

# SEAWOLVES ZEMORNEZ

**Player's Manual**

[www.kodiak64.com](http://www.kodiak64.com)

# Thank You!

First of all, a very special thank you from me personally for buying this digital edition of Seawolves, as that gives me a morale boost as I go all-out to finish my main C64 project, Parallaxian.

I hope you have far more fun playing Seawolves than I had during the long hours of testing, debugging and fine-tuning its 30,000+ lines of code!

Writing a game like this is not like running a marathon. That analogy would be too weak. It would – fittingly for the theme of Seawolves – be more like swimming an ocean, such is the enormity of the task and the literally thousands of potential points of failure. I mention this to hopefully enable you to appreciate the inexpressible volume of effort that goes into such a project and to perhaps understand why game development is s-l-o-w. This experience has certainly given me a fresh perspective on, and appreciation for, the enormous amount of work produced by Manfred Trenz, the Rowlands brothers, Andrew Braybrook, Tony Crowther and many others back in the day. It also explains why there are so many “Games That Weren’t”... Coders begin projects, make great progress with scrollers, gfx, multiplexors and so on, but then find themselves in a rapidly expanding quagmire of debugging, optimising and endless fine-tuning that turns into a black hole of time-consumption and attrition.

Anyway, thank you once more for buying this digital release. If it proves successful, I would be very keen to release a cartridge version for real C64s, with some extra features.



**Jon. / Kodiak**

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# VICE configuration

Note that this is the **digital edition** of the game, meaning this version is designed first and foremost to work on the VICE emulator, which should ideally be at least version 3.1.

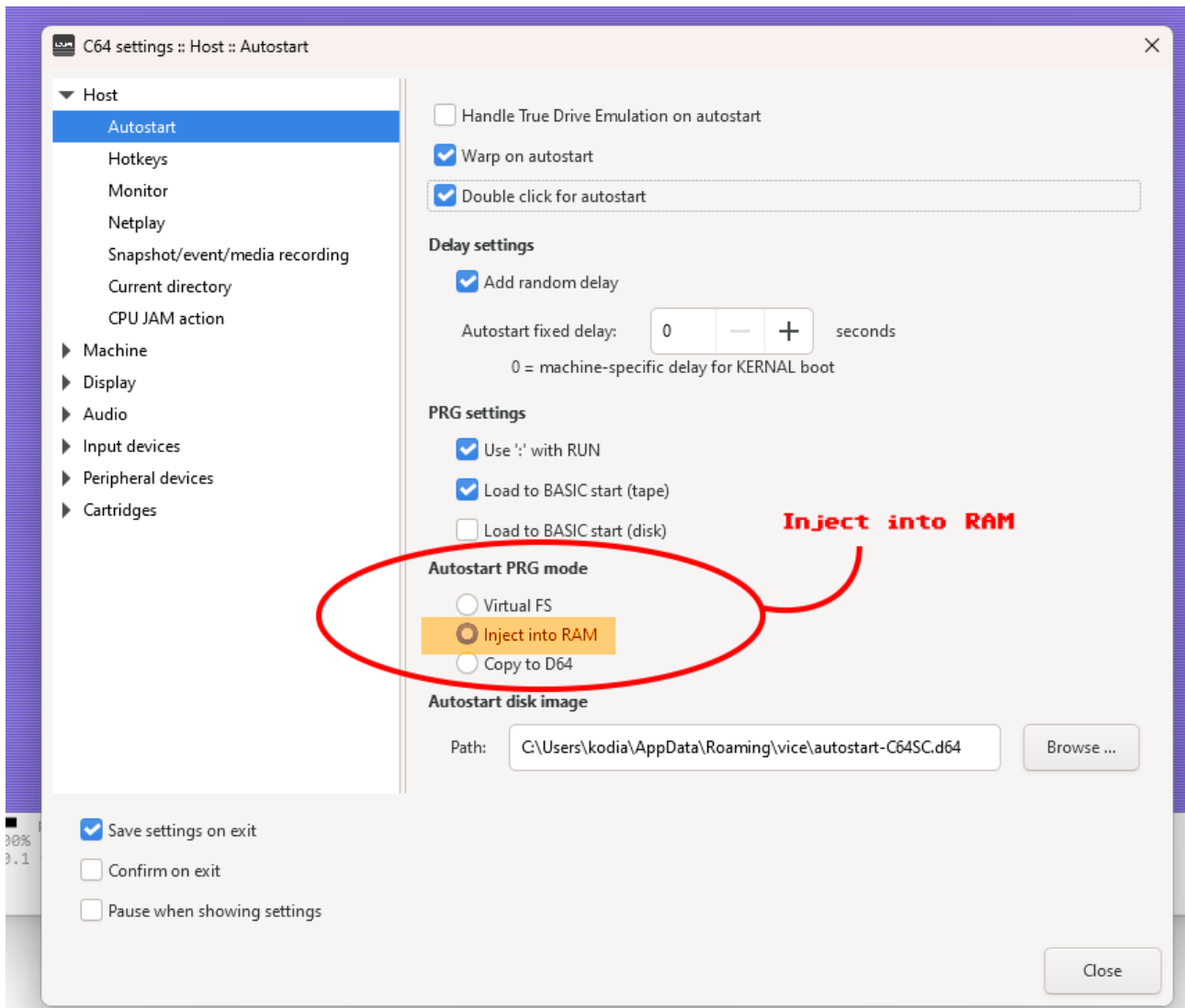
You should ensure VICE's Autostart settings have PRG autostart mode set to **“Inject to RAM”** (or, in newer VICE versions, **“Inject into RAM”**):



