

Leviathans!

*A Game of Aerial Combat
In a 19th Century
that never was...*

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1 Summary

Leviathans! (working title) is a boardgame which pits opposing fleets of aerial warships against each other in a different, but non-fantastical Victorian setting. Battles consisting of 6-12 units per side are intended to be completed in 2 hours, plus or minus. A variety of different units of opposing nationalities, a construction system allowing the development of personalized units, and the ability to extend it into a campaign system with linked battles provides a high degree of replayability and player engagement.

Leviathans! is more complex than games such as Heroscape, but less complex than a tournament-level game of Classic Battletech. Key features of the game are:

- An engaging “chrome-laden” game setting
- A mix of units with their own “personalities”
- Manageable battles with multiple units on each side
- Speed of resolution
- Decisive (eg. brutal) combat system which encourages daring moves and discourages ‘fence-sitting’
- Plenty of chances to roll dice and see things break (often on the enemy’s side!)

While the basic premise which enables these flying warships to fly is fantastical, it is so in the vein of Jules Verne or H.G. Wells – beyond that premise, there are no other races, no magical powers, and no extraterrestrial travel. It is set in a period when the European colonial powers were still snatching up the remaining unclaimed territorial prizes, and before the power blocks which were to bring the world to the Great War in 1914 solidified. This allows a wide range of scenarios to be created where elements of different forces of varying sizes may clash, with the potential to lead up (if desired) to some alternate Great War.

The game design, while based on map board play, easily lends itself to both the production of miniature game-pieces, and conversion to be played using those game-pieces over gaming terrain. Also, the potential exists to expand on the game-universe background in other directions – stories, RPG – if this should prove promising.

2 Game System

2.1 Introduction

Leviathans! is a board game of aerial combat between large, metal-clad sky battleships in an alternate late 19th Century. Each player commands a squadron or squadrons of metal-clad sky vessels, termed generically “Leviathans” (in the Anglophone world, anyway) ranging from destroyer and cruiser through to battlecruisers, battleships and the majestic Leviathan class. Each turn, players move their units alternately, then resolve combat simultaneously, until victory is decided.

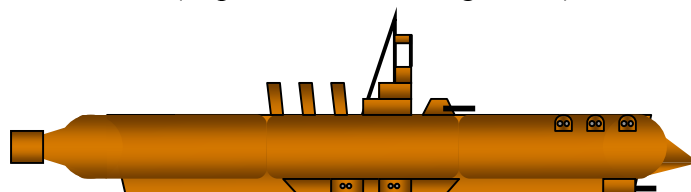
Each class of Leviathan has different characteristics, can carry different equipment (some more than others), and absorb more or less damage than others, allowing for a high degree of individuality of combat units. Players may choose to deploy a small number of battleships or Leviathans, or a larger number of battlecruisers, cruisers and destroyers, and each approach requires different tactics.

Flavour-wise, the game is set around the years 1895-1905, in a Europe similar to our own of that time. The setting is less “steampunk”, and owes more to the fiction of H. G. Wells and Jules Verne – “industrial fantasy”, where steam breathes life into machinery, and (in the words of Rudyard Kipling) “Iron, cold iron is the master of them all!” The colonial powers – England, France, Germany and Imperial Russia – are clashing over the remaining unclaimed territories around the globe (and some currently held by each other). Politics have not settled into the power-blocks that took the world to war in 1914 – with Queen Victoria on the throne, England and Germany are close by ties of blood and convention, while France and Imperial Russia (not the weak, “sick man of Europe” in this world) find themselves increasingly aligned. Meanwhile, the United States dreams of empire-building in South America – the absorption of Cuba having whetted certain politician’s appetite for conquest.

2.2 Playing Pieces

Each playing piece in the game represents a single vessel. Flying ships gain their lifting power from *electrical fluid* (see the Universe section), held in copper containment vessels inside the hull. Forward propulsion is provided by means of coal-fired, steam-powered “air-screws” (propellers). Compared to wet-navy vessels of the period, Leviathans are lightly armed and armoured, but for that cost achieve the freedom of the third dimension and greatly improved mobility (particularly cross-country).

