Shiva Game Design Document

Project 1 - Phase 4

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# Section I: Game Overview

## 1.1: Concept

Shiva is a turn-based strategy game set in a post-apocalyptic Earth, overrun by mysterious aliens. In it, the last surviving members of humanity are in a bitter fight to the end, as they attempt to maintain a colony to protect them against the forces of nature, as well as the new foreign inhabitants of the planet. The colony, controlled by the player, must explore the surrounding land to gather resources, more survivors, and weapons to defend themselves from an ever-increasing alien horde hellbent on eliminating humanity’s last hope.

## 1.2: Feature Set

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Shiva blends resource management and strategy into a turn-based experience. It allows players to explore a new world each time, as the game board is randomly generated each time. No two games of Shiva will play the same, given its random generation, resource systems to promote careful decision making, as well as its research system, granting bonuses to various aspects of play, but in limited amounts. It also features an alien cast which will continually offer challenges, with multiple types and abilities players will need to work around to ensure their survival.

## 1.3: Genre

Shiva’s genre is turn-based strategy. In addition, it has a heavy focus on careful resource management and is set in a top-down perspective.

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## 1.4: Target Audience

Shiva’s target audience is those interested in turn-based strategy games (such as the Civilization series) as well as those interested in survival games, and games with an alien setting. We expect Shiva’s target audience to be players within teenage years but also millennials who’ve grown up with survival horror media (An expected age range would be 15-30 years of age).

## 1.5: Game Flow Summary

A game of Shiva will begin in a similar way, starting out with a small number of units to explore the immediate surrounding area. Once players find resources, they will eventually also run into aliens, and depending on their location and elements of the map, the player must prepare defenses to keep them at bay or eliminate them. As a game of Shiva progresses, players continue to find more resources so long as they continue to explore, and they continue to develop new advantages through research. However, the aliens also progress. Alien nests spawn continually through the game and serve as a constant threat. More dangerous alien types also begin to appear as time goes on, forcing further adaptation, or leading to the player’s eventual demise. The game will always end with the player failing to protect their colony due to some reason, either a lack of resources or being overrun by the aliens, with the goal being to hold out as long as possible.

## 1.6: Look and Feel

Shiva’s look and feel are intended to correlate to one of its main mechanics: the fact that the player’s eventual death is inevitable. Since the goal is purely to survive as long as possible, we feel the game is better suited for a grittier and grim feel to it. The game’s name is inspired by Shiva, the Hindu god of destruction, and the name also applied to the aliens of the game. The aliens are going to be constant threats of destruction, and the game will convey that feeling through mechanics like resources (or a lack of them thereof), via their game mechanics, and their appearance.

## 1.7: Project Scope

The project scope as a whole encompasses a turn-based strategy game with a randomly generated game board, where the goal is for the player to survive as long as possible with increasingly dangerous alien threats. The game also encompasses resource systems and research systems to enhance decision making and provide more restrictions (thus creating more strategy in each decision). Finally, the game scope includes a cast of alien threats that act differently from each other and have unique resistances and designs, to force the player to constantly be looking for more ways to survive.

# Section II: Gameplay

## 2.1: Game Progression

The game’s progression starts out with the player having a limited pool of resources and units. The player is given only 1 civilian and 1 soldier unit, and enough food resources to allow them to survive for a couple starting turns. In the early game, players must use their units to explore the land around them or collect more food resources to keep their colony alive. As they explore the land around them, they may find landmarks that can grant them more resources, including weapons or fuel, or other advantages, such as faster research, more units, or information on nearby threats. As the player progresses into the mid-game, they’ll begin to become more aware of the alien threats around them and be encouraged to destroy alien nests to prevent being swarmed by enemies. They will also unlock more bonuses from the research system, allowing them to have stronger units and more options for defense. The end game’s progression will always involve the aliens becoming increasingly more dominant until the player’s defenses crumble and are unable to keep them at bay, and aliens swarm the city. Alternatively, increased alien presence prevents the player from obtaining valuable resources, such as food, and that resource scarcity ends the game by starving the player of the tools they need to survive.