The graphics were designed to work in either CRT mode or “Fisher Price” LCD mode, so that is up to you. I like the native VICE colour palette, or any palette than maintains the organic luma of the C64’s colours – you can read more on this at <https://kodiak64.com/blog/luma-driven-graphics-on-c64>

**The SFX will not sound right unless your SID settings on VICE are set to 8580 (ReSID).**

And, last but not least, you should be running the game on VICE in **PAL mode**; the game will not work in NTSC mode.



(In newer versions of VICE, set **Inject into RAM** under **Host > Autostart**, as shown above).

# Gameplay Quick Guide

You control a midget submarine via joystick (left, right and fire) and your mission is to sink as many enemy warships as possible. You don't know who the enemy is or if your commanding officer is sane, but hey, Steven Seagal wrote this screenplay, so...

Using **F1/F2 key** on the title page to select, the game can be played in any one of 4 unique modes:

1. **1 Player Mode**, in which you roll solo.
2. **2 Player Mode**, in which you and a fellow humanoid play at the same time if you, being a C64 nerd, have any friends willing to humour your penchant for retro gaming for an evening. You can either choose a strategy aimed at eliminating the other player (by winning all 3 rounds within any given level) or you can co-operate to see if that gets you further in the game. Personally, I would let them win a few times to suck them in before getting serious about beating them.
3. **Wingman Mode**, which is pretty much the same as 1 Player mode except for the fact you have a loyal wingman drone that sticks by your side and is invulnerable to all that the enemy throws at it. However, if your sub is destroyed, your wingman will self-terminate with you in an act of devoted robotic loyalty.
4. **AI Rival Mode**, in which the second player is a rival submarine that acts totally in its own self-interest seeking firing solutions against enemy ships. You may be able to piggyback your tactics onto its in order to advance through the game (for example, to act as its helper), but watch out for it winning 3 rounds in a row in any given level, as that will spell the end of the game for you. Unlike your sub, however, the AI Rival cannot be eliminated by beating it in all 3 rounds within a level (otherwise the game would revert to 1 Player Mode, which would negate the point of there being an AI sub mode). Therefore, your goal should not be to win 3 rounds in a row within a level to eliminate the AI rival, but rather, to ensure that it does not win 3 in a row and thereby eliminate you.

In all modes, Player 1 is controlled via joystick port 2 and Player 2 via port 1, because there is nothing remotely irrational or contradictory about that.

Your midget submarine can fire torpedoes in **salvos of 4**, meaning there is a brief gap between each salvo before you can fire again. Each level consists of **3 rounds**, and there are **8 levels** in the game, each with their own unique scene.

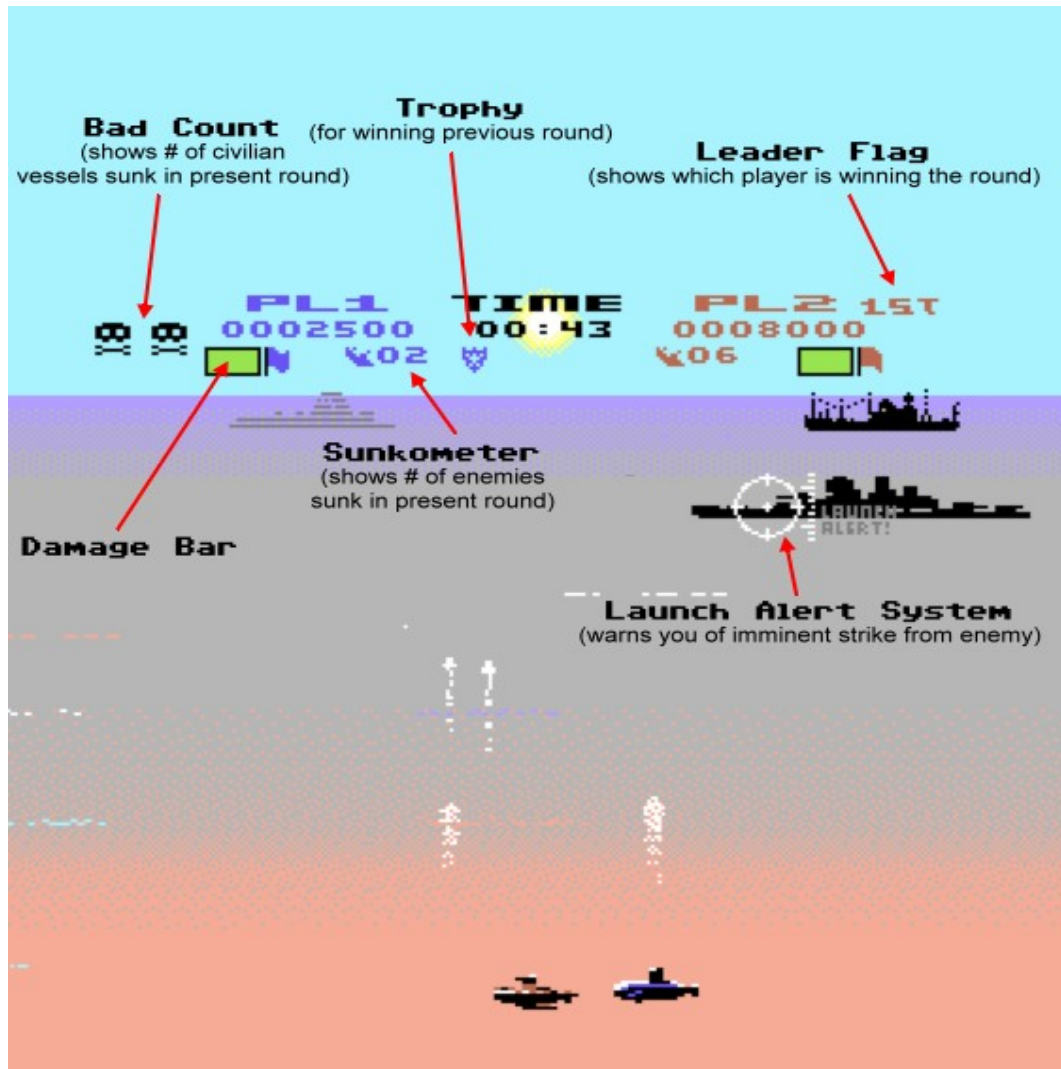
To progress through each round, **THE 3 GOLDEN RULES ARE:**