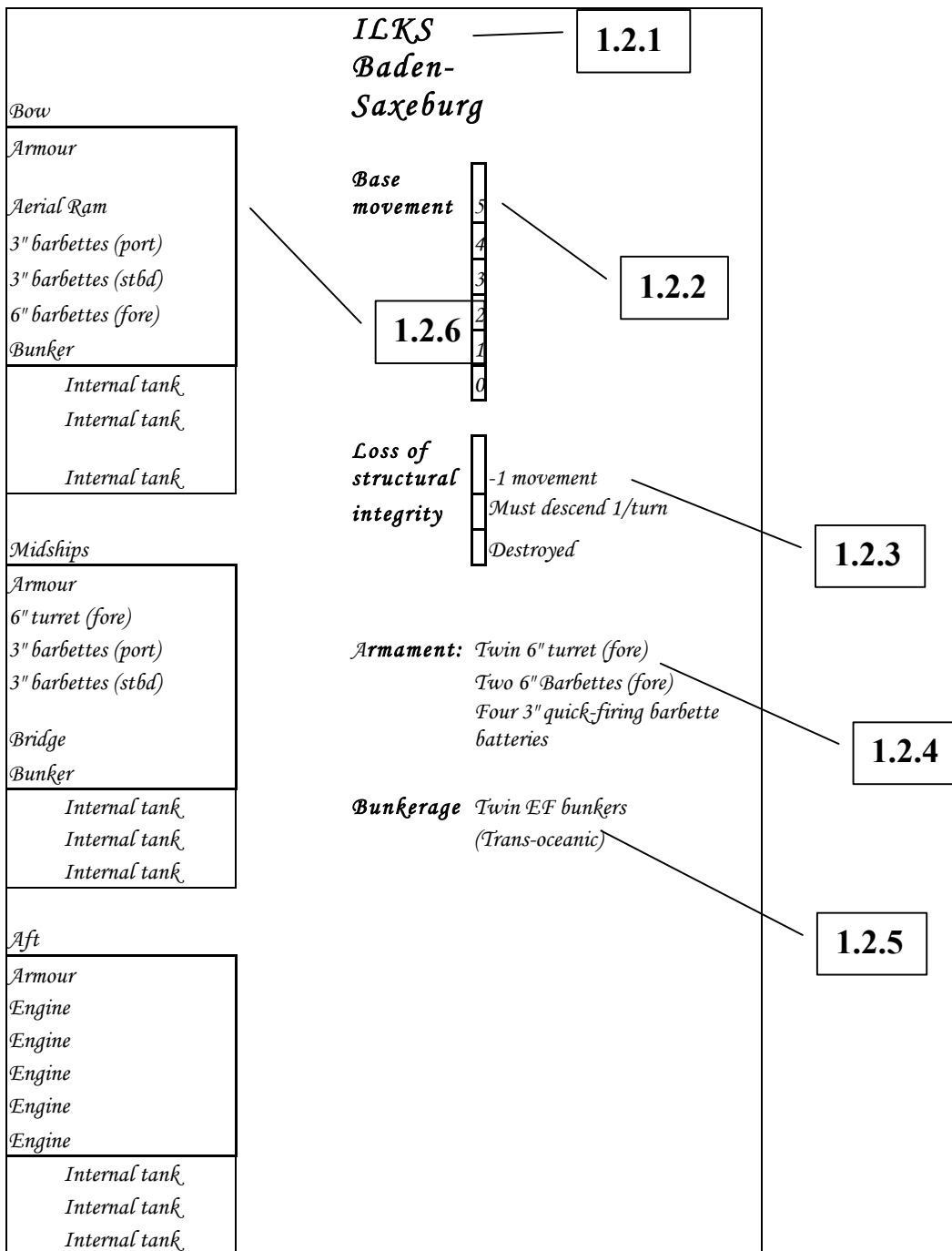
Consider the German ILKS (Imperialische Luftkriegschiffe) *Baden-Saxeburg*:



(side view)

This powerful, fast battle cruiser-class Leviathan is designed for scouting in advance of the Imperial High Flying Fleet, eliminating hostile cruiser screens, and commerce raiding. Battle cruisers are highly valued for ‘Flying the Flag’ cruises, their high tactical speed allowing them to move swiftly from trouble spot to trouble spot. As with all such designs, the *Baden-Saxeberg* trades protection, and some armament, for speed.

In game, the *Baden-Saxeberg* is represented by a Blueprint (aka record sheet), showing its vital statistics:



2.2.1 Name of Ship

Each Blueprint is marked with the name of the Leviathan it represents.

In this case, the Blueprint is for ILKS Baden-Saxeburg

2.2.2 Mobility

Leviathans! is played on a hex map (although conversion to a miniatures game would be straightforward). Each Blueprint identifies the maximum normal speed which that Leviathan can achieve. As damage is taken, this value can be reduced. This represents the maximum number of movement points which the ship can expend during one turn. Movement points can be used for forward movement, or turning the ship.

The Baden-Saxeburg can achieve a top speed of 5MP, corresponding to 50 knots. It achieves this speed at a cost in terms of armour and weaponry.

2.2.3 Structural Integrity

This allows the player to record the effect of losing entire ship sections (See 2.2.6) on the Leviathan as a whole. Major damage typically first reduces the vessel's ability to maintain maximum speed, then its ability to maintain height, then finally its ability to stay in the air at all.

As with all vessels of the Baden-Saxeburg's size, loss of one hull section reduces its top speed by 10 knots, due to increased drag and stresses placed on the hull. Loss of a second hull section marks the point at which the vessel can no longer hold altitude, requiring it to seek the ground before its ultimate destruction. Loss of the third hull section marks destruction of the vessel.

2.2.4 Armament

Leviathans carry lighter armament than naval vessels of the period, consisting of:

- Multiple 3" quick-firing guns – short ranged, but doing considerable damage when they hit
- 6" long guns – trading damage for greater range
- The largest vessels are able to mount 9" guns – greater yet range and damage, should they hit.

These guns are deployed in:

- Turrets, which provide a 240 degree field of fire (fore or aft). may only be mounted on the mid-sections of larger vessels.
- Barbettes. Each barbette has a 120-degree field of fire to one side of the vessel. Barbettes may be mounted on any section.
- Bow- and Stern-chasers: specialized barbettes which can be mounted (once) on the bow or stern section of a vessel. The amount of armament carried by the vessel is shown here.

The Baden-Saxeburg is clearly designed for independent operations. 6" Krupp guns in bow chaser mounts, backed by another pair of 6" guns in a forward-facing turret, allow it to engage lighter vessels from outside their capacity to retaliate. Batteries of

quick-firing guns on the flank provide close-in protection, and can be used for ground bombardment as well. The Baden-Saxeberg carries no armament to the rear – relying on the power of its mighty reciprocating engines to carry it away from danger in that quarter.

2.2.5 Bunkerage

This indicates how extensive the coal storage is on the vessel. This only has effect in the Campaign Game.

In keeping with Imperial Germany's ambitions, the Baden-Saxeberg carries sufficient coal for journeys of a thousand miles or more – giving it greater tactical range and flexibility than, say, Austro-Hungarian Leviathans, while still falling short of the trans-oceanic ranges of Her Britannic Majesty's Leviathans.

2.2.6 Ship Sections

Each vessel is divided into two or more sections, with a number of slots representing the size and capacity of that vessel to mount engines, armour, weapons etc. For example:

- Destroyers consist of two sections (fore and aft), each of four slots.
- Light cruisers consist of two sections (fore and aft), each of five slots
- Cruisers consist of two sections (fore and aft), each of six slots
- Heavy cruisers consist of three sections (fore, midships and aft), each of four slots
- Battleships and Battle cruisers consist of 3 sections (fore, midships and aft), each of 6 slots
- Leviathans (equivalent to the Dreadnoughts of our world) consist of 4 sections (fore, fore-midships, aft-midships and aft), each of 6 slots.

