

# XenoLancer

## Game Design Document

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## Executive Summary

### Overview

The player takes the role of an alien explorer rescuing his captured friend from Earth. Piloting a damaged, salvaged ship, the player must battle his way through Earth's solar system and, eventually, Earth itself in an effort to rescue his friend. Earth has reverse-engineered the alien technology, creating an armada of advanced spaceships.

### Gameplay

XenoLancer is a top-down scrolling shoot-em-up (shmup). The player (or two players on the same computer) controls the ship and fights enemies as they appear. The game progresses through a linear sequence of levels. The player earns points through their performance. In addition to acting as a traditional score, points serve as a form of currency and can be spent to upgrade the ship's weapons and abilities. Players who upgrade a lot will have an easier experience but a lower high score, whereas players seeking an extra challenge can withhold on upgrades, making the game more difficult but attaining a higher score.

### Rules

- Linear sequence of level progression
- 8-directional movement
- No health meter; one-hit kills from enemy projectiles, obstacles, collisions
- Points gained for destroying enemies, deducted for purchasing upgrades
- Freedom of movement limited to what is visible on-screen
- Art
- The art for XenoLancer will be a combination of two-dimensional vector and art and sprites.
- Technical Platform

- Adobe Flash CS3 and the Flash Actionscript 3 scripting language. The game is intended to run in the Adobe Flash player inside of a web browser.

# Game Specifications

## Story

The player was part of a team of alien space explorers. While traveling through hyperspace, their main ship was destroyed by a hyperspace storm. The player and a friend managed to escape in one-man vessels. These smaller ships were also damaged by the storm, and flung far apart from each other before returning to normal space. The player drifted lost through space with a damaged ship, trying to find supplies for repairs, and searching for some sign of the lost friend. Eventually, the player receives a psychic cry for help from the friend, who is in great pain.

The friend has been captured by Earth military and is being experimented on by scientists. Humans study the technology on the remains of the friend's alien ship, and use it to greatly advance their own spaceship and weapons technology.

The player alien responds to the friend's distress call. By the start of the game, the player manages to fly to Earth's Solar System and encounters humans armed with primitive versions of the alien technology. The humans do not yet fully understand how to use the technology efficiently. Fortunately for the player, the new human spaceships are built with parts suitable for repairing an alien ship.

The player fights through the Solar System toward Earth to rescue the friend from the human laboratory. The alien pilot must blast through Earth's newly upgraded armada of ships and space stations, while salvaging parts from defeated enemies to restore as many of the ship's systems as possible.

As the player progresses toward Earth, the Earthlings grow fearful, but also greedy for the new technology they may find on the player's ship. The humans frantically send ever more massive warships to capture the player.

## Characters

### ALIEN PILOT (PLAYER)

- Masked hero
- No voice
- Unnamed
- Thoughts expressed in cutscenes through text
- Concerned for captured friend
- Angry at humans
- Rescues friend at end of the game and carries away in spaceship

- Story has little direct description of her as an alien
- Clues that hero is alien through context and alien-looking equipment
- If player wins with high enough ranking, hero takes off helmet
- Reveals that hero is female-looking alien

## **ALIEN CAPTIVE**

- Seen in cutscenes
- Indistinct glimpses in psychic images
- Brief flashes
- Trapped in a lab
- Voice screaming in pain
- Seen clearly when player completes rescue at the end of the game

## **HUMAN ADMIRAL**

- Sends radio messages to human ships
- Gives orders to capture player
- Dialogue with final boss ship
- Aggressive and proud
- Demands surrender of player

## **Level Progression, First to Last**

- Fight fleet in space near Saturn
- Asteroid belt battle
- Attack fleet base stationed on Mars
- Space battle approaching Earth
- Attack base with super cannon being built on Earth's Moon
- Atmospheric entry fight against defense satellites
- Fight over Earth land and cities
- Fly into underground tunnels to hidden research lab

## **Point of View**

- Bird's eye view of the top of the spaceships
- Player's ship front is always oriented toward the top of the computer screen
- Most player weapons fire toward top of screen

## **Movement**

- Use keyboard controls to move the ship around the screen (arrow keys or WASD)
- Left arrow/A key moves ship leftward on screen, right arrow/D key moves right, up arrow/W key up, down arrow/S key down
- 8-directional movement
- Move in direction as long as key is held down
- Hold two different direction keys for diagonal movement
- No gravity
- No momentum

## **Level Content**

- Linear levels organized in a linear sequence
- Enemy military vessels come onscreen at particular points in time and attack
- Each type of enemy has a unique appearance, movement pattern(s), health amount, weapon types
- Most enemies leave screen after finishing a particular attack script
- Occasional enemies stay onscreen until killed
- If player survives to the end of the level's enemy sequence, must fight level boss
- Bosses have stronger health and firepower than normal enemies
- Must kill boss to progress to next level
- point total screen after each level

## **Points/Score/Currency**

- Destroyed enemies leave salvage floating down-screen
- The player flies over salvage to pick up and gain points
- More powerful enemies leave salvage that is worth more points

## **Upgrade Abilities**

- The player's alien ship starts the game with only partial functionality
- The player is unable to use the best weapons at the start of the game
- The player may repair the ship between levels by spending points earned during levels

- The player can spend points at a menu between levels
- The player may choose from multiple repair types
- Each repair grants a new ability or upgrades a current ability
- More powerful abilities cost more points
- Menu shows points remaining and points spent
- Shows point value of each upgrade
- Acquired abilities are never lost
- High point costs mean few players can afford to ever get all abilities
- Highlight upgrade before selecting to read a description
- Some upgrades have multiple ranks to improve their effectiveness
- Some upgrades are prerequisites for other upgrades