- **Avoid finishing the round with a flashing "sunkometer".**
- **Sink no more than 3 civilian vessels** (note that whacking an orca counts as destroying a civilian vessel, because when they are not brutally killing seals and other marine creatures themselves, orcas can be quite cute and adorable).
- **Ensure your damage level does not reach zero.** More information on how this might happen is revealed in the **Gameplay Deep Dive**.

Each level is complete when you have survived all 3 of its rounds. *Happy hunting!*

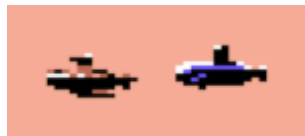
# Gameplay Deep Dive

Okay, you've got the basics squared away and have probably "taken her for a dance" a few times. Now it's time to get serious and flesh things out a little more.



- **Controls are simple:** joystick in port 2 for player 1 (see? not confusing at all!) and in port 1 for player 2. Move left or right as required and press fire to launch a torpedo. **There are additional controls in Wingman Mode** (see below for more details).
- Torpedoes can be fired in salvos of 4, but there is none of the original Seawolf's annoying long countdown for the next salvo to be ready.
- Enemy ships are black, civilian are red (except for the nuclear waste ships which exhibit a pulsing glow).
- The enemy forces are not just sitting ducks; they have learned a lot since the days of the old Seawolf game and, after trying and failing with some polite requests for you to desist, they then escalated with a flurry of firmly worded letters of protest. With that idea also floundering (to their great surprise), they decided to dabble in the innovative concept of *striking back*.

- When your damage level gets very low and the spanner symbol flashes, your speed will be limited and stay thus until you can repair your sub by collecting a repair kit.
- If your damage level falls to zero, your submarine implodes and it is **GAME OVER** for you.
- Likewise, it is **GAME OVER** if you sink more than 3 civilian vessels in any round; each kill of a civilian vessel is indicated by a skull-and-bones beside your score, and when you make 3 such unwanted kills in a round, the skull & bones flash to warn you that you are just one more kill of a civilian vessel away from the game ending for you. However, the skull-and-bones slate is wiped clean at the end of each round.
- In the 2 player competitive modes (i.e. 2 Player Mode or AI Rival Mode), if either player wins 3 rounds in a row within a level, it is **GAME OVER** for the losing player.
- Also note that sinking a civilian vessel (or killing an orca) reduces your kill count of enemy ships on the sunkometer. This could be the difference between winning a round or losing it, and consequently could cost you the game, so be selective with that fire button!
- **Player 1** is the **bluish** submarine, and **Player 2** is **reddish**; hence PL1's score area is denoted by blue and PL2's by red. (**NOTE:** In Wingman Mode, your loyal wingman drone is **yellow**). The AI Rival has its own unique design and has a glow around it, to help you to distinguish it from your own sub in the heat of the action.



- **“Sunkometer”**: This holds the tally of successful kills for each player underneath their score. In the 2 player modes, the player with the most kills at the end of a round wins the round and is awarded with a special shield accordingly; if a player wins all 3 rounds within the level, it is automatically **GAME OVER** for the other player (unless it happens to be the AI Rival who loses all 3 rounds within a level). If both players finish the round with the same number of kills, then no winner is declared for that round. Note that the sunkometer gets reset to zero at the end of each round, so there is no carrying over of kill counts from one round to the next.