Other classes of ships – cargo ships, passenger liners, twin-hulled transports etc – can all be extrapolated in terms of this approach.

In the game, the line between Battleship and Battle cruiser is marked by allocation of armour and engines. The Baden-Saxeberg opts for speed over protection, and is equipped accordingly.

2.2.7 Equipment

Each slot of a vessel's hull can contain one piece of equipment, each of which has different characteristics.

- **Armour.** Each Armour absorbs one point of damage (See 2.7) taken by that section, and is destroyed in the process.

The Baden-Saxeberg achieves its high speed at a cost – comparatively lightly armoured, it can only absorb one point of damage per section before taking internal damage.

- **Turret:** Consists of one gun mount (typically multiple 3", or twin 6" or 9" guns) Each hull section (see 2.2.6) may mount one turret. 3" turrets may be placed on any hull section; 6" turrets may only be placed on the mid-section of

a Cruiser, Armoured Cruiser, Battle cruiser, Battleship or Leviathan. 9” turrets may only be mounted on one of the mid-sections of a Leviathan class vessel.

- **Barbettes:** Each barbette has a 120-degree field of fire to one side of the vessel. Barbettes can only bear on the port or starboard sides of the vessel.
- **Bow- and Stern-chasers:** specialized barbettes which can be mounted (once) on the bow or stern section of a vessel. The greater bracing required for such mounts limits them to a 60 degree field of fire either directly ahead or astern of the vessel, respectively.

As noted previously, the Baden-Saxeurg emphasizes ranged firepower to the front, with moderate protection to the sides. It relies on its high speed to gain advantageous firing positions against its foes.

The properties of each class of weapon, other than firing arcs, are independent of the type of mounting used:

Type of Gun	Range	Damage
3” QF	3 hexes	1-3
6”	6 hexes	1-2
9”	9 hexes	2-3

- **Engines:** each engine unit adds movement ability to a vessel. Engines may only be mounted in the stern of a vessel. The number of movement points (MP) given by each engine depends on the class of vessel it is mounted in:

Class of vessel	MP per engine
Destroyer	3MP
Light cruiser, cruiser	2MP
Heavy cruiser, Battleship, Battle cruiser	1MP
Leviathan	1MP

Massive reciprocating steam engines make up most of the available space in the stern of the Baden-Saxeurg, to the exclusion of almost anything else.

- **Bridge:** each vessel must mount one bridge on either a fore or mid section. Loss of the bridge, and the central coordination from it, imposes penalties on a vessel during combat. A second, or **Flag Bridge** may be mounted in another (valid) section. As long as a vessel has at least one intact bridge, it incurs no control penalties. Few but the largest fleet flagships carry such a second bridge.

The Baden-Saxeurg is conventionally designed in this respect – a single Bridge mounted in the center section. German Leviathans shun the Frenchified practice of mounting the bridge far forward.

- **Aerial Ram:** Following a freak incident during a short war in the Balkans, the idea of the **Aerial Ram** caught on amongst European aerial architects. Ordinary Leviathans can collide, potentially inflicting massive damage on their opponent (and themselves). The Aerial Ram increases the damage taken by the target vessel, while protecting the ramming vessel.

Some critics point out the inherent difficulties of ramming a target capable of moving in three dimensions, but German aerial architects – like most others, in love with the look of the thing – convinced the Emperor that an Aerial Ram simply must grace the bow of any vessel as powerful as the Baden-Saxeberg. Despite the vessel having engaged in two years cruising German holdings in the South Pacific, and clashes with French and Russian opponents, the Baden-Saxeberg's ram remains unchristened in combat.

- **Bunkers:** These represent the stocks of coal used to feed the boilers, which produce both steam to drive the vessel's air-screws, and electricity to power the Aether Vortexes which give the electrical fluid its lifting power. Vessels with larger bunker capacities can travel further between recoiling, giving them both enhanced strategic range, and enhanced tactical flexibility. Bunkerage becomes more important in the Campaign Game.

With two bunkers in a hull of its size, the Baden-Saxeberg can travel from Berlin to London without refueling, with a side trip to bomb Paris if wanted. However, its journey to the New Guineas required multiple coaling stops – Berlin to Ankara, Ankara to Iran, Iran to India (using British facilities), India to Ceylon, Ceylon to the New Guineas (bypassing hostile French Indochina). British capital ships of similar size can travel direct from London to Suez (still important as a coaling stop, even as its influence as a trade path declines), Suez to Ceylon, and Ceylon to Australia.

- **Internal Tanks.** Internal tanks represent the containment vessels used to hold the electrical fluid from which a Leviathan gains its lift. As the ship is damaged, these vessels take damage (see Combat 2.7). When all internal tanks in a section are destroyed, the vessel incurs a loss of structural integrity (see 2.2.3).

2.3 Game-Turn Sequence

Each game-turn consists of the following steps:

- Determine initiative
- Movement
- Wind effects
- Combat
- Apply combat results

The game continues until one player has lost all his units, or any other special victory conditions have been achieved.

2.4 Determine Initiative

At the beginning of each turn, each player rolls 2D6, with the following modifiers:

<<design note: crib initiative & movement sequence from CBT>>

2.5 Movement

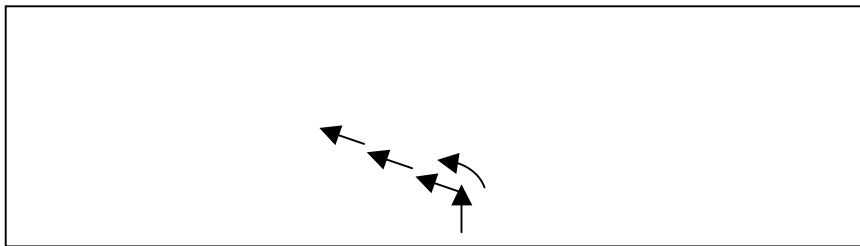
Movement is handled at one of three levels of complexity. In addition, there are optional rules which can be added to the basic or advanced game.

