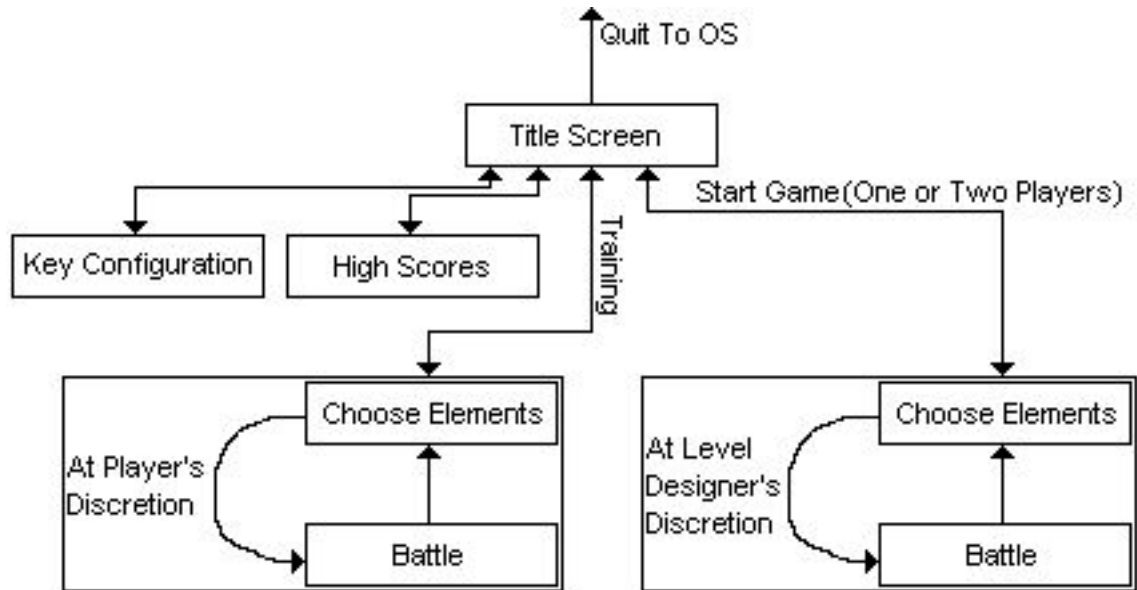


High Concept: Choose several magical abilities to help you survive a perilous flight fraught with danger.

1 Game Shell



Every state in the Game Shell (with the exception of Battle) is navigated by manipulating graphical buttons. The functionality of each state is also accessed by manipulating graphical buttons. Graphical buttons can be manipulated with the mouse (mouse-overing and clicking) and by the keyboard (using Movement buttons to highlight a button and an Element button to invoke its functionality).

The Title Screen displays the game logo, team logo and game credits. Title Theme is played.

Key Configuration allows the player to map any keyboard or joystick button to Movement directions or Elements. Menu Music is played.

High Scores displays the names and scores of players who hold high scores. Menu music is played.

Training allows the player to play a simple level where (s)he is invincible and may choose a new set of Elements at any time. The level is populated with a few flying enemies that move and shoot slowly and predictably, and are respawned when they are killed. Menu music is played.

Choose Elements allows the player to select four Elements, one for each Element Button, from the set of sixteen Elements. Menu music is played.

Battle denotes the game proper, as detailed in THAT SECTION (Jared, how do I do section stuff?).

2 Battle

2.1 Gameplay

Players try to fly through and survive the challenges the level designers have concocted – but whether that means blasting everything in sight, gracefully avoiding all harm, or getting up close and personal for melee combat is up to the player. All of these approaches and more are available – it all depends on which Elements the player elects to equip at the outset of a level. One or two players can fly onscreen at once.

The action unfolds on a 2D plane (the monitor’s screen) as the world scrolls by, in full 3D, according to the wishes of the level designers. Once begun, the game inexorably progresses from beginning to end. The player must survive the threats placed by the level designers, with periodic opportunities (also placed by the level designers) to choose a new set of four Elements for the next stretch of gameplay. At each one of these “Choose Elements” opportunities, some hints are given as to what kind of challenges are on the horizon.

Players can move in the eight cardinal directions using four digital Movement keys. Each Element is mapped to a digital button. When an Element’s button is depressed for the first time, the player’s ship undergoes a rapid transformation to that Element’s form. Some Elements have abilities that are invoked by tapping that Element’s button. Others have abilities that are invoked by holding the Element’s button for a period of time and then releasing it, and still others have abilities that are constantly active for as long as the player’s ship maintains that Element’s form (ie does not depress any other Element’s button).

Both the player ships and the enemy ships have a certain amount of health that is decreased when they are struck by harmful objects. When a ship’s health is completely depleted, that ship is destroyed.

Both the player ships and the enemy ships have a certain amount of mass that influences how they are affected by physical forces.

Unlike many games of this ilk, enemy ships can collide with one another (possibly hurting each other if such collision is damaging; for example a collision between two enemies covered in sharp blades), enemy projectiles

can collide with other enemies (making it possible for enemies to shoot one another if they are not careful), and, when two players are present, the player ships can also collide with one another (possibly causing harm to one another if, for instance, one player is actively using the Technology Buzz-Saw ability). Shots fired by one player, however, will never adversely affect the other player.

Players are given a number of "extra lives" to complete the game. When two players work together, they share these "extra lives" in their joint effort to survive to the end. When the finale of the game is reached the game concludes in victory, and the player is returned to the Title Screen. If one (or both) players are destroyed and have no remaining lives, the game finishes in defeat, and the player is returned to the Title Screen.

Score is accrued by performing well in the game.

2.2 HUD

The current score, current health, Level Timer, and number of lives for player one (and, if applicable, player two) are superimposed over the view of the gameworld.