**WARNING!** If your Sunkometer remains flashing by the end of a round, it will be **GAME OVER** because you have not met the quota for that round.

- **QUOTAS**: In the one player modes (i.e. 1 Player Mode and Wingman Mode), you must end each round with at least 10 kills recorded on your sunkometer, or it will be **GAME OVER** for you. In the two player modes (i.e. 2 Player Mode and AI Rival Mode), your quota is halved to 5 kills for each round. When your sunkometer stops flashing, you know you are on-quota or above it. And remember, every time you sink a civilian vessel (or kill an orca), your sunkometer's tally is reduced by 1, so don't be fooled by thinking that just because you sunk multiple enemy vessels, you are automatically in the clear! **NOTE:** In 2 Player Mode and in AI Rival Mode, if only one player sub is left, the quota for all ensuing rounds reverts to 10.












- Sinking a **capital ship** (i.e. battlecruiser, SSBN or carrier) adds **EXTRA KILLS** to your sunkometer. So does taking out the submersible or the Kraken. More information on this is contained in the *Enemy Combatants* section of this manual.
- If you (or a rival sub) sink a nuclear waste ship (indicated by your radiation warning detection system making such ships “glow”), the radiation from it temporarily inverts your controls and depletes your sub’s strength. In Wingman Mode, this will have the additional effect of temporarily untethering the Wingman from your lateral movements.
- Damage can be remedied if you collect a repair kit from a helicopter bearing your player colour (blue helicopter for Player 1, red for Player 2, although bear in mind in the IR level of the game, everything is green so that helpful indication is absent). Friendly helicopters appear in most circumstances when there are less than 30 seconds remaining on the timer. Remember, the helicopters are your lifeline, so be sure not to miss a scheduled rendezvous with one! In earlier levels, helicopters arrive in a double visit, but in later levels they appear once in any given round. Also note that they are scheduled for every other round (i.e. they skip a round like so: red, blue, red, blue, red, blue, red, blue, ad infinitum), so pace yourself accordingly.
- Note that you can only collect a repair kit from a helicopter in your own colour; this means that Player 1 cannot collect Player 2’s kit and vice versa.










- In AI Rival Mode, note also that the AI Sub gets special treatment from its helicopter every time its damage levels get too low to compensate for its self-harming tendencies.
- Damage to your sub is caused by:
  1. The shockwave from the battlecruiser's depth charge – the closer you are to it when it explodes, the worse the damage it inflicts.
  2. Contact with any antisubmarine homing mine.
  3. Sinking a nuclear waste vessel (this causes a gradual decline in your damage bar, until the radiation dies off after a few seconds; and, as mentioned before, it also temporarily inverts your controls).
  4. Crashing at high speed into the submersible (which appears in later levels).
  5. Being impacted by the submersible's torpedo, which is an instantly lethal **GAME OVER** event.

# Combatants

The following tables constitute the game's target-rich environment's list of "cast and crew" (summarised on the game's title screen).

<p><b>Stealth warship ("Zumwalt"):</b> These have a shielding-cloaking capability which they activate midway across the screen; if your torpedoes strike a Zumwalt when the shielding is active, they will be unable to damage it and simply appear to pass through it. <i>Who said the Philadelphia Experiment was a myth?</i></p>	 <ul style="list-style-type: none"> <li>• 2000 Points</li> </ul>
<p><b>Battlecruiser:</b> A heavily armoured capital ship that requires multiple hits to sink. They are extremely dangerous because they return fire at you with a devastating depth charge; luckily, you have an automated <i>threat-detection system</i> in your little submarine that alerts you to an imminent strike from the battlecruiser.</p>	 <ul style="list-style-type: none"> <li>• 2500 Points</li> <li>• 5 kills added</li> </ul>
<p><b>SSBN:</b> These capital ships require multiple hits to sink, but they dive to evade your barrage so you have to be sharp to catch them.</p>	 <ul style="list-style-type: none"> <li>• 2500 Points</li> <li>• 4 kills added</li> </ul>
<p><b>Carrier:</b> Like the SSBNs and battlecruisers, these are capital ships and require multiple hits to sink. You can slow them down with initial torpedo strikes, but bear in mind that they will attempt to take evasive action.</p>	 <ul style="list-style-type: none"> <li>• 2500 Points</li> <li>• 4 kills added</li> </ul>
<p><b>Destroyer:</b> Although technically important ships, the enemy's destroyer fleet is in need of an overhaul, as is clear from the smoke they emit from their funnels. They are obviously lower value targets than the armoured vessels mentioned above, and one strike sinks them.</p>	 <ul style="list-style-type: none"> <li>• 1500 Points</li> </ul>
<p><b>Hovercraft:</b> Fast and nimble, these amphibious assault vessels always take "cold feet" and attempt an exit stage left. What should be done to them? <i>You know the drill...</i></p>	 <ul style="list-style-type: none"> <li>• 2000 Points</li> </ul>
<p><b>Spy Ship:</b> They are the reason why the enemy is aware that you are nearby. That is, apart from all your attacks on enemy ships. Your own on-board eavesdropping equipment allows you to listen to their transmissions in Morse Code. <i>No extra points are awarded for figuring out what they are saying (and yes, it is a real message in Morse Code)!</i></p>	 <ul style="list-style-type: none"> <li>• 2000 Points</li> </ul>