## Cheat Code

- Cheat code to grant all upgrades
- During levels, the word CHEAT flashes at top screen edge constantly

## Overheat

- Many acquired abilities fill up the player ship's heat meter
- More powerful abilities generate more heat
- Some abilities add heat one time upon activation
- Some abilities add heat at constant rate over time while toggled on
- If heat is at maximum, player can no longer use heat-generating abilities
- If no heat abilities are used for 20 seconds, all heat dissipates in 3 seconds
- Player glows more red as it approaches heat limit; flashes red when at limit

## Coolant

- Particular enemies drop coolant tanks when destroyed
- Player flies over coolant to pick up
- Instantly lowers heat by 25 percent of player maximum

## Save Points

- Selected abilities and point totals automatically saved at the end of a level

- During levels, the game saves the player's status upon reaching checkpoints
- Checkpoint saves abilities, points, position in level

## **Player Death**

- Player ship dies instantly if struck by weapons, obstacles, or enemy vehicles
- After death, the player gets death menu with options
- Players restarts at last passed checkpoint save

## **Pause**

- Player can pause the game during levels to bring up options
- Player can restart the current level from pause menu
- Player can return to the game's title screen from pause menu

## **Restarting Level**

- If players restart a level, reload the save made at the end of the previous level
- If players restart level, taken back to repair/ability selection menu
- Option to spend points differently from last time before starting level again
- If player restarts same level three times, gets option to sell upgrades for points
- Can sell all past upgrades and spend points on totally different upgrades
- Points spent count toward total of points spent during game

## **Points from Never Restarting**

- The game keeps track of whether the player has restarted during each level
- Completing a level without restarting earns bonus points at level's end
- Each restart lowers bonus points by one third; zero bonus after third restart

## **End Ranking**

- Displays point totals at end of game
- Displays total number of points earned in the game

- Displayed total points remaining unspent on abilities
- Displays total points spent on abilities/repairs
- Player earns a ranking based on how many points have been left unspent
- Rank incentive for players to beat the game without point-bought abilities
- Award for beating game without ever spending points
- Award for beating game without restarting
- Negative mark for selling upgrades for points
- Negative mark for using cheat code

## **Menu Navigation**

- Arrow keys/WASD keys select menu options

## **Media Assets**

### **Level Artwork**

- Vector art done in flash by team members
- Spaceships, gun turrets, tanks, asteroids
- Temporary glows around vehicles show active shields or auras
- Projectiles, beams
- Low animation with few moving parts
- Larger bosses with multiple moving parts
- Space or land background scrolling down vertically

### **Menu Art**

- Title screen
- Pause menu
- Repair ability selection menu
- End of level point award screen
- End of game point total and ranking screen

### **Cutscene Art**

- Still slideshow between levels, drawn by team
- No animation
- Right before level start or right after point screen
- Can fast forward or skip scene with button tap
- Shows alien pilot of player's ship in masked flight suit
- Psychic visions of alien's friend being experimented on by Earthlings
- Human military and scientists organizing to fight off player

## **Sound Effects**

- Free-for-use sounds acquired online
- Weapon fire
- Explosions
- Psychic whispers

## **Music**

- Original music
- Exciting action music during levels
- Hi-tech sci-fi music during menus
- Title screen theme song
- Military song for cutscenes with Earth military

## **Voice**

- Recorded by team
- Radio chatter of Earthling military commanding or panicking
- Conversations of Earth scientists about experiments on alien

## **Menus**



# Main Menu

## NEW GAME

- Shows background story which can be skipped
- Starts a new game at level one

## LOAD GAME

- Shows the statistics of the current saved game
- Option to load the saved game or return to the main menu

## CONTROLS

- Shows the controls table for the game
  - Movement
  - Fire weapon
  - Change weapon
  - Pause

## SOUND ON/OFF

- On selection, it will toggle whether or not the sound will be on or off

## ENTER CHEAT

- Brings up an input that the user will be able to type in a cheat code
- Once submitted, a sound will play and text will be shown that will indicate whether or not the cheat has been accepted

## HIGH SCORES

- Brings up the high score menu

# Upgrade Menu

## SALVAGE

- Shows the total amount of salvage gathered, spent, and remaining

## REPAIRS/UPGRADES/ABILITIES

- Shows the list of available repairs/upgrades/abilities
- See Upgrade Abilities

## SAVE GAME

- Saves the statistics of the game, before spending salvage points

## **QUIT GAME**

- Brings up a yes/no stating whether or not the player wants to quit without saving
- Returns to the main menu without saving

## **Pause Menu**

### **RESUME GAME**

- Will un-pause the game and resume normal gameplay

### **SAVE GAME**

- Saves the statistics of the game using the last checkpoint as a return point

### **RETURN TO LAST CHECKPOINT**

- Will revert back to the last checkpoint
- If no checkpoints have been reached, will return to the beginning of the level

### **RETURN TO START OF LEVEL**

- Will return to the Upgrade Menu between the current level and the previous level

## **CONTROLS**

- Shows the controls table for the game
  - Movement
  - Fire weapon
  - Change weapon
  - Pause

## **SOUND ON/OFF**

- On selection, it will toggle whether or not the sound will be on or off

## **QUIT GAME**

- Brings up a yes/no stating whether or not the player wants to quit without saving
- Returns to the main menu without saving