## 2.2: Mission/Challenge Structure

Shiva’s challenge is found in its increasingly difficult enemies. As the game progresses, not only do nests appear more rapidly, but enemy types become much more dangerous. Flying enemies that ignore some defenses become more common, and Siege enemies, whose sole purpose is to destroy defenses, barricades, and the main colony, become more prevalent. This combined with increased nest appearance will make it increasingly hard to remove nests and enemies from the board to the point where it is no longer possible to do so, thus ending the game.

## 2.3: Objectives

Although Shiva’s most direct objective is to survive as long as possible, there are multiple side missions and goals that are important in the game as well.

The first of these is exploration. In order to survive as long as possible in Shiva, players will need to know their surroundings and gather resources from them. Knowing the map around the colony is also important, allowing players to find alien nests, find natural defenses (mountains, rivers, lakes, etc) and place defenses as needed.

The second side objective is destroying alien nests. In Shiva, players can destroy enemy spawn points by applying proper combat resources (weapons and soldiers) to do so. Although nests will always be spawning around the map, destroying one will reduce the pressure on defending from that region, granting the player the ability to apply defenses and resources to other areas of the map.

## 2.4: Game Flow

The game flow of Shiva is mostly described like so:

1. The player explores the area around them, finding resources, threats, and revealing the map.
2. The player combats the threats they find using the resources they obtain. They continue to keep their colony alive by also using those resources.
3. The player upgrades the tools they have via research. Enemies also upgrade, finding new locations to attack from, and becoming increasingly more difficult to combat.

This loop of play will continue until the player is unable to either combat the threats they find or keep their colony alive, as they have run out of resources.

The game is turn-based. Each turn, the player will complete all their actions (moving units, creating resources, researching, etc.) and then the computer will take its turn, moving the aliens and generating new spawn points.

As the player explores the map, tiles go from being clouded to visible. Any units within 3 tiles of fogged tiles will cause those tiles to become visible. Figures 1 and 2 show an example of this feature. The player starts off in their home base with only their immediate surroundings being visible (Figure 1). As the player sends units around the map, more tiles become visible. Once the player is able to see important tiles, such as ones containing battlefields or alien spawn pods (Figure 2), they can interact with those tiles.



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# Section III: Mechanics

## 3.1: Movement

Every turn, the player will be able to select each of their units and move them. Each unit will have a certain amount of tiles they can move each turn. Units that can move are assigned a ‘Movement’ attribute, which holds a number corresponding to the maximum number of tiles the unit can move. Civilians can move a maximum of 3 tiles per turn and have a movement of 3, while soldiers can move a maximum of 5 tiles per turn and have a movement of 5. After the player clicks on the unit they wish to move, the player clicks a tile that unit can move to, and the unit will move accordingly. If the unit has not yet moved a total of their maximum movement, then the player may move the unit again until the maximum movement has been reached. For example, if the player moves a soldier 1 tile away from their original location, then the player may choose to move that soldier again up to 4 tiles away from their new location.

If the player places unit(s) in a vehicle, then the player may choose to move that vehicle. Each vehicle also has maximum movement. A bus has a movement of 5 and can carry up to 8 units at a time, a car has a movement of 7 and can carry up to 4 units at a time, and a savitr has a movement of 9 and can carry 1 unit at a time. A savitr is an alien vehicle the player can either find or access through research points (Figure 3). 

During alien waves, the aliens will have a chance to automatically move. They do not have a tile limit, unlike the player’s movement. Aliens will keep moving until they are killed or stopped. Aliens will have different speeds at which they move. There are three speed levels: slow, mid-speed, and fast.

## 3.2: Objects and Actions

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Tiles on the map will contain objects that may be interacted with. Each object will have a UI that appears when clicked on showing the object’s attributes and what you may do with that object. For example, Figure 4 shows a turret placed on a tile. When clicked on, it displays the object’s name, health, and status. It also contains buttons for the actions that may be performed on this tile. Currently this includes repair and populate for the turret in Figure 5. Repair would assign a unit to repair the object to regain health. Populate assigns a unit to man the tile. In this case it assigns a unit to take control of the turret and fire it at incoming aliens.

