

# NANOGEAR

COMBAT ON A WHOLE NEW SCALE

## Game Design Document

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# 1 GAME OVERVIEW

## 1.1 GAME CONCEPT

### 1.1.1 SYNOPSIS

Nanogear is a third person competitive combat game featuring tiny customizable vehicles called Nanogears that attempt to outsmart, outmaneuver, or just plain demolish their opponents. It is fast-paced vehicular combat set in an advanced, futuristic world where tiny, visually diverse arenas are ground zero for this new form of competitive entertainment.

The main characters are the Nanogears themselves, controlled remotely by the player (or AI) who takes on the role of a Nanogear pilot navigating through arenas at varying locales. These Nanogears are equipped with the pilot's choice of a variety of components including a drive – its primary means of locomotion, a turret, and an ion based weapon that serves as the primary tool of destruction. The player competes against other Nanogear pilots for fame and glory in organized combat that is broadcast to viewers as a popular form of entertainment. In addition to the main weapon that the player outfits the Nanogear with, during combat the arena will have Gear Cores scattered at various positions that provide a random Special Item to the player when picked up. These items can be either offensive or defensive in nature and can significantly alter the course of a match.

### 1.1.2 GENRE AND TARGET AUDIENCE

On the surface this is a third person vehicular combat game, and that will appeal to the competitive crowd. But the visual aesthetic of the game, the customization options, and the collection items will also appeal to a more casual group of players. This combination targets a broad demographic of 13-34 year old gamers, both male and female.

### 1.1.3 GAME PREMISE AND UNIVERSE

Nanogear takes place in a future where microscopic circuitry and nanotechnology are common place and machinery, automation and robotics are a major part of nearly every discipline of the labor force. It is within the normally unseen recesses of this world that the player competes in tournaments for glory, fame, and prestige as a Nanogear pilot.

### 1.1.4 WHAT DO I CONTROL?

As a Nanogear pilot, the player controls a Nanogear. There is no character interaction in the sense that the player would take on the persona of a person or a creature and directly control them – the player is the pilot. Instead all gameplay is experienced through the lens of a camera drone that hovers just

behind and above the player's Nanogear. Using this view the player remotely pilots their Nanogear.

### **1.1.5 MAIN FOCUS**

For the purposes of story the player's main objective is to become the best Nanogear pilot in the league. This is accomplished by winning matches, and climbing the leaderboards. Those that prefer a more casual experience may choose to focus on collecting customizations and completing achievements.

### **1.1.6 GAME MODES**

Nanogear will focus mainly on the multiplayer experience (both online and local), but has a few single player game modes as well. (Details about each of the game modes can be found in sections 13 and 14.)

#### **1.1.6.1 SINGLE PLAYER**

The single player modes will include a survival mode, and a target practice mode, and a short campaign. This campaign will start with a tutorial and introduction to gameplay.

#### **1.1.6.2 LOCAL MULTIPLAYER**

Local multiplayer will include all of the multiplayer game modes that the game offers and implement a split-screen feature to allow up to four players to play on a single television. Local multiplayer will not be available on mobile devices.

#### **1.1.6.3 ONLINE MULTIPLAYER**

Playing online will consist of all multiplayer game modes and include the possibility of multiple local players joining online matches together. These local groups will be matched with other local groups of similar size whenever possible. Remote groups (i.e. those formed using the online friends list) will not have this restriction.

### **1.1.7 UNIQUE FEATURES**

The most unique selling point that helps Nanogear stand out from the rest of the games in the vehicle combat genre is the physical scale in which it takes place. The game is played from a tiny perspective that that few people get to experience. This may necessitate the use of effects like depth of field to help convince the player of the extremely small scale of the game world. The physics of the players' Nanogears and particles will also reflect this tiny scale to a degree.

## **1.2 FEATURE SET**

### **1.2.1 GENERAL FEATURES**

- Tiny Remote controlled combat vehicles
- Amazing new miniature perspective in many varying locations
- 3D graphics
- Stylized textures with cell shading
- Visually diverse particle system

### **1.2.2 MULTIPLAYER FEATURES**

- Leaderboards
- Easy match making system
- Find your pal and group up using Friends List
- Group voice chat

### **1.2.3 GAMEPLAY FEATURES**

- Customizable vehicular combat
- Many unique parts (functional and cosmetic) to customize your Nanogear
- Nanogear stats vary depending on the combination of parts used
- Many diverse game modes to choose from (see section 3.1.4 for details)
- Special powerful items that can turn the tide of battle
- Take special items dropped by defeated opponents

## **1.3 GENRE**

The Vehicular combat genre has had a number of major titles that allow for mayhem and destruction, but none have brought it on the scale that Nanogear will. Competition in Nanogear will happen in tiny locations that are usually out of sight or not easily accessed by the human eye. The excitement factor and sense of wonder will both be elevated by these new environments.

In addition, the level of customization of each Nanogear both on a functional level as well as on a cosmetic level will be immense and sets it apart from the rest of the genre. The total number of possible combinations of functional parts alone being over 380 at launch.

## **1.4 TARGET AUDIENCE**

The primary target audience for Nanogear is gamers within the age ranges of 13-34. Within this primary demographic, Nanogear will draw in a number of different player types. The competitive player will likely make up the majority of these while other types will fit in and have things to do. Collectors will have a vast array of parts both functional and cosmetic to unlock, explorers will be presented with



many varying locations to discover with hidden or difficult-to-navigate pathways to take advantage of, and even jokers will have interactive level features that they can use to wreak a little havoc.

## **1.5 GAME FLOW SUMMARY**

Beginning from the main menu, the player first chooses if they want to play a single player game or a multiplayer game. Based on that they are given a choice of available game modes, and then they are taken to the pre-game assembly bay to select their desired Nanogear loadout. This will be their default loadout that was chosen from the main menu assembly bay, or the player can choose to alter their default loadout at this point. In the case of a local multiplayer match or a local group in an online match this screen will be split so that each player can choose their loadout at the same time. Once all loadouts are locked in, the match begins.

The strategies and objectives for each match will vary depending on the game mode that was selected, but each player will attempt to accomplish the given objective and achieve victory. Once the match is over the player will be presented with a victory or defeat screen depending on how they did that displays stats appropriate to that match and any rewards that might have been earned.

## **1.6 LOOK AND FEEL**

Nanogear's visuals consist of a gritty style of cell shading with hand painted textures and liberal use of ambient occlusion. Normal maps will also be implemented to provide additional visual detail. The arena visuals vary slightly to match their individual locations with more saturated colors in places that are more brightly lit and a more subdued palette for darker locations. This will provide a means to adjust the ambiance in relation to the location and time of day in which any given match takes place.

## **1.7 PROJECT SCOPE**

Due to its nature, this type of game lends itself well to future downloadable content after launch, but for initial production it will consist of the following major assets in the quantities provided. Additional environmental and UI work will also be required.

- Arenas – 8
- Nanogear Chassis – 8
  - Four types – two of each
- Nanogear Turrets – 6
  - Three types – two of each
- Nanogear Weapons – 8
  - Four types – two of each

## **2 STORY AND PREMISE**

Nanogear takes place in a future where microscopic circuitry and nanotechnology is common place and machinery, automation and robotics are a major part of nearly every discipline of the labor force.