# **Player Weapons**

## Plasma Bullet (Main Weapon) Upgrades

- Hold "spacebar" key to fire plasma bullet stream
- Bullets disappear after hitting enemy or reaching top of screen
- Usable at game start
- Deals 5 damage
- Upgrade to increase damage by +1; max +10 (costs 10 salvage)
- Increase main weapon attack width by 25%; max +200%; (costs 10 salvage)
- Convert main weapon to super wide spread shot; toggle-on by pressing "3" key; (costs 50 salvage) 1 heat per shot
- While spread active, player has fan-like aura in front
- Chain shot; bounces toward nearest enemy after hit; heat per shot (low priority for implementation)
- While chain active, light spirals around player ship

## Charged Beam and Upgrades

- Buy upgrade to access charged beam (costs 20 salvage)
- Charge builds while "spacebar" key not pressed; press "spacebar" to fire charge in straight line
- Hit enemies behind other enemies; goes through all
- While charging, ball of light grows at front tip of player ship; flashes when ready
- Requires 1 second charge time
- Deals 25 damage; no heat
- Benefits from damage upgrades to plasma bullet attack (gains +5 instead of +1)
- Dispersion beam upgrade; destroys enemy projectiles; no heat (costs 20 salvage)
- Persistent beam upgrade; keeps emitting for 2 seconds; toggle-on; 5 heat per shot (costs 50 salvage)
- Persistent beam keeps damaging enemies it touches; damage per half second
- Toggle-on with "3" key, same as spread toggle for plasma bullet
- Cannot charge new beam while persistent beam is still emitting
- While persistent beam toggled on, charge ball is bigger
- Explosive beam upgrade; explosion radius damage around struck enemies; no heat (low priority for implementation)

## Homing Missiles

- Buy upgrade to access missiles (costs 50 salvage)
- Hold "E" key to fire missiles; continuous fire 1 burst per second
- Targets enemies nearest to player at time of fire
- Deals 5 damage per missile; basic level has 1 missile
- No heat
- Missile flight is slow; half speed of plasma bullet main weapon
- Upgrade to increase number of missiles per burst +1; max 8 missiles (costs 50 salvage each)
- Explosion upgrade; radius damage when rocket explodes; radius is length of player's ship; (costs 50 salvage)
- If homing missile goes off-screen before hitting enemy, it vanishes
- If homing missile target leaves/dies before hit, missile keeps going straight
- Upgrade homing missile to seek new closest target if original leaves/dies (costs 10 salvage)
- Upgrade homing missile turn speed and forward flight speed by 25%; max +100%; passive; no heat (costs 5 salvage)

## Targeting Beacon

- Buy upgrade to access beacon; requires homing missiles first (costs 20 salvage)
- No heat
- Readies to fire if "E" key left unpressed for 1 second; press "E" to fire straight up
- Medium range projectile; dissipates after half screen
- Places targeting reticule graphic on struck target
- Beacon effect lasts for 10 seconds
- Increases damage taken by target by 20%
- Causes all players' homing missiles to home on the target instead of enemies nearest to player
- Firing another beacon shot deactivates previously fired beacon and effect
- Destruction of target also deactivates beacon
- Upgrade to increase percentage damage bonus by 20%; max +100% (costs 20 salvage)

## Evasion Slide

- Usable at game start without upgrade

- Double tap left or right arrows to quickly slide in that direction
- Slides at five times normal speed for half second
- Creates 10 heat per use
- Upgrade to gain damage immunity during slide (costs 50 salvage)
- Upgrade to long slide; hold left/right after double tap to slide longer time (costs 10 salvage)
- Upgrade to low heat slide; slide heat reduced by 1; maximum reduction by 8; (costs 5 salvage)
- Upgrade to redirect enemy bullets toward direction of slide; requires damage immunity (costs 10 salvage)
- Redirected bullets kill enemies
- Redirected bullets move at double speed
- Upgrade to up/down slide by double tap up/down (costs 5 salvage)
- Upgrade to leave damaging trail during slide; stays in place 5 seconds (costs 10 salvage)
- Damage trail does 15 damage, plus 15 every half second of continuous contact
- Upgrade trail damage +2 (costs 5 salvage)
- Upgrade damage trail to barrier; trail blocks enemy attacks (costs 10 salvage)

## Lightning Chain

- Buy upgrade to access lightning chain (costs 20 salvage)
- Tap and release "Q" key to fire bolt; 5 heat per shot
- Medium range; dissipates if it doesn't hit target after half screen
- Creates straight line of lightning between struck target and player
- Lightning does not damage target it is anchored to
- Lightning damages other enemies/missiles it touches
- Any one target may only be anchor to one chain at a time
- Any other chains must be anchored to different targets
- Each chain lasts 15 seconds
- Enemies continuously in chain take damage every half second
- Deals 5 damage plus 5 more every half second
- Upgrade to increase damage +1 each time it deals damage (costs 5 salvage)
- Player and anchor's movement determine length/position of chain
- No maximum length; can move away from anchor
- Effect ends if anchor target is destroyed or moves off-screen
- Upgrade to destroy enemy bullets and wave shots with chain (costs 5 salvage)

## Lightning Sphere

- Upgrade to access lightning sphere; requires lightning chain (costs 70 salvage)
- Hold "Q" key 1 second to charge up; release to fire; 50 heat per shot
- Fires large sphere; double size of player ship
- Sphere damages anything it touches and does not disperse on hit
- Keeps traveling up-screen at slow speed; half of player's ship normal speed
- Firing a another sphere while previous one is active will disperse previous sphere
- Player controls sphere's left-right movement by moving ship
- Sphere travels left-right toward same X-axis screen position as player
- Sphere's X-axis movement is slow; half of player ship normal speed
- Enemies in constant contact with sphere take continual damage per half second
- Deals 10 damage per half second
- Upgrade to increase damage +1 per half second (costs 5 salvage)
- Upgrade to increase sphere X-axis speed by +100%; max +1100%; (costs 1 salvage)