The home town will also be considered an object. This will be able to show the player how many units are currently living there and what tasks are being prioritized. The player can send more units to the home base to aid in tasks such as research development, farming, or repair. 

Units will be objects when exploring the map. The player may click on them to give them orders. Units can only survive with adequate food. Clicking a unit will let you see how much food they have, and the player can give them more food if they have some available. The player mainly uses the units to interact with other objects on the map such as vehicles, terrain, defences, or alien spawn pods. 

Vehicles simply aid player movement and don’t otherwise interact with the world, though aliens may target and destroy them.

Terrain may sometimes be interacted with by units. Some terrain, like battlefields, may be moved to and explored. After exploring the terrain the object will give the player certain resources (Figure 6). Some terrain are objects meant to get in the player’s way, such as lakes. The player cannot interact with these objects and cannot move units to the tile. The possible terrain can be seen in Figure 6 and includes:

* Cities - Interactive tile that can contain recruitable units and any resource.
* Battlefields - Interactive tile that can contain research points, weapons, or fuel can be recovered.
* Landing sites - Interactive tile that can contain research points
* Forests - Non-interactive tile where entering the tile spends 2 movement.
* Lakes/Water - Non-interactive tiles that only flying/hover units can pass.
* Mountains - Non-interactive tile where entering the tile spends 3 movement.
* Plains - Base tile that the player can always move to normally, but provides no resources.

Broken defences can be found by the player while exploring the map. The player can repair and move these defences. Defences can also be bought and placed using research points. These defences each have unique characteristics and mechanics. Possible defences include:

* Turret - Shoot units from 2 tiles away, including flying units (Figure 7).
  + Manual Turret - Fast firing, medium damage turret that requires a soldier unit assigned to it in order to attack aliens.
  + Manual Alien Burst Cannon - Slow firing, high damage cannon that requires a soldier unit assigned to it in order to attack aliens.
  + Automatic Alien Laser - Medium damage laser rifle that does not require a unit assigned to it to attack aliens.
* Traps - Slow down and destroy enemy units on the same tile (Figure 8).
  + Barbwire - Halves enemy speed, however disappears after slowing down 8 enemies.
  + Hidden Explosive - Deals large damage to any enemies on the tile
  + Harvester - Consume an enemy and turn them into resources. Has a 3-second cooldown between uses.
  + Motion sensor sentry - Underground sentry that appears when an enemy is on the same tile as it. Enemies will only target it when it is above ground.
* Walls - Cause a tile to become uncrossable by ground units (Figure 8).

Alien spawn pods will randomly appear around the map. During alien waves, these spawn pods will spawn aliens to attack the player. If the player finds these spawn pods on the map they may destroy them to lighten the load of the next wave.

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## 3.3: Combat

The primary combat occurs during an alien wave, which occurs after the player finishes their turn. Aliens spawn from the alien spawn pods around the map and attack the player. There are multiple types of aliens for the player to defend against. Concept art for these units can be seen in Figure 9. These include:

* Rudra - Mid-speed base melee unit. These can attack anything on adjacent tiles. These are the most common enemies.
* Agni - Fast, high damage melee units that prioritize vehicles.
* Indra - Mid-speed, medium damage ranged unit. Indra can attack anything 2 tiles away from itself. Can shoot over traps and lakes.
* Shak - Slow firing, high damage ranged cannon unit. Slow, but they can attack anything 3 tiles away from itself. They prioritize the player’s turrets.
* Vima - Mid-speed flying melee unit. Vima can fly over traps and water.
* Trimurti - Slow moving, high damage siege unit that will only head towards the home base and ignore everything else in its path.

Whenever a defensive unit or alien unit identifies a target and begins attacking, then they will continue to attack at their predetermined interval until the target is destroyed. A unit can be attacking something while being attacked at the same time. During the wave phase everything is moving and attacking based off its internal mechanics and AI.

