MAD Project Design - G00312715

3D Rail Shooter - **Calamity Hour**

Preface

This document specifies the design for “Calamity Hour”, is a 3D rail shooter inspired in both name and nature by Time Crisis and Virtua Cop. The Player is a Combat robot sent to stop a Robot uprising. It follows a linear path with Arcade elements.

Inspirations

The 3D Rail shooters that have inspired the design of this game are the ***Virtua Cop*** and ***Time Crisis*** Series which are synonymous with the genre itself. However, to talk about Rail shooters and their mechanics, you first need to talk about Light guns.

Light guns are a form of controller that would read the position of a screen and compare with the console/game to see if the position was a hit or a miss on the target.

CRT screens would move a rapid beam of light down the screen, something the Light gun could verify exact positioning.[1]

- **Virtua Cop (1994):** The first game in the Virtua Cop series was published by Sega in September 1994 as an arcade cabinet, with sequels Virtua Cop 2 (1995) and Virtua Cop 3 (2003) also releasing in arcades.

  Gameplay uses a *Light Gun* to target enemies, and to reload the Player moves the gun out of the screen’s view.
  The Player would need to dispatch the enemies before they had a chance to fire. The game would zoom in on enemies that were about to fire, and the Player would need to target a shot from the gun in that area, should the Player be hit they would lose a life, should they be hit 5 times, the Stage would fail.
  The Player would move through areas within a Stage, clearing enemies as they go. Each Stage was timed to 60 seconds so the Players would need to advance through the areas as fast as they could.[2][3]

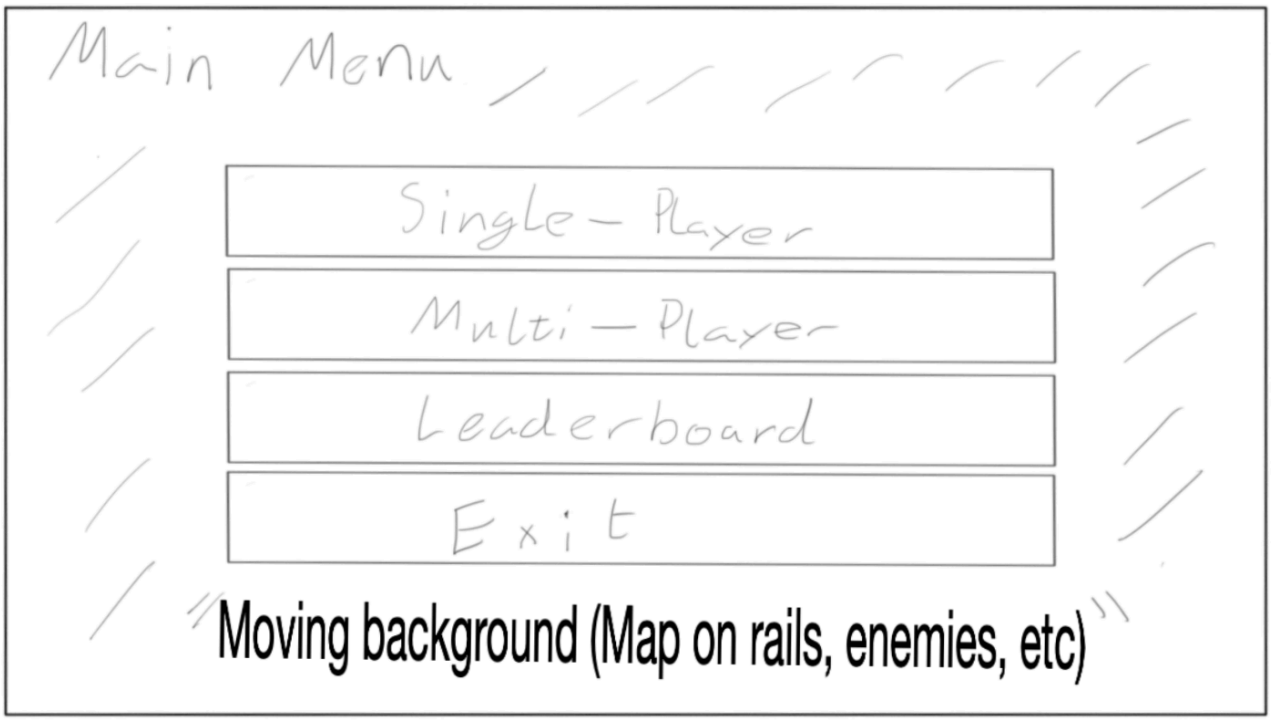
- **Time Crisis (1995):** The first game in the Time Crisis series was published by Namco in December 1995 as an arcade cabinet, with subsequent releases on the Playstation (1997) and Playstation 2 (2002), with the most recent release, Time Crisis 5 (2015) returning to arcades.