2.5.1 Beginner's Game Movement

The beginner's game is played on a 2-dimensional map board – there is no concept of elevation. Each turn, a vessel may:

- Expend one movement point to move forward one hex
- Expend one movement point to turn one hexside right or left. Note: Light cruisers and destroyers may make two turns in the same hex; other vessels must move forward at least one hex before making another turn.
- Expend all its movement points to move one hex directly backwards, without changing facing

Example: Lookouts on the Baden-Saxeberg's main mast sights a cargo vessel off the port bow. The Captain orders pursuit! The Baden-Saxeberg spends one movement point to move forward one hex, another to turn left, then the remaining 3 to move forward. This leaves the Baden-Saxeberg 7 hexes away from its target – just out of range of its 6" guns. While the Captain might urge more steam from the engines, and curse the engineers, the Baden-Saxeberg has no more movement points to spend this turn – it will have to close on the target next turn.



2.5.1.1 Collision

Only one vessel may occupy each hex. If a vessel attempts to move into the same hex as another vessel, each rolls on the following tables:

Note: the full collision system needs to be worked out. Modifiers to hit will include the differences in mass between the vessels, their speed, the angle of approach, and presence of a ram.

Accidental collisions will likely involve low damage, but there is a potential that the vessels might become locked together. Ramming is to be a high-risk strategy, high-damage tactic – ships may become locked together, and if one is sinking due to loss of structural integrity, the other will be pulled down too. Either way, ships at that range will be capable of pumping massive volumes of fire into each other, as well.

Roll			
0 -			
1			
2			

3			
4			
5			
6			
7 +			

2.5.2 Basic Game Movement

All Beginner's Game movement rules apply. However, the Basic Games adds the concept of elevation. Each level of elevation is about 500'.

Note: Leviathans are not nimble, aerodynamic craft. They do not rely on aerodynamic lift, and only use aerodynamic control surfaces to supplement their air-screws when turning their great bulks laterally. Vertical motion is controlled by increasing or decreasing the agitation of the electrical fluid within their containment tanks, by means of their Tesla Aether Vortexes. In any event, Leviathans which inclined to any great extent would suffer from loss of steam pressure due to problems firing their boilers, etc.

As well as occupying a hex on the game-map, each vessel has an elevation which is typically set at the beginning of the game. During the game, each vessel may climb (to a maximum of level 20), or drop (to a safe minimum of level 1). Vessels at level 0 are in contact with the surface – see Landing 2.5.2.2

- A vessel may expend 2MP a maximum of once per turn to increase its current elevation by one, to a maximum of 20.
- A vessel may expend 1MP a maximum of once per turn to decrease its current elevation by 1, to a minimum of 1 (barring landing, see 2.5.2.2).

Example: the Baden-Saxebug starts the battle at 3000 feet, or Level 6. On its first turn, it closes with the enemy while climbing for advantage – spending 2MP to change to level 7, and using its three remaining MP to move forward. Next turn it continues to climb, while turning to port. The player elects to move forward 1MP, turn left (1MP), climb to level 8 (2MP), and move forward again (1MP) for a total of 5MP. The point in the movement during which vessels climb or dive makes no difference – unless trying to ram (see Basic Game collisions 2.5.2.1) The following turn, the Captain notes the appearance of capital units of the Russian Imperial Fleet – this must be reported back to Berlin! The vessel spends 1MP to turn left, 1 MP to move forward (battle cruisers and similar large vessels cannot make consecutive turns without moving forward between them), another MP to turn left again, and another to move forward; the final MP is spent to drop one level.

2.5.2.1 Basic Game Collisions

As Beginner's Game collisions, except the vessels must be at the same elevation. Multiple vessels may safely exist or pass through a single hex, as long as all are on different elevations.

2.5.2.2 Landing

A vessel which wishes to enter elevation 0 must:

- Be facing in the direction of the prevailing wind (see Wind Effects, 2.6)
- Be at level 1 at the beginning of the turn
- Expend MP to move forward equivalent to the strength of the prevailing wind, and 1MP to drop one level

The vessel is then considered landed at the end of its movement, and is not subject to wind effects. Any unit which enters Level 0 in any other manner is considered crashed, and destroyed for game purposes.

Mission successful, and the French terror-raider dispatched, the damaged Baden-Saxeberg limps into port. With one engineroom crippled, and the bow section destroyed, the once-speedy battle cruiser has only 3MP available per turn.

Unfortunately, this means landing in the face of a 20-knot headwind. In order to land at its Luftkriegschiffedocke at Fredrichshaven, the Baden-Saxeberg must first line up on its moorings, which the Captain accomplishes with typical Teutonic efficiency. It then creeps forward, against the wind, until making a final lunge for the mooring dock. Timed precisely, the Captain's commands reduces height until the Baden-Saxeberg's landing lines touch ground just short of the ground crews eager to welcome the heroic German sky-sailors. Once the sky-anchor has been hauled up and attached to the Baden-Saxeberg's keel, the mighty ground-based engines draw it safely into the mooring dock. Once contact is made with the ground, the Captain orders "Stop all steam!" Deprived of electricity from the steam-engines, the electrical fluid in the remaining containment tanks loses most of its lifting capacity, and the Baden-Saxeberg settles into its dock, to await repairs – and new opportunities to defend the interests of the Fatherland.

2.5.3 Advanced Game Movement

All beginner's and basic game rules apply, with the exception of Initiative. Instead, the Initiative phase is replaced by the Plotting stage.

During the Plotting stage, each player writes down the planned movement for each of their vessels, using the following notation:

Notation	Effect
1,2,3,4,...	Move that many hexes forward in a straight line
R	Turn one hexside to the right
L	Turn one hexside to the left
-	Drop by 1 level
+	Climb by one level
V	reVerse – move backwards one hex (whole movement)
*	Attempt to ram (see below)

They must also record the starting & finishing level at each turn.

