

Sea Battle

Sea Battle is the art of battling with another ship in hopes of winning PoE, goods, and fame. Sea battle comes in two varieties: battle with brigands (computer characters known as "bots" for short) and battle with other player vessels (known as Player vs. Player matches, or PvP). Brigand battles will be treated with much more depth than PvP.

Getting to Know Your Ship

If you've come far enough in the game to be able to sea battle, you probably already know about the 5 main duty puzzles:

- Bilging removes bilge water from the ship.
- Carpentry (or carp for short) repairs the ship's damage.
- Sailing allows the ship to move faster.
- Gunning loads the cannons for use in battle.
- Navigation multiplies the efforts of the sailors.

In addition, you may know about the various meters:

- The bilge meter shows the amount of bilge in the ship. The rate of entering bilge is determined by damage. The more bilge in the ship, the slower the ship goes.
- The damage meter shows the damage the ship has taken either by battle or by wear and tear. High damage increase the rate of entering bilge water and reduces the effectiveness of the sailors.

- The Speed Meter shows how fast the ship is going.
- The Cannon Indicator shows how many cannons are loaded.

Each of the meters is affected by how well your crewmates perform in the duty puzzles. Keep this in mind as you battle. For example, if you have high bilge, move a pirate off of another station to help control bilge.

Ship Stock

Before setting sail, your ship must be properly stocked.

- Alcoholic beverages allow pirates to work at full efficiency. Without alcohol, the efforts of your mates will drop dramatically, and the crew will be at a severe disadvantage in any sea battle swordfights. Alcohol comes in three flavors:

- Swill (40 proof), though short in lifespan, is pretty cheap
- Grog (60 proof) is a good middle beverage.
- Fine Rum (100 proof) will last the longest, but is expensive.

Make sure to buy the most economical drink (that is, the cheapest per proof). This may actually involve some number crunching. **RUM IS NOT ALWAYS BEST!!!**

- Cannonballs can be shot at your opponent to cause damage. Smaller ships use small cbs, Brigantines use medium cbs, and Frigates use large cbs.

On The Open Sea

When you chart a course and set sail, you'll notice that your path consists of a series of League points. At each League point, a duty report shows up for all working pirates. The following will also occur:

- Your ship will stop until an order to sail is issued.
- The ship will slowly fill up with bilge
- The ship's speed will slowly drop.
- No ship will be able to begin pursuing your ship, though ships already in pursuit will remain in pursuit.

Upon issuing the order to sail, the ship will automatically move toward the next League point in the charted path (reversing direction, if needed). The ship's course can only be changed at a League point or in port.

Other Ships

When sailing, you may see other ships. The following panel will show up on the Vessel tab when a ship is clicked:

① Quality Pillagers	① Crew that owns the ship
② Sin Lords	② Crew rank
③  ④ Greedy Bullhead	③ Type of ship
<Brigands> ⑤	④ Name of the ship
Attack!	⑤ Flag name (<Independent> for no flag, <Brigands> if brigands, <Merchants> if a merchant vessel.

Before attacking the ship, check the following things:

- What is the ship's might? The might ring surrounding the ship indicates the ship's might. Blue ships are too easy, red ships are too hard, green ships are just right.
- What is the crew rank? Crew rank takes the form of one of eight different titles. Starting with the easiest, they are Sailors, Mostly Harmless, Scurvy Dogs, Scoundrels, Blaggards, Dread Pirates, Sea Lords, and Imperials. In Brigand battles, crew rank determines the difficulty of the sea battle.
- Is this a brigand ship or a player ship? If it doesn't say <Brigands> or <Merchants>, it's a player ship.
- Is this ship part of or allied with your flag? Allies really shouldn't attack one another unless it's prearranged.
- Is this ship at war with your flag? If so, you would enter a sinking battle.

Keep all of these things in mind before pressing Attack! If an enemy ship attacks you, try to take note of these things as well. The crew rank in particular is important as a guide of how well the enemy will navigate in battle.

The Battle Navigation Phase

When two ships enter battle, they will appear on a grid of sea tiles like shown below:



Legend:

◁ Enemy Ship

⇒ Jet Stream

▷ Your ship

⬆ Tall Rock

⬇ Short Rock

○ Whirlpool

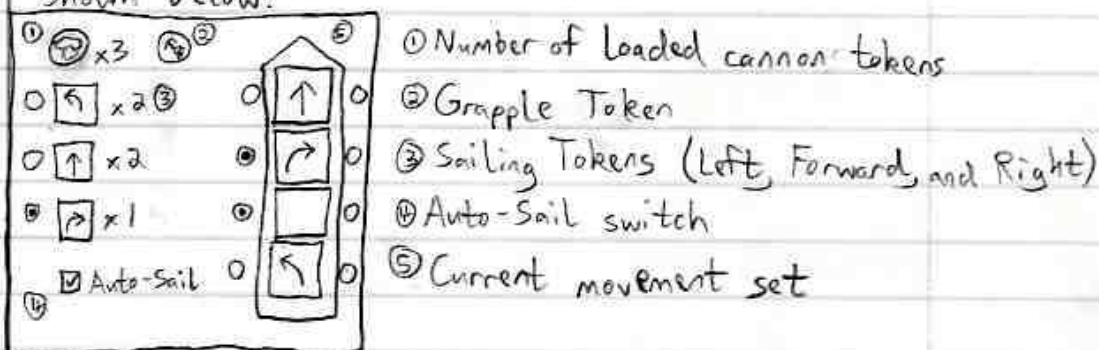
This signifies the beginning of Battle Navigation (Brav for short). In this phase, you attempt to fire cannonballs at your opponent, causing damage and weakening their ability to Swordfight. After a number of turns, one ship will grapple with the other, and the battle will move to the next phase...

The Swordfighting Phase

This is a standard swordfighting brawl with a slight twist. Depending on how much damage your ship has taken, a number of unbreakable black blocks will appear at the bottom of the screen (up to a maximum of six rows). This will of course make the swordfight more difficult. The crew that wins the swordfight wins the sea battle and is allowed to take PoE and goods from the defeated vessel.

Controlling Your Ship

Battle Navigation is split into turns consisting of four movement phases. At the beginning of each turn, the Bravver of each ship will enter their moves using the interface shown below:



To put in a move, one can do either of the following:

- Drag Tokens from the left to the current move set.
- Click on the current move set to shuffle through the available tokens.

When placed, a token will turn dark, then Light when the move has been officially entered. Dark tokens won't be executed (if there is very bad lag on the server, the tokens may remain dark for a while, so be careful).

When time is up, the moves will be executed in this order:

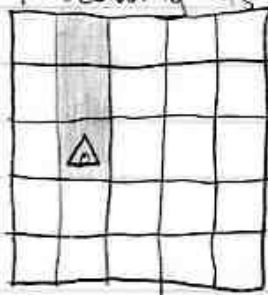
- Each ship's movement token is executed.
 - Each ship moves according to any special tile it is on.
 - Each ship fires whatever cannon/grapple tokens they used.
- Cannons have a range of 3 squares, grapples are only one square.

Battle Navigation Basic Strategies

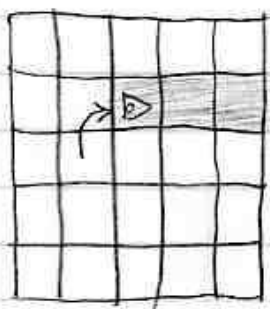
Avenues of Attack Concept

While the board may appear to be a simple grid, the board can also be viewed as a collection of rows and columns called Avenues of Attack (or Avenues for short). If ships could navigate anywhere they wanted, this would be very trivial. However, ships cannot turn on a dime; instead, they have to at least move forward one space, rotate, then move forward again, essentially moving the ship diagonally.

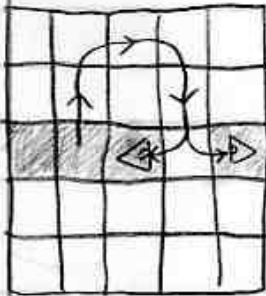
The point of viewing the board as a sequence of avenues is that certain avenues are easier to get to than others. Take the following as an example:



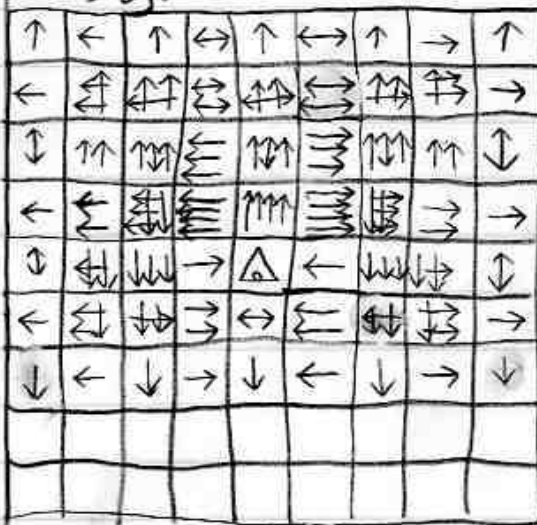
The ship's current avenue is shaded. Forward tokens will move the ship along the same avenue. If the ship makes a right turn instead...



... then this will be the new avenue. Notice how the avenue below here (the row the ship was originally on) is almost completely inaccessible since the ship moved up along with the turn. This avenue was reached in one move...



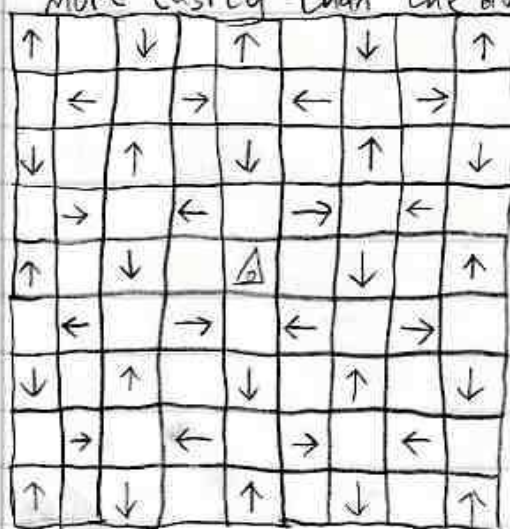
So how easy is it to get to each avenue? The following grid shows how easy each avenue is to reach based on arrow density:



How is this useful? The biggest use is in defense. When you attempt to avoid shots from the opposing ship, you should choose paths that can only be shot from difficult-to-reach avenues. This will be discussed in depth later during the AI discussion.