  Gameplay also used a *Light gun* to Target enemies that would be shooting back, should the Player be hit they would lose a life, should they be hit 3 times, the Stage was failed. It differed from Virtua Cop in that all enemies are presented in a gallery style as opposed to homing in on a particular enemy.
  Time crisis utilised a unique cover system, controlled by a foot pedal, that allowed the Player to avoid danger, from either the environment or enemies, as well as reload their weapon.
  Similar to Virtua Cop, the Player would move through the timed Stages by clearing enemies out of the different areas.[4][5]

Front-End

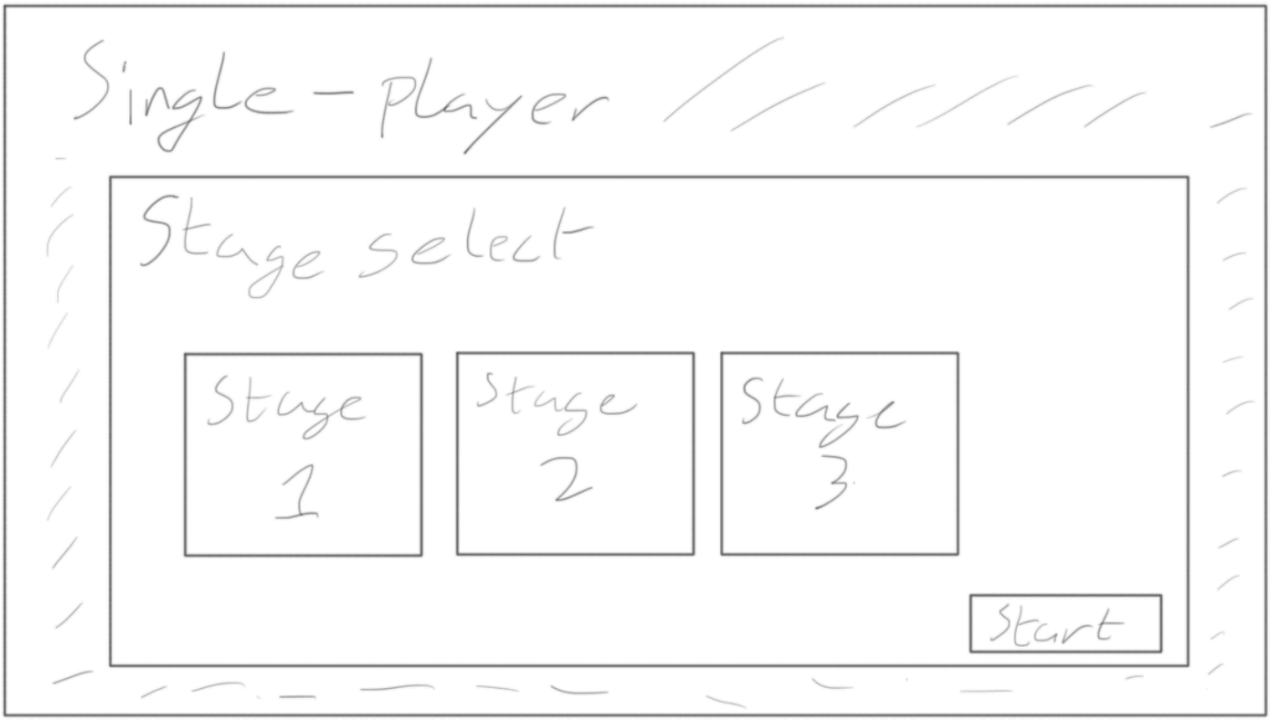
Upon initial loading of the game, the Player will be presented with the title card while loading is taking place. Providing a play button once menus are loaded.

From here they should be given 4 options, *Single-player*, *Multi-player*, Leaderboard and *Exit Game*.



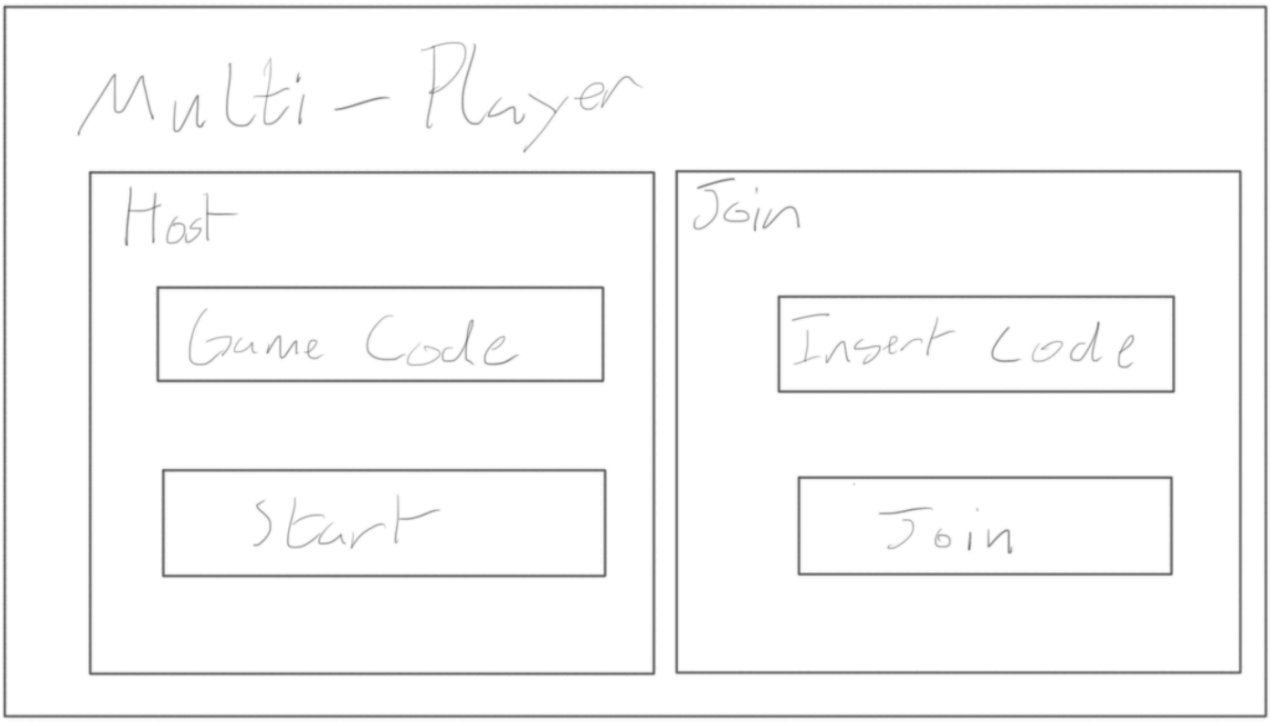
- **Single-player:** Selecting the Single-player option should bring the Player to the Stage select screen. On the Stage select they will have the option to pick the Stage they want

