 or 16, the ship surrenders.

Critical: If a ship receives a critical hit, roll two dice and consult the

Critical Hit Table. The following critical hits are possible:

CRITICAL HITS

Magazine: Vessel loses one gun with a damage value of 1 or greater, takes hull hits equal to the damage value of the destroyed gun, and takes one additional critical hit resolved using the damage value of the destroyed gun.

Bridge: This counts as a crew hit, killing crewmen equal to half the damage value of the round. In addition, the vessel may not voluntarily change course or altitude in the next turn.

Fire: A fire is started on board the ship. The initial fire level is equal to the damage value of the firing gun.

Uncontrolled Flooding: The ship suffers hull hits equal to the damage value of the firing gun (as modified by armor) immediately and at the beginning of each friendly Movement Phase. It is possible to repair one damage result while another continues to cause flooding.

Boiler: Roll a die. If the result is less than the damage value of the firing gun the boiler blows up and the ship sinks. Otherwise, the ship's speed is reduced by the damage value of the firing gun. This speed reduction is not permanent—the amount of the reduction is reduced by one each subsequent turn.

Screw: The vessel's screws (propellers) are hit and the ship's speed is permanently reduced by one.

Rudder Jammed: The ship may not change course until the rudder is freed. To free the rudder, roll 1D6 for a number greater than the damage value of the firing gun. If the hit result reads "Rudder Jammed Right," the ship turns one compass heading to the right each cable it moves until the jam is cleared. If the hit result

reads "Rudder Jammed Left," the ship turns to the left until the jam is cleared. If the result merely says "Rudder Jammed," then the ship continues in a straight line until the jam is freed. To free the jam, roll higher than the damage value of the gun that jammed the rudder. A roll of 6 always frees the rudder.

Loss of Trim: The ship's trim controls are damaged; the ship suffers a sudden loss of trim. The owning player immediately attempts to recover trim by rolling greater than the damage value of the firing gun on 1D6. (If the loss of trim was caused by a collision, the player recovers by rolling greater than half the difference in hull sizes, rounding fractions down.) Ships with a hull size of 5 or larger have a +1 modification to the die roll. Ships with a hull size of 10 or larger have a +2 modification, etc.

A roll of 6 will always recover trim, regardless of the damage value of the firing gun or the die roll modifier used.

If the ship recovers trim, it remains at its current altitude but may not voluntarily change altitude during its next Movement Phase. If the ship does not recover trim, it immediately drops one altitude level, and the attempt to recover is repeated. This procedure is repeated until either the ship recovers trim or it crashes. If the ship drops one or more altitude levels, then the ship may not move, fire, fight fires, or change any crew assignments until the end of the next Movement Phase. (The crew is still stunned.) If boarded, the crew may defend itself.

Lifters Jammed: The ship's large lifting panels are temporarily jammed in place—the ship may not change altitude until they are freed. To free the lifters, roll greater than the damage value of the gun that jammed them. A roll of 6 always frees the lifters.

WIND SPEED TABLE

<i>Die Roll</i>	<i>Wind Speed</i>
1	0
2	1
3	1
4	1
5	2
6	2

STORM APPEARANCE
TABLE

<i>Die Roll</i>	<i>Summer</i>	<i>Winter</i>
1	—	—
2	—	—
3	—	Storm
4	—	Storm
5	Storm	Storm
6	Storm	Major Storm

STRATEGIC SIGHTING
TABLE

<i>Die Roll</i>	<i>Ship</i>	<i>Flyer</i>
1	—	—
2	—	—
3	—	—
4	—	—
5	—	Sight
6	Sight	Sight

ALTITUDE GAUGE

Cables													
VH													VH Very High
H													H High
M													M Medium
L													L Low
VL													VL Very Low

If the vessels are at different altitudes, use the altitude gauge printed above.
Note the location of the firing flyer and the target flyer. Then plot the location of any flyer which might block the line of sight.

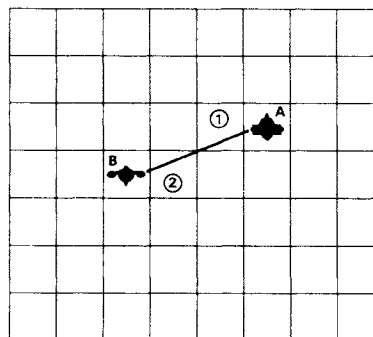
After you plot the squares that the flyers occupy, trace the line of sight between the firing flyer and the target flyer.

If the line of sight passes through the bottom half of a box containing an intervening flyer, then it is considered to be blocked.

For example, in the diagram to the right, flyer A and flyer B are exchanging fire.

A flyer in position 1 would block the line of fire between the two, as the line of sight passes through the bottom half of its square.

A flyer in position 2, however, would not block the line of fire.



SPACE: 1889 PDFs

These PDFs are based on the scans used for Heliograph's *Space: 1889* reprints with the color pages and inserts restored.

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Space: 1889® by Frank Chadwick

Role-Playing In A More Civilized Time. Everything Jules Verne should have written. Everything H. G. Wells could have written. Everything A. Conan Doyle thought of, but never published because it was too fantastic. Everything you need for adventures of the century! This rulebook contains the complete role-playing rules with the exciting background of Victorian science fiction: ether flyers and Martian cloudships, the canals and civilizations of the red planet, Venus' swamps and dinosaurs, the honeycombed interior of Luna, and the thrills of inventions and inventors—the driving force behind Victoria's multiworld empire! It also includes the errata and additional rules from the *Space:1889 Referee's Screen*. This PDF includes the color pages from the original GDW printing. 224 pages.

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by Frank Chadwick

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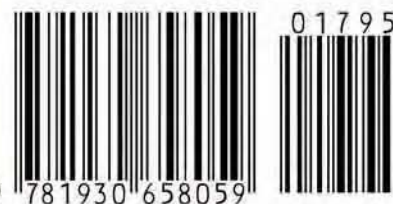


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