### **2.1 WHAT IS A NANOGEAR?**

Many varying tasks that require access to extremely confined or hard to reach places were made easier and more efficient with the advent of tiny, automated, robotic machines called Nanogears. These Nanogears only measure about ½ of a millimeter but they turned competitive sports on its head when resourceful hobbyists began retrofitting them for combat on a whole new scale. Weapons, remote control systems, and reinforced shells were added, and what started out as a fad quickly grew in popularity due to its relative ease of entry and the fact that Nanogear arenas could be set up virtually anywhere and take up very little space.

### **2.2 WHAT IS THE NCL?**

Once the popularity of Nanogear competition started to grow, it took only a few short years for a professional organization to emerge and The Nanogear Combat League (NCL) was born. The best of the best were recruited to join officially sanctioned teams and compete in public, often televised matches under the rules and regulations of this new organization.

### **2.3 WHAT IS THE NANOGEAR UNDERGROUND?**

Not every Nanogear pilot has what it takes to go pro, and not every Nanogear pilot that can go pro is willing to compete with the limits that the NCL imposes. These pilots have taken it upon themselves to organize unofficial matches and tournaments in their respective different regions of the world. Collectively these unsanctioned competitions are known as the Nanogear Underground. Without the limitations of the NCL, the Nanogear Underground became a no holds barred, anything goes kind of clash with various additional, altered rulesets.

### **2.4 CUT SCENES OR CINEMATICS**

There is only need for two types of cut scene or cinematic. The requirements for each are detailed in this section.

#### **2.4.1 GAME INTRO CINEMATIC**

This is the cinematic that plays just before reaching the main menu and again if the main menu remains idle. It will consist of dramatic gameplay video featuring various Nanogears and Arenas. The camera view in this cinematic

should not be limited to the normal player view from the camera drone, but can certainly include such shots.

### **2.4.2 PRE-MATCH CUT SCENES**

Each arena needs to have its own cut scene that plays just prior to the beginning of each match. They will vary depending on the game mode being played and should consist of a fly-through that begins at the player's spawn location and ends at the main objective of the match. In the cases like Death Match where game modes do not have a fixed or stationary objective, the fly-through should be a general tour of the level that features the arena's more prominent features.

## **3 GAMEPLAY AND MECHANICS**

### **3.1 THE GAMEPLAY**

#### **3.1.1 GAME PROGRESSION**

Game progression in Nanogear is fairly minimal. In a single player game, the Campaign is the only means of progression, and that happens through the completion of matches in a simulated tournament with AI teammates and opponents. Each match will ramp up in difficulty culminating in the ultimate challenge for the championship.

Multiplayer progression can be measured with the player's online leaderboard standings. Local only multiplayer will not count towards progression on the leaderboards, but can still be played to acquire additional unlockable items. In that sense, the amount of items unlocked can be used as a way to mark progression.

#### **3.1.2 GAME MODE / DAILY CHALLENGE / ACHIEVEMENT STRUCTURES**

Each method of progression – whether it is leaderboard rank or unlockable items – is structured to allow that progression to be quantifiably measured.

##### **3.1.2.1 GAME MODE STRUCTURE**

Game modes are structured fairly simply. The choice of single player or multiplayer is given at the main menu, and in the case of single player is very straightforward: the three single player modes are presented to the player and they can choose which they would like to play. Multiplayer game mode options are a bit different. The official NCL (Nanogear Combat League) modes are all always available, but the NU (Nanogear Underground) mode options are limited to one that is made available on a semi-random basis and changed out every three hours. The same mode will never be available twice in a row.

### **3.1.2.2 DAILY CHALLENGE STRUCTURE**

Daily challenges will be available as a means to earn tokens that can be used to purchase parts and cosmetics. Five challenges will be randomly chosen from a pool of possible challenges, and at the beginning of each daily cycle, any completed challenges will be replaced by new ones. Uncompleted challenges will remain until completed.

### **3.1.2.3 ACHIEVEMENT STRUCTURE**

Achievements are standard fare, but here they will be more like long-term or extra challenging challenges. They will have rewards commensurate to their difficulty including some exclusive rewards.

## **3.1.3 CORE GAMEPLAY STRUCTURE**

The core structure is definitely combat, even when the win condition for a match might be something other than having the most kills. Combat is always the underlying means by which all goals can be achieved.

## **3.1.4 GAME MODES AND THEIR OBJECTIVES**

The objectives of the game will differ depending on the game mode that is being played, but combat will be a constant underlying mechanic in all game modes.

### **3.1.4.1 SINGLE PLAYER MODES**

#### **3.1.4.1.1 RECONNAISSANCE**

In this mode the player can explore an arena of their choosing on their own without worrying about enemy fire. Gear Cores will spawn as they normally do so the player can become acquainted with the layout and devise potential strategies in relative peace. This time can also be used as an opportunity for players to familiarize themselves with any new Nanogear components that they might have recently acquired.

#### **3.1.4.1.2 TARGET PRACTICE**

This mode takes place in the Training Grounds and the player will be alone. Targets will be placed in various locations around the arena for the player to use to improve their targeting skills and familiarize themselves with new weaponry.

#### **3.1.4.1.3 SURVIVAL**

The player begins at the center of the Training Grounds and is presented with AI controlled training drones that spawn around the perimeter of the arena and continuously respawn after being defeated. The objective in this mode is to survive for as long as possible

#### **3.1.4.1.4 CAMPAIGN**

The single player Campaign mode serves as both a tutorial and introduction to the game. It is structured as a tournament in which the player occupies one of the starting brackets. The remaining brackets are occupied by AI opponents and the order these brackets are populated will be randomized, so each run through will be different from the last. The victor of each bracket that the player is not participating in will also be chosen at random. The first few matches will serve as the tutorial which will not be active after the first play through unless reset in the options menu. The objective in the campaign is to make it through all the brackets and come out on top as the NCL Champion.

#### **3.1.4.2 MULTIPLAYER MODES**

##### **3.1.4.2.1 OVERLOAD (NCL)**

These matches take place in symmetrical arenas with each end being controlled by a team of Nanogear pilots. Just outside of each team's spawn area is a Power Core. The objective of this type of match is to render the opposing team's Power Core inoperable by overloading and destroying it. Power Cores can be targeted with any weapon or offensive item. Each shot adds more power to the core bringing it closer to overloading. At the same time, the more energy that a team's Power Core has, the stronger their weaponry becomes. This game mode also features a unique Special Item called the Core Barrier that when used in proximity to the player's own Power Core provides a temporary shield that protects the Power Core from all damage. Damaging the barrier will bring it down faster.

##### **3.1.4.2.2 SUPER CHARGE (NCL)**

The goal of Super Charge matches is to be the first team to collectively control at least twenty Ion Capsules and hold on to them for fifteen seconds. Shortly after the match begins, Ion Capsules will begin to spawn in random locations near the center of the arena. Navigating a Nanogear into one will pick it up and the number that each Nanogear is carrying at any given moment will be displayed above them. For every twenty-five percent of damage that a Nanogear takes it will drop one capsule that can then be picked up by any other player. If a Nanogear is destroyed it will drop all of the Ion Capsules that it was carrying. Capsules that are dropped become fair game and can be picked up by any other player.