to play, and a Start button once the selection has been made. This will load their Single-Player session.

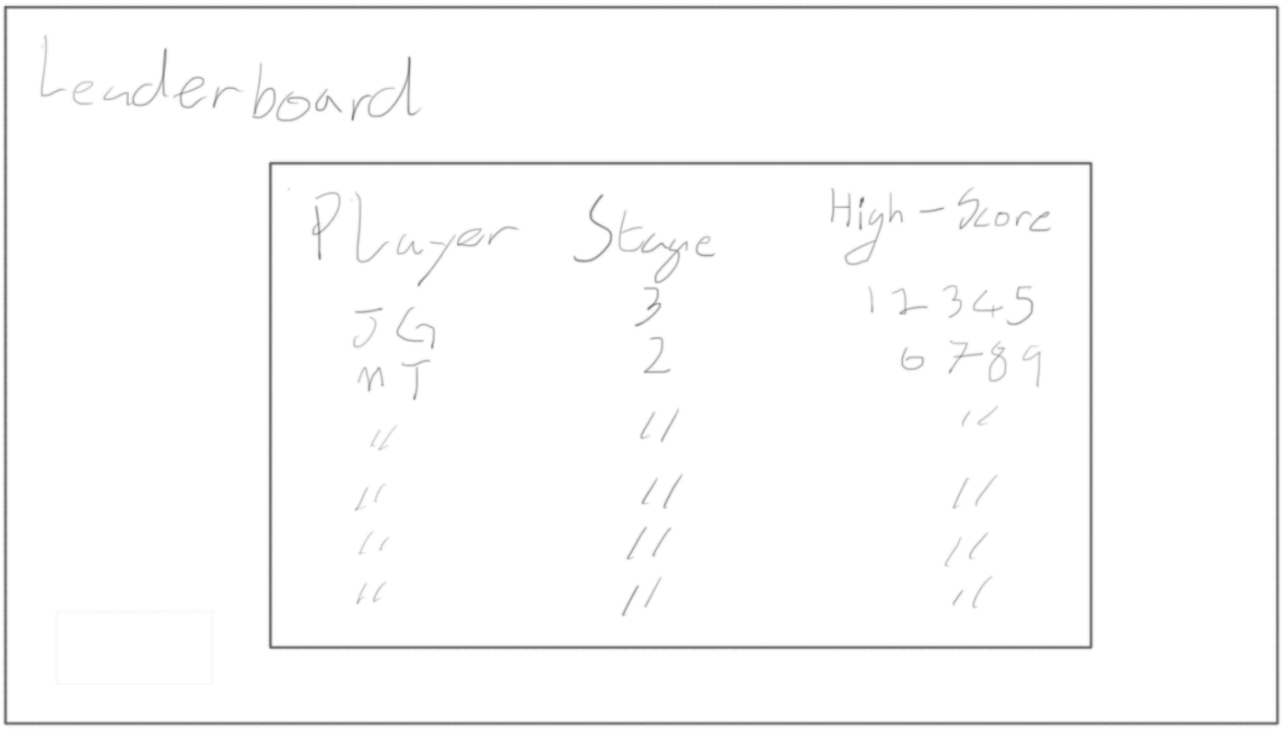


- **Multi-player:** Selecting the Multi-player option should bring the Player to the Multi-player lobby, from here, they will be given the option to either Host a game, or input a session code to join one.

  Clicking the Host option will provide them with a session code and inform them that the game is waiting for another client to connect, they will have the option to cancel this session while waiting for another Player. Once another Player has joined the session, it will then present the same Stage select screen as Single-player, and a start button once the selection has been made. This will load the session for both the Players



- **Leaderboard:** A collection of high scores, the Player's initials, and the Stage. Arcade style.