Serpentine Concept

An alternative method to analyzing avenues is another movement pattern called the Serpentine. A serpentine consists of all the squares a ship can reach using only Left and Right turns. Conveniently, this can be represented more easily than the avenue grid shown earlier:



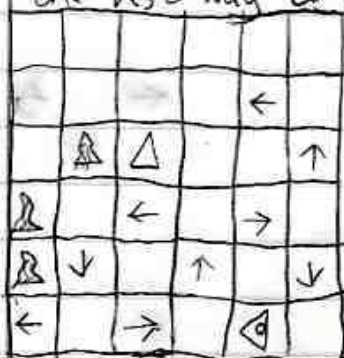
Notice the checkerboard pattern of the Serpentine, how each row/column contains either a vertical or horizontal (NOT BOTH) direction, and how the direction reverses every other row/column.

If a Forward is used, the serpentine pattern shifts one space in that direction, so it is relatively easy to keep track of the pattern no matter where you move.

The serpentine patterns can mainly be used for offense. The pattern tells you very quickly how many forwards, lefts, and rights you need to reach any square facing any direction, so you can line up your shots accordingly.

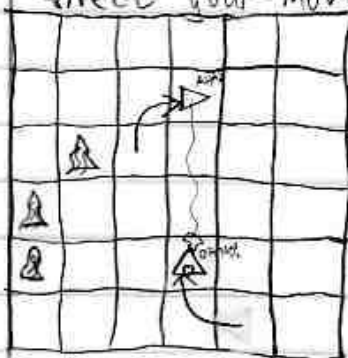
Now it's time to apply these techniques to some real examples:

Example #1: Assume the Brigand ship will not move. Show the best way to move for shots and a grapple in one turn.



Since it is known that the enemy won't move, think offensively. The Serpentine pattern is shown at left for one turn. It looks like Right-Left will get directly behind them, allowing 2 shots before the grapple!

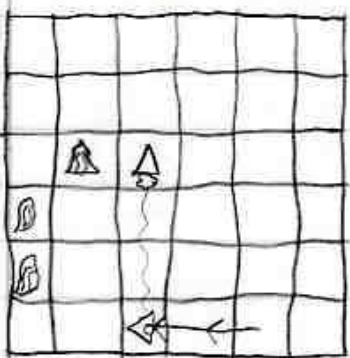
Example #2: Now assume the Brigs can move. How will this affect your moves? Make your moves so that you can't be hit.



Avenues analysis shows quickly that you could get intercepted easily if you perform a Right-Left.



It has already been shown that it is very difficult for a ship to reach an avenue directly to the side, so let's exploit that by moving forward instead. Now the enemy is too far away to shoot you since shots only go up to 3 squares away.



Just in case they don't move, let's move forward again and try to hit them. If they do move, the shot will miss, but at least you don't risk getting shot yourself.

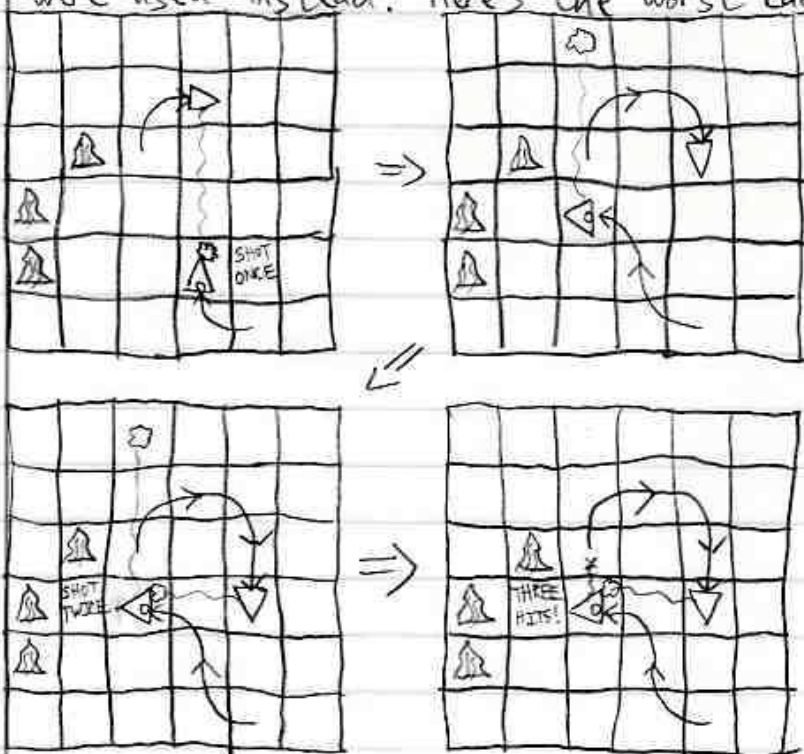


This spot, though difficult to shoot, is not impossible for the brigs to exploit. By the fourth move, they could finally get turned around and blast you. So your options are left, right, or forward. A right turn is risky (for the same reason as move #1), so let's go forward.

0	↑	0
0	↑	0
0		0
0	↑	0

So, in summary, here's the moves we came up with based on avenue analysis. Let's hope you had enough forwards! (If not, a left could be used for the final move instead)

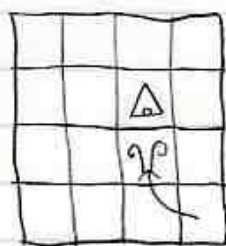
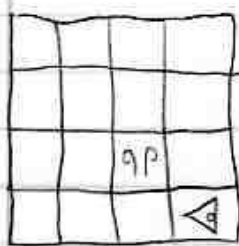
What could have happened if the moves from Example #1 were used instead? Here's the worst case:



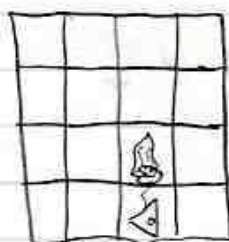
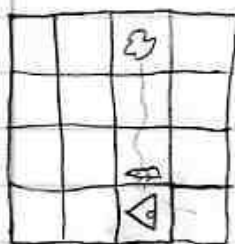
This is the downfall of many new braverers: they rush their offense and get blasted. Hopefully, now that you've seen this, you'll think more defensively.

Special Tiles

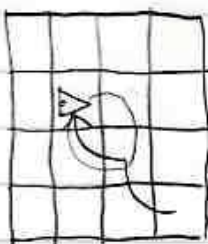
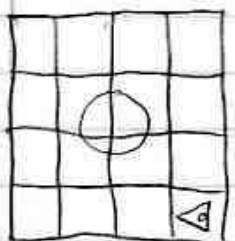
In addition to the standard tiles, there are special tiles that affect how ships move.



Jet streams move the ship in the specified direction no matter which direction the ship is facing.



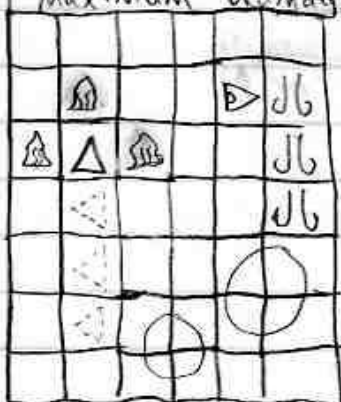
Rocks cannot be sailed on and cause damage to ships that ram them. Short rocks don't stop cannonballs but tall rocks do.



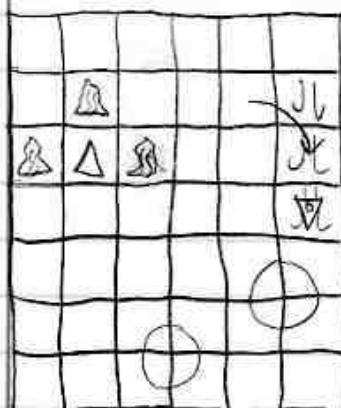
Whirlpools spin the ship clockwise. They can be hard to maneuver in sometimes, but very valuable.

Let's see how these tiles work with a real example that I've seen in the past.

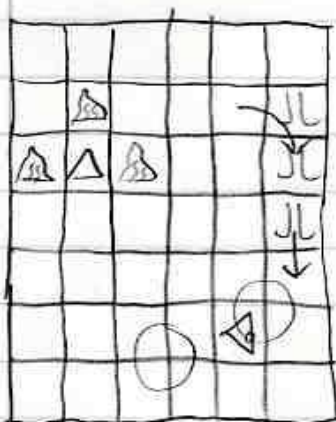
Example #3: It's late in the battle. These brigands aren't gonna move, but I need to shoot them one more time for maximum damage. How can I do it in one turn?



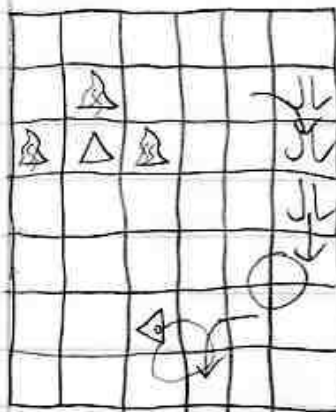
Let's start by seeing what the main goal is. I need to move to one of the avenues marked by dotted lines (that way I'm in range to fire at them). However, the target seems to be too heavily protected and too far away to reach in one turn, right? Wrong.



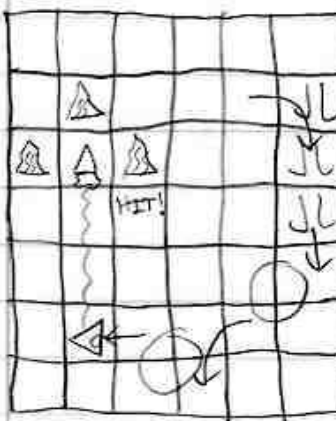
As you may have guessed, the special tiles are the key, so let's start by turning into the jet stream. This will carry the ship to the edge of the first whirlpool.



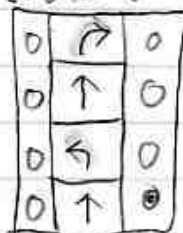
Now to deal with the whirlpools. There's two ways to enter the first: turn right or move forward. Turning right would rotate the ship away from the enemy, so let's try a forward. The result is that the ship now faces whirlpool #2.



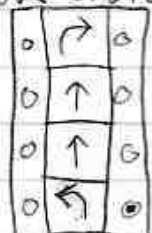
There are two ways to enter the second whirlpool as well: forward or left. It turns out that the choice doesn't matter, but the grid to the left shows the board as if I had turned left into the whirlpool. The point is that the second whirlpool moves me closer to the enemy.