3 Elements

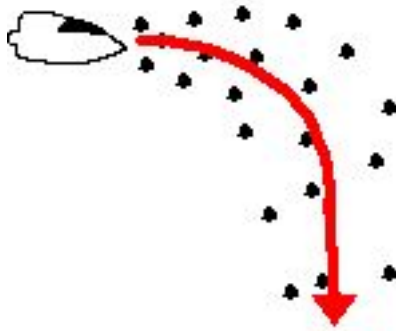
The player ship has the same amount of health regardless of form, but each form has a different mass.

Earth (Shotgun): Press and hold the button to charge. When released, the player fires a spread of rocks that are affected by gravity. The number of rocks and their initial forward velocities are proportional to the charge time. Rocks damage enemies that they strike.

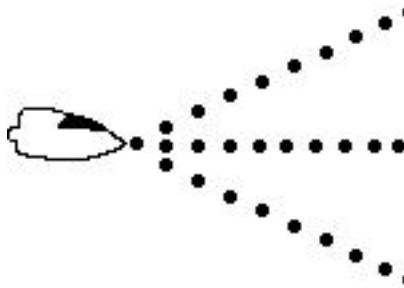
Short Charge



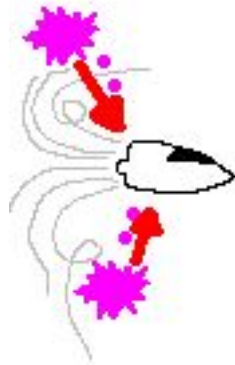
Long Charge



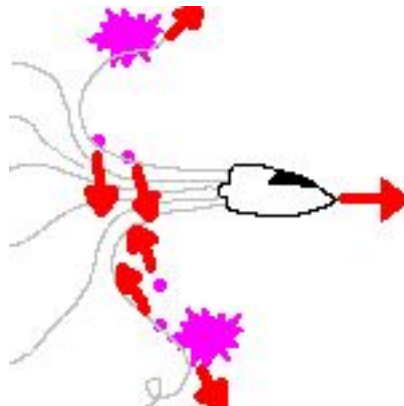
Fire (Spread Shot): Fires flaming projectiles in three or more directions. Press the button to fire once; hold the button to fire continuously.



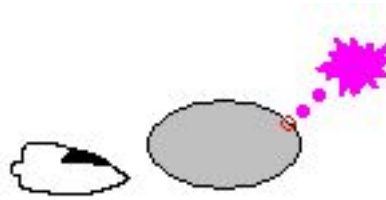
Air (Slipstream): So long as the player remains in the Air Element, the ship drops a quickly dissipating trail of attractive fields that become stronger as the ship moves faster, causing both light enemies and projectiles to "sling" behind the ship as it flies past them.



(Afterburn): As long as the button is pressed, the player has a higher than normal acceleration and maximum velocity.



Water (Bubble Shield): Press and hold the button to charge. When the button is first pressed a shield, for but a moment, surrounds and protects the player. When the button is released, a bubble is set on the play field at the player's current position. As projectiles collide with it, the bubble takes damage. When the bubble's health is gone, it is destroyed. The bubble's initial health is dependent on charge time. The bubble collides with enemy projectiles but does not collide with players. No consensus on collisions with player projectiles or enemies.



Chaos (Chaos Bat): While the button is not depressed, the bat is stored at its upper extent.



When the button is pressed, the bat quickly swings all the way around the ship until it reaches its greatest extent.

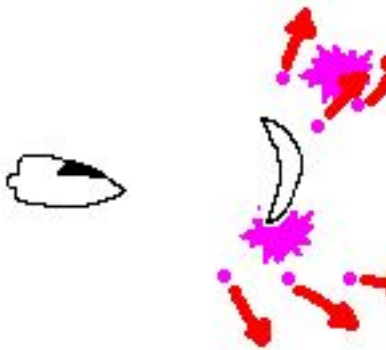


When the button is released it quickly swings back to its upper extent. While swinging, any enemies that the bat collides with are dealt damage, and are imparted with some velocity.

Order (Wavefront): Press and hold the button to charge. When the button is released a pressure wave is launched across the screen.



As the wave goes across the screen it will deflect projectiles that it collides with, losing an amount of health dependent on the power of the projectile. The initial health of the wave is proportional to charge time.

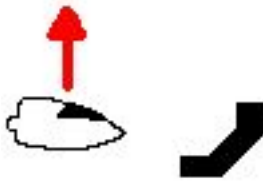


The wave also loses health by traversing the screen. When the wave hits an enemy, the enemy is buffeted and dealt a small amount of damage proportional to the health of the wave that hit it.

Light (Guided Laser): Press the button to fire a laser.



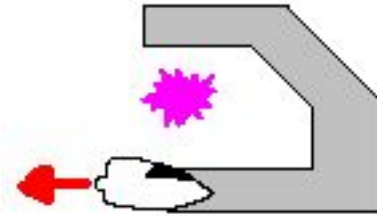
As long as the button is held down, whenever the player moves the laser will change direction to move in that direction.



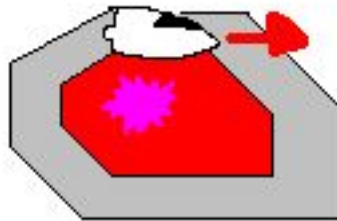
When the button is released, the laser will continue to move in whatever direction it was last going.



Void (Void Trail): So long as the player remains in the Void Element, a black trail follows behind the player. Any enemies that touch the trail are dealt damage.