##### **3.1.4.2.3 DOMINATION (NCL)/ KING OF THE HILL (NU)**

In these matches the player battles for control of a central location. The first to reach 100% control wins. To take the control area in a the team-

based Domination mode at least one member of a team must be inside the area with no opposing members inside for eight seconds at which point the controlling team begins to accrue control points at a rate of one per second. If the other team then captures the control area their points start increasing and the first team's will pause. If the control point is being contested when a team reaches 99% then it will stop increasing until all opposing players are off the point. The single player King of The Hill mode is the same, but with each player vying for control. Once a player gains control they will receive a boost to their armor allowing them to be able to survive against multiple opponents that are now all focusing their efforts on them.

#### **3.1.4.2.4 DEATHMATCH (NCL) / FREE-FOR-ALL (NU)**

In this classic mode, the number of kills that each team or player makes against the opposing team is tallied, and the most kills at the end of five minutes wins. If there is a tie for first when time runs out the match goes into sudden death and the next kill wins if that lead can be maintained for ten seconds. In the case of a tie for second place or below in a Free-for-All match, the position will go to the player with the fewest number of deaths. If that stat is also the same, then the deciding factor will be shot accuracy.

#### **3.1.4.2.5 SEEK AND DESTROY (NU)**

One Seeker, three Runners. It is the seeker's job to locate and destroy the Runners whose objective is to survive until time runs out. The Seeker is able to use their main weapon and all offensive Special Items while the Runners' main weapon is disabled and they are only able to use defensive Special Items. The Seeker starts at the opposite side of the arena from the Runners and must wait an initial fifteen seconds before being allowed to leave the spawn area while the Runners are given time to prepare. This mode is still played on an individual basis even though three of the players share an objective. To be considered a winner a player must achieve their objective. If one Runner survives and the other two are destroyed then only the Runner that survived is considered the winner and not the entire group of Runners.

#### **3.1.4.2.6 LOCK AND LOAD (NU)**

An Unstable Spark is spawned at the center of the arena for this point-based game mode. Each player tries to be the first to score three points by collecting the spark and taking it to one of two Discharge Stations located at opposite ends of the arena. Upon collecting the Unstable Spark it releases a burst of energy that knocks all other Nanogears back and momentarily disables them giving the player with the spark a brief

opening to head to one of the stations. Taking continued damage will increasingly destabilize the spark causing a slight hindrance to the speed of the Nanogear carrying it as well as becoming an increasingly greater threat to other players by doing area damage in a larger and larger radius. Avoiding fire after this happens will gradually cause the spark to return to normal. If destroyed the Nanogear carrying the spark will drop it, but the state of the spark will not reset. If the spark becomes unstable enough it will release a large amount of energy causing damage to anything within range with things closest to the epicenter taking the most damage and resetting the state of the spark.

## **3.2 THE MECHANICS**

### **3.2.1 PHYSICS**

The reality of the extremely small scale in which the game takes place could lead to unexpected – and likely undesired – results when it comes to physics. For that reason, physics in Nanogear will work much more closely to what would be expected with larger vehicles with the exception of a slightly floatier feel than normal.

### **3.2.2 MOVEMENT**

Movement can be described in relation to general Nanogear movement as well as turret movement.

#### **3.2.2.1 GENERAL MOVEMENT**

Main movement consists of using the left analog stick to navigate the Nanogear around the arena. Up and Down correlate to Forward and Reverse respectively, and Left and Right turning in those respective directions. The types of Nanogear drives are divided into two different steering categories. The Roller and Tread Types will need to move either forward or backward in order to turn while the Hover and Strider Types can go in any direction without the requirement of going forward or backward. The direction that their drive faces rotates after movement begins to match the direction of movement.

#### **3.2.2.2 TURRET MOVEMENT**

Turret movement correlates with the camera view and aiming. All turrets are functionally the same, but the heavier the turret, the slower the rotation speed

### **3.2.3 OBJECTS**

There are few objects in Nanogear besides the Nanogears themselves. The most widely used object is the Gear Core. Each arena has multiple spawn areas for them, and they are available in each game mode.

Certain game modes also have other objects that the player must interact with in order to achieve specific objectives: Power Cores, Ion Capsules, Unstable Sparks, and Discharge Stations. (Details about the functions of these objects can be found in the descriptions of the different game mode objectives in section 3.1.4.)

#### **3.2.3.1 PICKING UP AND DROPPING OBJECTS**

For those objects that can be picked up, doing so is just a matter of running into them. Contact with a Nanogear will cause the item to be absorbed, and in the case of Gear Cores converted into a helpful Special Item. When an item is dropped due to the Nanogear taking damage or being destroyed, it pops into the air to a height of about twice that of the Nanogear at a random angle between 90 and 270 degrees relative to the facing direction of the Nanogear that was carrying the item. Dropped items can then be picked up by anyone including the Nanogear that dropped it.

#### **3.2.3.2 MOVABLE OBJECTS**

Some props in the environment can be moved by either shooting them or running in to them. This will be limited in scope to the few things that would be feasibly moveable by something as small as a Nanogear like motes of dust.

### **3.2.4 COMBAT**

Combat mechanics in Nanogear include a few features that when combined provide the player with some strategic options.

#### **3.2.4.1 THE CHARGE SYSTEM**

The main resource that every Nanogear needs is its Charge. The miniscule nature of Nanogears allows them to fill their Charge by passively absorbing the ambient energy from the immediate environment. This is enough to maintain normal functions like movement and main weapon fire. Surplus energy is gradually collected and stored for use by the more power hungry Special Items. If a Special Item is acquired that the player does not immediately want, they can choose to absorb it to add 25% to their Charge meter allowing them to more quickly reach a level where they can make use of a Special Item or fire off a Charged Shot instead. Special Items can also be absorbed when the Charge Meter is completely full (100%) in order to Supercharge the Nanogear to 125%. While Supercharged the Nanogear will be covered in electricity particles to broadcast the fact that they are



potentially more dangerous. Any time the Nanogear returns to normal after being Supercharged there will be ten seconds of recovery time during which the charge meter cannot be used and will not be able to increase in charge.

#### **3.2.4.2 CHARGED SHOTS**

The other use for the charge system is with Charged Shots. In addition to the standard attack that the main weapon provides, the player is also able to fire a charged shot at any time as long as they have enough of a charge surplus. Each Charged Shot uses 15% of the charge meter, and is performed by holding down the fire button until the shot charges fully and releasing it at precisely the right time. If the player releases too early the buildup won't be strong enough for a charged shot and will dissipate back into the charge meter. If the button is held for too long, the Nanogear's safety measures will kick in and harmlessly disperse the additional energy which will then be lost. A successful Charged Shot will be visually more impressive than a normal shot and do 1.5 times the normal damage. A Supercharged Shot can be performed when the Nanogear is Supercharged. This will use up the 25% Supercharge energy and return the Nanogear to normal status. A Supercharged Shot will do twice its normal damage and look even more impressive. If not released in time a Supercharged Shot will dissipate and the energy will be lost just like a normal Charged Shot.

#### **3.2.4.3 SPECIAL ITEMS**

When a player comes into contact with a Gear Core they will absorb it and acquire a Special item. By making smart, strategic use of these items a player can turn the tide in a match. The use of each Special Item consumes 75% of the charge meter. Using a Special Item when Supercharged will make it more powerful and use up the Supercharge energy as well as the standard seventy-five percent of the Charge meter for a total of 100% leaving 25%.

(Additional details about each Special Item can be found in section 6.)