## Blast Field

- Buy upgrade to access blast field; (costs 20 salvage)
- Tap and release "W" key to fire; 50 heat per shot
- Hits everything in medium radius around player; 1/8 screen
- Deals 15 damage per half second
- Half-second duration
- Radius remains centered around player ship during player movement
- Upgrade to increase damage +3 per half second (costs 10 salvage); increases heat
- Destroys all enemy bullets/wave-shots/missiles regardless of missile health
- Cannot fire another blast field until previous blast field has expired
- Upgrade to grant player damage immunity while field fires; no extra heat (costs 20 salvage)
- Upgrade field radius +100%; maximum +300%; max radius should hit half screen; each level increases heat by 10 (costs 10 salvage)
- Upgrade field duration 1/2 second; increases heat by 25; max duration 3 seconds (costs 10 salvage)
- Upgrade to lower field heat cost by 2; max reduction 20; (costs 5 salvage)

## Gravity Field

- Buy upgrade to access gravity field; requires blast field (costs 20 salvage)
- Hold "W" key 1 second to charge up; release to fire; 30 heat per shot
- Gravity field remains at spot on screen where player was during activation
- Overrides enemy movement within field; sucks enemies in radius to field center
- Also sucks in enemy missiles
- Bosses immune
- Large radius; quarter screen
- Lasts two seconds
- Cannot fire another gravity field until previous gravity field has expired
- Upgrade field radius +100%; increases heat by 5 (costs 10 salvage)
- Upgrade field duration 1/2 second; increases heat by 10; max duration 5 seconds (costs 10 salvage)
- Upgrade to lower field heat cost by 2; max reduction 20; (costs 5 salvage)

## Time Warp

- Buy upgrade to access time warp (costs 20 salvage)
- Press "2" key to toggle-on; 5 heat per half-second
- Slows everything onscreen, including player (bullet-time); easier to dodge
- Screen color and sounds dampened while active
- Upgrade to lower heat by 1 per half-second; max reduction 4 (costs 20 salvage)
- Upgrade to make player not be slowed during time warp; increases heat by 5 per half-second (costs 50 salvage)

## Shield

- Buy upgrade to access shield (costs 30 salvage)
- Reacts to grant half second immunity to damage when struck by attack
- Not triggered if struck while immune during upgraded evasion slide
- After granting immunity, shield breaks; reforms after 5 seconds
- Player glows faintly blue when shield is formed and ready

- Flashes during half second immunity after being hit
- No heat cost, but shield does not form while player is overheated
- Requires no player activation
- Upgrade to decrease reform time by 1 second; minimum time 2 seconds (costs 50 salvage)

## Point-Defense Turret

- Buy upgrade to access turret (costs 25 salvage)
- Automatically targets and fires bullet in direction of nearest enemy/missile
- Requires no player activation
- No heat, but does not fire while player is overheated
- Fires once per second
- Shots dissipate after traveling quarter screen
- Only senses enemies within quarter screen
- Deals 5 damage; half damage against medium/large enemies
- Upgrade to increase damage +1 per shot (+1/2 vs medium/large targets); max +10 (+5) damage; (costs 5 salvage)
- If no enemies within range, turret does not fire
- Upgrade to increase number of turrets; extra turret targets next closest foe (costs 25 salvage)
- If more turrets than enemies in range, extra turrets target closest foe
- Upgrade to increase turret sensor and projectile range +50%; max +100% (costs 25 salvage)

## Heat Sinks

- Upgrade to increase max heat limit +2; costs 5 salvage

## Control Enemy Bolt (Dominador)

- Buy upgrade to access control ability (costs 20 salvage)
- Press "1" key to fire
- 10 heat per shot fired
- 5 heat per half-second to maintain effect after target is struck
- Medium range projectile; dissipates after half screen
- Firing another control bolt while previous one is traveling disperses previous bolt



- Allows control over single struck small/medium enemy
- Causes enemy to glow yellow
- Bosses immune
- Pressing key again while control is active deactivates control
- Target moves left/right as the player moves
- Target moves up/down inversely to how player moves
- If continued controlled movement would take target off-screen, it does not move
- Target faces bottom of screen
- Target continuously fires its weapons at max possible fire rate
- Target's weapons affect player's enemies instead of the player
- Enemy weapons affect the controlled target
- Player weapons do not affect the controlled target
- Player can still crash into target
- Enemies can crash into controlled target
- Plasma chain can anchor to controlled target
- Upgrade to lower maintenance heat cost by 1 per half-second; max reduction 4 (costs 20 salvage)

## Enemy Abilities

### Regular Enemy Attacks

- Bullets travel 20% faster than player normal speed; 5 damage
- Beams instantaneously cross screen; charge one second before firing; 25 damage
- Unguided rockets travel 20% faster than player normal speed; 10 damage
- Homing missiles travel 10% faster than player normal speed; 10 damage
- Rockets and missiles destroyed by player weapons; 1 health
- Shielded rockets and missiles have more health
- Enemy damage values are used when the player has control of the enemy ship

### Burst Bullet

- Fires series of 3 bullets toward target; each bullet fires half second after previous

## **Spread Bullet**

- Fires 3 bullets simultaneously; 1 goes toward target; 2 others 45 degrees different