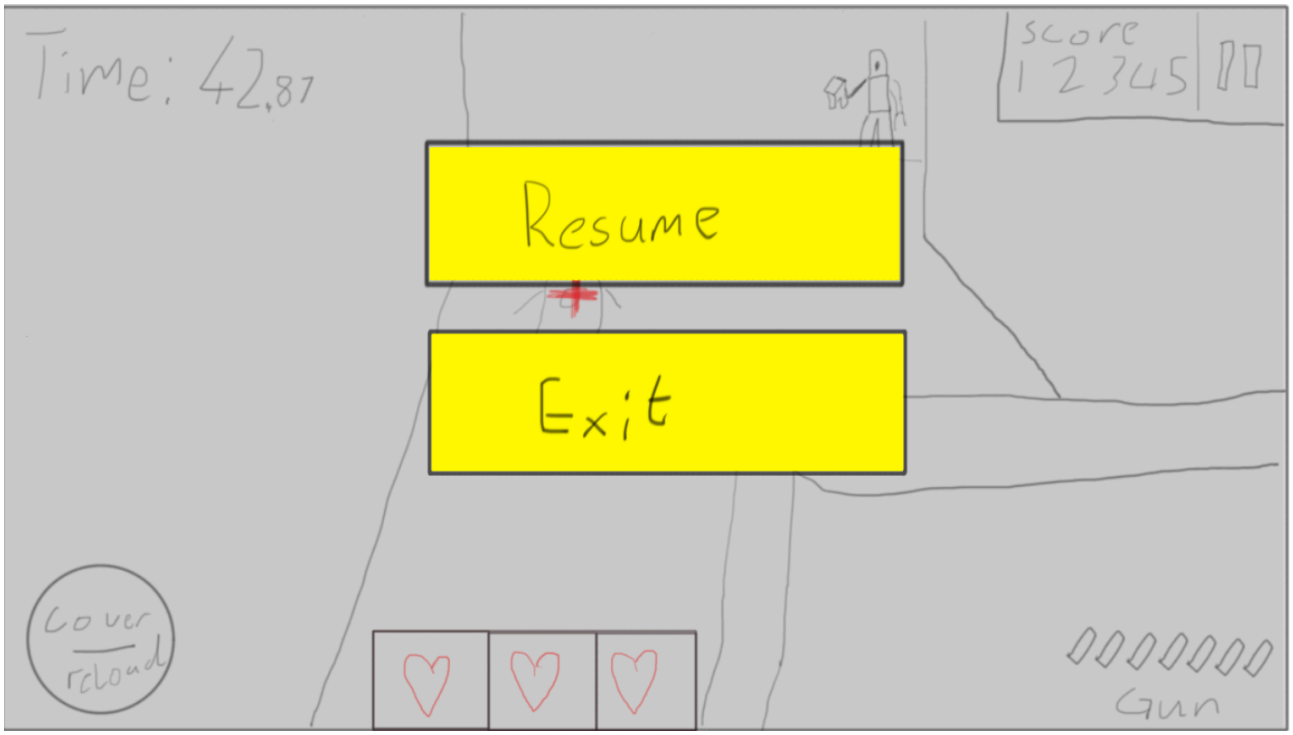


- **Exit Game:** This will close the game application.
- **Stage Select:** Upon selection of which mode the Player wants (after client connection for Multi-player), they will be presented with the same Stage select as Single-player before proceeding to the game. The Stages that are available to the Player will be present for selection, and once a selection has been made, the start option will be available to launch the game.

Menus

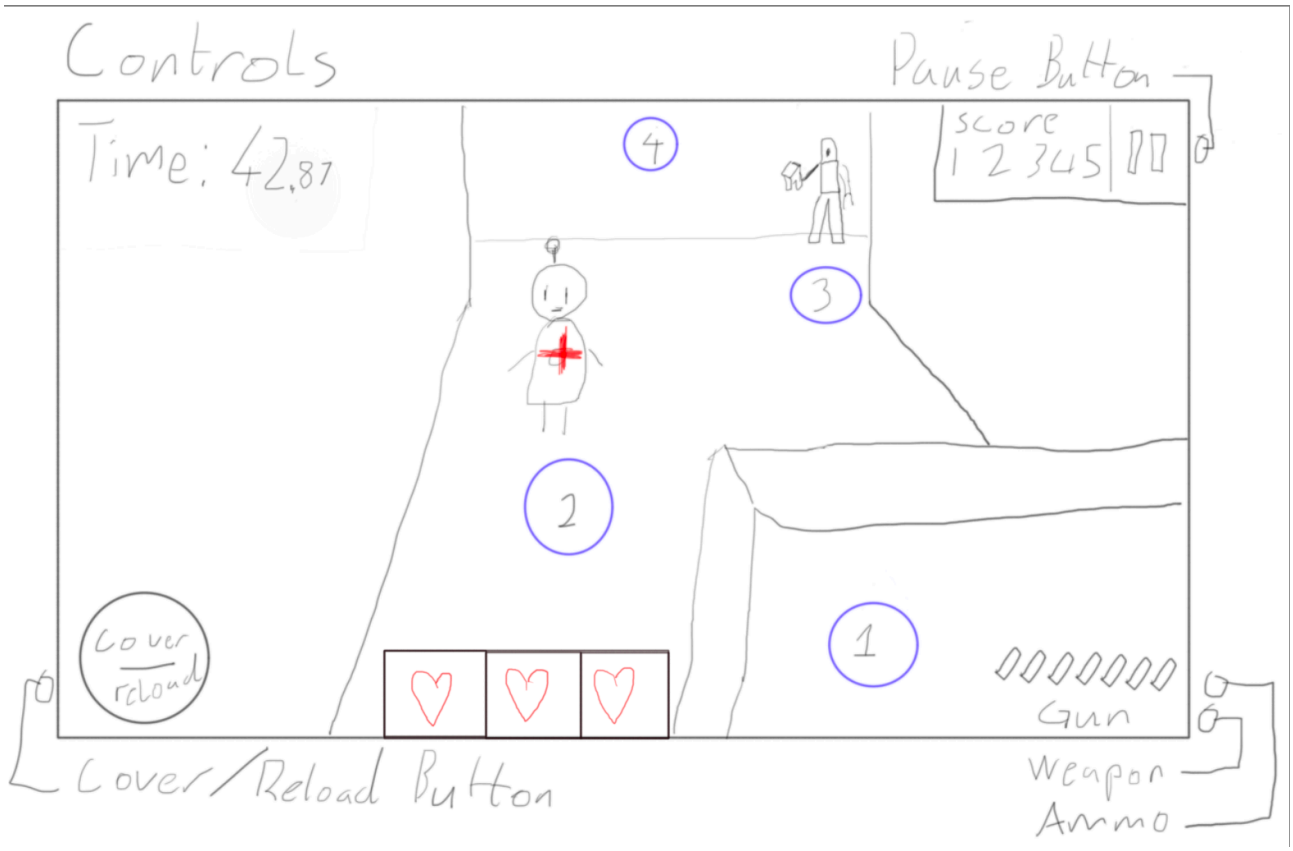
From within the game, the Player will be able to access the menu via the pause button in the top right corner. The pause menu will have 2 options.