The player may assign soldiers to defend a given area. These soldiers may move within 2 tiles of their starting location during the alien wave. Soldiers will move on their own during this phase to target and attack nearby aliens. Soldiers can be given weapons to use to attack enemies. These weapons include:

* Pistols - Slow firing, but can target anything within 2 tiles.
* Machine Guns - Fast firing with a range of only 1 tile.
* Alien Lasers - Fast firing with a range of 2 tiles.
* Alien rockets - Slow firing with high damage, but can only attack enemies exactly 2 tiles away.

## 3.4: Economy

The game’s economy centers around three resources: research points, food, and fuel.

Research points can be found by exploring the world, dedicating units to research at the home base, or defeating enemies. Gaining research points allows the player to either craft new defences, weapons, and vehicles or upgrade existing ones. Turrets can have their health, damage, range, and attack speed upgraded. Weapons can have their damage and attack speed upgraded. Vehicles can have their health and range upgraded. Traps each have unique parts of their mechanics that can be upgraded.

* Barbwire: The amount they slow down enemies, and the amount of enemies slowed down before disappearing can be upgraded.
* Hidden Explosive: The damage and range of the explosion can be upgraded.
* Harvester - The amount of enemies consumed before recharging and the amount of resources collected from each enemy can be upgraded.
* Motion sensor sentry - Health, damage, range, and attack speed can be upgraded.

Food can be grown in the hometown and found by exploring the world. Units need food in order to survive, and if there is not enough food for a unit in a round then that unit will die. The player can click on either a unit on the map or the hometown to give them food. Each object can only store a certain amount of food, and if the unit dies then the food they are carrying disappears.

Fuel can be found from exploring the map. Whenever the player uses a vehicle to transport units, the vehicle uses fuel. The player can give vehicles fuel, and if the vehicle does not have any fuel then the player cannot use it.

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# Section IV: Screen Flow

Figure 10 shows an example screen flow diagram for Shiva. Upon launch, the player will be shown a main menu screen. This will let the player view the tutorial, start the game, change the difficulty, or exit the application.

If the player chooses to see the tutorial, and example round of the game will start being played by the computer, that the player can watch. Text dialogs will appear to tell the player what is happening and why. There will be an exit button on screen for the player to go back to the start menu at any point. 

If the player starts the game, they will be taken to the game’s map. This is where the player will spend most of their time. It will be a single scene where the player has a limited view of the area. The player can use the arrow keys or WASD to pan their camera around the map. The UI on screen will be changing as events occur and the round progress.

During the game, the user will be able to click the escape button to open the escape menu. This menu will let the player change the current difficulty of the game, or exit to the main menu.

When the player loses they are brought to a game over screen. After clicking any button, a popup will appear asking if the player wants to exit. If they do, the game will close. If they choose no, then they will be brought back to the main menu.

# Section V: Options

Shiva plans to provide the player with the option to change the game’s difficulty. There will be three difficulties available to the player: easy, medium, and hard. Easy mode will have the slowest increase in the amount of enemies, while hard mode will have the fastest increase in the amount of enemies. In harder difficulties, the player will have to strategize more on how to best manage their resources to be prepared for incoming waves.

# Section VI: Story, Setting, and Character

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## 6.1: Backstory

Before Shiva occurs, Earth was attacked and overrun by groups of savage aliens, who crash landed onto the planet, and began destroying human settlements. As the aliens expanded, there were more and more battlegrounds between the remaining human armies, resistance forces, and the aliens. These battles culminated in humanity’s overall defeat, with the last known surviving human colony trapped on an island surrounded by ocean. Although aliens on the island begin fairly dormant, as soon as they become aware of the colony’s presence, they begin attacking, threatening the human race’s last chance at survival.

## 6.2: Game Progression

As you play the game, discover new features, or fight off aliens, there is a potential for a popup to appear on the player’s screen, giving a small amount of thematic lore relation to the player’s actions via text. This will help build background lore and develop the game’s world without needing to tell a direct story.