The final move is obvious: a forward with the cannon shot off the right side. So either of these move choices will work:



or



Using Whirlpools

The whirlpools in particular can be a little rough for the inexperienced braver. Depending on how they are used, they can either aid you or completely screw you over.

The diagrams below show what happens if you stay in a whirlpool:



Two things happen to a ship in a whirlpool:

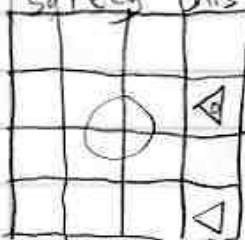
- ① The ship rotates 90° clockwise.
- ② The ship moves to the opposite corner of the whirlpool.

Keeping track of every ship movement in this fashion, however, is not necessary. Notice that your ship will end up in the exact same spot (though reversed in direction) if you stay in the whirlpool for two moves. With this knowledge, it is fairly easy to see where you'll end up after any given number of moves. For example:

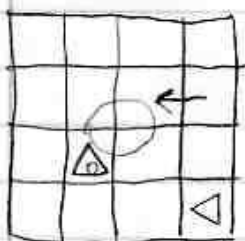
- After four moves, you will have reversed direction twice (or not moved at all)
- After five moves, you will have reversed direction twice and rotated once (the second picture above)
- After 100 moves, you will have reversed direction 50 times (so not moved at all)

Let's see an example.

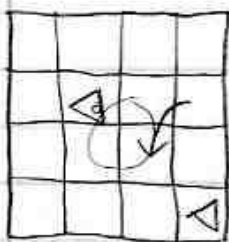
Example #4: Assume the brigand cutter cannot move but is going to fire all eight of its cannons this turn (in other words, staying beside it will get you shot). Without taking any damage, show the moves so that you can fire two shots safely this turn.



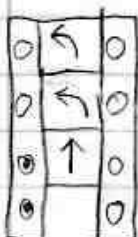
There's no way to get behind it from here quickly enough, so let's get in front using the whirlpool. There's two ways to enter the whirlpool:



First, you could move forward. By waiting two turns, you could reverse direction, use a Forward to get in front, and shoot once. (But we want to shoot twice...)



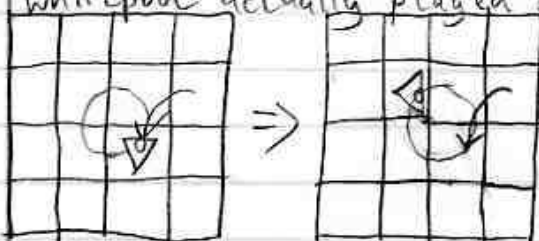
Second, you could turn Left. Here, a Left-Forward would put you in range using 3 moves, allowing for two shots.



So the correct moves are shown at Left. This is also a convenient place to stay because a grapple is only a Left-Left away!

Move Substitution using Whirlpools

Notice in Example #4 how the left turn into the whirlpool actually played out:

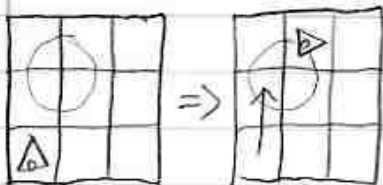


Doesn't this look like another set of moves you could have performed had the whirlpool not been there?

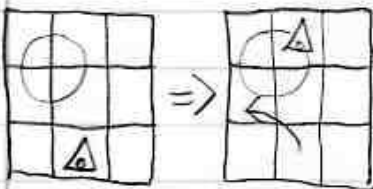


That's right. Turning left into the whirlpool above is exactly the same as moving forward twice without the whirlpool. The difference, of course, is that two forwards would take two moves, while the whirlpool version only uses one. So whirlpools can be used to execute sets of moves much more rapidly than normal, and this makes them very valuable tools for bravvers.

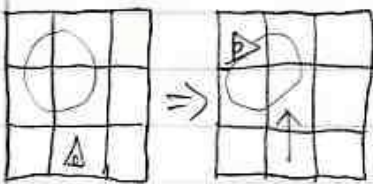
Here's a quick list showing a few move substitutions:



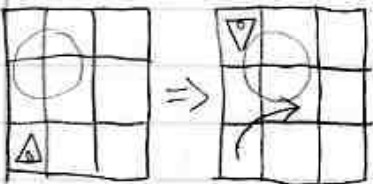
Forward into whirlpool.
Same as Forward-Right without.



Left into whirlpool (as in Example #4)
Same as Forward-Forward without.



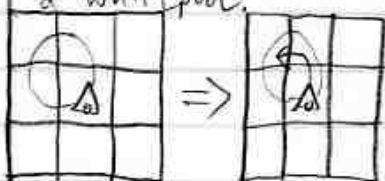
Forward into whirlpool
Same as Forward-Forward-Forward-Left-Left-Left without



Right into whirlpool
Same as Right-Left-Left-Left without

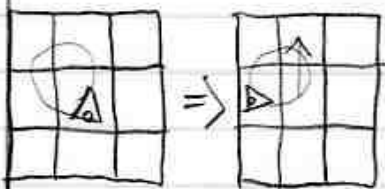
The last one in particular is a quick way to reverse direction in case the situation demands it.

Move substitutions can apply even when you're already in a whirlpool.



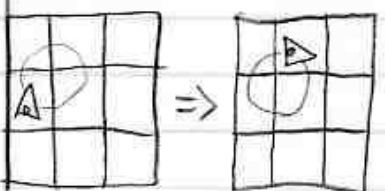
Left turn used.

Same as no move without whirlpool.
(Trust me, it's useful. See Example #5)



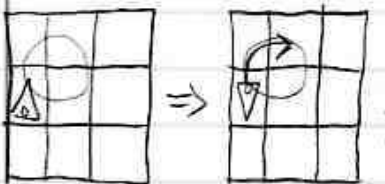
Forward used.

Same as Forward-Left-Left-Left without.



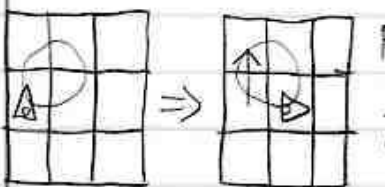
No move.

Same as Right without.



Right turn used.

Same as Right-Left-Left-Left-Forward-Forward without.



Forward used.

Same as Forward-Left-Left-Left-Forward-Forward without.

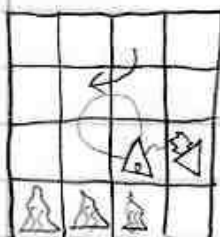
Ready for an example?

Example #5: Assume the brigand ship won't move. Show the moves to use to shoot four times without risking damage from the enemy cannons.

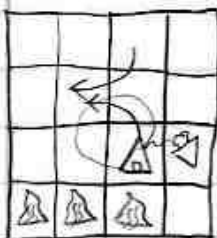


If you knew the enemy wasn't going to shoot, you could simply turn Left and blast him.

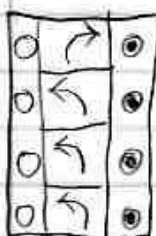
Unfortunately, this is not the case, so let's use the whirlpool to do it.



One of the move substitutions two pages back may be useful. The final one puts you on a good avenue to shoot them immediately.



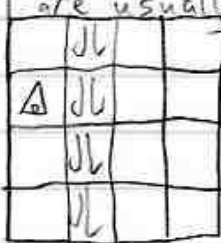
This is a good place to stay and shoot, but the whirlpool will try to move you away. The solution is to use another move substitution (the one that allows you to stay in place in a whirlpool).



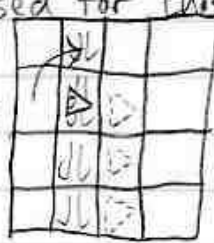
So these are the correct moves. See how useful whirlpools can be now?

Changing Avenues using Jet Streams

Jet streams are easy enough to use since they only move in one direction. The biggest use of jet streams is to move sideways. It has been shown that such a maneuver is very difficult to do normally, so jet streams are usually used for this purpose.

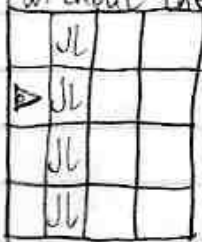


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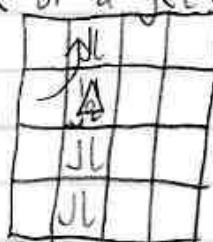


Notice that any of the dotted avenues can be reached in one turn using the provided jet stream

Another use is to move backwards. This is practically impossible without the use of a jet stream.

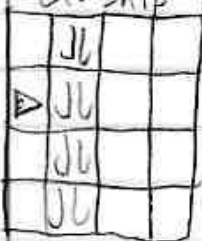


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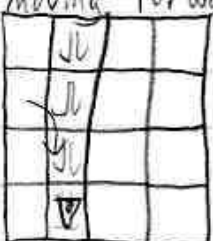


Notice that the jet stream will move the ship backwards as long as the ship remains in it

The final use of a jet stream is to increase the speed of the ship by moving forward at twice the normal rate.

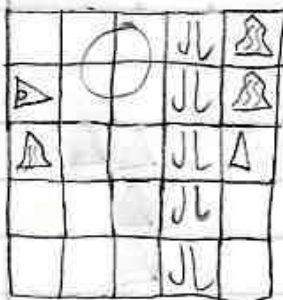


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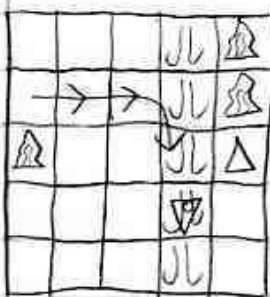


The ship will automatically move forward until it exits the jet stream.

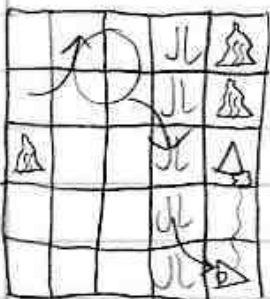
Example #6: Assume the brigand ship won't move. Without risking getting shot, show the moves to shoot it twice in one turn



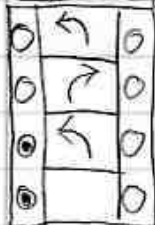
A simple right turn will get you shot, so you're gonna have to use the whirlpool and jet stream to move around. The problem is how to get behind the brigand ship so you can shoot it without taking any damage.



A good solution is to use the jet stream to move past the ship before it has the chance to shoot. But how? If the whirlpool weren't there a Forward-Forward-Right would work...