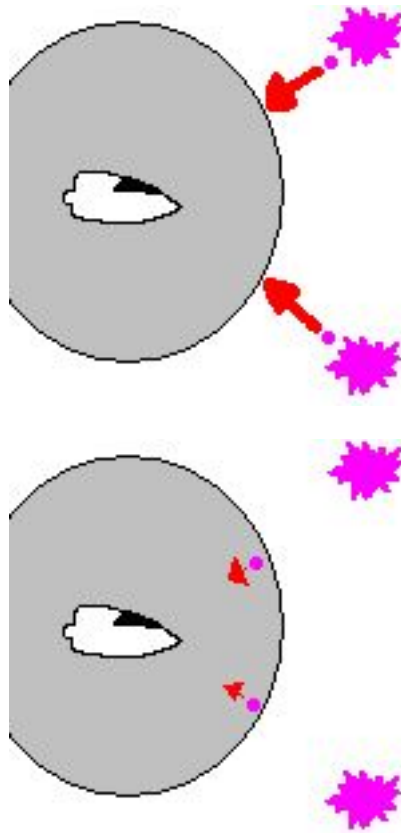
If the trail is enclosed, the enclosed area becomes void and any enemies within take a significant amount of damage.



The end of the trail, once closed, disappears.

(Booster): As long as the button is pressed, the player's velocity is set to a value higher than the player's usual maximum velocity.

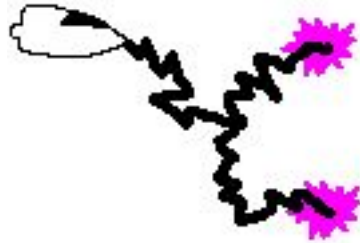
Time (Slow-Time Bubble): So long as the player remains in the Time Element, all game objects (except players) within the Bubble are slowed down.



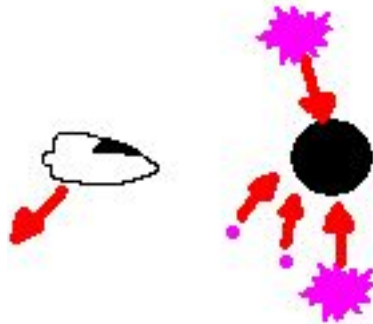
Electricity (Chain Lightning): Press and hold the button to charge. When the button is released, a lightning bolt leaps from the player ship to the closest enemy.



If the lightning bolt kills the first enemy it struck, it then leaps to the next nearest enemy. If multiple enemies are the same distance away, the lightning is split evenly between them.



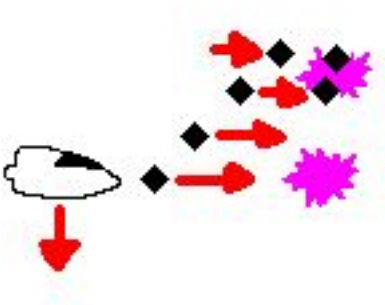
Gravity (Gravity Bomb): Press and hold the button to charge. When the button is released, a gravity bomb is placed on the play field. This gravity bomb exerts an attractive force on enemies and projectiles.



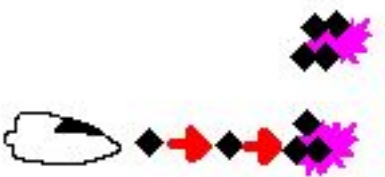
There are two options being considered for the placement of gravity bomb:

1. As the player charges the bomb, enemies are pulled towards the player. When the button is released the bomb is then shot away from the player, stopping when it hits something, or reaches some specified distance.
2. When the button is released, the bomb is placed at the player's current position.

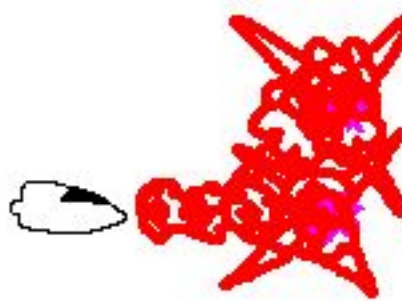
Crystal (Explosive Shards): Press and hold the button to fire a stream of explosives.



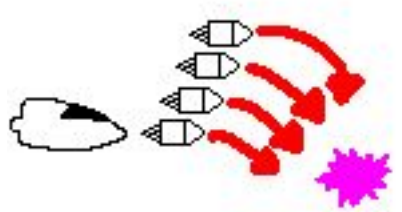
These explosives stick to enemies.



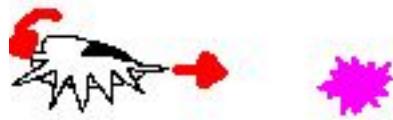
When the button is released, all explosives then detonate causing small explosions. Any two explosions near one another cause both explosions to grow larger.



Spirit (Homing Volley): Press and hold the button to charge. When the button is released, a number of missiles (proportional to charge time) are launched that track and pursue targets.



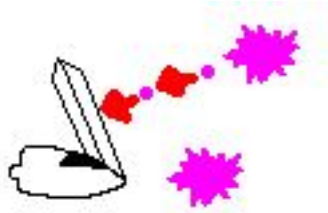
Technology (Buzz-Kill): So long as the player remains in the Technology Element, the player becomes a rotating buzz-saw. Press and hold the button to rev the buzz-saw to a higher rotational velocity.



The longer the player holds the button, the faster the buzz-saw rotates and the more damage it will deal. The faster the buzz-saw is spinning, the less acceleration the player has in directions not in the line of the saw blade (thus, the faster and more deadly the buzz-saw, the faster the player travels in his current direction but the more difficult it is to move in a new direction).



Metal (Shining Sword): While the button is released, the sword is stored at its upper extent. While held in the upper extent position the sword can deflect shots that strike it.



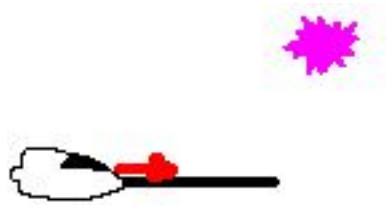
When the button is pressed, the sword quickly swings down to the bottom of the ship until it reaches its lowest extent.



While at its lowest extent the sword can also deflect shots. When the button

is released the sword quickly swings back to its upper extent. While the sword is swinging, any enemies that it collides with are dealt damage.