Example: the Baden-Saxeberg starts the battle at 3000 feet, or Level 6. On its first turn, it closes with the enemy while climbing for advantage – spending 2MP to change to level 7, and using its three remaining MP to move forward. Next turn it continues to climb, while turning to port. The player elects to move forward 1MP, turn left (1MP), climb to level 8 (2MP), and move forward again (1MP) for a total of

5MP. The point in the movement during which vessels climb or dive makes no difference – unless trying to ram (see Basic Game collisions 2.5.2.1) The following turn, the Captain notes the appearance of capital units of the Russian Imperial Fleet – this must be reported back to Berlin! The vessel spends 1MP to turn left, 1 MP to move forward (battle cruisers and similar large vessels cannot make consecutive turns without moving forward between them), another MP to turn left again, and another to move forward; the final MP is spent to drop one level.

Example: the movements given in the Basic Movement example would be recorded as:

Start Level	Movement	End Level
6	C3	7
7	1L+1	8
8	L1L1-	7
7	...	
	...	
	...	
	...	

Movement is then simultaneous.

Advanced Game Collisions

2.5.4 Optional Movement Rules

2.5.4.1 Terrain

While most combat occurs far above the ground, sometimes local terrain can play a major part in a battle. Terrain features (see terrain templates) have a level marked in each hex – this represents the level of the surface in that hex. Vessels that enter or end a turn in a hex at an elevation less than that of the hex are automatically destroyed. Vessels which end the turn in a hex at the same elevation as that hex are automatically destroyed unless they can meet the requirements for landing (see Landing 2.5.2.2)

2.5.4.2 Clouds

Other than terrain, clouds – ranging from thin sheets of cirrus to great blooming cumulus clouds) can also play a major role in determining the course of battles. Each cloud hex (see cloud templates) has the following characteristics:

- Base level, reflecting the bottom extend of the cloud
- Top level, reflecting the upper extend of the cloud.

If a cloud hex lies on the line of sight between two vessels, and exists at least at one level between those of the two vessels, then the cloud obscures the vessels which may then not fire at each other (see Combat 2.7).

Exception: vessels which are in adjacent hexes, and within 2 levels of each other, may always fire at each other (weapons and arcs permitting)

2.6 Wind Effects

2.6.1 Determine Starting Wind Conditions

Unless otherwise determined by a specific scenario, at the beginning of each game determine the prevailing wind. (Note: most battles are fought under conditions of no or light wind; few captains chose to hazard their vessels under gale conditions. But weather prediction is not at this point a science).

Die roll	Wind strength
1	No wind
2	No wind
3	No wind
4	Strength 1
5	Strength 1
6	Strength 2

Determine the wind direction by rolling one die

<<hex rose>>

2.6.2 Changes in the wind

In the Wind Effects phase, one player rolls 2D6.

Die roll	Effect
2-10	No change
11	Wind changes 1 hex to right or left (determine randomly)
12	Wind increases or decreases by one (determine randomly)

Note: if a prevailing wind of strength 0 decreases, roll a new wind direction randomly and consider the wind to be at strength 1.

2.6.3 Applying Wind Effects

Move all vessels facing either directly into the wind, or directly against the wind, a number of hexes equal to the current wind strength in the direction of the wind. Vessels facing any of the other four directions are not affected. If any vessel would be

forced to enter the hex (and in the basic or advanced games, the elevation) of another vessel, treat as a collision.

Move all cloud templates on the map a number of hexes equal to the current wind strength in the direction of the wind.

For example, despite demanding all steam from the engines, the Baden-Saxeberg appears just unable to ram a perfidious British blockade-runner. The British captain, however, has forgotten that his maneuvers have placed him head-on to the prevailing 10-knot breeze, reducing his movement just enough for the Baden-Saxeberg's Rhinemetall-forged ram to finally stab deep into the vitals of an enemy cruiser.

2.7 Combat

Note: combat is simultaneous, and damage is applied to all vessels after all firing has been declared and determined.

2.7.1 Beginner's Game Firing

Any weapon can fire on a target that is both:

- Within its arc of fire, and
- Within its maximum range.

The base chance to hit requires a roll of 6+ on 2D6, with the following modifiers to the dice roll:

Circumstance	Dice Roll Modifier
Firing vessel did not expend any MP this turn	+2
Firing vessel expended all its MP this turn	-1
Firing at enemy nose or stern arc	-1
Firing at enemy broadside	+0

2.7.2 Basic Game Firing

As per Beginner's Game, with the following additions:

2.7.2.1 Range Brackets

The base to-hit number depends on the weapon being fired, and the range. The base to-hit numbers (on 2D6) are:

- 4 at short range
- 6 at medium range
- 8 at long range

Ranges for the different weapons are:

Weapon	Short	Medium	Long
3"	1	2	3
6"	1-2	3-4	5-6
9"	1-3	4-6	5-9

2.7.2.2 Elevation

The target vessel must differ at least one less level than the number of hexes between the firing & target vessel.

Example: the Baden-Saxeberg, currently at Level 11, is attempting to interpose itself between a German passenger liner, and a French Leviathan-class, the Dunquerque (currently at level 10). At the end of the turn, the two vessels are at a range of 6 hexes, with an elevation difference of 3 hexes – the two vessels may fire at each other.

In the next turn, the Baden-Saxeberg continues to close; fearing it intends to ram, the captain of the Dunquerque elects to drop one level. At the end of the turn, the Baden-Saxeberg has passed in front of the Dunquerque, and they are one hex apart. Gunners aboard the Dunquerque are gleefully ready to fire their broadside on the plucky German vessel's stern – but zut alors! The two vessels are at a range of one hex, but two levels apart! They cannot bring their quick-firing batteries to bear high enough! The Germans escape a withering broadside – this time – but still have to deal with an enraged sky leviathan, now on their tail ...