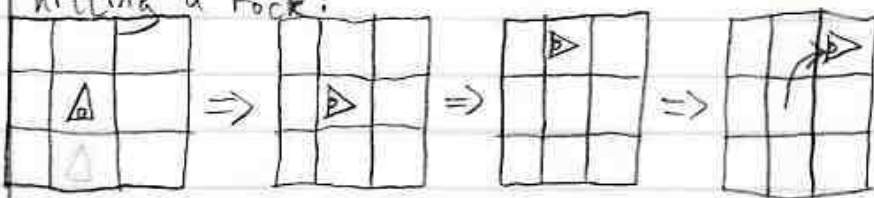
Fortunately you know move substitution! A left turn into the whirlpool is the same as a forward-forward without. From there, a left turn will get behind the enemy for two shots.



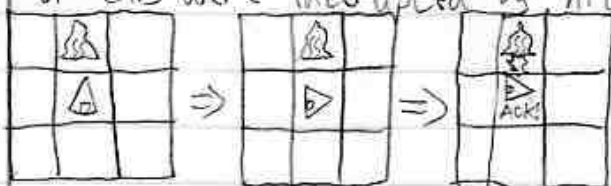
So there's the moves you need. Now you're bawrving like a pro.

Half-Turns using Rocks

Yes, even rocks can be useful to a braver in some instances. The problem with rocks is that everytime you hit one, your ship takes damage. Still, if there's an emergency, you'd probably rather take a little damage from a rock than take a lot of damage from enemy cannons. So let's look at the physics of hitting a rock:



The above diagrams show the progression of a typical right turn. The ship rotates, then moves up, then right. If any of this were interrupted by hitting something...



... then the rest of the move wouldn't be done. In this case, the ship hit the rock trying to move up, so neither the move up or move right were executed.



In this case, the move right was interrupted, so it wouldn't be executed.

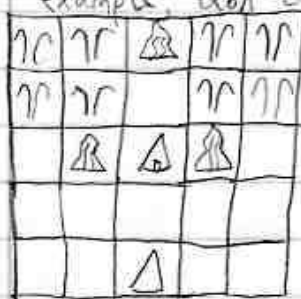
These interruptions can be done on purpose so that only part of the turn will be executed. Such a move is called a half-turn. Half-turns are useful because they eliminate the turning radius of the ships, making difficult-to-reach avenues very accessible:



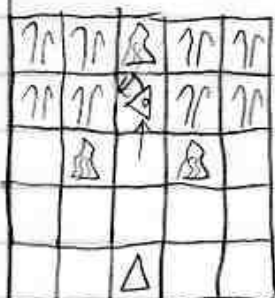
By hitting the rock, the ship accessed the very hard to reach avenue beside the ship in one move!

I'll show two examples: one for offense and one for defense:

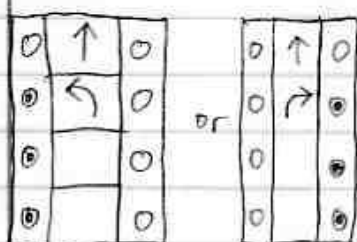
Example #7: Assume the brigand ship won't move. Show the moves to shoot the enemy three times in one turn. For this example, don't worry about damage.



The jet streams in this example prevent you from turning around fast enough to shoot the enemy. You'll have to pivot in place, but how?



By using a half-turn, you can pivot in place. A forward gets you next to the rock, and either a left or right will execute the half-turn, allowing for three shots.

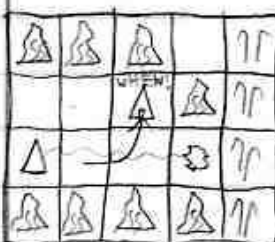


So these are the moves. Assuming you don't mind a little damage, that is.

Example #8: Assume the brigand ship won't move but is planning to shoot you with all four cannons. Show the moves to not only minimize damage but also shoot the enemy once.



The jet stream would make a good escape if it weren't so far away. To reach it, you would have to move forward three times, leaving yourself open to two cannon shots.



To minimize damage, you must dodge the enemy's cannons. A left turn is the only viable option.



A second left will execute a half turn, pivoting in place. From here, two more Forwards will put you in position to fire at the enemy.

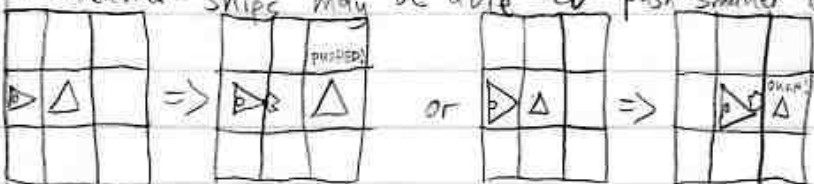


So here are the moves to minimize damage. The only damage you take is from one rock, but it's better than getting blasted.

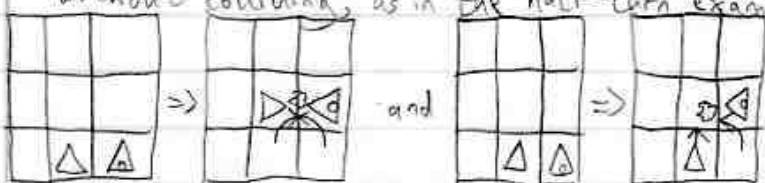
Ramming Ships

When two ships ram each other, it acts very much like hitting a rock except that

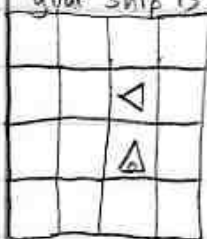
- The amount of damage each ship takes depends on what types of ships they are.
- Heavier ships may be able to push smaller ones out of the way.



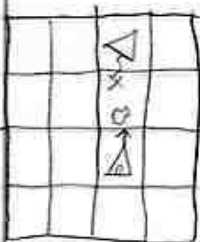
- If both ships are moving, the ships will go as far as they can without colliding, as in the half-turn examples



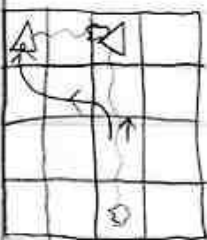
Example #9: This is a common strategy against low-level brigands. Though I haven't covered brigand AI yet, it can be assumed that they will grapple first, then fire three shots without moving. Show the moves to minimize damage and shoot them twice. Assume your ship is a cutter and the enemy ship is a sloop.



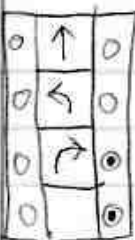
It seems like no matter what you do, the enemy will grapple you. What will you do?



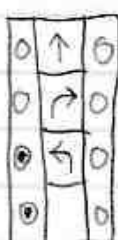
Push them out of the way of course. Since you have the bigger ship, you can push them out of grappling range with a forward.



The rest is easy. Either a Left-Right or Right-Left will let you blast them.



or



So these are the moves. You take a little ramming damage, but not much.

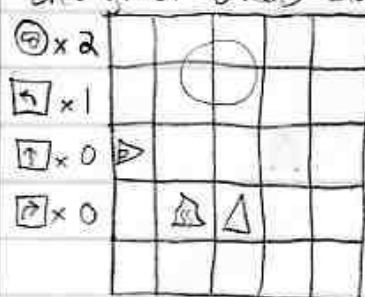
Token Constraints

Up to this point, it has been assumed that you had all of the movement and cannon tokens you needed to make the right moves. Sadly, this is not always the case, but you can make the most of the tokens you have by keeping these points in mind.

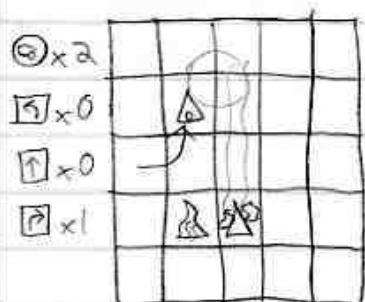
- The Auto-Sail box is turned on by default. When this option is on, the movement token you have the least of will be generated next. If there's more than one, it will prefer to generate forward, then left, then right. This can get annoying if you're low on moves, so turn off autosails to get whatever moves you need in a pinch.
- Each movement token has a lifetime of 5 moves before it disappears. Mousing over a movement token shows a tooltip with the lifetime of each token. The red number on the left shows how many will disappear if not used for the current turn.
- Remember that each time you turn, your gunner's barrel will move, possibly blocking his/her circle and making it difficult to load the cannons. For this reason, don't rely heavily on one type of turn. This ensures that you'll get gunning tokens more quickly.

Now for the last example.

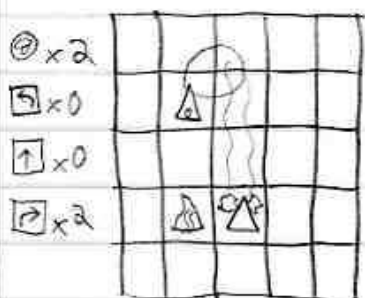
Example #10: Assume the brigand ship will not move at all (except firing cannons). Show how to maximize the enemy's damage and grapple in three turns. To show token constraints, you start with the given tokens and can only generate 1 sail and 2 guns per turn.



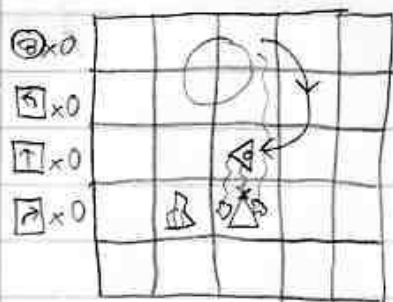
This time you only have one movement token to use, and can only get one extra movement token per turn. And you have to shoot them six times, too.



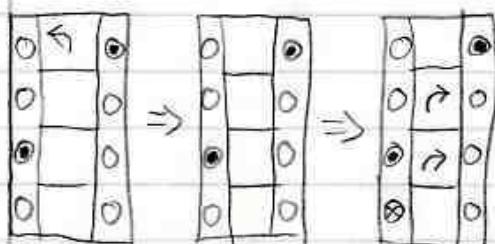
By moving left, you can blast the enemy twice around the whirlpool. Thinking ahead for the grapple, you should generate a right token.



Once more around, firing two more shots and generating another right turn...



One shot going around. Then use the two saved right turns to get in front, fire the last shot, and grapple.



Voila! There's your moves. Very efficient and using only three movement tokens, too.

Brigand AI and Tactics

So now you can maneuver your ship like a pro, right? Well, almost every example assumed that the brigands couldn't move. Now it's time to take off the training wheels and delve into the real world.