Wood (Grabby Vine): When the button is pressed a vine is shot outward, away from the player's current direction of movement.



As long as the button is held down, the vine continues to stretch away from the player's current direction of movement.



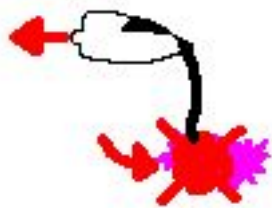


When the vine hits an enemy it becomes a weighted rope that moves around the screen based on the player's movement and the struggling of the ensnared enemy.





When the ensnared enemy hits another enemy, damage is dealt to both enemies. Similarly, if the ensnared enemy hits other harmful things, it takes damage.



When the button is released, the ensnared enemy ship is released and the vine is quickly retracted.

4 Enemies

Enemies each have a certain amount of health, a certain amount of mass, and one or more weakpoints where they will take damage if they are struck by something harmful.

4.1 AI Motion Styles

All enemies have an AI Motion Style.

Path-Bounded: The enemy is restricted to move along a specified spline and may not deviate. The spline has an associated direction that the enemy moves in. The spline is defined by the level designer while building a given level.

Path-Bounded with Perturbation The same as Path-Bounded, except that the enemy may make small perturbations to its path (so as to dodge projectiles, for example).

Area-Bounded: The enemy is confined to a convex, polygonal area defined in local coordinates once it appears onscreen. The enemy may move freely within this area of the screen, but may not leave. Multiple enemies may be restricted to the same area, but no polygonal area is allowed to overlap the splines of path-bounded enemies.

Fixed Local Space: The enemy is fixed at a location on the screen. The enemy does not move and will persist until destroyed.

Fixed World space: The enemy is fixed at a location on the level. The enemy will enter on the forward side of the screen and scroll to the other side at the scrolling speed of the level.

Affected By Gravity: The enemy is free to move as it chooses, but is affected by gravity. Therefore, such enemies are basically restricted to a distance away from the ground equal to the maximum height of their jumping ability, if any.

4.2 Movement Style

Any enemy that does not have a Fixed AI Motion Style has a Movement Style.

Linear Set Velocity: The enemy moves by setting its linear velocity to the direction and speed that it intends on moving.

Linear Acceleration: The enemy changes its movement by adding a vector in the direction it wishes to move to its current direction of travel.

Rotational Set Velocity: The enemy rotates by setting its rotational velocity to the direction and speed that it intends to rotate at.

Rotational Acceleration: The enemy changes its rotation by adding a rotational vector in the direction it wishes to rotate to its current direction of rotation.

4.3 Shields

Enemies can have one or more shields. Every shield exists on some arc around a ship. This arc can be anything from a complete circle to an arc of zero.

Absorption: When a projectile hits the shield the projectile is destroyed and the damage from the projectile is ignored.

Charge with a Special Attack: When a projectile hits the shield the projectile is destroyed and the damage the projectile would have dealt makes the shield more powerful. After gaining some amount of power, or when specified by the shield bearer, the shield performs some action (such as firing a powerful projectile).

Bumper: When a projectile hits the shield, the projectile is destroyed and the damage the projectile would have dealt is converted into kinetic energy that is applied to the shield bearer.





If the shield bearer collides with another ship along the shields arc some amount of kinetic energy is imparted to both the shield bearer and the struck ship.





Deflection: The path of the projectile is deflected away from the shield as it approaches the shield. The force exerted on the projectile is dependent on the shield. Projectiles will not collide with Deflection shields but instead pass through it – potentially striking the shield bearer.





Reflection: When a projectile hits the Reflection shield, the projectile's path is reflected about some vector determined by the shield, much like the Shining Sword.

Damaging: Projectiles do not collide with a Damaging shield – they instead pass through it and hit the shield bearer. If the shield bearer collides with another ship along the shield's arc, some amount of damage is done to the ship that was struck.

Degrades with Damage: When a harmful object strikes a shield that Degrades with Damage, the harmful object is dealt damage, and the damage the harmful object would have dealt is applied to the shield and the shield bearer based on the current effectiveness of the shield. As the shield becomes damaged, its effectiveness decreases.

4.4 Weapons

Enemies can have one or more weapons.

4.4.1 Weapon Characteristics

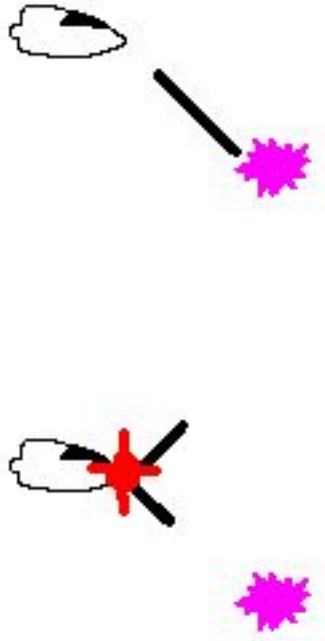
Firing Arc: Similar to shield arcs, firing arcs define a range of directions in which the ship is allowed to fire. This range of directions may be only one single direction.

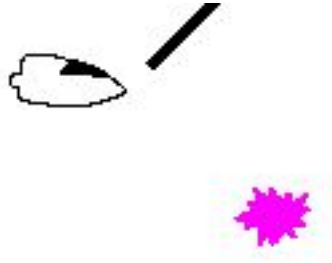
Damage: Damage can include a variety of effects including health reduction, stat reduction (lower acceleration speed, for instance) or locking an element so the player can't use it.

4.4.2 Weapon Listing

Player Elements: All enemies can be equipped with a player Element.

Bouncy Laser: A projectile that, when striking a target, will deal some amount of damage and then reflect off in a well-defined way.