- **Resume:** Return to the game where pause was initiated.
- **Exit:** Return to the menu.

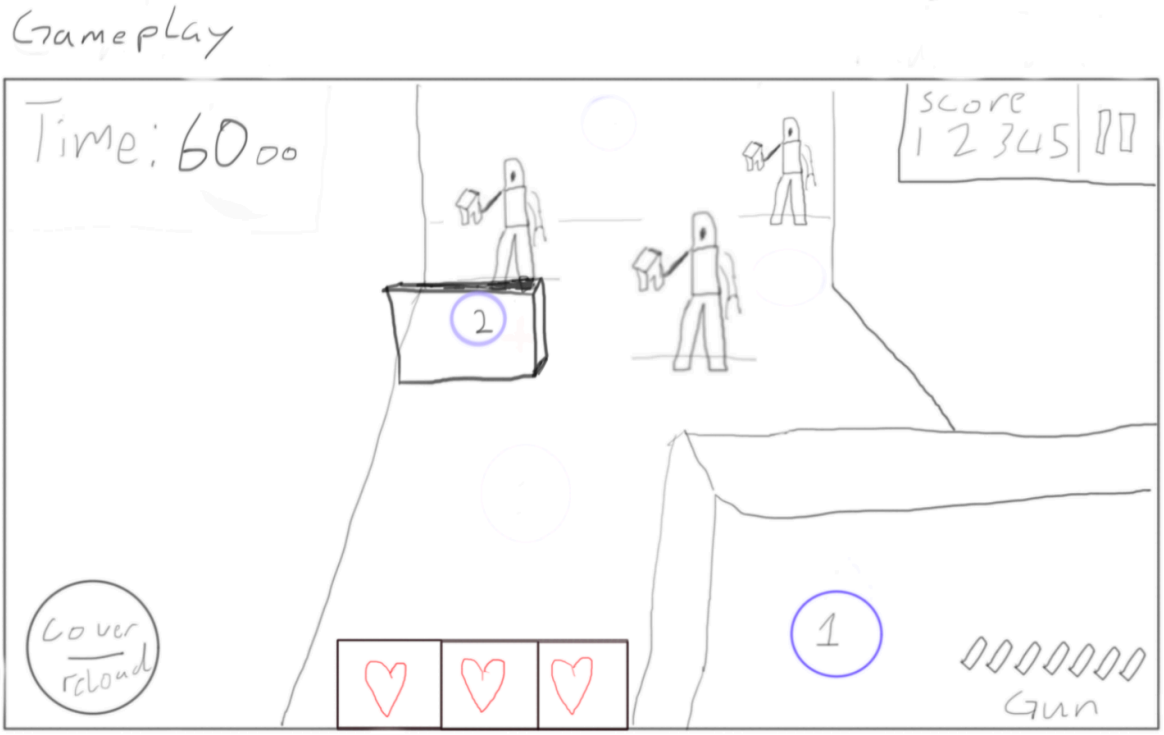


Controls

The Player will be given 2 options of control, Tapping on enemies(2 & 3) as a means of targeting and firing, and a cover/reload button. However unlike time crisis where releasing the pedal will cover the Player, the Player will need to press the button to cover(1) and then release it to exit cover with reloaded weapon. The Player may need to select a path by tapping the screen(4)



Gameplay



Gameplay will start by a short camera pan past the Player model [6], before entering the Rail camera and moving to the first cover position (1).

From here, the Player will need to dispatch the enemies, once the enemies for that cover have been taken care of the Player will move to the next cover position (2), and will repeat the process until they have cleared the area. Clearing all the areas will then clear the Stage.

Stage Design

Describing Stage design will also need some minor story points to justify some design decisions. Our main character is a Combat Robot that is being deployed to stop a Machine Uprising by Rogue AI controlled Robots.