### **3.2.5 ECONOMY**

The economy will consist of Credits, and the items that can be purchased with them. These Credits will be awarded in all game modes with the exception of Reconnaissance, Target Practice, and Survival.

#### **3.2.5.1 CREDITS**

Credits are earned from winning NCL matches, and the player will be awarded bonus Credits for outstanding performance. These can be used to unlock new Nanogear components and officially sanctioned NCL swag that can be used to cosmetically customize any Nanogear.

### **3.2.5.2 VOUCHERS**

Vouchers are rewarded from NU matches similarly to how Credits are earned in NCU matches. However, Vouchers are harder to come by. Only a single voucher is awarded after a victorious match. These can be redeemed for additional cosmetic items that have a bit more flair than the standard NCL options.

## **3.3 SAVING AND LOADING**

Saving occurs automatically at the conclusion of each match, as soon as an award is earned, as soon as an item is purchased with either Tokens or Vouchers, or whenever anything happens that alters the status of a player's account. This should also apply to the single player campaign, saving after each completed match. Saving in this manner makes resuming the game automatic when it is started again.

## 4 THE GAME WORLD

### 4.1 OVERVIEW

As far as gameplay is concerned, the world itself is only relevant inasmuch as it relates to the area immediately in or around any given arena since this is the only part of the world that will ever be seen.

### 4.2 WORLD SCALE

The scale at which everything will be presented will be relatively huge because of the diminutive size of the Nanogear that the player controls. Even the tiniest of objects will have a significant presence.

### 4.3 TECHNOLOGY

In the future world of Nanogear, robotics, microscopic circuitry and nanotechnology are commonplace and a part of everyday life. Advancements have been made in energy collection, transference and efficiency all of which directly apply to the underlying workings of what makes Nanogears able to function.

### 4.4 ARENA TYPES

The three types of arenas are detailed below along with a listing of the specific arenas in each type and the environmental features of each. Every type takes some degree of manipulation or construction to become a working Nanogear arena. This will be evident in the design and features of each arena.

(Additional details about each arena can be found in section 7.)

#### 4.4.1 NATURAL

##### 4.4.1.1 OVERVIEW

Natural arenas are found outside and make use of naturally occurring substances and objects to form boundaries and obstacles which are altered or arranged as minimally as possible to give the appearance of a naturally occurring location.

##### 4.4.1.2 KEY LOCATIONS

- Timber
- Grassland
- Pesticide

#### **4.4.1.3 OBJECTS / PROPS**

Natural assets include dirt, pebbles, blades of grass, twigs, leaves, and various insects. Artificial assets are kept to a minimum and should be made with a natural appearance like ramps, bridges, and railings.

### **4.4.2 RETROFIT**

#### **4.4.2.1 OVERVIEW**

This is the most visual diverse arena type. These arenas are made from existing and often unused man-made items or locations. They usually feature a bit more apparent modification than Natural arenas and each arena has its own visual aesthetic.

#### **4.4.2.2 KEY LOCATIONS**

- Clockwork
- Mainboard
- The In-between

#### **4.4.2.3 OBJECTS / PROPS**

The native objects of each of these arenas will vary. Clockwork has gears and cogs of varying dimensions, rods, springs, and flywheels. Mainboard has transistors, LEDs, capacitors, and processors. The In-between has cobwebs, wiring, pipes, nails, and various old discarded and derelict Nanogear parts. The ramps, bridges, etc. of each of these arenas should match the aesthetic of the rest of the visuals.

### **4.4.3 CUSTOM**

#### **4.4.3.1 OVERVIEW**

Custom arenas are those that are built from the ground up specifically for Nanogear competition.

#### **4.4.3.2 KEY LOCATIONS**

- Training Grounds
- The Nanodome

#### **4.4.3.3 OBJECTS / PROPS**

The objects in these Custom type arenas are mostly terrain obstacles that are geometric in nature with a clean, futuristic, industrial look. These shapes consist of cubes, pyramids, spheres, archways, and various polyhedrons. The use of emissive lighting is prevalent throughout.

## **4.5 DAY AND NIGHT**

There is not a day/night cycle that gradually moves from one to the other. Instead each of the arenas will have two possible lighting schemes that mimic the lighting being either “on” or “off.” In some that may appear as night and day while in others for example it may be the difference between light from a lamp and ambient moonlight coming in through a window, or floodlights and the glow of emissive lighting. This will add a bit of diversity without the need to build a bunch of additional assets.

## 5 NANOGEARS

### 5.1 OVERVIEW

Each Nanogear consists of three vital components: a Drive which is its means of locomotion, a Turret that serves as the upper half of the Nanogear and provides a mounting point for the third component – the Weapon which uses ionic energy as projectiles. Each type of component has a different set of stats and each individual component has its own properties for those stats.

### 5.2 CONSTRUCTING A NANOGEAR

In the Assembly Bay before each match the Player will choose to outfit their Nanogear with any combination of the three main components that they choose from any of their previously collected components.

When combining components, the armor ratings from both the Drive and the Turret are combined to get the total Armor value of the Nanogear. This Armor rating will affect the resulting Speed of the Nanogear by decreasing it as the Armor Rating increases. The heavier it is, the more the speed will be affected.

There is a limitation to choosing a Drive and Turret combination. The weight classes of the two components can only have a difference of one. For example, a light components can be paired with a medium ones, but not heavy ones.

### 5.3 DRIVES

The base of a Nanogear and its method of moving around is known as its Drive. Drives come in many different shapes and styles and mainly determine the maneuverability of the Nanogear. They also have a bit of an Armor Rating that is combined with that of the Turret for an overall Armor Rating. The main differentiating properties of each main type are detailed below.

#### 5.3.1 ROLLER TYPE

Roller Type Drives are a medium class component

##### 5.3.1.1 FOUR WHEELS

This Drive features four knobby wheels. The two rear wheels are slightly larger than the ones in front. ● ●

##### 5.3.1.2 SIX WHEELS

All six wheels of this Drive are the same size, and the two in front are separated a bit from the other four. ●●●●

### 5.3.2 TREAD TYPE

Tread Type Drives are a heavy class component

#### 5.3.2.1 TWO TREADS

The two tank-like treads on this drive are taller in the front and taper down along their length to the back.

#### 5.3.2.2 FOUR TREADS

Similar to the tapering of the Two Tread Drive all four of these treads are tapered. The two smaller front treads get taller from front to back and are positioned close together. The two larger rear treads are taller in the front and support the majority of the Nanogear with the wider footprint they get from being spaced farther apart from each other.

### 5.3.3 STRIDER TYPE

Strider Type Drives are a medium class component

#### 5.3.3.1 FOUR LEGS

As the name suggests this Drive has four legs – robotic and spider-like, but with a bit of armor plating on each leg.

#### 5.3.3.2 SIX LEGS

Similar to the Four Legs Drive, but with an extra pair of legs. The addition of two extra legs means that the armor plating is absent from this model.

### 5.3.4 HOVER TYPE

Hover Type Drives are a light class component

#### 5.3.4.1 SINGLE DUCT

This drive has a single large hover mechanism centered at its base.

#### 5.3.4.2 QUAD DUCT

Four smaller hover mechanisms of equal size are used for this Drive.