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# Section VII: Game World

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## 7.1: Look and Feel

The game will be styled in pixel art, but the overall feel the game has is a grim one. Since the player controls a group of survivors which will inevitably fall victim to hostile threats, the game conveys grim feeling intertwined with facing the unknown, due to threats from hostile and very foreign aliens. Aliens are designed in ways that make them appear less humanoid and therefore more unknown, creating feelings of mystery a bit of horror.

## 7.2: Description

The game world is set in a post-apocalyptic Earth. Mankind is no longer the dominant force on the planet, so much so that the colony the player controls is the last remaining group of humanity on Earth. Aliens roam the planet, searching out civilizations to destroy, creating more nests across the planet as they consume more and more life. Additionally, the game’s specific setting is an island. The game is surrounded by water (to give the board a finite distance, as well as confine the player and make them feel trapped).

## 7.3: Physical Characteristics

The island the game takes place on has a variety of terrain. It features forests, open plains, rivers, and more mountainous regions as well. It also features city ruins, past alien battlegrounds, and alien landing sites to explore. The island is overrun by aliens who continually create nests as they move across the board. The main colony is always formed in the center of the island.

## 7.4: Levels and Connections

The game features just one level, though since it randomly generates itself each attempt, it plays differently each time. However, the level always has some consistent designs. First, the colony is always placed in the center-most tile of the map. Additionally, the spaces immediately around it are always open plains. After that, the island is always surrounded by water tiles which the player cannot cross via any method. The island also always features the same number of “landmark” spaces (Cities, Landing Sites, and Battlegrounds) to prevent one run from having more resources available than another.

## 7.5: Puzzles and Problems

The world has two main problems: First, the aliens which roam the planet. The player must find a way to combat them without losing all their resources or their colony. Aliens can also impede progress, preventing the player from obtaining new resources or research to improve their defenses.

The second problem is resource scarcity. Given that there are a finite amount of most resources, or creation of them is time-consuming, the player must carefully manage resources so they do not run out of supplies and then be destroyed by the aliens.

## 7.6: Objects

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The Objects in the game world are Terrain Tiles, Aliens, and Allied Units. Terrain Tiles include natural terrain, spaces with landmarks, spaces with nests, and the colony the player defends.

Aliens include all alien objects. These objects move and attack player-created units, defenses, vehicles, and traps.

Allied Units include civilian and soldier units, which can be put to use by the player to explore the board, create resources, defeat aliens, remove nests, and build defenses.

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# Section VIII: Interface

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## 8.1: Visual System

The game plays from a top-down perspective overlooking the game board, with a HUD displaying crucial information at all times overlaying the view of the game board. The camera viewing the board can also be moved at any time to any location.

## 8.2: HUD

The HUD will overlay viewing the game board at all times. The player will be able to see how much of each resource they have, how many units they have, how much research they have, and the health of the colony at all times. Additionally, the player will be able to open the research menu from the HUD by clicking at it, as long as it is their turn. Finally, the hud has a button which the player clicks to end their turn, and allows the computer to play the aliens’ turn.

## 8.3: Menus

The game’s most important menu is its research menu. From there, the player will be able to spend research to upgrade units or systems.

## 8.4: Camera

The camera angles from a top-down perspective. The player is able to move the camera to center on any position of the game board via the arrow keys.

## 8.5: Lighting

Unexplored tiles will be covered in pitch-black fog which prevents the player from seeing them. Once explored, the player will be able to see the tile at all times, and it will be fully brightened at all times (there is no “vision” mechanic which darkens the tile if it's not being looked at).

## 8.6: Control System

The player controls the camera via the arrow keys. They can click on units to move them to other spaces, provide them with resources, and make them fight enemies. The player can also use the mouse to open the resource tree and end their turn when finished.