2.7.3 Advanced Game Firing

<<can't currently think of any changes – left for completeness' sake>>

2.8 Damage Resolution

Once all firing rolls have been completed, roll on the table below for each weapons mount that hits to determine how many points of damage are applied to the target:

Roll	Damage		
	3"	6"	9"
1	1	1	2
2	1	1	2
3	2	1	3
4	2	2	3
5	3	2	4
6	3	2	4

The attacking player then determines which section of the target ship has been hit by that weapon by rolling on the appropriate one of the following tables:

If target is a destroyer, light cruiser or cruiser:

Roll	Firing intotarget's		
	Bow	Broadside	Stern
2	Fore	Fore	Fore
3	Fore	Fore	Fore
4	Fore	Fore	Fore
5	Fore	Fore	Fore
6	Fore	Fore	Aft
7	Fore	Aft	Aft
8	Fore	Aft	Aft
9	Aft	Aft	Aft
10	Aft	Aft	Aft
11	Aft	Aft	Aft
12	Aft	Aft	Aft

If target is a heavy cruiser, battle cruiser or battleship

Roll	Firing intotarget's		
	Bow	Broadside	Stern
2	Fore	Fore	Fore
3	Fore	Fore	Fore
4	Fore	Fore	Fore
5	Fore	Fore	Midships
6	Fore	Midships	Midships
7	Midships	Midships	Midships
8	Midships	Midships	Aft
9	Midships	Aft	Aft
10	Aft	Aft	Aft
11	Aft	Aft	Aft
12	Aft	Aft	Aft

If target is a leviathan

Roll	Firing intotarget's		
	Bow	Broadside	Stern
2	Fore	Fore	Fore
3	Fore	Fore	Fore
4	Fore	Fore	Fore-Mid
5	Fore	Fore-Mid	Fore-Mid
6	Fore	Fore-Mid	Aft-Mid
7	Fore-Mid	Aft-Mid	Aft-Mid
8	Fore-Mid	Aft-Mid	Aft
9	Aft-Mid	Aft	Aft
10	Aft-Mid	Aft	Aft
11	Aft	Aft	Aft
12	Aft	Aft	Aft

Damage is then applied one point at a time to that section.

- If there is any undestroyed armour on the section hit, destroy that first. There is no further effect.
- Otherwise, roll 1D6 and determine which equipment is damaged. If the dice roll indicates a slot occupied by destroyed armour or equipment, or an unavailable slot, roll again. Destroy the equipment in that slot, with the following effects:

Equipment	Effect
Engine	The maximum speed of the vessel is reduced by 1 MP. Mark off the top box remaining in the speed track on the Blueprint
Weapon	That weapon may not fire again from next turn onwards
Bunker	No effect outside campaign game
Ram	Ship no longer counts as equipped with a Ram for purposes of collisions.

In addition, the vessel also takes structural damage. Mark off one of the remaining Internal Tanks in the damaged section. If all Internal Tanks in a section are destroyed, then mark off the top available Damage to Structural Integrity box on the target's Blueprint, and apply any listed penalties to that vessel from then on.

2.8.1.1 Example of Beginner's Combat.

The Baden-Saxeberg has maneuvered around, and is able to bring its bow-facing guns to bear on the Dunquerque's lightly-defended stern. At a range of 3 hexes, the Baden-Saxeberg can fire both its turreted 6" guns, plus those in the bow chaser mounts. The to-hit roll required for both is a base 6+, however the following modifiers apply to the dice roll:

- *As the Baden-Saxeberg moved its full 5MP this turn, -1*
- *As the Baden-Saxeberg is firing into the Dunquerque's stern arc, -1*

For a total of -2. The captain of the Baden-Saxeberg rolls an 11 for the turret, adjusted down to 9, and 9 for the bow chaser, adjusted down to 7. Both weapons hit!

In return, the Dunquerque fires its one aft-facing battery of 3" quick-firing turrets at its tormentor. The Dunquerque only used 2 of its 3 available MP this turn, but is firing at the bow arc of the Baden-Saxeberg, for a total dice-roll modifier of -1. The base to-hit is again 6. The French captain rolls 8, adjusted down to 7, also a hit.

Damage is then applied. The German captain rolls 1D6 to determine damage from the 6" turret, and rolls a 2 – one point. He then rolls 2D6 for location, getting a 7 – on a Leviathan-class target, fired at from astern, this does one point of damage to the aft-mid section. The Dunquerque carries two points of armour on this section; the first is marked off. The German captain then rolls 1D6 to determine damage from the 6" bow chaser, and gets a 4 – two points. He rolls for location, getting a 6 – also the aft-mid section. The first point of damage destroys that section's remaining armour. The German captain then rolls 1D6 to determine which equipment in that section is damaged, and rolls a 2 – as the equipment in the second position is the (now destroyed) armour, the captain rolls again. This time he rolls 4 – wiping out one of

the Dunquerque's port-side 3" barbettes. The French captain also marks off one internal tank hit on the aft-mid section.

In return, the French captain rolls 1D6 to determine damage inflicted on the Baden-Saxeberg. She rolls a 5 – three points of damage. Rolling on the bow arc column of the appropriate table, she rolls 2D6 for location – a roll of 7 indicating hits amidships. The first point of damage destroys the section's one slot of armour, leaving that section unprotected. The French captain then rolls 1D6 for the second point of damage, getting a 6 – bunkerage. Coal spills out of the damaged vessel – this may cause problems returning to base, but leaves the vessel able to fight unaffected. The German captain does however mark off one internal tank in the mid section. A roll of 2 means the last point of damage disables the Baden-Saxeberg's 6" turret – a devastating blow to the vessel's long-range gunnery. A second internal tank is marked off on the mid section.

2.8.1.2 Example of Basic Game combat

The Baden-Saxeberg and Dunquerque are in the same relative positions as above, except the Baden-Saxeberg is at an elevation of Level 8, and the Dunquerque is at level 10. As the difference in elevation (2 levels) is less than the range in hexes (3 hexes), both vessels may fire at each other.

When the Baden-Saxeberg fires at the Dunquerque, it is at short range for the 6" weapons (base to hit of 4), with the same –2 total modifiers on the to-hit roll. Rolls of 11 (adjusted to 9) and 9 (adjusted to 7) are both still hits.

For the Dunquerque, however, the situation is less favourable. At a range of 3 hexes, its 3" guns are firing at long range, with a base to-hit of 8. The same –1 modifier will be applied to the to-hit dice roll. The roll of 8, adjusted down to 7, is in this case a miss.