Before the Battle

Before the battle even starts, it is essential that the braver notice a few things about the enemy:

- ① What is the enemy's might? Green ships are an even match, so try to attack them. Red or orange ships are too dangerous, and attacking blue or cyan ships will earn you a visit from the Black Ship (the term is "blackshipped").
- ② Is this a brigand battle or PvP? In this section, the answer to that is brigand (PvP will be covered later).
- ③ What is the crew's rank? You must know this in order to know properly.
- ④ What is the enemy's ship type? I'll deal mainly with sloop vs. sloop here, throwing in a warbrig or two later on.

The Three Phases of Sea Battle

In a typical sea battle, there are three phases of ship-to-ship combat:

- The First Turn: On the very first turn, the opposing ship won't have a clue how you move, so it will simply move closer to you to attempt to grapple or shoot.
- Mid-Battle: Between the first turn and the end of battle is this phase. Both ships will have plenty of sailing tokens so there will be plenty of movement.
- End Battle: Eventually, one ship will run out of moves, leaving it defenseless. The other ship will then fire off the last shots and go for the grapple.

Low-Level Brigands: Sailors

As the first example of brigand AI, let's examine the Sailor class of brigands. Sailors are the weakest of all eight ranks and are commonly found while defeating brigands for the navy.

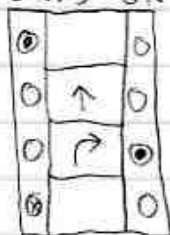
All brigands have some psychic ability: that is, they can see what moves you have entered, and will act accordingly. Some brigands do this better and faster than others. As you may have guessed, Sailors are the worst at reading your moves. That's why I'm starting with them.

Last Second Move

Since Sailors take so long to read your moves, you can take advantage of a technique known as Last Second Move, or LSM. The idea is to put in your moves just before time runs out so that the enemy cannot react to your moves in time. You can gain a significant edge over low-level brigands this way.

Anticipating Your Enemy's Moves

Each ship in battle has a white bar hovering above it. This bar shows the opposing ships how many moves that ship will make:



For example, the ship at left would have a bar that is $\frac{3}{4}$ full. Shots and sails count as moves, but grapples don't.

Therefore, the ship is said to perform 3 moves.

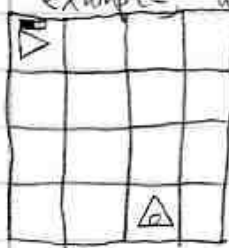
As you put in moves, your movement bar will fill up as well. Brigands don't pay much attention to the bar, however, since they can see your moves directly. As you change moves, you'll notice that the brigand's movement bar changes as well. You can use the movement bar to your advantage by anticipating which moves your opponent will use based on how many moves they plan on using.

Low-Level Brigand General Movement Strategy

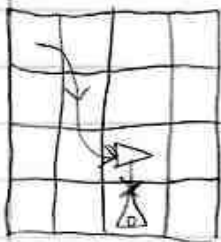
The last thing we need to know is how the brigands will tend to move during their turn. Low-level brigands will typically follow these rules:

- If they can do so, they will move to grapple you.
 - If they can't grapple, they will instead move to shoot directly at you.
 - If they can't do either, they will just move closer to you.
- Brigands will try to use as few moves as possible. Keep this in mind as we work through a short example.

Example #1: Let's consider a simple setup first. First, determine how the brigands are likely to move. Then, plan your moves to do as much damage as you can. For this example assume the brigands are Sailors.

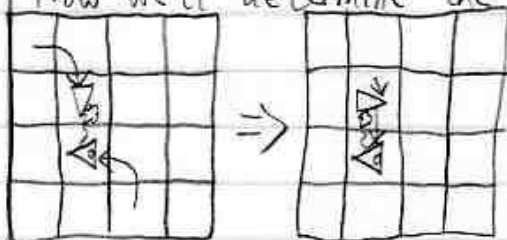


The brigand's movement bar shows that it will move only twice this turn. Let's see if this corresponds to the movement patterns listed above.

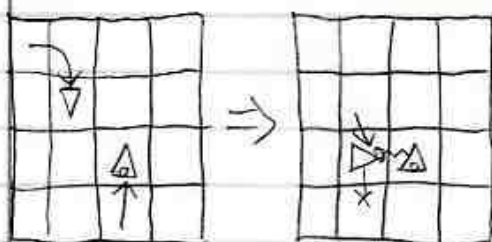


The brigands can move within grappling range with a Right-Left. Since Low-level brigands tend to grapple first and foremost, this is likely the moveset they will use.

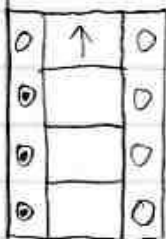
Now we'll determine the best set of moves to counter:



One possible move is a left turn, then a few shots. This, sadly, doesn't escape the grapple.



A better solution is a forward, with three shots at the end. This not only evades the grapple, but allows for 3 shots.

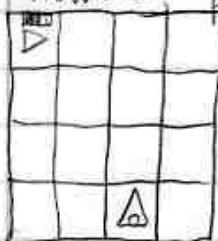


There's your moves. This, of course, assumes that the original assumption of where the brigands would move is correct.

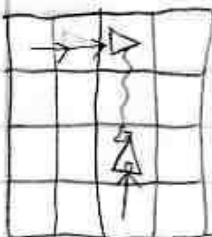
Correcting Errors in Judgment

Of course, sometimes you may guess wrong. The second part of your strategy will be to minimize damage in case your original estimate was wrong. Often times, this requires you to give up a few shots in favor of defensive movements. Let's see an example.

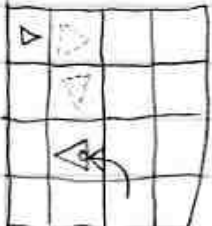
Example #2: Let's use the same setup as before. This time, however, put in moves to minimize worst-case damage.



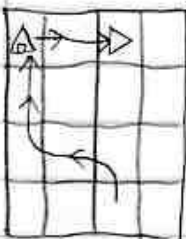
We've already established that the enemy is likely to perform a Right-Left to try for a grapple.



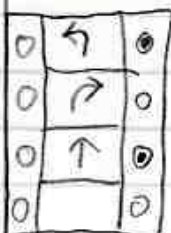
But suppose we're wrong. If the enemy moves Forward twice instead, it could cause a lot of damage to your ship.



Let's reexamine the option of a Left turn. No matter where the enemy moves, a shot off the righthand side will hit.

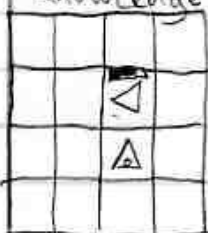


From there, a Right-Forward would put you behind the enemy in the worst case. In the best case, you would be a few squares further away. (a good defensive position).



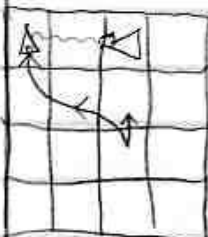
Something like this, then is recommended. Notice how error correction significantly changed the strategy.

Example #3: Let's now revisit an example from the previous section. Remember that we assumed the brigands would try to grapple first, then fire without moving. We didn't have the knowledge to prove this then, but we do now.



The first step is to figure out what the enemy will do. Since they're already next to you, the brigands won't have to move to grapple. Since low-level brigands grapple first, this is the likely move.

But how do you explain the additional three moves? Well, if the grapple attempt fails, then it will try the next available strategy, which is to move into position to fire at you. Since the brigands are already next to you, they can fire three times without moving. Hence, the brigands are expected to grapple first, then fire three shots, which was the original assumption.



The second step is to react to what the brigands will do. Since we have already done that, I'll skip it.

Moving up the Food Chain...

Of course, you are very likely to attack brigands of higher levels. The next level up is Mostly Harmless, which can read your moves slightly faster but are essentially the same as Sailors. These two classes of brigands are generally grouped into the low-level brigand category.

There are four main groups of brigands:

- Low-level (Sailors, Mostly Harmless)
- Mid-level (Scurvy Dogs, Scoundrels, Blaggards)
- High-level (Dread Pirates, Sea Lords)
- Imperials (they get a whole section by themselves)

Having finished strategies for Low-levels, time to move on to the next group...

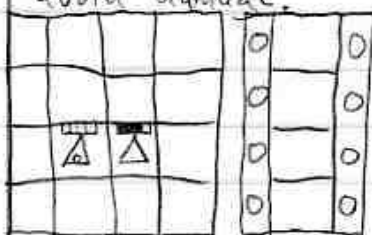
Mid-Level Brigands

Mid-Level Brigand classes include Scurvy Dogs, Scoundrels, and Blaggards. At this point, LSM usually won't work; they will generally react to LSM by performing an LSM of their own. That's not pretty. The key is to use a similar strategy called...

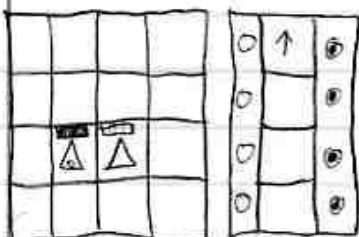
Last Second Change (LSC)

It is known that brigands can read your moves, and it is also obvious that they react in a way to make your moves futile. But what if you were to put in fake moves, allow your opponent to react to the fake moves, then put in moves to counter your opponent's counter? Such a move is called Last Second Change. Below is an example of LSC in action.

Example #4: Use LSC to get the jump on these mid-level brigands. You may assume that the brigands will try to avoid damage.

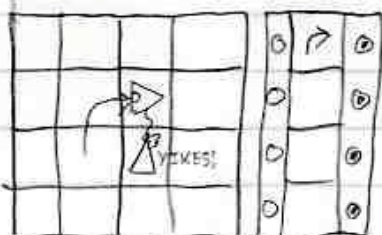


When you start out, the brigands will likely have 3 moves in: three shots and a grapple, with a possible Left turn. Not pretty.



Since we assume the brigands will avoid damage, let's pretend to move forward and fire everything. Suddenly, the brigands remove all of their turns.

This is because any move would put them in range of your cannons, while a shot or grapple alone would miss.

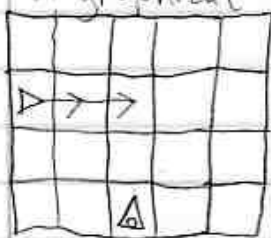


The brigands think they've fooled you... until you switch in a right turn instead of a forward. Ouch time.

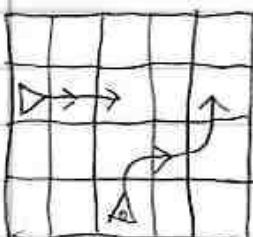
Thinking Ahead: The Movement State Space

LSM and LSC are examples of how to think ahead in battle navigation. In the case of LSM, it appears that you aren't going to move. Therefore, the brigands will choose their moves based on the information that you aren't going to move (this is referred to as looking 0 moves ahead since the opponent is not moving). Then you make your moves based on the brigands' moves (this is looking 1 move ahead).