## **Burst Spread Bullet**

- Fires series of 3 spread bullets; each spread fires half second after previous

## **Bullet Circle**

- Fires 8 bullets, each in one of 8 directions; up/down/left/right/diagonals

## **Tight Bullet Circle**

- Fires 16 bullets; like BULLET CIRCLE but more bullets evenly distributed in circle

## **Burst Bullet Circle**

- Fires series of 3 bullet circles; each circle fires half second after previous

## **Split Beam**

- Fires 3 beams simultaneously; 1 goes toward target; 2 others 45 degrees different

## **Wave Shot**

- Wave shot twice as wide as player
- Destroys player bullets and rockets and keeps going without dissipation
- Prevents charged beam from affecting targets behind wave shot
- Dispersion beam upgrade destroys wave shot
- Piercing beam upgrade hits enemies behind wave shot
- 10 damage
- Wave shot travels 20% faster than player speed

## **Annihilation Sphere, Enemy**

- Twice as wide as player
- 20 percent slower than player

- Sphere deals 10 damage per half second
- Destroys player rockets

## **Slow Spray**

- 45 degree arc with center line oriented toward target
- Reaches across whole screen instantly
- Visibly charges 1 second before firing
- No damage; does not count as hit against shield
- Spray maintained toward original target point 5 seconds
- Player slowed to half speed while in spray; evasion shift speed also slowed

## **Slow Aura**

- Circular aura around activator
- Radius 1/8 screen
- Fills whole radius instantly
- Visibly charges half second before firing
- No damage; does not count as hit against shield
- Player slowed to half speed while in spray; evasion shift speed also slowed
- Persists 5 seconds
- Remains centered on and moves with activator

## **Defense Aura**

- Circular aura around activator
- Radius 1/8 screen
- Fills whole radius instantly
- Visibly charges half second before firing
- Destroys player bullets, rockets, control bolt, plasma chain shot, target beacon
- Dispels effects of control bolt, plasma chain, target beacon if target is in aura
- Persists 1 second
- Remains centered on and moves with activator
- Activator immune to damage while field is active

## **Time Warp Immunity**

- Enemy is immune to time warp
- Its movement and attacks are not slowed by time warp
- Permanent effect; requires no activation

## **Plasma Chain, Enemy**

- Line of damaging plasma drawn between two enemy ships
- Each end of chain is anchored to one of the ships
- Destroying or controlling one anchor ship disperses plasma chain
- Chain destroys player bullets and rockets
- Deals 5 damage on contact
- Repeats damage every half second if player stays in contact with chain

## **Stealth Cloak**

- Enemy invisible; flickers into visibility for quarter second once per second
- If charging up attack, charge energy is visible
- Impacts of player weapons still visible
- Immune to targeting by point defense turret and homing missile
- Loses stealth while affect by player's control bolt, target beacon, plasma chain

## **Stealth Aura**

- Centered on activator
- Persistent; requires no activation
- Grants stealth cloak to enemy ships and missiles in quarter screen radius
- Spread Homing Missile
- Fires 3 missiles simultaneously
- One missile toward target
- Two other missiles at 45 degree angle to either side of center missile
- Missiles begin turning to track player instantly after firing

## **Splitter Homing Missile**

- Missile seeks player as normal homing missile for one second
- After one second or if shot by player, it detonates
- Upon detonation, it fires spread homing missile targeted at player
- New spread missiles are immune to damage half second after creation

## **Bullet Circle Rocket**

- Rocket detonates after two seconds or is within 1/8 screen of player
- Also detonates if it will exit screen soon
- Detonates if shot by player
- Upon detonation, it fires bullet circle

## **Bullet Circle Homing Missile**

- Missile seeks player as normal homing missile for one second
- After one second or if shot by player, it detonates
- Upon detonation, it fires bullet circle

## **Rocket Wave**

- Simultaneously deploy row of six rockets side-by-side
- All rockets oriented in same direction
- Rockets do not move yet
- Center two rockets fly forward first
- Half second later, each pair of rockets further out start flying forward
- Repeat until all rockets fly

## **Reactive Evasion**

- Enemy ship quickly slides toward left or right when player attack is very close
- Slides at five times player normal speed for half second
- Immune to damage during slide
- Slides along X-axis away from player's X-position

# Enemy Flight Patterns

## Figure Eight Flight Pattern

- Enemy flies onscreen, flies a figure-eight pattern, then exits opposite its entry side
- Maintains constant flight speed; same as player speed
- Constantly faces the direction it flies toward

## U-Turn Flight Pattern

- Enemy flies onscreen and flies steep parabola path
- Normal flight speed same as player speed
- Slows down to u-turn direction at parabola apex
- Accelerates to exit screen flying toward the side of its entry
- Constantly faces the direction it flies toward

## Double U-Turn Flight Pattern

- Enemy flies onscreen and flies steep parabola path
- Normal flight speed same as player speed
- Slows down to u-turn direction at parabola apex
- Accelerates to toward the side of its entry in another parabola
- Slows down to u-turn direction at second parabola apex
- Accelerates to exit screen flying opposite the side of its entry
- Constantly faces the direction it flies toward

## Approach Player Flight Pattern

- Enemy aims toward player current position and flies toward in straight line
- Flight toward player is 20 percent faster than player speed
- If flight will take enemy off-screen, it slows to reach zero speed before exit
- During slow, enemy maintains same move direction but turns to face player
- When reaching zero speed, it flies full speed toward player's current position
- Will slow to aim at player three times before continuing flight off-screen

## **Horizontal Strafe Patrol Pattern**

- Flies slowly from side to side in straight line
- Half speed of player movement
- Reverses direction of movement when almost touch side of screen
- Constantly faces bottom of screen
- Moves off-screen to side after ten patrols