<p><b>Tugs Boat:</b> Slow-moving, small enemy vessels. Not exactly primary targets, but worth sinking nonetheless.</p>	 <ul style="list-style-type: none"> <li>• <b>500 Points</b></li> </ul>
<p><b>Patrol Boat:</b> Same observations as with Tug Boat, but being armed, they are worth double the points.</p>	 <ul style="list-style-type: none"> <li>• <b>1000 Points</b></li> </ul>
<p><b>Trimaran:</b> Large littoral patrol vessels, which in reality are “low-hanging fruit” targets, having no armour. They are nimble, however, and tricky to hit.</p>	 <ul style="list-style-type: none"> <li>• <b>1500 Points</b></li> </ul>
<p><b>Ekranoplans:</b> Fast, jet-powered Ground-Effect Vehicles (GEVs), they pose a threat to safety and peace in the sea lanes and appear to be recklessly operated by maniacs on a joyride. Accordingly, there is a 2500 point bounty on their heads.</p>	 <ul style="list-style-type: none"> <li>• <b>2500 Points</b></li> </ul>
<p><b>Orca:</b> Occasionally, you will encounter an orca, which you should kindly allow to swim on past. Killing one results in your sunkometer’s tally being reduced by 1 and a 10 second penalty period in which your motion controls are <b>LOCKED</b>. This leaves you vulnerable to enemy fire and, of course, unable to function fully until the penalty period elapses.</p> 	 <ul style="list-style-type: none"> <li>• <b>Player suspended for 10 seconds</b></li> <li>• <b>1 kill deducted from your tally</b></li> </ul>
<p><b>Kraken:</b> Conversely, a giant mutant <b>Kraken</b>, genetically modified by the enemy forces, also appears in later stages of the game. This creature you should eliminate because, being a mutated weapons-grade giant octopus, it is obviously armed with <b>homing mines</b>.</p> <p><b>NOTE #1:</b> The Kraken, like the Mini Sub and orca, cannot be hit by your torpedoes unless it is on the surface of the water.</p> <p><b>NOTE #2:</b> A Kraken kill is worth 15 on the Sunkometer, but only to the player who fires the final kill shot at it.</p> <p><b>NOTE #3:</b> If you have not killed the Kraken by the end of the round in which it appears, that round continues until you kill it.</p>	 <ul style="list-style-type: none"> <li>• <b>2500 Points</b></li> <li>• <b>15 kills added</b></li> </ul>

**Mini Sub:** An armoured but crude, diesel-powered, steam-punk-style mini submarine will sail into your firing line from time-to-time, and like the Kraken, it too is armed with **homing mines** which it launches if you give it reason to feel threatened. **NOTE:** In the 2 player modes, the player who delivers the final coup de grâce steals all the points and kills!



- **2500 Points**
- **5 kills added**

**Submersible:** In later levels an enemy submersible craft appears and attempts to make sneak attacks with its instantly lethal torpedoes, which are initially at too low a depth to collide with your sub, but which rise as they travel. You must improvise a means of attacking the submersible; note that if you do not manage to destroy it, it will continue its torpedo attacks indefinitely, meaning you should try to destroy it either as soon as possible or as practical to do so.



- **2500 Points**
- **15 kills added**

**NOTE:** Killing the Submersible adds a whopping 15 kills to your sunkometer, but doing so typically takes a heavy toll on your sub's endurance. As before, the player who delivers the killing blow gets all the points and the extra kills.

**Tankers, Ferries and Trawlers:** Benign civilian traffic. Sinking one them results in a skulls-and-bones penalty and the loss of a ship from your sunkometer's tally. If you sink more than 3 in any given round, it's game over, so if you're in the mood for a killing spree, take it out on the enemy vessels.



- **1 kill deducted from your tally**

**NOTE:** Civilian vessels, apart from the radioactive waste ship, are red.

**Nuke Ship:** These are special civilian vessels that carry radioactive waste, so sinking them will badly degrade your sub's damage level and temporarily invert your controls. Thankfully, your sub has a radiation warning system that projects a glow over them.



- **Player controls inverted for 5 seconds**
- **1 kill deducted from your tally**
- **Damage increased during radiation leak**

# Extra Controls for Wingman Mode

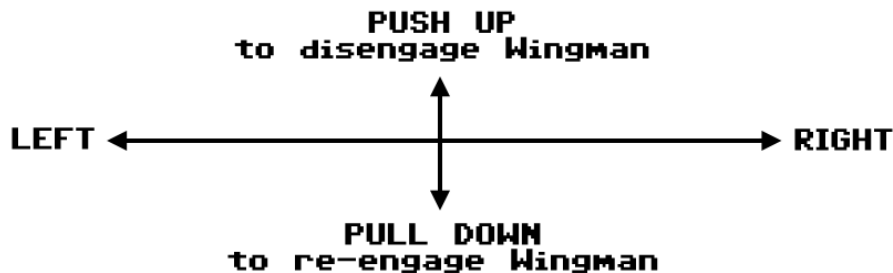
In Wingman Mode you can move and shoot as with all other modes (left, right and fire), and the Wingman drone will tail you and fire when you do.