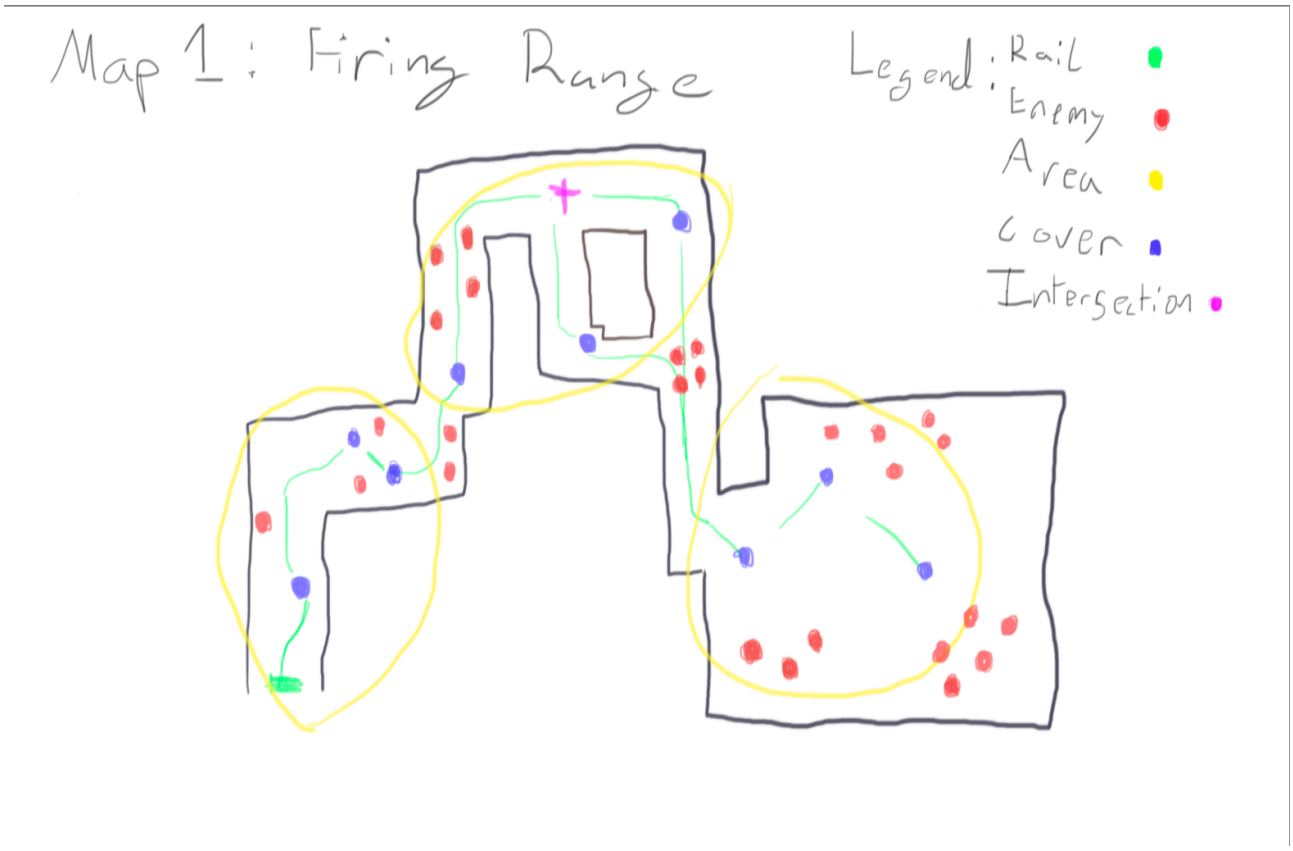
From the legends provided, You can see the positioning of key components for each Stage.

- **Rail:** This is the pathway the Player will take through the Map
- **Enemy:** The spawn points for the various enemies that the Player will need to deal with. Due to the finite nature and progression of a Rail shooter, Enemies are clustered together, often times, multiple sets of enemies will be dealt with from the same cover position.
- **Area:** The Areas within a Stage, that the Player will need to progress through.

- **Cover:** The cover positions that the Player will be able to use to avoid danger, and reload their weapon. They also serve as an anchor point on the rail.
- **Intersection:** An area of the map where the Player gets to choose the direction of progression.

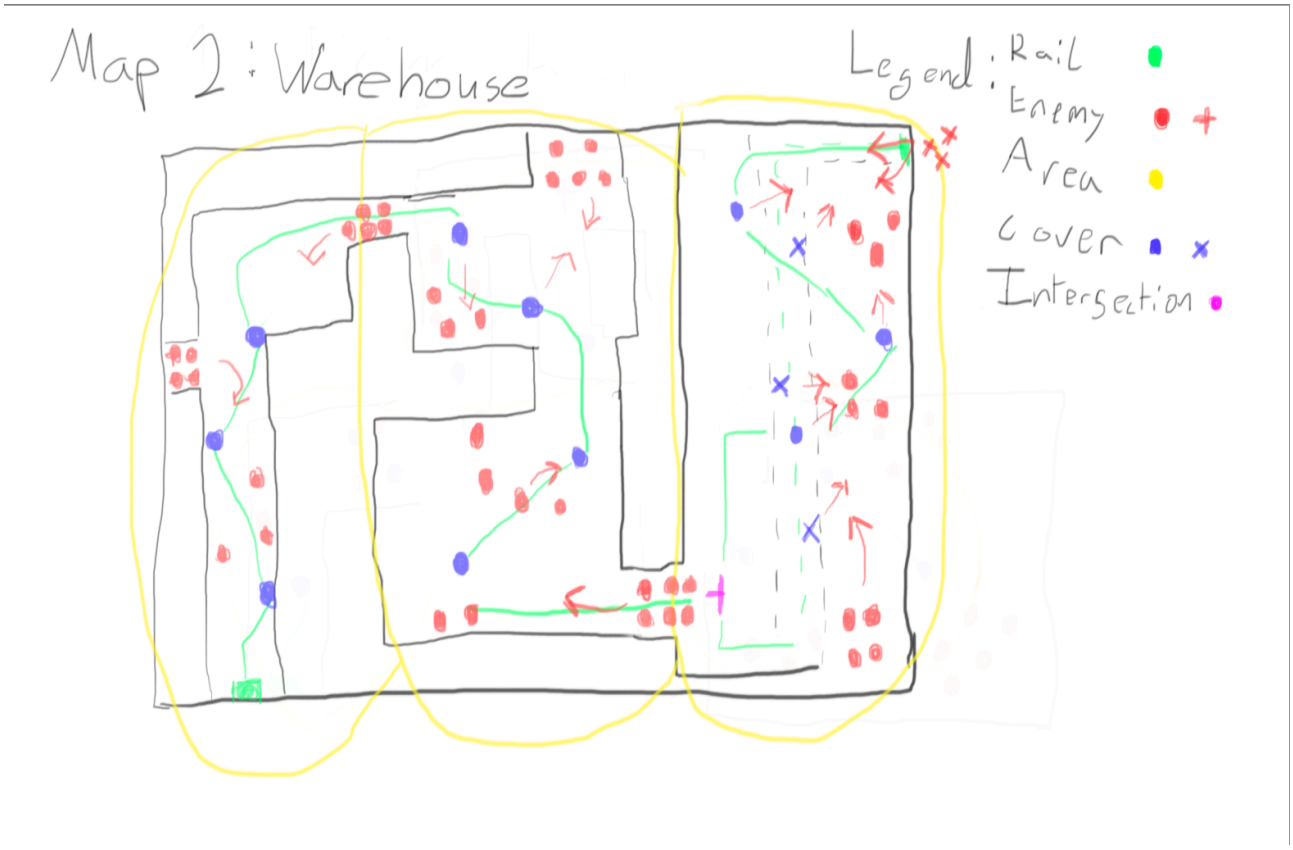
Firing Range: This map will be considered as a “Prep for Deployment” simulation for the Combat Robot, the final preflight checks to ensure Combat systems are operational. It will act as a Tutorial for the Player. They will move through this “Simulation” and take down simple targets as fast as they can.