### 5.3.5 DRIVE PROPERTIES CHART

	maneuverability	armor	speed
4 Wheels	9	5	11
6 Wheels	8	5	12
2 Treads	9	7	9
4 Treads	8	8	9
4 Legs	10	6	9
6 Legs	10	5	10
1 Duct	7	4	14
4 Ducts	8	4	13

## **5.4 TURRETS**

Turrets mainly affect the armor value of the Nanogear, but some may also have small benefits in other ways. The three turret categories are straightforward and easy to understand. Their differences are listed here.

### **5.4.1 LIGHT TYPE**

Light Turrets are sleek and detract little if not nothing to a Nanogear's speed. The trade-off is their lack of armor compared to other Turrets.

#### **5.4.1.1 LIGHT 1**

Armor + 0

Speed - 0

#### **5.4.1.2 LIGHT 2**

Armor + 1

Speed - 1

### **5.4.2 MEDIUM TYPE**

Medium Turrets are the middle-of-the-road choice for those who want to balance their speed and armor stats.

#### **5.4.2.1 MEDIUM 1**

Armor + 2

Speed - 2

#### **5.4.2.2 MEDIUM 2**

Armor + 3

Speed - 3

### **5.4.3 HEAVY TYPE**

Heavy Turrets provide large amounts of armor at the expense of speed.

#### **5.4.3.1 HEAVY 1**

Armor + 4

Speed - 4

#### **5.4.3.2 HEAVY 2**

Armor + 5

Speed - 5



## 5.5 WEAPONS

The firing experience will be different for each of the weapons chosen when outfitting a Nanogear. The different weapon categories found in Nanogear cover the main weapon archetypes: shotgun, rifle, sniper rifle, and heavy ordinance. The Nanogear versions of these archetypes and their main properties are explained in this section.

The Piercer, Ripper, and Shredder Types will, for the most part, be hitscan weapons with certain ranges, so using them is just a matter of placing the reticle over the target and firing. The Blaster Type is strictly a projectile based weapon. With one of these it will be necessary to lead the target, but because projectiles are affected by gravity, they have the advantage of being able to fire over obstacles.

### 5.5.1 PIERCER TYPE

The Piercer Type is the quintessential sniper rifle of the Nanogear world. They have long range, high accuracy, and a low fire rate.

### 5.5.2 RIPPER TYPE

Ripper Type weapons have medium range, average accuracy, and a fast fire rate. They are comparable to assault rifles.

### 5.5.3 SHREDDER TYPE

The Shredder Type has a short range and low accuracy with an average fire rate. Similar to shotguns, they are most effective at short range.

### 5.5.4 BLASTER TYPE

Blaster Types are the heavy artillery. They have a medium range, average accuracy and a slow fire rate. Their shells usually detonate on impact or shortly thereafter.

### 5.5.5 WEAPON PROPERTIES CHART

	damage	rate of fire	range	accuracy
Piercer 1	3	TBD	20mm	90%
Piercer 2	4	TBD	18mm	85%
Ripper 1	1	TBD	13mm	70%
Ripper 2	2	TBD	14.5mm	60%
Shredder 1	3	TBD	8mm	45%
Shredder 2	3	TBD	9.5mm	40%
Blaster 1	4	TBD	14mm	65%
Blaster 2	5	TBD	12mm	60%

## **5.6 COSMETIC CUSTOMIZATIONS**

By competing in matches and earning Credits, the player will be able to earn and purchase cosmetic items to customize their Nanogear to their liking.

### **5.6.1 PAINT COLORS**

Paint Colors will be available in a wide variety of hues and palettes from the basic matt and glossy finishes to other more expensive or rare options like metallic or glow-in-the-dark. A different Paint Color can be applied to each area of the currently selected Paint Style.

### **5.6.2 PAINT STYLES**

All Paint Styles will be universally usable on all Nanogears, and they will each feature two distinct areas that can be colored as the player sees fit using any Paint Styles available to them. The simpler and more common styles are simple linearly delineated two-tone schemes or simple racing stripes, and the rarer styles would incorporate more intricate designs like flames, or tribal patterns.

### **5.6.3 DECALS**

Many decals are earned through the completion of various quest-like achievements that will earn the player sponsorship of various fictional companies and the right to display their logo. Other non-sponsor decals of differing designs are available to purchase with Credits or gained in Parts Shipments.

### **5.6.4 ION EFFECTS**

Some of the coolest Nanogear customizations are the different Ion Effects that can be collected to change the appearance of the particles used each time a weapon is fired. These come in many different colors and will use many different particle effects. Simple examples include different colored tracer effects with varying styles, and more exotic examples include elemental effects like fire, ice, and electricity, and magical effects like wispy smoke or sparkles.

### **5.6.5 CAMERA SHELLS**

The Camera Drones that follow each Nanogear around to broadcast the action can also be customized with different shells. There will be styles that match the visual style of each of the Nanogear components for those that want them to visually match their chosen configuration, and there will be unique shell options as well. Each Camera Shell will have two areas that the chosen Nanogear colors will be applied to, so the Camera Drone will always match the color scheme of its Nanogear.

## **6 SPECIAL ITEMS**

### **6.1 OVERVIEW**

When a player comes into contact with a Gear Core they will absorb it and acquire a Special item. By making smart, strategic use of these items a player can turn the tide in a match. Below are the descriptions of the currently planned items.

### **6.2 OFFENSIVE ITEMS**

These items are used against opposing Nanogears to cause large amounts of damage.

#### **6.2.1 MISSILE BARRAGE**

Upon using this item the player is presented with a reticle on the ground that they can then move using the right stick. When the player has located their target they then press the Special Item button to launch the barrage. A salvo of missiles fly skyward, and the other players do not get a warning indicator until the missiles have reach the zenith of their trajectory. If the opposing Nanogear is quick enough they could possibly avoid getting hit.

#### **6.2.2 STATIC SPARK**

A single use energy mine that discharges a large amount of energy whenever an opposing Nanogear come into close proximity with it. When used it is dropped at the player's location and takes three seconds to arm itself.

#### **6.2.3 HOMING MISSILE**

As the name suggests, this missile will lock on to and follow its target, detonating on impact with damage and a knockback effect.

#### **6.2.4 EMP**

When used, this item sets of a blast originating from the Nanogear itself causing damage to any Nanogear in its radius, disabling it for five seconds and destroying all projectiles caught in the blast including those from other Special Items.

### **6.3 DEFENSIVE ITEMS**

Defensive Special Items are used to assist the user with various protective abilities.

#### **6.3.1 REPAIR KIT**

The repair kit will repair the Nanogear for, at most, one third of its total hit points. A particle effect will accompany it that rises off of the Nanogear.

### **6.3.2 DEFLECTOR SHIELD**

A semi-transparent bubble of energy envelops the Nanogear. This shield deflects all damage it receives including any damage beyond its total amount of hit points. Any damage in excess of its hit points will destroy the shield but not damage the Nanogear.

### **6.3.3 CLOAKING DEVICE**

This item renders the Nanogear completely invisible to opponents making it an excellent strategic item. Any damage that the Nanogear receives while invisible will short out the invisibility. Friendly Nanogears will see the invisible player as a ghostly version of itself. This will be done with a specialized shader.

### **6.3.4 SPEED BOOST**

When activated, the Speed Boost grants the Nanogear a burst of speed that can get it out of a tight situation or into a better firing position in a very short amount of time.

## 7 ARENAS

The arenas in Nanogear are varied in style and location, but each provides a sense of the diminutive scale that is involved with being a Nanogear Pilot. The following are the planned arena concepts.