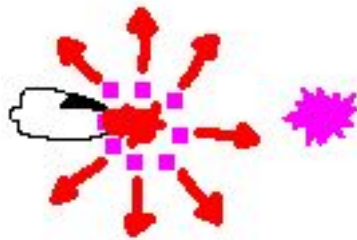
Non-intelligent Missile: A projectile that once fired continues in a straight line until it strikes something on the screen or goes off the screen.

Grenade: A projectile that once created becomes affected by gravity. The initial velocity the projectile is created with determines the path it will take.

Event On Death: When the enemy is destroyed, it will do something – anything supported by the engine (i.e. a gravity well, an explosion, more enemies are spawned at that location, etc).

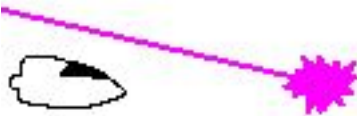
Fragmentation Projectile: Can be either a non-intelligent missile or a grenade. After some period of time, or upon striking something, the projectile will explode and generate a group of non-intelligent missiles or grenades.





Force Perturbation Attack: An enemy can exert a force on another ship or projectile.

Rail Gun: The enemy fires a beam across the entire screen that deals damage to the first thing that it hits.





Grappling Hook: The enemy can shoot the Grappling Hook, which, in flight, acts as either a non-intelligent missile or a grenade. When the Grappling Hook hits something it creates a rope or rod between the firing ship and the ship that was struck. The physics of this would be similar to the player's Grabby Vine.

Stabbing Melee Weapon: The enemy can attack with a short-range melee weapon. Similar to the player Swinging Sword or Chaos Bat, except that it attacks in one direction at a time, extending from the attacker towards the defender, instead of being swung.

Healing: Restores health to another ship. The vector for this could take the form of an actual projectile that must strike a ship to heal it, or all ships a certain distance from the healing ship are healed, or other methods could be implemented.

Teleportation: The enemy teleports to another location on the screen. This could be at the enemy's behest or it could occur as a player-influenced trigger (i.e. if the enemy is about to be hit by a projectile). The enemy could reappear in a random placement on the screen, or the enemy could wilfully select its destination position.

Targeting Intersection Lasers (TIL): This weapon is only effective when several enemies, each equipped with a TIL, are onscreen at once, operating as a group. It behaves as a railgun, except that the beam passes through all obstacles, and: 1) When all the TILs of a group of enemies simultaneously intersect a ship, that ship takes large quantities of damage. 2) When any two TILs simultaneously intersect a ship, that ship takes damage.

Floating mines A Fragmentation Projectile that can be placed and fixed to a point in local space or world space.

4.5 AI Behaviors

Enemies can have one or more of the following elements to their behavior:

Maintain Distance: The AI will attempt to maneuver itself so as to keep its distance from a target (such as the player).

Avoidance: The AI will try to maneuver itself so as to avoid colliding with other objects such as players, projectiles, other enemies, and terrain.

Teamwork: The AI attempts to maneuver itself so as to create a formation with other enemies, allowing for strategies such as surrounding the player.

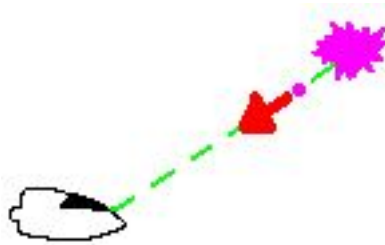
Hive Mind: A single AI that controls multiple ships, such as the Swarmers.

Defending a Dynamic Target: The AI will try to prevent damage to a particular target.

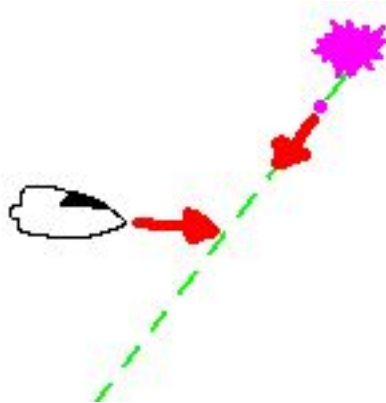
4.5.1 Targeting Style

Targeting Style is the method that the AI uses to govern its movement and targeting habits. An enemy with a projectile weapon but no Targeting Style is furnished with some predetermined shooting pattern that it mechanically repeats.

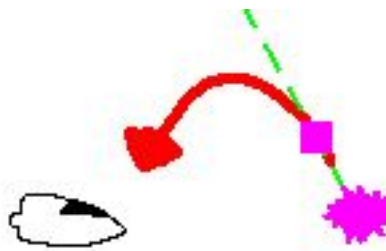
Vector targeting consists of shooting on a direct line from the AI's position to the target's current location.



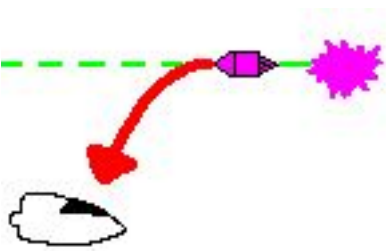
Lead targeting allows the AI to take into consideration its own movement, the target's movement, and/or the speed of its projectile.



Lobbed targeting allows the AI to aim appropriately when firing projectiles that are affected by gravity.



Homing targeting allows the AI to take into account shooting projectiles that have non-deterministic paths.



4.5.2 Mentality

Mentality is a range of play styles that defines the aggressiveness of the AI. One extreme is the kamikaze Mentality (where the enemy is completely uncaring of its own well being) to the coward Mentality (where the enemy will attempt to save itself above all else).

5 Level Design

The camera has six degrees of freedom – it can follow an arbitrary 3D path through the world, at an arbitrary velocity, acceleration, rotational velocity and rotational acceleration.

Enemies can be created and placed throughout a level, based on camera position.

Any segment of a level that requires one or more enemies to be dispatched before the player may continue has an associated Level Timer set by the level designer to an arbitrary time. The Level Timer counts down, and when it reaches zero, the enemies are dispatched in some way, allowing the player to proceed even if (s)he elected to take no offensive Elements.