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# Section IX: Artificial Intelligence

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## 9.1: Enemy AI

Enemy aliens will have their AI developed primarily around selecting targets. Upon spawning, the aliens will all initially have the player’s home base as their target, and start heading towards it. Aliens will only choose another target once that target becomes within the sight-range of the alien. Each alien will be able to ‘see’ player resources within a certain amount of tiles of itself. If there are multiple player resources within the alien’s sightline it will either choose the closest target, or decide based off the alien type’s innate prioritization settings. Once a target has been chosen, the alien will take the shortest route to that target. If there is an object in the way of the alien’s path, such as a lake tile or wall, then they will take the shortest route around the obstacle. If a higher priority target appears within the sightline of the alien on the way to its current target, then the alien will change course to the higher priority target.

Here are the details of each alien unit:

* Rudra - These melee units have a sight range of 4 tiles. They will attack whatever is closest to them. Once they are 1 tile away from their target, they will begin their attack sequence.
* Agni - These fast, high damage melee units have a sight range of 6 tiles. They will prioritize attacking vehicles. If there is a vehicle within sight range of the unit, they will set their course to the vehicle, otherwise they will attack whatever is closest to them. Once they are 1 tile away from their target they will begin their attack sequence.
* Indra - These ranged units act similarly to Rudra. They have a sight line of 4 tiles and will attack whatever is closest to them. Once they are within 2 tiles from their target, they will begin their attack sequence.
* Shak - These high damage ranged units have a sight line of 5 tiles, and prioritize the player’s turrets. If there is a turret within sight range of the unit, they will set their course to the turret, otherwise they will attack whatever is closest to them. Once they are within 3 tiles from their target they will begin their attack sequence.
* Trimurti - These slow siege units do not have a sight range. They will head straight towards the player’s home base and never prioritize anything else. Once the unit is 1 tile away from the base, it will begin its attack sequence.

If the alien destroys its target and does not have another target within it’s sight range, it will default back to targeting the home base.

The same pathing AI will likely be used for all moving units. Every unit will have a target tile, and want to take the shortest route to that tile.

## 9.2: Friendly Non-Combat Characters

The only non-combat units that would require some form of AI are civilians and vehicles. Both are simply moving around the map, so they just need pathing AI. They will take the shortest route to the tile the player selects as their target. If the unit becomes under attack, they will not be able to defend.

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## 9.3: Friendly Combat Characters

There are three types of friendly combat units to consider: Soldiers, turrets, and traps.

Soldiers will act similarly to alien units. During waves, each tile with soldiers will have a sight line of 3 tiles. When an alien comes within the sight line of the soldier, soldiers can move up to 2 tiles away from their starting position in order to get within firing range of the alien. Once they are within firing range of the alien (Firing range of soldiers is dependent on the weapon they are holding… See Section 3.4) then the soldier will begin its attack sequence.

Turrets will have a sight range equivalent to their attack range. Turrets can not move, so instead they will simply attack whatever is closest to them and within their attack range.

Traps will only activate when an enemy steps on the same tile as them. Each trap has unique properties to its attack sequence, but they will all follow the same AI routine of waiting until the enemy is on top of them to activate.

# Section X: Game Art

## 10.1: Style Guides

The game’s art will be top down and pixelated. We will be doing our own sprites for this project, as we have prior experience with sprite art. Example art of creature and game concepts can be found earlier in the document, on the pages relevant to their individual topics.

## 10.2: Characters

Characters, such as allied and enemy units, will have a pixel image instead of being presented as top down. This is to help distinguish between enemy types, and make the game more clear for the player. There will be sprite designs to also help convey which direction objects are moving or facing.

## 10.3: Environments

Environments will be textured using distinct colors so that there is a way to easily distinguish between different types of tiles at a quick glance.

## 10.4: Equipment

We will be using Game Maker 2’s in engine sprite editor as well as photo editing programs such as GIMP to create our sprites.

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# Section XI: Sound and Music

The game will have sounds for creatures and units for audio feedback when units are being attacked, being moved or attacking, or when clicking options, so the player has more than one feedback response. We will be using sounds from open source libraries instead of creating our own.