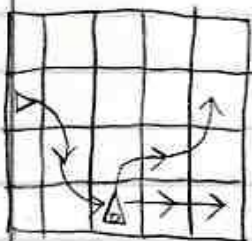
A graphical example may help explain things a bit more:



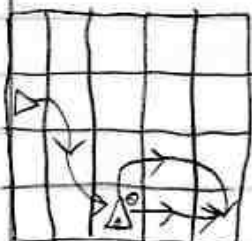
Thinking you won't move, the brigands will likely try a forward-forward to get in a few shots. They are looking 0 moves ahead since they are trying to navigate without looking at your moves.



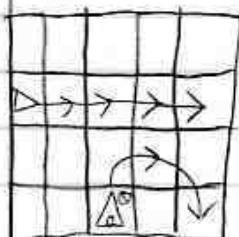
Knowing this, you could look 1 move ahead. Since the enemy will move forward twice, you could move Right-Left to intercept them.



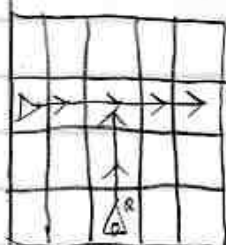
Now the brigands could potentially look ahead of your moves, looking 2 moves ahead. This would allow the brigands to shoot you on the way, then shoot again from behind you.



And you could look 3 moves ahead. Delay one, then Right-Right to blast them as they move forward.



And so on...



And so on...

The drawings above represent part of the Movement State Space, a combination of possible movement patterns for each number of moves looked ahead. Normally, one doesn't have to look more than 1 or 2 moves ahead in brigand battles.

High-Level Brigands

Dread Pirates and Sea Lords fall into the high-level brigands category. These brigands can react fast enough to foil even LSC moves, and they rarely mess up their moves, either. So how do you beat them?

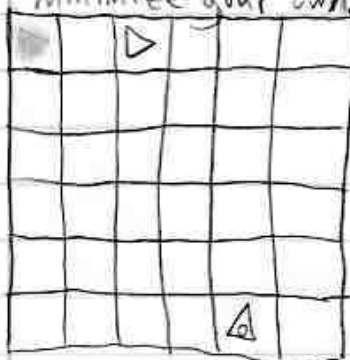
Managing the Battle Move by Move

Most brigands won't intentionally take damage unless

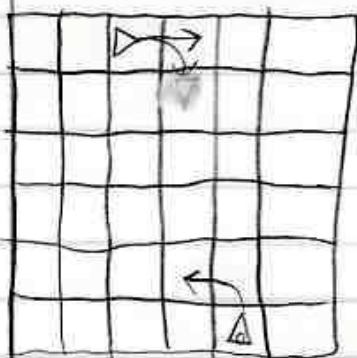
- ① They are out of moves,
- ② They deal a greater amount of damage to you, or
- ③ They have no choice.

Therefore, for each move, you'll want to make your moves so that your opponent reacts the way you want it to. An example of this is below.

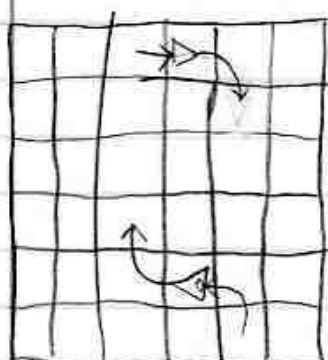
Example #5: Assume you are fighting high-level brigands. Make the best moves you can to maximize enemy damage and minimize your own.



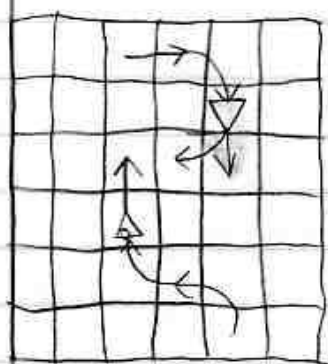
The key here is to examine the situation move by move. Your opponent has 4 possible moves first: Left, Right, Forward, or Delay.



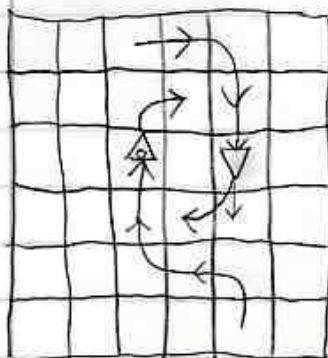
If your opponent goes Right, it puts you in a bad defensive position; one or two more moves and they are open to attack you! Here, of course, you would want to turn Left to prevent this. Since the brigands won't take intentional damage, they'll go straight.



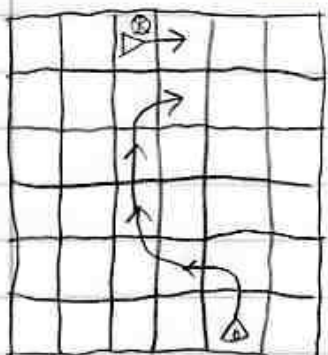
Now for move 2. The brigands will likely turn right to get closer to you. A Right turn on your part will move you closer as well.



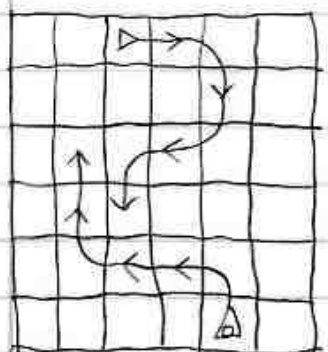
On to move 3. Two good moves for the brigands would be a Right or Forward. Either way, a forward on your part would allow you to shoot. If the brigand decides on a Forward, they'll likely reciprocate, so this is their likely move.



Finally, Move 4. The brigands probably won't stick around to take damage, so they'll try for a Forward or Right, Turn Right yourself; in the best case, you can shoot them again. In the worst case, you'll have a good offensive position.



Since one requirement is to minimize damage, let's do some error checking. If the enemy looks at your entire move set, they could blast you twice on your forward moves, then again as you make your last right. That could hurt slightly.

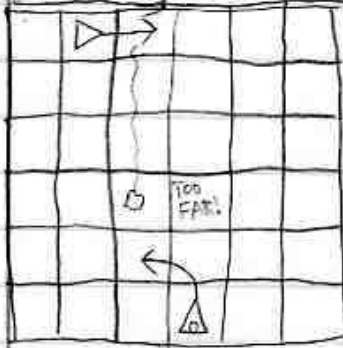


Is there anything you can do? Yes and no. If you do any change to your move set, you'll have to go through the process again, which takes time. To save time and space, I'll summarize how to change it; scoot over one avenue to avoid the worst-case.

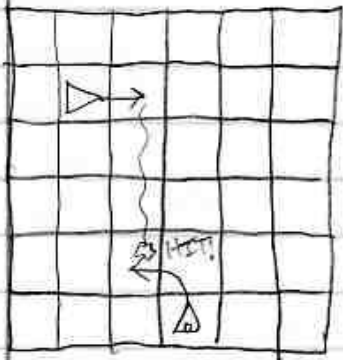
0	←	0
0	↑	0
0	→	0
0	↑	0

There's the moves. Notice how it's expected that few if any of those shots will hit. The shots are rather "warning shots" that force the brigands to move to your advantage.

Revisiting Avenues of Attack and Risk Management



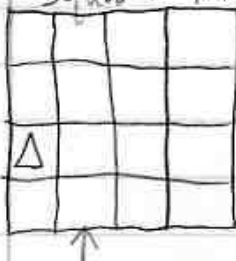
In the previous example, it was recommended without question that a left turn be your first move. This is because there was no risk in this move; if the brigands turn right, you hit them, and there's no way for them to retaliate.



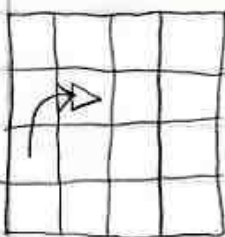
But what if they were one square closer? Suddenly, your left turn isn't so appealing since a brigand forward would allow retaliation. Depending on your situation, this may not be acceptable.

To facilitate the discussion of risks like these, I'll define a quantitative way to represent these risks based on the Avenues of Attack method discussed earlier. Since the enemy can only reach certain avenues quickly, they'll only be able to shoot certain squares on certain moves, making some squares riskier than others to maneuver on. I'll define a "Risk number" that summarizes how much risk there is in moving onto a square on a certain move.

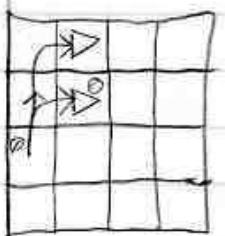
Example #6: Determine the risk numbers for the indicated square for all four moves.



The risk number for Move 1 is how many ways in the movement state space the ship can hit that square; in other words, the number of possible movesets that allow the ship to hit the square.



For Move 1, a right turn would allow a shot. No other option allows this, so the risk number for move 1 is 1.



For move 2, there are three possible movesets that allow a shot: D-R, R-D, and F-R (abbreviated to save space). So the risk number for move 2 is 3.

Move 3 is a bit more complicated because there are so many movesets to examine. Methods for determining these movesets will be discussed later, but for now I'll use the brute force method of looking at the board and picking out the right ones. Possible movesets are D-R-D, R-D-D, F-D-R, F-R-D, D-D-R, D-F-R, L-L-F, R-R-F. So the risk number for move 3 is 8.

By now, the brute force method is getting way too complicated, so I'll spare the details and say that the risk number for move 4 is $0 + 4(1) + 6(1) + 4(2) + 3 = 21$. How did I do that? Read on.

An Easier Way: Partial Risk Numbers and the Risk Equation

Of course, the brute force method is horribly complicated when looking at the later moves. If only there were a way to simplify it... and there is. I'll define a "Partial Risk Number" as the number of movesets in the Risk Number that contain no delay moves. The reason is that after this move, a delay can be inserted in any spot to create a risk for that next move. In other words, if move 2 had L-F as a risk, then move 3 would contain this moveset with three possible spots for delays (D-L-F, L-D-F, and L-F-D).

By using partial risk numbers, you can concentrate just on the moves at hand and not about all possible combinations of delaying previous moves. To account for the extra delays, simply multiply the partial risk number for the previous move by the number of ways to insert delays. This is a basic combinatorics problem; I won't bore you with details, so I'll just give the result.

Let P_i represent the Partial risk number for move i .