### 7.1 TRAINING GROUNDS

The Training Grounds is a square arena that was completely manufactured from the ground up specifically for Nanogear training. With its light grey metallic construction and blue emissive accent lighting The Training Grounds provides a clean and distraction-free environment to allow the player to focus on the core mechanics of combat and familiarize themselves with their particular load out. The construction is geometric and the layout is symmetrical with the ground level featuring obstacles around the perimeter of the arena that can be used for cover. The center is dominated by a three level structure consisting of four towers at the corners and a wider one at the center. Ramps and bridges traverse and connect these towers to each other and the ground creating an intricate lattice of vantage points that the player can use to practice their skills.

In the survival game mode, training drones will spawn at eight points around the perimeter of the arena with preference to the spawn points furthest from the player's current position at the time to avoid spawn camping. Once spawned the AI will take over to direct the drone through the arena to attack the player. The arena will also have a separate set of spawn points for the targets that spawn during Target Practice mode. These are scattered throughout the entirety of the arena.

### 7.2 THE NANODOME

The Nanodome is another completely custom Arena. It features some similarities to the Training Grounds like the clean industrial look of its paneled walls and floors and emissive lighting. Unlike the Training Grounds, the Nanodome is a round arena with a large open space in the middle surrounded by multiple structures around the periphery like a tiny city with a town square (or circle) in the middle. The structures here are a bit more organic, taking on rounded corners and curving to match the curvature of the arena. There are overhanging ledges on every structure that are often connected to form bridge-ways over paths that radiate out from the center clearing like the spokes of a wheel. These structures and their lights vary in color. The material of the buildings appears to be of different metals, while the lights are different hues depending on the quadrant of the arena in which they are located.

Eight span points are spaced equally around the circumference of the arena game modes that require them, and a group spawn location is placed on opposite sides for team match start points and respawn locations.

### **7.3 MAINBOARD**

Mainboard makes use of old electronics and consists of a highly modified set of circuit boards from various electronic devices stacked on top of each other to form three tiers. Tiers two and three are each made up of two smaller boards separated by a gap that runs the length of the arena in perpendicular directions to each other. This leaves a vertical space at the center of the bottom tier with no other tiers directly above it. Capacitors, LEDs, and copper circuit paths cover each board, and capacitors in particular can be hazardous to a Nanogear because they occasionally discharge excess power and if a Nanogear is too close when that happens it will take a little damage and be stunned for a moment similar to the effects of an EMP, but on a smaller scale.

### **7.4 THE IN-BETWEEN**

Located in the space between two old wooden walls, The In-Between is dusty and has its share of shredded cobwebs. The arena is “L” shaped, and the central objective of those game modes that have one is in the corner of two adjacent walls. Old nails jut out in a few places and splintered pieces of wood litter the arena floor. Ramps, bridges, and platforms crisscross overhead, and tunnels cut diagonally between the two walls.

### **7.5 CLOCKWORK**

The inner workings of the antique pocket watch that houses the Clockwork arena have not been functional in hundreds of years, but by retrofitting the gears, springs, and shafts within an interesting and dynamic environment has been made available for competition. There is a central pillar that extends from the floor to the watch face ceiling with different sized cogs on it forming platforms. Other gears of varying sizes fill the remainder of the watch’s casing and serve as surfaces for different tiers that are connected with ramps and bridges. Some of the gears constantly rotate while others suddenly and sporadically turn a few degrees and stop again.

### **7.6 GRASSLAND**

The circular shape of the Grassland arena is centered by a low, wide hill. This hill contains tunnels that connect the outside combat area with a bunker-like set of caverns. Four Jump Pads located in the main central chamber launch players up through holes in the ceiling and out onto the top of the hill. The surface is covered with the normal groundcover one would find in the average back yard. Blades of grass form pathways and bridge-ways connecting the ground with the tops of rocks and twigs.

## **7.7 TIMBER**

Set on a branch of a felled tree in the woods, Timber features a vast forest all its own full of tiny fungal growths, spore stalks, slime molds, and lichen, all of which range in size from shrubs to trees in relation to a Nanogear. The play area will be symmetrical with the top surface of the branch being a direct conflict zone covered in the fungal forest. Paths extend from each end of the arena towards the center down each side of the branch using toadstool platforms when the curvature of the branch becomes too steep. Halfway to the center line of the arena each of these four path ends at a tunnel that has been drilled into the branch and extends directly across to the other side meeting up with the opposite path. Between these two tunnels and connected to them by two more short tunnels is a large central chamber. This chamber is where the central objective can be found.

## **7.8 PESTICIDE**

This arena has a lot of custom work, but it is all done in a way to mimic nature. It is symmetrical, but the left side is dominated by an ant hill and the right by a termite nest that has been burrowed out of a small log. Even though the style and texture of the two sides are different the tunnel layouts are symmetrical. A small ravine connects the two sides and is the main path between them, but other more circuitous routes exist as well. Grass, twigs and leaves function as obstacles and pathways in addition to ramps and bridges. A large flat river stone dominates the center point of the arena.

## **8 USER INTERFACE**

### **8.1 OVERVIEW**

The interface should be clean and fun with a bit of a futuristic industrial feel. Whenever a menu option is chosen, the menu will transition dynamically with name of the chosen option moving up to become the title of the new menu or screen and the rest of the options falling away. The reverse happens when moving back a previous screen or menu.

### **8.2 MAIN MENU**

The Main Menu will consist of options for Single Player Game, Local Multiplayer Game, Online Multiplayer Game, The Assembly Bay, Leaderboards, Achievements, and Options. It will also prominently display a corresponding image for each option when it is highlighted.

### **8.3 SINGLE PLAYER MODE MENU**

The Single Player Menu contains the four options that are available for play by one person: Campaign, Survival, Target Practice, and Recon.

### **8.4 LOCAL MULTIPLAYER MENU**

Local Multiplayer Menu options include all four NCU game mode options (Death Match, Overload, Super Charge, and Domination) and one NU option that cycles to a new NU game mode every three hours. The NU option is separated from the others in its own NU decorated space on the screen.

### **8.5 ONLINE MULTIPLAYER MENU**

The options and screen layout here are nearly identical to the Local multiplayer screen with the obvious exception of the title.

### **8.6 ASSEMBLY BAY**

This is the screen that a player can go to at any time to change their default Nanogear loadout. It is also displayed just before the beginning of each match to give that player an opportunity to tweak their loadout to better suit a particular map or game mode. The Nanogear itself is displayed prominently in the right two thirds of the screen and is instantly updated with every component that is selected. All unlocked components and cosmetic customizations are available to use here and options for each are on the left side of the screen. Once the desired loadout is set, the player can press the “save” button to save that loadout so it will be automatically chosen in the pre-match assembly options. Pressing the “Back” button after making changes will result in a warning popup that says, “Are you



sure you want to go back without saving your changes?” Pressing “no” will return them to the Assembly bay, and “yes” will take them back the previous menu. When this screen comes up prior to a match, the “Back” and “Save” buttons are replaced by a “Begin Match” Button. There is no need to save the loadout here since the choices made at this point are just temporarily used for one match.

## **8.7 LEADERBOARDS**

The Leaderboard screen will keep track of three separate boards: an NCL Leaderboard, an NU Leaderboard and an Overall Leaderboard.