However, you can also decouple the Wingman by pushing **UP** on the stick as you move. This places the Wingman into IDLE mode, indicated thus:



Conversely, to reactivate the Wingman and call it to return to your side, pull **DOWN** on the stick. Give it a few moments to waken up, and it will home in on you. (Note that once you call it back, the Wingman will be able to fire torpedoes before it reaches your side again).

The easy way to remember the joystick operations is “push away”, “pull back”.



The main purposes of this extra feature in Wingman Mode are:

1. So that you can drop off the Wingman to block incoming homing mines, given that the Wingman is indestructible and your sub is not.
2. To enable you to likewise use the Wingman as an indestructible shield against the lethal torpedo fired by the submersible, but bear in mind that the torpedo will travel under, or graze the underside, of any player sub or Wingman near its launch point, so if you are using the Wingman as a shield in this case, make sure to locate it properly.
3. To let you use it as a ramming weapon against the submersible (oops, I just told you a way to sink that adversary!).
4. So that you can deactivate the Wingman when the extra firepower it brings might cause too much collateral damage (i.e. when there are civilian vessels nearby).

Unfortunately, the Wingman is unable to shield you against the shockwave from the Battlecruiser's depth charge or from the mini mine's blast if you are very close to the Wingman when a mine detonates on contact with it.

Also note that you temporarily lose the tethering effect of the Wingman during depth charge explosions and during radiation leaks from a sunken nuclear waste ship.

# Seawolves Levels

Each level consists of 3 rounds, as stated earlier.

All 3 rounds in a level will share the same basic attack pattern (occasionally with some situation-dependent on-the-fly modifications to said patterns), so it might be helpful to learn those patterns so that you can predict what is coming.

This is in contrast to the original Seawolf type games, in which shipping appeared randomly.

The levels are as follows:

1. Temperate ocean day.
2. Sunset on a dusky bay.
3. Moonlit sea.
4. Icy misty sea.
5. Tropical misty sea.
6. Infra-red night.
7. Cumulus sea.
8. City bay.

**NOTE 1:** In the foggy / misty levels, visibility will be degraded. That is the point, after all, of having such a feature in the game!

**NOTE 2:** In the IR level, normal colour cues are absent as everything is in a shade of green, thereby potentially causing confusion during the 2 player modes. Again, this is a deliberate design decision to keep the game challenging.



# Ways to Play Seawolves

Seawolves can be played a number of different ways within the 4 modes described earlier:

## 1 Player Mode:

- Play with the objective of reaching as far into the various levels as possible.
- Play as a high score chaser.
- Play as a stress-release killing spree.

## 2 Player Mode:

- As with 1 Player Mode's potential approaches above.
- Play as a duel with the other human player, in the hope you can eliminate your fellow humanoid via the three-in-a-row route or by lasting longer against the various things that reduce your sub's energy (damage bar).
- Play as a team with the other human player, with a view to advancing as far as possible together.
- Forget about another human player and roll solo with 2 joysticks!

## Wingman Mode:

- As with 1 Player Mode's potential approaches above. In terms of wholesale stress-release "in-the-zone" destruction, I personally find Wingman Mode particularly cathartic.
- Remember, you can "consciously decouple" the Wingman drone sub by pushing up on the stick, for situations in which you might prefer a less scattergun approach. For example, when there are 3 skull + bones flashing to indicate that you are one careless kill of a civilian vessel away from it being **GAME OVER!**

## AI Rival Mode:

- As with 2 Player Mode above, albeit if your aim is to work with the AI Rival (rather than against it), the AI Rival will not see this as teamwork, so you have to let it do its thing while you try to use that to your advantage to keep up with it and advance through the rounds. Personally, I like to win the first round within a level in this mode (if I can beat the AI Sub!), and then try not to beat it in the other 2, so that we stick together through the rounds.



# Concise Development Notes

This expands on the game's title screen credits.

- **CONCEPT:** As initially proposed by NM156, Seawolves was meant to be a 4 player update on the old Seawolf game, with some marine life thrown in for added interest, and for a while I was coding it along that path. However, it became clear that there would be inadequate CPU time for a 4 player game, and not long after, I aborted the 3 player fallback version for the same reason. Instead, I settled on maximising a 2 player experience and dispensing with the things I disliked about the original Seawolf game (i.e. the drifting sea mines, the long countdown between torpedo salvos, the small number of enemy types and the very linear gameplay). In their place came all the new things you see in the game as it is now, and along the way a number of ideas were tried out or designed only to be aborted (for example: a foreground drifting iceberg, flocks of birds, dolphins, a fishing trawler that catches the player subs in its net, an enemy strike plane, and so on).