3 Universe

3.1 *Introduction to the World of Leviathans!*,

Or How The Air Was Won.

The world of Leviathans! is our own world ... almost. A different world, where giant metal skyships called Leviathans patrol the skies, and fractious European colonial powers clash above the outposts of empire. Our world, seen through the eyes of H.G. Wells, Jules Verne, and Tom Swift.

The isolation of *eletroid*, or the electrical fluid (see attached timeline) by the Polish genius Rynchowski in 1878, and the identification of its remarkable lifting abilities when agitated by the Aether Vortexes of Nicolai Tesla, made construction of Leviathans possible. The appearance of the French Aether Lifter *Ganymede* at the Great Exhibition at the Crystal Palace, followed moments later by that of the British armed sky-ship *Leviathan* (both constructed under shrouds of secrecy) marked a revolution in military development. Soon, designs for sea-going battleships lay abandoned, while the smartest young military minds – such as Zeppelin, Jellicoe and Fisher – transferred to their nation’s respective High Fleets.

The Colonial powers leapt at the opportunity to replace wet-navy battleships with the new sky titans. Leviathans – as the class of vessels became known – offered all the advantages of naval ships, and then more, in terms of power projection. Leviathans proved markedly resistant to the whims of weather which had blighted previous experiments in lighter-than-air flight, while capable of proceeding directly to their destination, unlike naval vessels. Indeed, “As the Leviathan flies” means direct and unstoppable. Leviathans also could travel where ships couldn’t – as the Captain of HML *Aboukir* said, upon crushing the Pathan rebellion in Afghanistan by bombarding their mountain refuges, “Let’s see the ship-herders do *that!*”. And lastly, even the largest Leviathans could be constructed for a fraction of the cost of ocean-going battleships, the main limits on construction being separation of the electrical fluid from current in massive steam-driven ‘elefactuaries’.

3.2 *The Principles of Electrical Flight*

How Electrical Fluid Makes Possible these Wonders of the Sky

As previously noted, electrical fluid (or eletroid) is a chemically inert substance which can be separated from electrical current. It tends to permeate through most substances, and can only be contained in an electrically blocking container such as a Faraday cage

Electrical fluid has no measurable mass, and it is this property which allows it to be used to generate lift. If all the air inside a copper sphere is displaced by electrical fluid, the mass of the sphere drops measurably; the sphere becomes slightly buoyant as a result of the displacement of air. However, in its rest state, electrical fluid fails to generate enough lift to compensate for the weight of the container used – eg. produces no usable lift.

3.3 Technicalities

A Brief Description of the Innards of a Leviathan

All Leviathans are constructed around similar lines.

The bulk of the vessel (in volume terms, anyway) is taken up by immense spherical pressure vessels filled with pure electrical fluid, or eteroid (as it is known on the Continent). At the base of each sphere is fitted a Tesla Vortex Agitator, whose effect on the electrical fluid generates lift. The spheres must be precisely engineered – not only must they resist pressure of the electrical fluid from within, they must also form an electrical barrier (or ‘Faraday Cage’) to prevent external charges from influencing the fluid. The consequences of leaks in the containment sphered can range from the problematic (loss of lift), to the catastrophic (massive discharges of electrical current seeking to reunify with the electrical fluid).

The spheres are attached firmly to a ventral keel, which also supports the machinery necessary for flight – coal-fired boilers which provide the motive force for both the Vortex Generators, and the massive air-screws at the stern which propel the Leviathan through the air. Smaller Leviathans have single air-screws supplemented by fins for steering, while larger ones may have two, three or even four sets of air-screws, with or without fins. The keel usually supports an extension reaching most of the width of the hull. This housing contains bunkers to service the boilers, cargo and crew accommodation and other storage. Entry to the Leviathan is normally obtained by means of hatches, ramps and other such openings in the

A light dorsal spine usually runs the length of the Leviathan. Incapable of supporting the same loads as the keel, the spine usually carries the Leviathan’s bridge, placed high for greater visibility. British Leviathans display a conservative mid-spine placement of the bridge, hearkening back to seagoing vessels; Leviathans of other nations (particularly the French) placing theirs further forward. Finally, a metal skin provides line-streaming and further protection for the containment spheres.

Military Leviathans, of course, add numerous additional items of equipment. Most replace the commercial cast-iron plating, ranging from 1/8” to ¼” of cold steel, with greater thicknesses of military plate. However, given the great volume of the Leviathans, any attempt to upgrade armour protection results in a concurrent loss of lift capacity, which results in loss of speed or potential armament, and often both. Accordingly, most Leviathans boast little more thickness of armour than the now-obsolete ocean-going destroyers that came before them.

The chief armament of the Leviathan is the 3” quick-firing gun, or equivalent – the Prussian 6-pounder, French “75”, and so on. These can be mounted in turrets or barbets, and when firing en masse can cripple an opponent in short order. Attempts to fit larger guns run into difficulties both in terms of weight, or in terms of recoil. 6” guns can be carried in turrets mounted in the central sections of Leviathans for stability, or in bow- or stern-chaser barbets with somewhat limited fields of fire. Finally, the largest Leviathans can deploy

4 A Chronology

1732 Stephen Gray (England) demonstrated electrical conductivity by stringing wires through the trees in an orchard. Passed static electricity through the wire.

1745 The Leyden Jar is invented in Leyden (Netherlands). The first electrical condenser, a storage mechanism for an electrical charge. The first Leyden jars were a literally a glass jar filled with water and two wires suspended in the water.

1746-52 Ben Franklin flying kites in Pennsylvania to demonstrate that lightning is a form of static electricity. (Wire run to the kite could produce sparks at the ground, or charge a Leyden Jar.) Led Franklin to invent the lightning rod and to formulate the single fluid (imponderable fluid) theory of electricity.