## **8.8 ACHIEVEMENTS**

All of the achievements in the game will be listed here with the ones that have not been completed marked with an “Incomplete” label. Most will have an icon and description. A handful of hidden achievements will only have a question mark icon and a description of “?????” until after they have been completed.

## **8.9 OPTIONS SCREEN**

For either a console or mobile device, the options menu does not need to have many options. The ones that it does have are divided into three categories which are separated by tabs.

### **8.9.1 GAME OPTIONS**

The game options consist of the following:

- **AI Difficulty** – Easy, Medium, Hard, Insane
- **Y-Axis Invert** – A simple checkbox that controls whether or not to invert the y-Axis when looking up and down
- **Tutorial Reset** – A button that when pressed prompts the player if they would like to reset the tutorial so that it can be played through again.

### **8.9.2 AUDIO OPTIONS**

The audio options are simple and contain sliders for the following:

- Master Volume
- Music Volume
- SFX Volume
- Voice/Announcer Volume

### **8.9.3 CREDITS**

The credits is just that. This option will take the player to the credits screen that can be exited just like any other UI screen or menu.

## **8.10 RESULTS SCREEN**

The Results Screen is the screen that is presented at the end of each match to display the results and provide some statistics from the match. Each Game mode will have a different set of stats to display that are relevant to that specific mode, but regardless of the game mode, the Results Screen will always display to the player if they were victorious or if they were defeated. Each participating Nanogear will have their individual stats displayed next to portraits of their Nanogears. The only two Single Player modes that have a Results Screen are Survival and Campaign, and the Nanogear with the best performance on the winning team will be recognized as MVP. In NU matches the MVP is still awarded to the best overall performance even if that particular Nanogear did not come in first place. The displayed stats for each game mode are as follows:

### **8.10.1 SURVIVAL STATS**

- Time
- Drones Destroyed
- Deaths

### **8.10.2 CAMPAIGN STATS**

Each match in the Campaign mode will use the stats that correspond to the type of match that was played.

### **8.10.3 OVERLOAD STATS**

- Kills
- Deaths
- Damage done to Enemy Power Core

### **8.10.4 SUPER CHARGE STATS**

- Kills
- Deaths
- Number of Capsules controlled at end of match

### **8.10.5 DOMINATION / KING-OF-THE-HILL STATS**

- Kills
- Deaths

- Time spent in the on the Capture Point

#### **8.10.6 DEATHMATCH / FREE-FOR-ALL STATS**

- Kills
- Deaths
- Assists

#### **8.10.7 SEEK AND DESTROY STATS**

- Seeker
  - Kills
- Runners
  - Amount of Time survived

#### **8.10.8 LOCK AND LOAD STATS**

- Kills
- Deaths
- Goals

### **8.11 PAUSE MENU**

The Pause Menu has two options, Resume Game and Forfeit Match. When active, the screen will be darkened slightly and a window will pop up in the center of the screen with two options in it. During single player modes and Local Multiplayer matches the gameplay will pause, but gameplay will continue during online play when this menu opens.

### **8.12 HUD**

The HUD consist of all of the relevant information the player needs to keep track of the status of their Nanogear and the state of the match.

The Nanogear's hit points are displayed as a segmented bar at the bottom left of the screen next to a small portrait of the player's Nanogear located at the left end of the bar.

The Charge Meter is displayed in the bottom right corner of the screen. This will also be displayed as a bar that matches the style of the hit point bar, but with a charge symbol to the right of the bar instead of a Nanogear portrait.

The current Special Item that is available to use has a unique icon that is displayed at the bottom center of the screen.

Match status info is located at the top center of the screen and is different for each of the different game mode objectives:

- **Survival** – A timer displays how long the player has been in the match, and just below that a counter keeps track of the number of drones destroyed.
- **Overload** – damage meters are displayed to keep track of the remaining hit points of each Power Core. Player team in blue and opposing team in red.
- **Super Charge** – counters keep track of each team's total Ion Capsule count. In addition, each Nanogear carrying at least one capsule will have a number floating above them indicating how many they currently have.
- **Domination** – A central meter track which team controls the point and the status of that control. As a team is taking the point this meter will fill over the span of four seconds with that team's color (blue for the player's team and red for the opposing team). If a team takes the point from the other team then the meter must first be drained and then refilled with the new color. On either side of this meter is a percentage count of each team's control score. This will only increase for a team while they have full control of the point.
- **King-of-the-Hill** – similar to Domination, but instead of different colors in the meter for each player, all opposing player's will be red and the Nanogear that is controlling the point will have their portrait in the meter to specify exactly who owns it. There will also be additional percentage counters extending to either side of the meter to display everyone's current score along with their names. The highest score will have a highlight effect on their percentage as well as their portrait if they currently control the point.
- **Deathmatch** – the match's countdown timer will be at the center flanked by the teams' current kill counts.
- **Free-for-All** – the match's countdown timer will be at the center with the current first place player's kill count directly below that, and the player's own kill count below the current leader's count. If the player is the current leader then the second count will be that of the current second place player. These counts will also be accompanied by the players' names.
- **Seek and Destroy** – for this match a match timer is in the center with dots below representing the number of remaining Runners still active. Every time a Runner is destroyed, one of these dots gets overlaid with an X.
- **Lock and Load** – a timer is in the center with player names and current goal counts flanking it on either side.

### 8.13 PLAYER INFORMATION SYSTEM

There are a number of visual cues that inform the player about the state of other Nanogears. As a Nanogear takes on more and more damage, it will at first begin

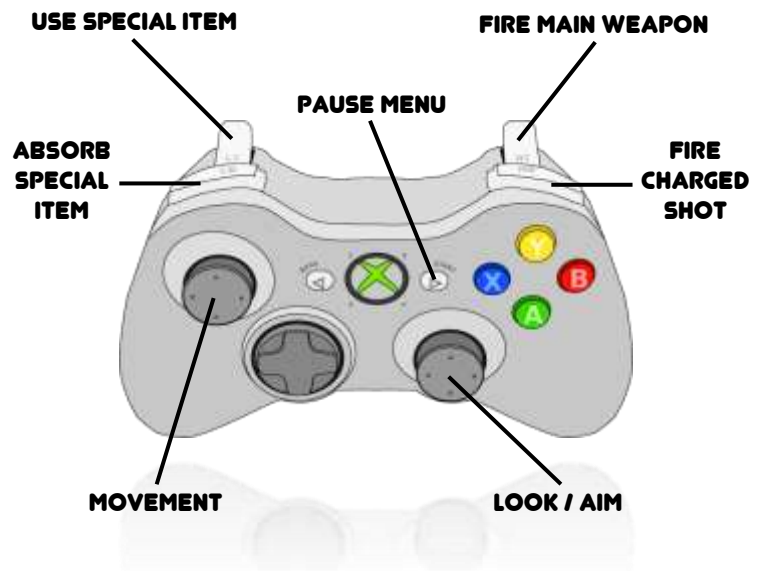
to spark a little at fifty percent, and that spark effect will grow more prevalent the more damage it takes until it is destroyed. Also, a Nanogear that is in a Supercharged state will have a special energy aura effect surrounding it. Both of these effects apply to the player's own Nanogear as well.

## 8.14 LIGHTING SYSTEM

The lighting setup for Nanogear will need to be unique due to the perspective. For outdoor areas it will need a prominent ambient light with directional lighting being secondary and very soft shadows. Indoor spaces that use artificial means of lighting can use a more traditional setup, but the shadows should still be very soft.