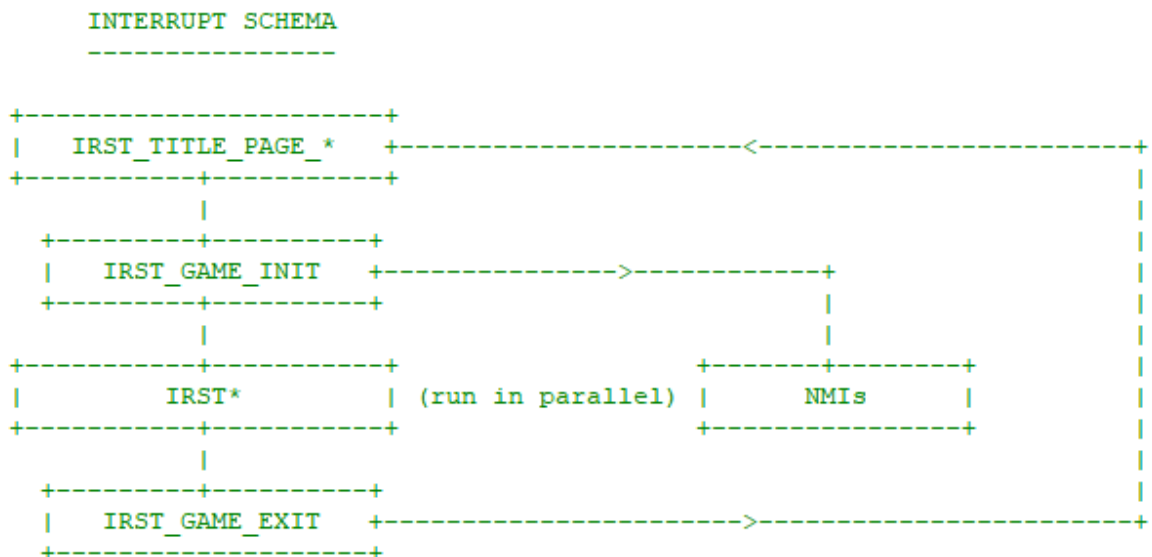
In terms of pacing, the game is similar to 1980s-era arcade machines, with what I hope is a palpable sense of in-the-midst-of-battle chaos, so that you really feel you are in a total scrap when things gets busy on-screen. Nevertheless, despite the intense moments of bedlam that come along, you should still be able to maintain focus on a strategy for advancing.



(Above: development snapshot)

- CODE:** I intended to write the code quickly as a break from Parallaxian (not that I am capable of coding quickly), although the SFX player I developed for Seawolves is also being worked into Parallaxian. Both games use each other's tech to a large degree, which I cover in the Seawolves development book (complete with the game's fully annotated source code), and I am hoping to release that some time in 2024. Like Parallaxian, Seawolves makes extensive use of NMIs running in parallel with IRQs, and details of how to set up NMIs are in the book, along with design philosophy, SFX model, and so on. I wrote all of the code on Notepad++ (which has a nice assembly language formatting feature) and then I compiled it using CBM Prg Studio by Arthur Jordison. And given that the game uses a lot of "illegal" opcodes, I also extensively referred to *No More Secrets* by Groepaz, which is the most important 6502 assembly coding reference beyond CBM's old Programmer's Reference Guide and is a book which I self-amusingly refer to as my "Coding Consigliere". If you want to maximise programming in Assembly Language on the C64, you have to get to grips with the illegal opcodes.

The coding process was, frankly, horrendous. This was largely due to the technical battles I had with (a) the VIC-II chip, in which unusual things with the sprite y-expand feature were performed to produce water warping effects, and (b) with the SID chip and my attempts at interweaving SFX to get round the limitations of having only 3 channels. Combine that with close to 30 timer interrupts cutting into half a dozen IRQs, some of which fire at moveable locations, and you have a recipe for the coding equivalent of herding thousands of cats. Whilst riding a unicycle. In a hurricane. With someone lobbing grenades at you... All-in-all, though it may not seem to be the case upon superficial inspection, this game was only just, by the skin of its teeth, possible on the C64.



- PAL-only:** Although originally planned to be NTSC compatible, it became obvious early on in development that only PAL has the raster time to perform the real-time torpedo rendering and the water warping effects. However, when the source code is released (in the planned e-book of the game's development), I would be happy to

let any competent NTSC coder loose on making a gracefully degraded version for our American cousins.