## **Downward Moving Horizontal Strafe Pattern**

- Flies slowly from side to side at half speed of player movement
- Reverses direction of movement when almost touch side of screen
- Also constantly moving down-screen at quarter speed of player movement
- Constantly faces bottom of screen

## **Follow Player Strafe Pattern**

- Maintains same Y-axis position
- Constantly checks for and drifts toward player's X-axis position
- Moves slowly; half player's move speed
- Constantly facing bottom of screen

## **Straight Path**

- Moves in straight line across screen
- Speed same as player normal speed
- Constantly facing direction of movement

## **Straight Path Pause**

- Moves in straight line across screen
- Speed same as player speed until 25 percent across screen
- When reach 25 percent, decelerates to half speed
- When reach 75 percent across screen, accelerates to normal speed
- Constantly facing direction of movement

# Enemy Descriptions

## Small Ships (Fighters)

### Hermes (Figure Eight Burst Bullet Fighter)

- Flight: Figure Eight, medium speed
- Health: 10
- Attack Type: Burst Bullet
- Attack Target: each bullet flies at player's position at time of firing
- First Attack: starts attacking 1 second after coming onscreen
- Attack Rate: starts new burst 1 second after end of previous
- Appearance: Small ship; same size as player
- Salvage: 10

### Ulysses (Double U-Turn Homing Missile Fighter)

- Flight: Double U-Turn; high speed
- Health: 25
- Attack 1: Homing Missile
- Target 1: player; fires missile if player is in 120 degree arc in front of ship
- Attack 2: Regular Bullet
- Target 2: player's position when bullet is fired; fires if player not in missile arc
- First Attack: starts attacking 1 second after coming onscreen
- Attack Rate: fires new missile or bullet 2 seconds after previous attack
- Appearance: small ship; same size as player
- Salvage: 20

### Siren (Double U-Turn Plasma Chain Fighter)

- Flight: Double U-Turn; high speed
- Health: 30
- Attack 1: Plasma Chain
- Target 1: plasma chain connects fighter with other plasma chain fighter
- Attack 2: Regular Bullet
- Target 2: player's position when bullet is fired
- First Attack: plasma chain always active; fires first bullet 1 second after appearance
- Attack Rate: chain active until linked fighter killed; repeats bullets every 1 second
- Appearance: small ship; same size as player
- Salvage: 20



## **Harpy (Approach Player Slow Spray Fighter)**

- Flight: Approach Player Flight Pattern; high speed
- Health: 30
- Attack 1: Slow Spray
- Target 1: player position at firing time
- Attack 2: Regular Beam
- Target 2: straight forward
- First Attack: charges weapons upon coming onscreen; fires after charge
- Attack Rate: charges new beam when slowing to turn; fires half second into acceleration
- Starts charging slow spray immediately after previous use ends; fires ASAP
- Appearance: small ship; same size as player
- Salvage: 30

## **Hydra (Approach Player Splitter Homing Missile Fighter)**

- Health: 30
- Attack 1: Splitter Homing Missile
- Target 1: fires forward
- Attack 2: Burst Bullet
- Target 2: each bullet flies toward player's position at firing time
- First Attack: fires weapons 1 second after coming on-screen
- Attack Rate: missile every 3 seconds; bullets 1 second between bursts
- Appearance: small ship; same size as player
- Salvage: 40

## **Erinyes (Straight Path Burst Spread Bullet Fighter)**

- Flight: Straight Path, vertical top to bottom; medium speed
- Health: 20
- Attack Type: Spread Burst Bullet
- Attack Target: straight forward and 45 degrees to either side
- First Attack: starts attacking 1 second after coming onscreen
- Attack Rate: starts new burst 1 second after end of previous
- Appearance: Small ship; same size as player
- Special: Reactive Evasion; max uses 1 per 3 seconds
- Salvage: 20

## **Cerberus (Straight Path Spread Homing Missile Fighter)**

- Flight: Straight Path, vertical top to bottom; medium speed
- Health: 30

- Attack 1: Spread Homing Missile
- Target 1: player; fires missile if player is in 120 degree arc in front of ship
- Attack 2: Regular Bullet
- Target 2: player's position when bullet is fired; fires if player not in missile arc
- First Attack: starts attacking 1 second after coming onscreen
- Attack Rate: fires new missile or bullet 2 seconds after previous attack
- Appearance: small ship; same size as player
- Special: Reactive Evasion; max uses 1 per 3 seconds
- Salvage: 30

### **Hades (Approach Player Beam Stealth Fighter)**

- Flight: Approach Player Flight Pattern; high speed
- Health: 20
- Attack Type: Regular Beam
- Attack Target: straight forward
- First Attack: charges beam upon coming onscreen; fires after charge
- Attack Rate: charges new beam when slowing to turn; fires half second into acceleration
- Appearance: small ship; same size as player
- Special: stealth cloak
- Salvage: 20

### **Hercules (Straight Path Bullet Circle Rocket Fighter)**

- Flight: Straight Path, vertical top to bottom; medium speed
- Health: 30
- Attack 1: Bullet Circle Rocket
- Target 1: straight forward
- Attack 2: Regular Bullet
- Target 2: player's position when bullet is fired
- First Attack: starts attacking 1 second after coming on-screen
- Attack Rate: fires new missile or bullet 2 seconds after previous attack
- Appearance: small ship; same size as player
- Special: Reactive Evasion; max uses 1 per 3 seconds
- Salvage: 30