R_i represent the risk number for move i .

Then $R_i = \sum_{n=0}^i \binom{i}{n} P_n$ (this is the general form)

$R_0 = P_0$ (if the ship is already in range, $P_0=1$)

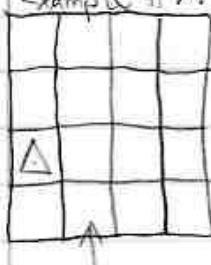
$$R_1 = P_0 + P_1$$

$$R_2 = P_0 + 2P_1 + P_2$$

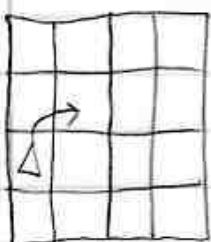
$$R_3 = P_0 + 3P_1 + 3P_2 + P_3$$

$$R_4 = P_0 + 4P_1 + 6P_2 + 4P_3 + P_4$$

Example #7: Rework Example #6 using Partial Risk numbers.

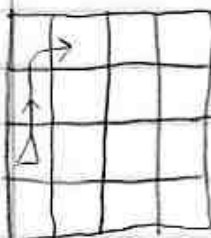


Since the ship is not already in range, $P_0=0$.



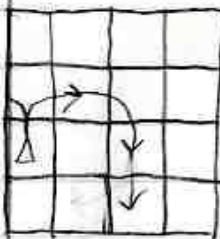
Recall that a right is the only risk, and since it doesn't include a delay, $P_1=1$

$$\text{So } R_1 = P_0 + P_1 = 0 + 1 = 1$$



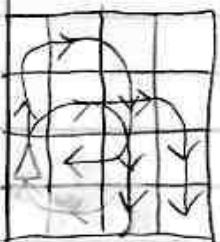
A F-R is the only non-delayed risk, so $P_2=1$

$$\text{And } R_2 = P_0 + 2P_1 + P_2 = 2(1) + 1 = 3.$$



There are two nondelay movesets for move 3: R-R-F,
L-L-F, so $P_3 = 2$

$$\text{And } R_3 = P_0 + 3P_1 + 3P_2 + P_3 = 0 + 3(1) + 3(1) + 2 = 8$$



There are three nondelay movesets for move 4: F-R-R-R,
R-F-R-F, R-R-F-R, so $P_4 = 3$

$$\text{And } R_4 = P_0 + 4P_1 + 6P_2 + 4P_3 + P_4 = 0 + 4 + 6 + 8 + 3 = 21$$

Much easier than juggling delays, right?

Utilizing Risk Numbers

So how are these risk numbers useful? Their primary function is to give an indication of how dangerous it is to move onto a square on a certain move. A high risk number indicates that it is very likely the enemy will shoot you if you sail onto the square, while a low number indicates a rather low probability of retaliation. Ideally, the braver would choose the attack path with the lowest risk,

Another use is to avoid damage altogether. Any square with a risk number of 0 cannot be shot at, providing a way for the braver to avoid all damage.

Page 51 Omitted because:

- (1) I haven't finished it yet.
- (2) It's not really important.
- (3) It's really confusing.
- (4) It's basically a chart full of risk numbers.
- (5) Umm... hang on, I know there's a fifth reason...
I'll think of it later.

Have a nice day!



After a bit of practice, you should get a feel for how the numbers work without calculation. The risk numbers are merely a quantitative way to summarize avenue analysis, so if you have trouble understanding them, you can always rely on good old fashioned avenue analysis instead.

Imperials: A Basic Rundown

And now for the main reason anyone would probably ever read this manual: how to battle Imperials. Imperials (abbreviated as "imps" for short) are the most difficult to defeat due to their ferocious battle navigation and excellent swordfighting abilities. Unlike the other classes, imps have a completely different AI pattern and thus require a significant overhaul on the braver's attack strategy.

Before you read any further, PLEASE make sure you have read everything before this. My discussion probably won't make any sense unless you do.

Basic Imperial Attack Strategy

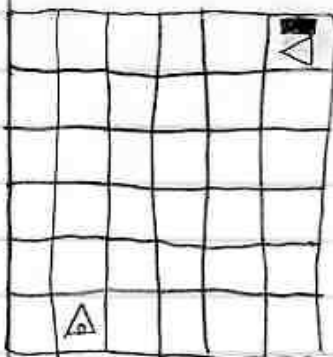
Unlike the other classes of brigands, Imperials will NOT try to grapple as their main goal. Instead, their main goal is to blast you a few times, only grappling if it is convenient or if you have taken heavy damage.

Imperials will always take the shortest possible path to you in order to shoot you with deadly accuracy. IF you try to move, Imperials will shoot you as you move, adding to the damage. So how do you possibly counter them?

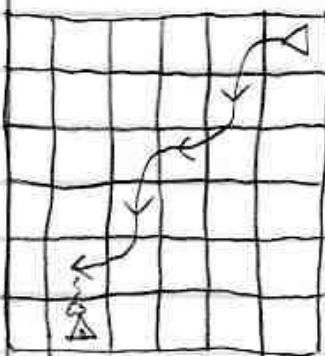
"Fighting Like An Imp": Revisiting the Serpentine Movement Pattern

Imperials, fortunately, are very predictable. Since they will always take the shortest path, you can know almost every time where they will move. What is this shortest path? Let's see an example.

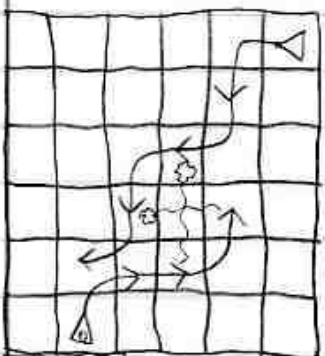
Example #8: This is the first turn of a battle against an Imperial sloop. Show the moves to minimize your damage and maximize your opponent's damage (images shown on next page).



This example is slightly rigged, but it shows the essentials. The imperials will take the shortest path to get as close as possible to you so they can shoot/grapple you. What is this shortest path?



This is a likely candidate. Notice how there are no forwards in this path. It looks suspiciously like something I've discussed before... that's right, it's a serpentine! Imps love serpentine because they allow diagonal (therefore faster) movement.



Because this is the first turn of the battle (I'll discuss this in a minute), we can assume the imps will definitely go through with this movement. The only question left is how to react. A possible moveset is shown at left to hit the enemy twice.



Ouch time for those nasty imperials, and it's only been one turn!

Revisiting the Three Phases of Battle

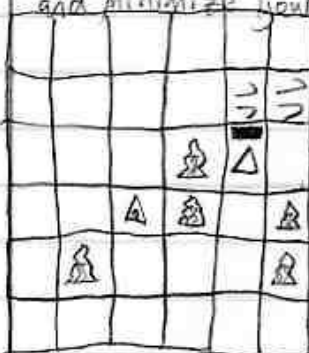
Recall that near the middle of this document I said there are three phases to a typical battle:

- ① The First move: Nothing has happened. The brigands have not seen you bray yet and don't know if you'll use LSM or LSC. Surprisingly, these techniques work very well during this phase, so deal as much damage as you can during this turn.
- ② The Movement Phase: After you've used LSM/LSC once, the enemy will now expect it and counter it easily, even using a few LSM/LSC moves of their own. At this point, the strategies for high-level brigands are somewhat useful.
- ③ The End Battle: One ship (hopefully not yours) should run out of moves. Deliver the last few shots and grapple.

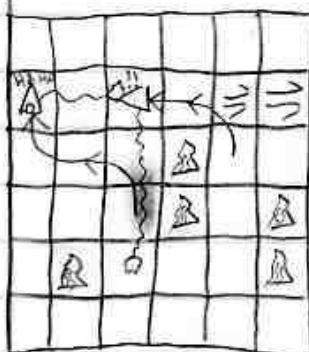
Depending on the phase of battle, certain strategies are more useful than others. Successfully beating imps in a sea battle requires a mixture of the strategies already presented.

I'll illustrate the differences in each phase with a few examples.

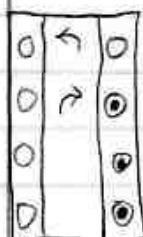
Example #9: Assume this is the first turn of a battle with an Imperial brigand sloop. Show the moves to maximize enemy damage and minimize your own.



Since this is the first turn, we can analyze just the shortest path to your ship. It looks like a Left-Forward will do the trick.

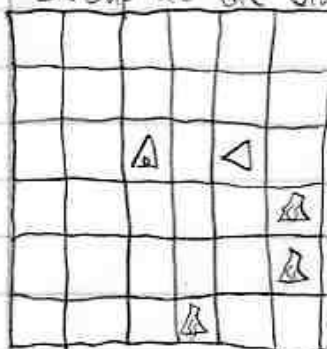


A simple Left-Right, then, will put you in a great position to shoot them 3 times while avoiding all their shots. Woo!

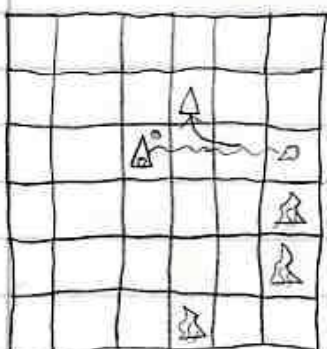


It almost seems too easy to be true, until you realize that this was only the first turn strategy. Now for the fun.

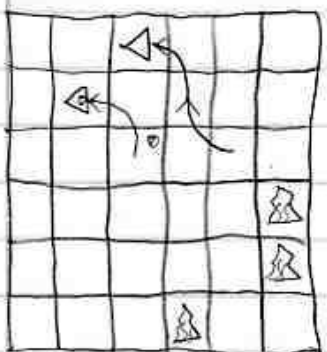
Example #10: Continue with the second move. Assume the setup at the end of Example #9.



Now we can't rely on first-turn strategies anymore. We'll have to do the analysis move by move.



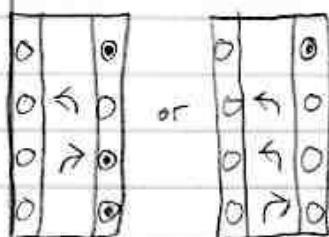
Notice how there's no risk of being shot from where your ship is. On the first move, at least. You can use this to your advantage by firing once. This will deter your opponent from using a forward or delay as their first move and make them a bit more predictable.



No matter whether the brigands choose a left or right, they'll likely use their second move to get in front of or behind you. To minimize your own damage, you should move. I recommend a left turn to avoid the potential of ramming the opponent while turning right.