- **GFX:** A lot more GFX materials were created for the game than ended up being used in it; many things were tried that either worked well, but just did not fit with the game's vibe, or else simply never looked right. John "Hend" Henderson (whose game *The Wild Wood* I have also worked on) designed the orca and kraken animations, along with lots of other things that didn't make the final cut of the game, including some amazing sea mine designs that I wanted to add to the title screen, but which in the end had to be sacrificed due to the RAM shortage (you know RAM is an issue when you resort to using the spare bytes in sprite data as variables!). Perhaps they will reappear in a *Seawolves 2* (which I discuss the concepts for in the book). Many of the visual effects in the game are rendered in real time, i.e., they do not use predefined graphics data. Examples of this are the implosion effect when the player submarines "die", or the ocean wave effects, the water distortion effects, the animation of the ships' radars, etc., and of course, the player torpedo effect. Details of how these effects were achieved are covered in the planned development book.
- **SFX:** To enhance the sense of frantic battle at sea, the explosion sound effects had to have an echo / tremolo quality, which is a tricky task with SID chip. I also wanted the option for some SFX to use 2 channels at once, or if demand is too high at the moment of request, the ability to degrade down to a 1 channel version of the effect (this is the case with the sonar SFX). Accordingly, a bespoke SFX player was made for the game, with a view to it being transplanted into Parallaxian also, but given that the SID chip only has 3 channels, some SFX switch between channels during the effect (for example the helicopter sound effect does this with 2 channels and the torpedo sound effect with all 3), depending on which channel (if any) is free at the point of request. So, for example, on "chop" of the helicopter's rotors might use CH2 and the next one might use CH3. Music was written for the game by CRISPS, and for a long time appeared in the technical test-beds, but in the end I had to sacrifice it due to RAM constraints in this digital edition. It may make a comeback in the planned cartridge release, however.
- **PLAY-TESTING:** A very special thanks to the *Seawolves* play-testers, as well as advice, suggestions and feedback from my contacts in Germany, France, England, Australia, the US and Canada.
- **MORE THANK YOU MESSAGES TO:** Thanks to Oziphantom for tips several years ago on using the NMI, to Lasse Oorni for his "rants" online and for his technical advice on SID and I/O, to Padua and Artstate for their friendly greets, to Louie Dimovki of Retro Gamer Nation for his feedback, to all who always believed in me and who kindly donated to me via PayPal, Ko-fi and by other means (and especially the person who single-handedly salvaged Parallaxian's Kickstarter), and of course, a huge thank you to my little flock just for existing. Above all, I acknowledge and thank God for giving me the gumption to make this game... on many occasions in its very difficult and obstacle-strewn development, I really had to pray my way around a problem.

# Homages

Just for the curious, here is a list of homages / nods / winks within Seawolves:

- **Edge of Disgrace:** The transitional effects on the title screen are a nod to the opening moments in my favourite demo, *Edge of Disgrace* by Booze Design.
- **The Last Truckstop 3:** The water ripple effect on Seawolves' title logo is partially modelled on the water effect in the first "flip disk" screen on *The Last Truckstop 3* by Fairlight.
- **Subway (the sandwich company):** The green and yellow hues of the Subway logo inspired the Seawolves logo's colours. *Is Seawolves the first C64 game to pay homage to Subway Sandwiches?*
- **Fortnite:** Fortnite's game's logo strongly influenced the Seawolves logo, even though I have never played Fortnite and do not know what it is about.
- **Dropzone and Stealth (Broderbund):** The title screen displays of those games heavily inspired the Seawolves counterpart, which is a very 1980s stylistic motif.
- **Creatures:** One of the explosion designs in *Creatures* is loosely but very consciously referenced in the explosions when you sink a small ship.
- **Creatures 2:** Clyde's potion pickup effect is referenced in the "wobble sub" effect when you collect a repair kit dropped by the helicopter.
- **Beach Head:** The battleship scene, in which the player fires at enemy ships, is mirrored / reversed in Seawolves where it is the enemy's battlecruisers firing at you.
- **Luftrauzers:** Its water splashes inspired those in Seawolves.
- **Ecco the Dolphin:** The shimmering foreground waves / ripple effect was inspired by, and loosely modelled on, the interlude / get ready screen in *Ecco the Dolphin*, not that I have ever played that game, but I did study some YouTube videos of it.
- **Broforce:** I may be stretching it to call this a homage, but the Seawolves helicopter design was derived from the end-of-level chunky chopper design in *Broforce*.
- **Parallaxian:** The black silhouetted hi-res sprites have their immediate inspiration from elements of my "big" game, *Parallaxian*, which in turn took certain design cues from the Art Deco silhouettes of the animated Batman series (I am betraying the fascinations of my youth here!)

# Proposed Extras (Cartridge)

I would like to add the following extras for the proposed C64 cartridge version of Seawolves:

- Additional sound effects.
- High score table on the title screen (the digital edition has insufficient memory left for this).
- Title screen music (the digital edition has insufficient memory left for this).
- The option of in-game music.
- The option of paddle controls, assuming the extra controls for Wingman Mode can be accommodated.
- Enhanced AI for the rival sub.
- Extra combatants, especially in the foreground.
- Additional marine life.
- 2 extra levels.
- Alternative enemy shipping patterns.

I also have the crazy notion that a native C128 version, on cartridge, might be viable on a limited edition release, but would like to hear from the scene about that... it might be a really bad idea!

# Seawolves Development E-book

I am also writing an e-book called *Seawolves Development Notes*, which is ideally suited for C64 game developers due to its technical content.

It features the following highlights:

1. Gameplay philosophy.
2. Graphics philosophy, including implementation of real-time visual effects.
3. Sound effects philosophy and technical implementation.
4. Game technology overview, including how to set up NMIs.
5. Complete source code (fully annotated). There are over 30,000 lines of code, making this impractical to release in a hard copy format.

Meanwhile, if you have not yet visited my website and checked out my blog, you can do so at:

[www.kodiak64.com](http://www.kodiak64.com)

There are technical articles for coders as well as more generic blog posts concerning my C64 projects.