Previous theories had held there were two electrical fluids and two magnetic fluids. Franklin theorized just one imponderable electrical fluid (a fluid under conservation) in the universe. The difference in electrical charges was explained by an excess (+) or defect (-) of the single electrical fluid. This is where the positive (+) and negative (-) symbols come from in electrical science. Debates over the two fluid vs. single fluid theories were hot and heavy for many years, but gradually Franklin's single fluid theory came to predominate.

1785 Charles Augustus Coulomb (1736-1806) invented the torsion balance, thus performing the first quantitative experiments in the history of electrical science. The torsion balance is a simple device: a horizontal cross-bar is mounted on a stretched wire. A ball is then mounted on each end of the cross bar.

Coulomb showed electrical attractions and repulsions follow an inverse square law. However, while he noticed some misalignment of his apparatus at the time – a lifting of the larger charged sphere – he discounted this as irrelevant to his experiment, and failed to document this in journals of the day.

1791 Luigi Galvani (1737-1798) investigating electricity as the source of life. Galvani believed living tissues contained electricity. He conducts a number of experiments including the connecting of pieces of metal (zinc, copper, iron, tin, etc.) to each other. In what is considered to be his most famous experiment, Galvani attached one end of a bimetallic arc to the muscle of a severed frog's leg, causing the frog's leg to kick violently.

1800 Alessandro Volta (1745-1827) announced the results of his experiments investigation Galvani's claims about the source of electricity in the frogs legs experiment. He undertook to prove that he could produce electricity without the frog. Took the same bimetallic arcs (several of them) and dipped them in glasses of brine.

This was Volta's **Couronne des Tasses**, his first battery. His voltaic pile was another (new, improved configuration for a battery) With it he showed that bimetallic arcs were the source of electricity, which he theorized was a kind of fluid flowing between the strips.

Effectively, this experiment marked the end of the biological search for electricity as the life force because Volta showed the electricity came from entirely inorganic materials. At the same time Volta's pile brought biological interest in electricity to an end, it created new interests in the phenomenon among both physicists and chemists.

For physicists, the availability of a steady current offered the first opportunity for systematic experimentation with electrical phenomena. It also popularized the concept of the 'electrical fluid'.

1820 Hans Christian Oersted (1777-1851) in Denmark demonstrated a relationship between electricity and magnetism by showing that an electrical wire carrying a current will deflect a magnetic needle.

1820 François Arago (1786-1853) in France showed that a spiral of copper wire carrying a current will attract iron filings thus creating the first electromagnet.

1822-27 André Marie Ampère (1775-1836) gave algebraic expression to the basic attractions, repulsions, etc., formalizing understanding of relationships between electricity and magnetism.

1826 Georg Simon Ohm (1787-1854) announced Ohm's Law (used to describe the resistance in conducting materials). Ohm wanted to measure the motive force of currents of the electrical fluid. He found that some conductors were more permeable than others and quantified the differences.

1821 Michael Faraday (1791-1867) built the first electric motor, a device for transforming an electrical current into rotary motion

1831 Faraday made the first transformer, a device for inducing an electrical current in a wire not connected to an electrical source.

1878 Franciszek Rynchowski (1850-1929), Polish engineer and inventor, isolated electrical fluid from electrical current. He named the new material *eteroid*, and in extreme secrecy began to investigate its properties. He discovered that the material was effectively without mass, but behaved like a noble gas. It also tended to leak through any material container, with the most efficient container being a Faraday cage.

1882 Spies from the *Okhrana*, the Russian Imperial Secret Police, obtained copies of Rynchowski's notes and samples of both eteroid and the mechanisms by which it could be separated. Russian scientist Oblimovsky begins a crash program (ultimately fruitless) to develop an eteroid-based

explosive shell. Shortly afterwards, British secret agents passed on copies of Oblimovsky's research to Her Majesty's authorities.

1883 Famous British scientist Sir Edward Challenger identifies the lifting properties of etheroid, or as the British insist on calling it, 'electrical fluid', when energized through the use of Aether Vortex generators based on designs by Nicolai Tesla. The first electrical fluid flier is built from an old hot-water tank, powered by a bank of galvanic batteries. This lifts Challenger's coachman, Tom Ablett, to a height of 150 feet, before the boiler bursts at a weakened seam and crashes to the ground. Tom Ablett becomes the first casualty of electric flight.

1884 French scientists investigating etheroid on behalf of the 3rd Republic convince their government to fund the construction of an 'Aether Flyer', pointing to the opportunity to bypass England's existing naval superiority by taking to the skies. The keel of the Aether Flyer *Ganymede* is laid.

1887 After a series of false starts (and fatal accidents), the *Ganymede* is smuggled to Britain in pieces (under cover of railway locomotive parts), and reconstructed inside the French pavilion at the Great Exhibition at the Crystal Palace outside of London. To the amazement of the crowd, the *Ganymede* lifts itself skywards, draped in bunting, belching smoke and carrying beneath it a platform on which two mounted and armoured *Curiassiers* brandished the *Tricolore*. When the French Ambassador challenged Prime Minister Gladstone, "Eh, and sir, what do you say to that?", the Prime Minister checked his watch, brushed a smut from his sleeve, and asked "Why is yours so infernally dirty?" Moments later, Her Majesty's Sky Ship *Leviathan* – first sky vessel of that name – chugged its way across the sky, conspicuously absent coloured bunting and horsemen, but equally conspicuously displaying a pair of 3" howitzers mounted on its bow, and a number of new-fangled Gatling repeating rifle-guns.

1888: the great Sky Race begins. All major powers abandon construction of naval warships, and throw their best and brightest military minds into building bigger and better sky vessels. Over the next dozen years, sizes increase from the initial *Leviathan's* destroyer class, to skygoing battleships such as the German *Kaiserin* or French *Dunquerque*. Weight and recoil limitations prevent the use of weapons above 6" guns on Leviathans, as sky warships are now universally (within the Anglophone world, anyway) called.

1900: Britain unveils a new, even larger class of sky battleship – *HML Leviathan*, second of that name – great enough to carry a pair of turreted 9" guns. With tensions rising over colonial adventurism, Europe seems poised for open warfare – which might, given the extent of the Colonial powers, involve the whole world ...