Collidable areas (such as walls and ceilings) are areas that no object can pass through. Some collidable areas (such as spikes) cause damage to objects that intersect it.

Triggers can be defined (such as the tripping of a tripwire, the pressing of a button, or the destruction of an enemy) that activate some other event (such as the spawning of new enemies, a jailbreak of freed prisoners, or any other event supported by engine).

The playing of arbitrary sounds, and the displaying of arbitrary 2D graphics or text on the HUD are also available to level designers.

6 Art Requirements

6.1 Presentation

GAME takes place in a world of 19th century technology infused with a healthy dose of magical sorcery. Mechanical engineering is firmly in the steam age, giving rise to wind-powered graineries, waterwheel generated household electricity, steam-driven trains and coal-powered machines of war. At the same time, sorcery is often used to augment the otherwise mundane capabilities of the indigenous civilization, providing magical flight, combat

shields of pure energy, ensorcelled cannons of mass destruction, and thau-maturgic medieval weaponry.

Dragons, phoenixes, hydras, griffons, unicorns, gargoyles and other, even more fantastic creatures are entirely at home in GAME, and are sometimes harnessed as beasts of burden or steeds of battle. However, the countryside is still largely dominated by the indigenous civilization's elegant, minimalistic architecture – simple, functional buildings made of metal, brick and wood. The more mundane sights of the indigineous civilization are generally simplified versions of what actually existed in the 19th century – nothing flashy or complex. By comparison, the magical elements of the world are, almost without exception, dazzling, transparent, reflective – flashy and impressive.

The good guys generally consist of biomorphic, curvilinear, legato forms, with smooth color gradients from light brown to light green. Some bad guys have warped and twisted variants on the good guys' forms, whereas other bad guys have staccato, mathematical forms, with harsh contrast in color schemes.

PolyCount (abortive)
64 bullets/sec * 4 sec = 256 bullets for enemy
64 bullets/sec * 4 sec = 256 bullets for player
512 bullets*12 polys = 6144 polys
500 poly player ship
6644 polys

6.2 Asset Requirements

6.2.1 Game Shell Art

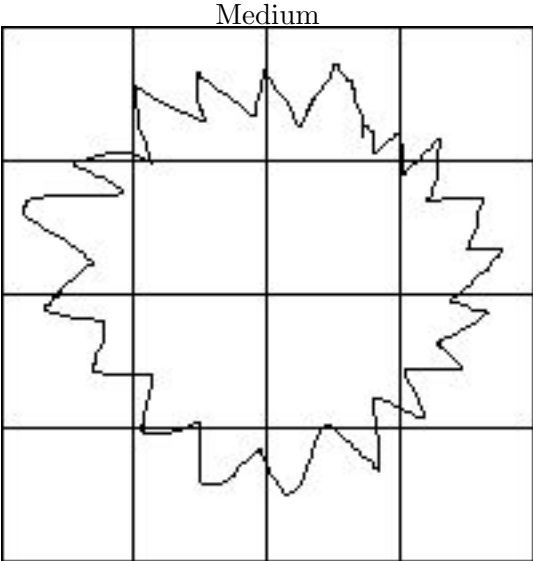
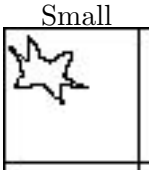
1. Team logo
2. Game logo
3. Background Screen
4. Element Icons
5. Font
6. Button Graphic
7. Hey Austin, do you want to do the menu graphics?

6.2.2 In Game Art

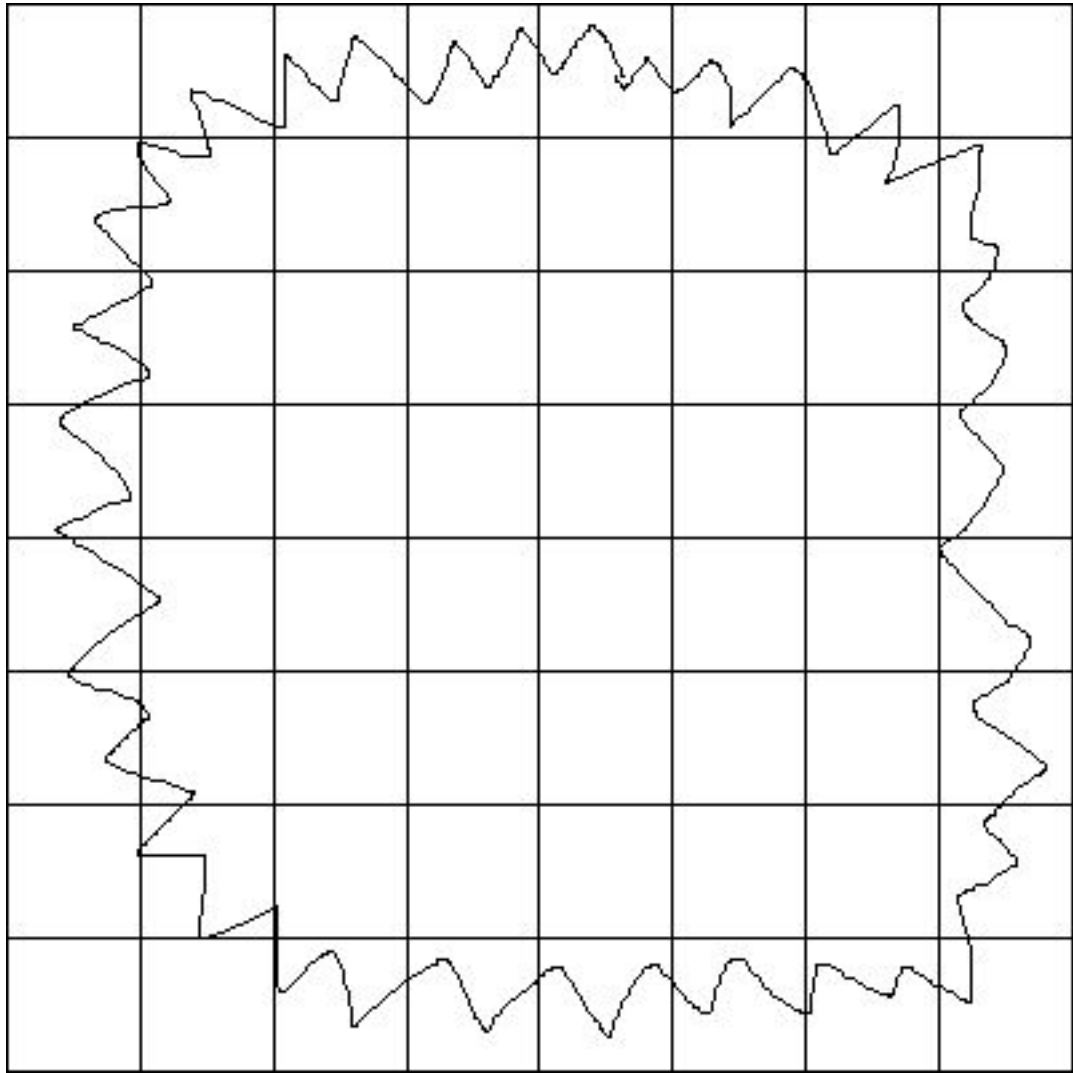
Diagrams are to scale.