- **Enemies:** Simple targets
- **Intersection:** Player will face the same group of enemies, just from different sides of the hallway.



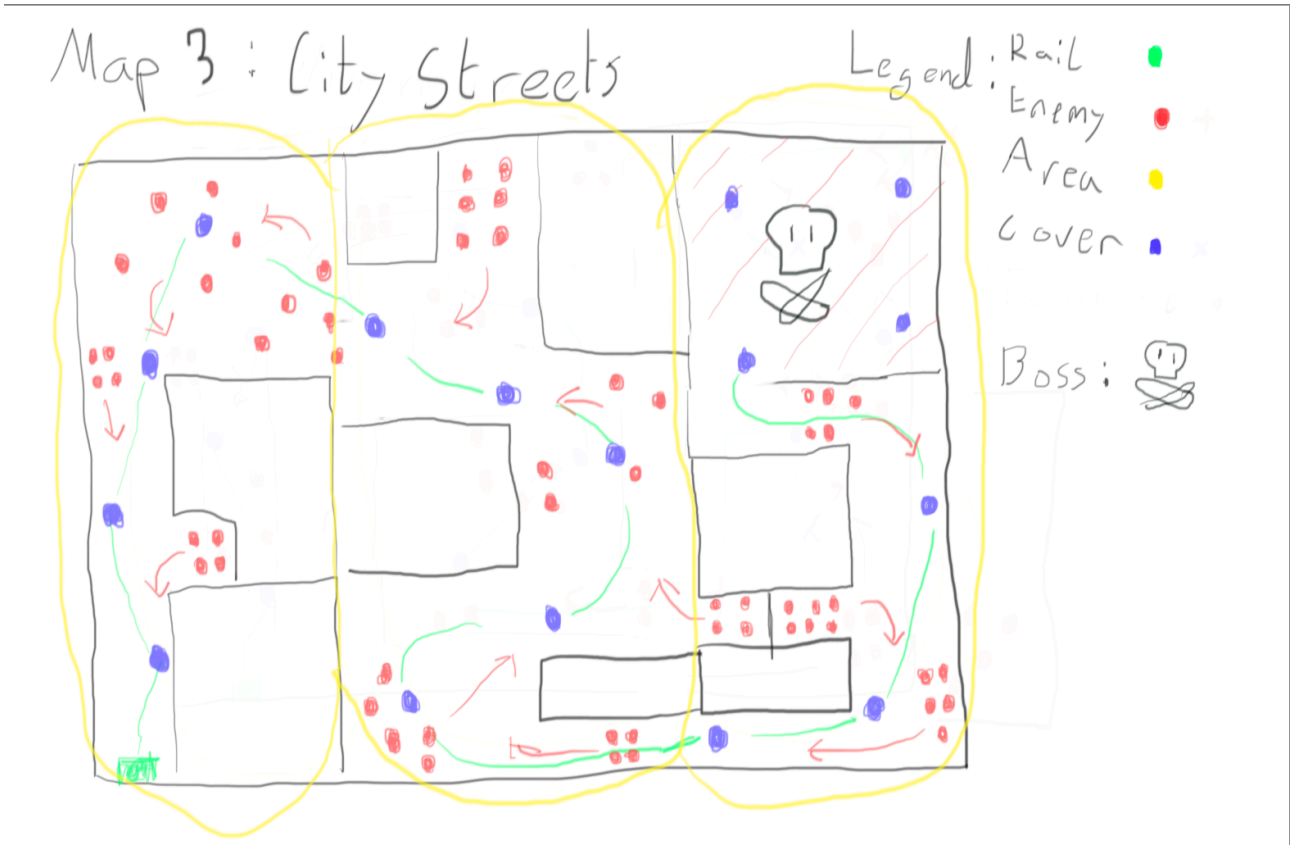
Warehouse: This map will be the first “live fire” scenario for the Combat Robot, it is assumed to be a Warehouse that has been taken over by the Rogue Robots. It will consist of narrow corridors and open areas.