### **Chimera (Straight Path Spread Bullet Fighter)**

- Flight: Straight Path, vertical top to bottom; medium speed
- Health: 15
- Attack Type: Spread Bullet
- Attack Target: straight forward and 45 degrees to either side
- First Attack: starts attacking 1 second after coming onscreen
- Attack Rate: starts new burst 1 second after end of previous

- Appearance: Small ship; same size as player
- Salvage: 10

### **Pegasus (Approach Player Beam Fighter)**

- Flight: Approach Player Flight Pattern; high speed
- Health: 15
- Attack Type: Regular Beam
- Attack Target: straight forward
- First Attack: charges beam upon coming onscreen; fires after charge
- Attack Rate: charges new beam when slowing to turn; fires half second into acceleration
- Appearance: small ship; same size as player
- Salvage: 10

### **Artemis (U-Turn Homing Missile Fighter)**

- Flight: U-Turn; high speed
- Health: 15
- Attack Type: Homing Missile
- Attack Target: player; only fires while player is in 120 degree arc in front of it
- First Attack: starts attacking 1 second after coming onscreen
- Attack Rate: fires new missile 2 seconds after previous, if player is in target area
- Appearance: small ship; same size as player
- Salvage: 10

### **Gemini (Straight Path Plasma Chain Fighter)**

- Flight: Straight Path, vertical top to bottom; medium speed
- Health: 25
- Attack Type: Plasma Chain
- Attack Target: plasma chain connects fighter with other plasma chain fighter
- First Attack: plasma chain already active when fighter appears
- Attack Rate: chain always active unless linked fighter is destroyed or controlled
- Appearance: small ship; same size as player
- Salvage: 10

## **Medium Ships (Corvettes)**

## **Warhammer (Horizontal Strafe Wave Shot Corvette)**

- Flight: Horizontal Strafe Patrol
- Health: 80
- Attack 1: Wave Shot
- Target 1: straight forward
- Attack 2: Burst Bullet
- Target 2: each bullet flies at player's position at time of firing
- First Attack: starts attacking 1 second after coming onscreen; both weapons
- Attack Rate: wave shot every 2 seconds; burst bullet every 1 second
- Appearance: medium ship; triple dimensions of player
- Salvage: 100; coolant

## **Falchion (Downward Moving Strafe Defense Corvette)**

- Flight: Downward Moving Horizontal Strafe Pattern
- Health: 80
- Attack 1: Split Beam
- Target 1: straight forward, and extra beams 45 degrees to the side
- Attack 2: Defense Aura
- Target 2: centered on self
- Attack 3: Burst Bullet
- Target 3: each bullet flies at player's position at time of firing
- First Attack: starts charging or attacking 1 second after coming onscreen; all weapons
- Attack Rate: defense aura starts charging 2 seconds after previous use
- beams start charging 2 seconds after previous use
- bullets fire 1 second after previous burst
- Appearance: medium ship; triple dimensions of player
- Salvage: 100; coolant

## **Halberd (Straight Path Pause Slow Spray Corvette)**

- Flight: Straight Path Pause
- Health: 100
- Attack 1: Spread Homing Missile
- Target 1: player; middle of spread pointed at player location at firing time
- Attack 2: Slow Spray
- Target 2: player position at initial firing time
- First Attack: starts charging/attacking weapons 1 second after appearance
- Attack Rate: weapons charge/attack 2 seconds after end of previous use
- Appearance: medium ship; triple dimensions of player
- Salvage: 100; coolant

## **Claymore (Horizontal Strafe Annihilation Corvette)**

- Flight: Horizontal Strafe Patrol
- Health: 100
- Attack 1: Annihilation Sphere
- Target 1: straight forward
- Attack 2: Spread Homing Missile x2
- Target 2: fires 1 spread from left and 1 from right side of ship; perpendicular to facing
- First Attack: attacks 1 second after appearance
- Attack Rate: all weapons every 2 seconds
- Appearance: medium ship; triple dimensions of player
- Salvage: 100; coolant

## **Flamberge (Follow Player Strafe Wave Shot Corvette)**

- Flight: Follow Player Strafe
- Health: 100
- Attack 1: Wave Shot
- Target 1: straight forward
- Attack 2: Spread Bullet Circle Homing Missile
- Target 2: forward spread
- First Attack: attacks with wave shot 1 second after coming on-screen
- Attack Rate: repeats wave shot every 2 seconds; fires missiles half second after wave shot
- Appearance: medium ship; triple dimensions of player
- Salvage: 150; coolant

## **Katana (Downward Moving Strafe Stealth Aura Corvette)**

- Flight: Downward Moving Horizontal Strafe Pattern
- Health: 100
- Attack 1: Rocket Wave
- Target 1: straight forward
- Attack 2: Spread Homing Missile x2
- Target 2: 1 spread from left and 1 from right side of ship; perpendicular to facing
- First Attack: attacks 2 seconds after coming on-screen
- Attack Rate: all weapons every 2 seconds
- Special: Stealth Aura
- Appearance: medium ship; triple dimensions of player
- Salvage: 120; coolant

## **Morningstar (Downward Moving Strafe Slow Aura Corvette)**

- Flight: Downward Moving Horizontal Strafe Pattern
- Health: 100
- Attack 1: Spread Bullet Circle Homing Missile x2
- Target 1: 1 spread from left and 1 from right side of ship; perpendicular to facing
- Attack 2: Split Beam
- Target 2: straight forward, and extra beams 45 degrees to the side
- First Attack: charges/attacks 1 second after coming onscreen
- Attack Rate: beam starts charging 2 seconds after last attack; missiles every 3 seconds
- Special: Slow Aura
- Appearance: medium ship; triple dimensions of player
- Salvage: 150; coolant