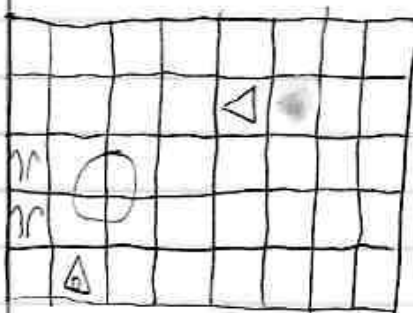
From here, your actions depend on whether you value offense or defense more. If you'd like another shot at your opponent, a Right turn would have a roughly 50% chance of working. If you'd rather wait and defend, try a Left-Right to avoid most shots from your opponent.



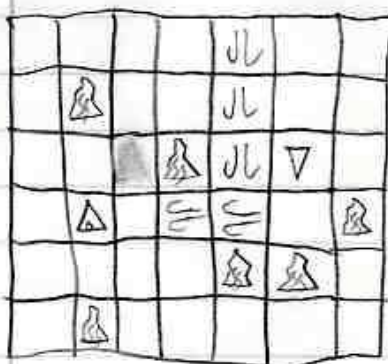
The Left-hand moveset is for those who value offense, while the right-hand moveset emphasizes defense instead.

Dealing with Special Tiles

Of course, the board is not going to be pure ocean. There will likely be many jet streams, whirlpools, and rocks all over the place. Depending on where they are, they might help or hinder you, so I'll spend a few pages talking about dealing with them.



This board may seem innocent enough at first, but no matter where you move, the enemy can shoot you on the first move. This is an example of a board that is unfavorable to you.

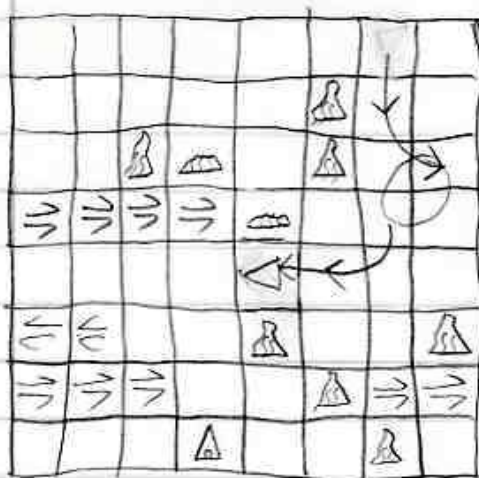


This board, on the other hand, guarantees you at least one good shot opportunity with little risk to you.

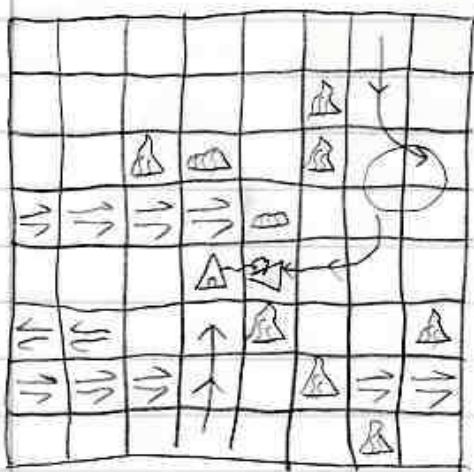
With a little bit of planning, you can put yourself in a good position most of the time, making you less likely to take damage. Let's look at an example.

Example #11: Assume this is the first turn against an Imperial sloop. Show a moveset that will maximize enemy damage and minimize your own.

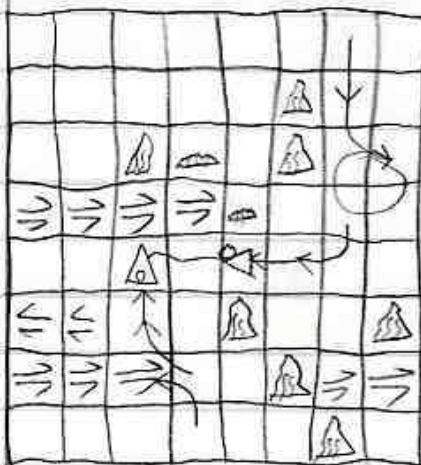




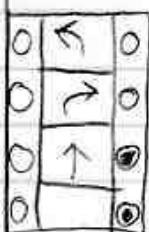
First, determine how the enemy will move. A F-L-R-F moveset would get them closer to you and in a good position to fire next turn. Since this is the first turn of the battle, we can assume this is the correct set of moves.



It may seem like F-F-F, then, will allow two shots without you taking damage this turn. However, during the next turn, you'll have to fight against that jet stream in front of you to turn around, putting you in a bad situation.



Instead, try a L-R-F. The jet stream near you will scoot you right one avenue, still allowing for two shots. This time, however, a L-R-R next turn will escape any retaliation from the enemy by hiding behind a rock, minimizing your own damage

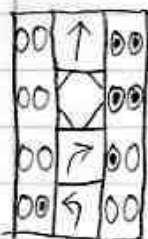


There's the moves. If you could come up with this, you should have no problem fighting with a sloop.

Larger Ships: Blockers and Cannons

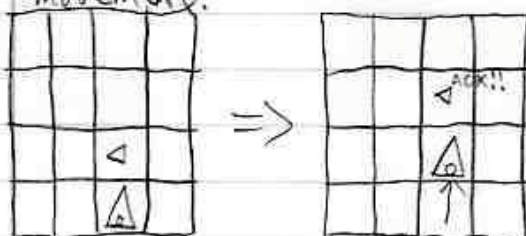
You may have mastered the art of sloop navigation, but larger ships have some slight variations you should be aware of.

First, all ships larger than cutters may only use at most three sail tokens per turn. In place of one sailing token position is the blocker, which can be moved to any of the four positions and counts as a delay. This essentially limits the speed of larger ships and alters strategies slightly.



Second, all warships (War Brig, War Frigate, and Grand Frigate) can fire twice off a side per move. Such an addition makes it possible to fire 16 times per turn! That's serious firepower.

Third, ramming mechanics may be different depending on the size of the opponent. A sloop can be pushed completely out of the way by a War Brig without interrupting the Brig's movement.



The key to effective navigation, then, is where to place the blocker. Your strategies should all involve at least one delay (which is where to put the blocker). I won't go into any examples since it is only a minor tweak to the strategies already covered.

Player vs. Player Battle Navigation

Player vs. Player battles (PvP for short) happen when one player ship attacks another player ship, resulting in a battle between real players. Unlike brigades, which are predictable, players can all have different styles of nav, and it takes a true master of navigation to win.

Might Rings: The True Story

A pirate must be careful to choose a ship that they can defeat. When it comes to player ships, the might ring alone is not an accurate indicator of how difficult a ship is. This is because the might ring is a reflection of the duty puzzle skills of the pirates on board. A ship with one highly skilled pirate, then, may appear green to a ship full of inexperienced pirates simply because of the difference in duty puzzle skills. However, the single pirate may not stand the slightest chance since he/she is vastly outnumbered.

It is common practice for some underhanded crews to load a sloop full of greenie alts to lower their might ring color. This allows them to attack weaker ships and artificially inflate their PvP rating. As a warning, then, I say this to you: DO NOT LAUGH IF YOU ARE ATTACKED BY A BLUE-RINGED SHIP!!!

Find out who you're dealing with before you attack a player ship. Use /who to look up who's aboard the ship. Look at the crew's name, reputation, and battle records. Find out if you're at war with their flag (indicating a sinking battle). THEN attack if you feel you can take them.

A Quick Lesson in Psychology

Unlike brigand battles, humans are capable of learning how you behave and exploiting it. This difference makes psychology an important factor in PvP battles.

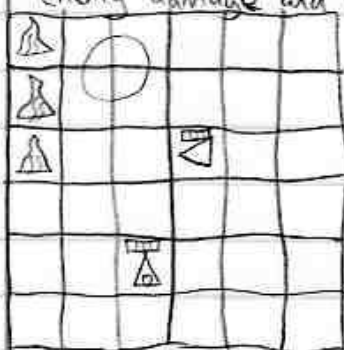
First, remember that humans can only see your movement bar, not your actual moves. This makes the concept of warning shots somewhat useless.

Second, many players tend to use LSM a lot since it hides the number of moves they'll use. When dealing with such a player, LSC can be your best friend. They'll react to a certain number of moves, while you switch it up at the last second and intercept them similar to brigands.

Third, being too predictable (doing the same thing in a situation) makes you more likely to be hit. Sometimes you just have

to pull some crazy moves to catch them off guard.

Example 1: This is the second turn of a PvP against an opponent using LSM. Give a moveset that can maximize enemy damage and minimize your own.



This situation is actually very similar to a battle I have fought before. A F-F will obviously not work because the opponent can move forward once to blast you four times. Similarly, a L-R won't work because of the rocks.



Normally, turning right would put you right in their line of fire, but more than likely, the opponent will move forward. Therefore, a R-L will get behind and blast them.

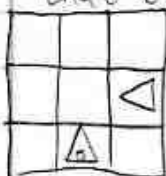


They'll never know what hit them (well, until it happens, I guess...)

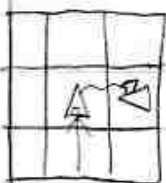
The Power of the Delay

If there is one movement that is usually not expected, it's the delay. Most players tend to put in their moves so they execute immediately without delay, and many expect their opponents to do the same. You can often catch them off guard by throwing in a delay or two before moving.

Example 2: This is a variation on the Double Forward trick that can be done against high-level players.



Seems like a simple setup. Each ship is facing the same square.



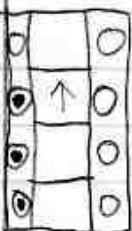
If the opponent doesn't move, you can simply move forward and blast them. This is looking 0 moves ahead.



To counter this, however, most navvies will move forward twice: once to block the opponent's forward and again to blast them (this is the Double Forward trick). This is looking 1 move ahead.



This is where the psychology comes in. By delaying your forward once, you can slip behind them as they move forward a second time, catching them unawares.



Keep in mind that this will only work against a raider who uses the Double Forward trick. A less experienced raider could actually beat this strategy with a single forward!

War and Sinking

When two warring ships attack each other, the battle becomes a sinking PvP. This changes the battle in several ways.

- A warning will be broadcast that ships can be sunk.
- If any ship reaches full damage during the battle, it will sink. A sunken ship and all of the supplies/booty on board are lost forever and cannot be recovered.
- Grappling is still allowed. However, the winning team may plunder ALL of the other ship's booty as well as the vast majority of their supplies.
- Any experienced member of either flag may receive an injury if their ship is sunk.