- **Enemies:** Multiple types of robots, Increasing in amount.
- **Intersection:** The Player will be given the option to go up on a walkway, or proceed on the ground level into the more open shipment side of the warehouse, they will fight a large group of enemies, but the cover and enemies will be at different positions depending on the path they choose.



City Streets: This map will be a continuation from the warehouse. The Rouge Robots have now pushed into part of the city and have taken control. The Player will move throughout the city streets, fending off robots that will spawn in side streets. They will progress through various courtyards and alleyways until reaching a large open area. In this open area there will be a boss encounter where the Player will move from cover to cover dealing damage to the boss and enemies that are spawning.

- **Enemies:** Large quantity of all robot types and a Boss robot.

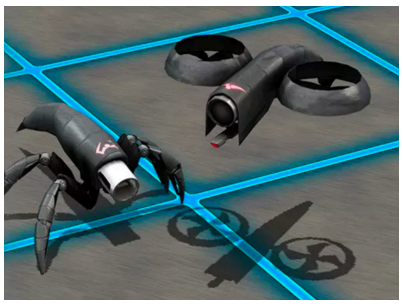


Enemies

Basic Targets: Incapable of firing back, the Player simply needs to hit this target, and the enemy will be removed. [7]

Little robots: Small robots that will roll towards the Player, 1HP/1 hit to kill, so if they are hit they de-spawn in a small explosion, should they reach the Player however, they will explode and take away one life. [8]

Medium Robots: Robots capable of firing back, require 2HP/2 hits to kill, will de-spawn in an explosion. [9]



Special robots: Robots that will drop collectibles, won't engage Player but move fast, 1HP/1 hit to kill, de-spawn in an explosion.[10]

Large Robots: Robots capable of firing back in greater volume, require 3HP/3 hits to kill, will de-spawn in an explosion. [11]

Mech Boss: 30HP/30 hits to kill, will move in and out of view, other enemies will appear alongside it, can fire a lot of bullets in bursts at the Player, meaning having to cover for longer. [12]

Power-ups

In-game collectible sprites that will be achieved by skinning a simple 3D Object > Cube in Unity.

From Right to Left, All of equal drop chance:

- **Infinite Ammo:** The Player will receive Infinite Ammo for 10 seconds, Time traversing the Rail not included.
- **Additional 10 seconds:** The Player will have 10 seconds added to their in-game timer, However the Player's clock will never go above 60 seconds..
- **Extra Life:** The Player will be given an Extra Life.

Due to the nature of a Rail shooter, Enemies are finite, and subsequently there are finite opportunities for a Player to be awarded a Power-up. To counter-act this, the Power-ups will spawn in one of two ways.

- **Power-up scenario 1**: In the eventuality a Player has dispatched an Enemy, there will be a random chance for an Enemy to drop a Power-up. A simple "Pick a Number between 1 and 10" scenario will be invoked. The Player will be assigned a random number, and if that number matches the random number that the enemy was assigned, the enemy will drop a random Power-up, which the Player shoots to collect. This scenario effectively makes the chances of a Player getting a Power-up 1 in 10, or 10%. [13]

- **Power-up scenario 2:** Due to the limited Nature of enemies, There should be scenarios that a special enemy will spawn in a Scripted location. This enemy will not attack the Player, instead will be carrying out a secondary action like running across the background. If the Player dispatches this enemy, the will drop a Power-up. To do so will mean possibly over extending and receiving damage in the process of attempting to get the power up. [14]

Multi-player

Multi-player will follow the same style as both Virtua Cop and Time Crisis, Both Players will be on the same rail, facing the same enemies at each cover point, Co-operating to clear the Stage. To account for the second Player, the amount of enemies will be increased by 1.5 times. Both reticles will be visible for each Player to show what each Player is targeting.

References

[1] https://en.wikipedia.org/wiki/Light_gun#Cathode_ray_timing

[2] https://en.wikipedia.org/wiki/Virtua_Cop

[3] https://www.youtube.com/watch?v=08sD5Oz3Lpw

[4] https://en.wikipedia.org/wiki/Time_Crisis

[5] https://www.youtube.com/watch?v=UPsCvo_7lHs

[6] https://assetstore.unity.com/packages/3d/characters/robots/space-robot-kyle-4696#content

[7] https://assetstore.unity.com/packages/3d/environments/military-target-136071

[8] https://assetstore.unity.com/packages/3d/characters/robots/robot-sphere-136226

[9] https://assetstore.unity.com/packages/3d/characters/robots/robot-soldier-142438

[10] https://assetstore.unity.com/packages/3d/characters/robots/scifi-enemies-and-vehicles-15159

[11] https://assetstore.unity.com/packages/3d/characters/robots/robot-1-65726

[12] https://assetstore.unity.com/packages/3d/characters/robots/medium-mech-striker-124342#content

[13] https://stackoverflow.com/questions/41192056/how-to-have-a-powerup-have-a-slight-chance-of-spawning-when-killing-an-enemy

[14] https://gamedev.stackexchange.com/questions/68735/how-can-i-distribute-powerups-fairly

[X] https://www.gamedevs.org/uploads/grand-theft-auto.pdf