ASSUMING THAT WE CAN "PALETTE-SWAP" TEXTUREMAPS...

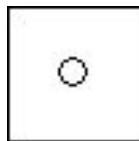
Explosions (small, medium, large)



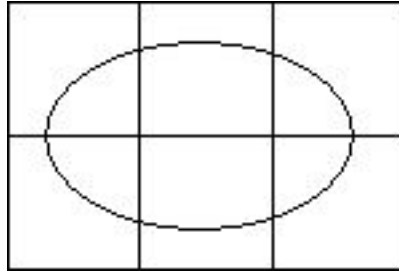
Large



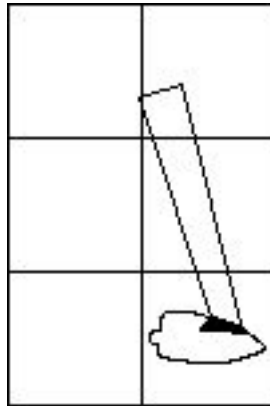
Enemy Circular Bullet Small Rocks Fiery Bullets



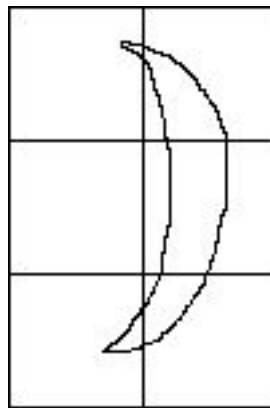
Water Shield



Chaos Bat



Order Forceful Wavefront

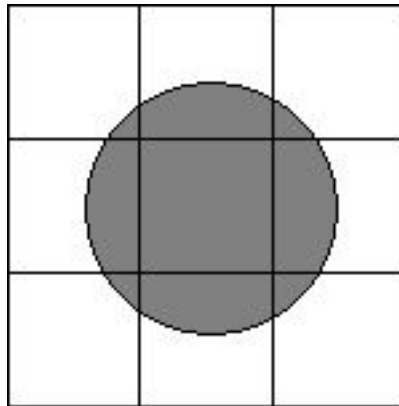


I think that these should be procedural, not art asset based:

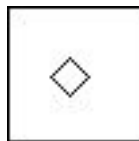
1. Snaking Laserbeam
2. Whirling Slipstream

3. Rail Beam
4. Perturbation Attack
5. Teleportation Effect
6. Healing Effect
7. Fireworks
8. Void Trail
9. Void Vortex
10. Time Bubble
11. Chain Lightning
12. Gravity Charging
13. Arc Shield
14. Grappling Hook
15. Tripwire

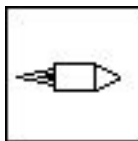
Gravity Bomb Black Hole



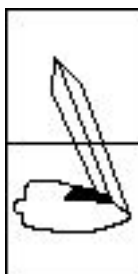
Crystal Explosive



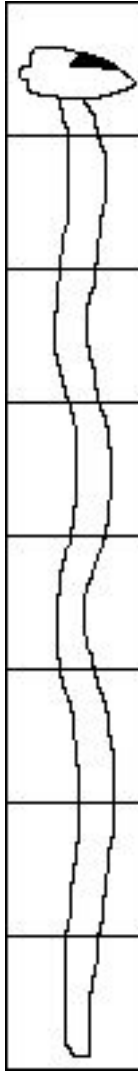
Spirit Homing Missile



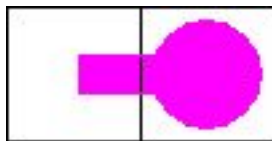
Metal Shining Sword



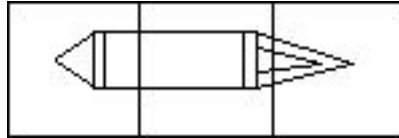
Wood Grabby Vine



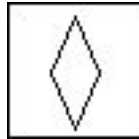
Turret with 360 rotational capability



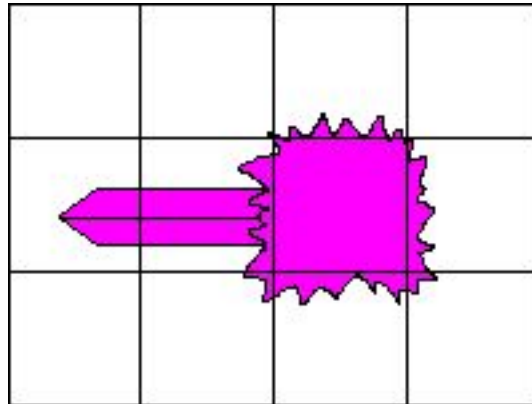
Missile (Regular)