## 8.15 CONTROL SYSTEM

Nanogear's controls are simple, intuitive and designed to make it easy to quickly and easily pick up the game and start playing. The image to the right is an example of the control map that will be provided to players to give them a quick and easy reference to help them understand how to pilot their Nanogear.



## 8.16 HELP SYSTEM

In order to help the player learn the ins and outs of piloting a Nanogear, a tutorial will be implemented to teach the basics. This tutorial will be active when the player first plays the game, but will not repeat again unless the option to reset is used.

The player will first be prompted to play the campaign and when the first match commences they will be instructed on the basic controls for movement, aiming, and firing. The second match will be used to teach the charge meter and the use of special items and charged shots. The third match adds the Supercharge mechanic.

## 9 ARTIFICIAL INTELLIGENCE

### 9.1 OVERVIEW

Much of the game and its objects will be manipulated directly by players, but in the case of AI opponents there are certain behaviors that will determine their actions and how well they perform them. The main differentiating feature that determines AI behavior will be the main weapon that the Nanogear has equipped. Other properties of the Nanogear can affect the behavior of the AI as well such as its maneuverability rating and how much armor it has. Combined with the weapon type and the amount of damage that Nanogear has sustained, these properties could cause the AI to be more aggressive or more defensive in any given situation.

#### 9.1.1 PLAYER AND COLLISION DETECTION

Unity's rigid body system and mesh colliders will be used to provide realistic collision and physics interactions.

#### 9.1.2 PATHFINDING

Pathfinding will be handled by Unity's NavMesh system and raycasting will be used for line of sight. With a combination of those systems AI should be able to look for, find, and chase opponents.

## 10 MUSICAL SCORES

### 10.1 OVERVIEW

With a game like Nanogear that has a large amount of action, the music for it should reflect that.

#### 10.2 RED BOOK AUDIO

The quality of the music is an important factor, the Red Book standard provides that kind of quality. The use of proper instrument voices will be used to give the music of each arena a unique sound that can help to define that particular playing experience.

## 11 SOUND EFFECTS

### 11.1 OVERVIEW

The sound Effects should be easily recognizable for what they are and fit well with the action to which it is associated. .

### 11.2 SOUND DESIGN

Audio for sound effects can be created in a few different ways depending on the sound that is being made. They can be sourced from real world recordings for things like outdoor ambient sounds of the forest. They could also be recorded and then edited to alter them or combine multiple sounds together to make a composite effects for things like the sounds of machinery or possibly Nanogear movement sounds. And of course, they can also be completely synthesized artificial sounds. The sounds of all of the Nanogear weapons fire might be done this way.

## 12 ONLINE PLAY

### 12.1 OVERVIEW

When starting an online multiplayer match the player is placed into the match-making queue that will locate other comparably skilled players and place them into the same match.

### 12.2 MAX PLAYERS

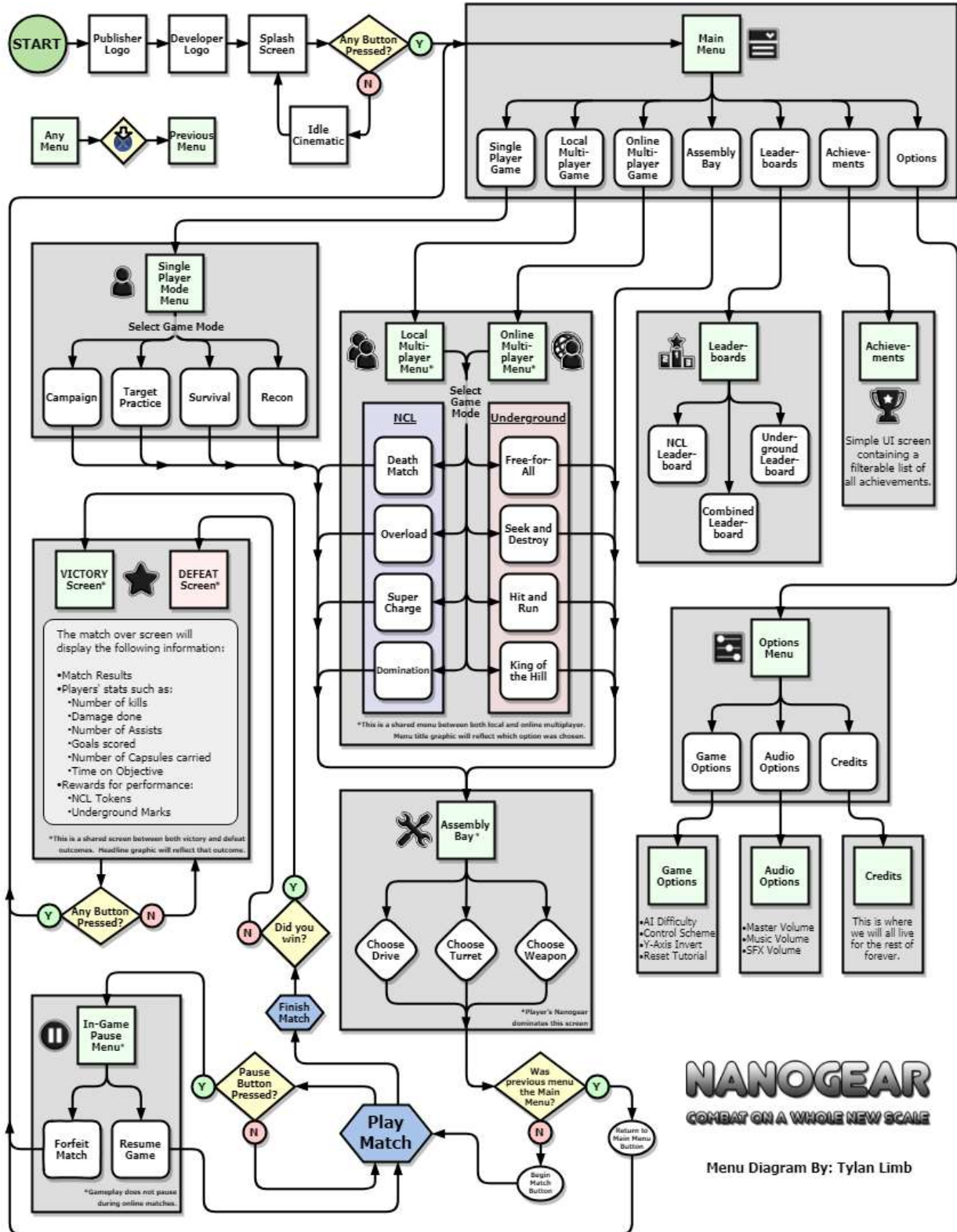
All game modes are designed for a maximum of eight players with the exception of Seek and Destroy. That mode is played with five players – one Seeker, and four Runners.

### 12.3 SAVING AND LOADING

Due to the real-time arena based nature of the game, saving mid-match is not possible. Any rewards and other relevant results of the match are automatically saved. There is no real need to save in the middle of a match since the only real information that needs to be saved is the customizations that have been unlocked, achievements and challenges that have been completed, and rankings in the leaderboards, all of which can be done automatically each time any of these things change at the end of a match.

# 13 INTERFACE APPENDIX

## 13.1 FRONT END FLOW CHART



Menu Diagram By: Tylan Limb