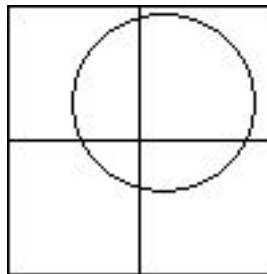
Grenade



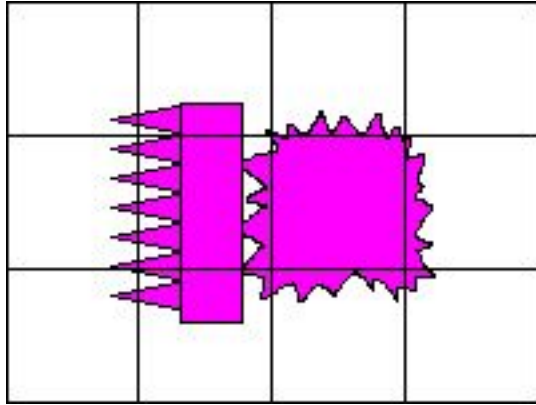
Stabbing Melee Weapon



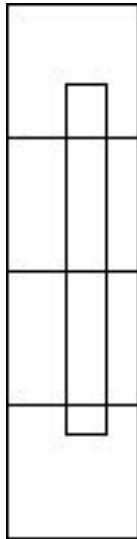
Floating Mine



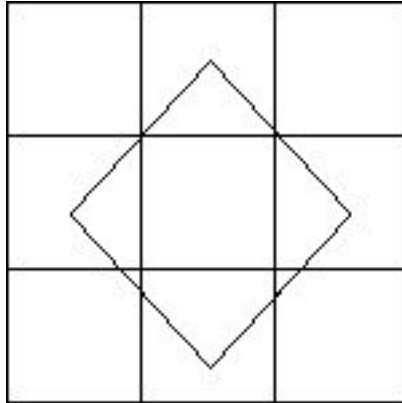
Spikey Shield



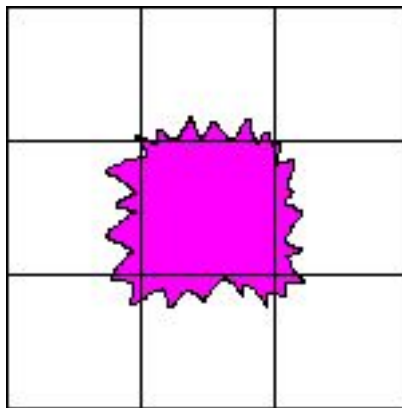
Mirror



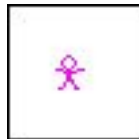
Swarmier Hive



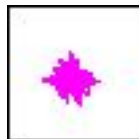
Joe Enemy



Soldier (stand, shoot, run, jump, climb, duck & cover)



Swarmer Enemy



Boss Enemies (NOT REQUIRED AT FIRST, EH?)

1. Rockship (rock outside, molten rock inside)
2. Huge Hand Burrowing Enemy
3. Huge Melee Weapon Guy (with axe and visible "shieldable" weak-points)
4. Suck'n'Blow Enemy With Big Spiked Maw
5. Giant Crab (pincers) or Giant Hydra Enemy (heads)
6. Fatty Pushback Enemy
7. Subway Enemy

Player in all 16 Elements



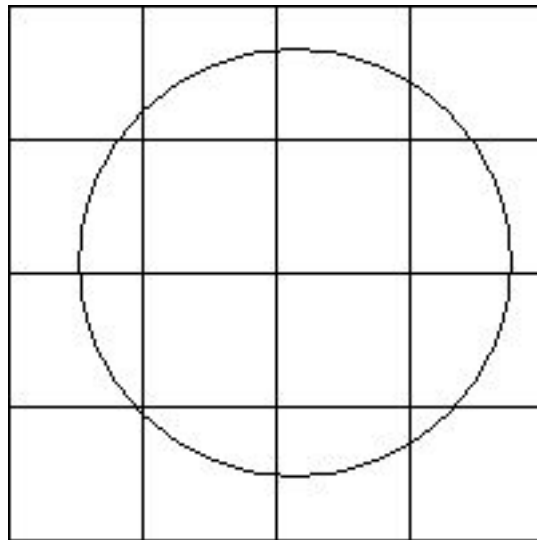
Skybox

HOW ARE WE GONNA DO FLEXIBLE TERRAIN, HUH?

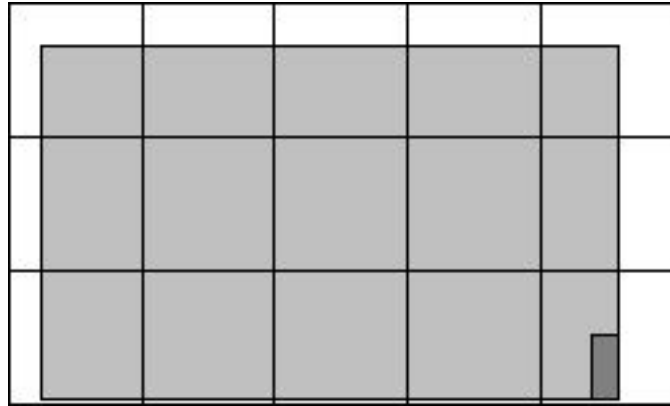
Tileable harmless ground

Tileable harmful ground

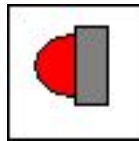
Important Stationary Object



Building with Door



Big Red Button



7 Sound Requirements

sound effects

music