## **Arbalest (Follow Player Strafe Rocket Wave Corvette)**

- Flight: Follow Player Strafe
- Health: 120
- Attack 1: Rocket Wave
- Target 1: straight forward
- Attack 2: Burst Bullet
- Target 2: each bullet flies at player's position at time of firing
- First Attack: starts attacking 1 second after coming onscreen; both weapons
- Attack Rate: rocket wave every 2 seconds; burst bullet every 1 second
- Appearance: medium ship; triple dimensions of player
- Salvage: 100; coolant

## **Bosses**

### **Patrol Cruiser**

- Flight: Horizontal Strafe Patrol
- Health: 300
- Attack 1: Burst Bullet (2 turrets rotating to aim at player)
- Attack 2: Burst Bullet (2 guns firing only forward)
- Attack 3: Homing Missile (2 launchers)
- Attack 4: Charged Beam (4 guns firing only forward)
- Attack Rate: burst bullet each gun 1 burst/second; missiles each launcher 1 missile/2-seconds; each beam randomly fires every 2-4 seconds
- Appearance: large ship
- Salvage: 500

# Game Design Technical Specification

## Overview

Since there are three programmers, the game code will be broken into three parts: Tools & Assets, Game Engine, and Controls. This serves as a starting point and by no means final. The following is a brief description of each responsibility:

- The language being used will be Actionscript 3.
- The primary development tool will be Adobe Flash CS3.
- The target audience will be anyone that has as Flash-enabled browser.
- The game engine will be homegrown with any provided API's from Actionscript only.
- No other external libraries have been considered at this moment.

## Project Scope

Due to the limited amount of time, this game is meant to be a prototype of a more polished version. This does not mean it is not playable. Simply that future updates beyond the scope of the project should not be considered during implementation. I will be designing the requirements with that in mind.

## Tools & Assets

- Sound & Music.
- Access to database
- Storing high scores.
- Sharing ships.
- Map files and map scripts with guidance from level designer.
- Keyboard settings.
- Movement keys
- Switch Weapon key
- Attack/Defend Keys
- Network play.
- Co-op

## Game Engine

- Collision detection
- Ship movements.
- Dash
- Upgrade weight
- Projectile movements
- Spread Shot
- Beam Shot
- Homing Missiles
- Other types
- Bounce
- Recoil
- Deflecting
- Particle effects (might use raster images instead)
- Fire
- Smoke
- Sparks
- Damage/defense type
- Piercing
- Impact
- Explosive
- Core AI
- drone behavior
- ship movements
- targeting system

## Controls

- User Interface
- Start Menu
- Keyboard Settings Menu
- Other Settings (if any)
- Combat Menus
- Shop Menu (for equipment and weapons)
- Cut Scene Menu
- Game Logic
- Decides on behavior from keyboard commands.
- Decides how weapons behave and how much damage they produce
- ex. One weapon might not work against a boss.



- Decide the AI type for units. Some might even be stationary turrets.
- Reads the Map and loads sprites into engine based on map directions.

## Interfaces

- Xenolancer
- [Game]Controller
- Menu
- Level
- Event
- Sound
- Map
- ShmupEngine
- Sprite
- Projectile extends Sprite
- SpreadProjectile extends Projectile
- Projectile extends Projectile
- HomingProjectile extends Projectile
- Weapon
- Spread extends Weapon
- Homing extends Weapon
- Beam extends Weapon
- AI
- Stationary extends AI
- Drone extends AI
- RandomBot extends AI
- Scripted extends AI
- Move
- Fly(String direction) extends Move
- Fire(Weapon weapon, int angel, int velocity) extends Move
- Control
- Bind
- DB
- HighScore
- Network
- NetworkPlayer

# Schedule and Personnel

## Deliverables

### Friday, November 14th

Overall- The Xenolancer mini game! At this stage basic gameplay will be in place. The game will consist of the hero's ship on the screen flying around and shoot mock enemy ships. The enemy AI will not be in place so enemy ships will simply fly from the top to bottom of the screen, firing in a random manor. Some art will be done but not necessarily integrated into the gameplay.

Rob- Setup efficient development environment and familiarize everyone with tools being used (Subversion, Flash, etc).

Corey- Start menu, dead return to checkpoint menu, mock shopping menu (not yet functional)

Leo- Basic gameplay engine. First and most basic weapon implemented. Projectile motion for basic weapon(s), collision detection and destruction of enemy ships.

Thomas and Christian- First draft vector images of hero's spaceship and a couple enemy ships. Level design and background image for first level. Sprit graphics for each weapon firing plus bullets.

### Tuesday, November 25th

In class demo- Basic gameplay is in place. Ship can move and fire. One or two enemies that the hero can attack.

### Wednesday, December 2nd

Overall- At this point the game will be feature complete. Gameplay is complete. Graphics for hero's ship and enemy ships are complete. All weapons have been added to the game.

Rob- Complete system for loading in game maps. Help Leo with gameplay.

Corey- Finish game menus, inc. a functional shopping menu. Game logic

Leo- Rest of the core gameplay. Particle effects for weapons. Enemy ships reacting to damage. Enemy AI.

Thomas- More vector images as needed. Work with Leo to direct gameplay.

Christian- Oversee all sound effects and first portion of the game music.

### Wednesday, December 9th

Overall- This stage will be spent refining the gameplay to make it as enjoyable as possible. The game should feel complete and any lose edges are tied up or discarded. Adding music and sound effects will be a big part of the final stage. In addition, additional levels will be designed and added into the game.

Rob- Program in music and sound where Christian sees fit. If time allows add networking for two player co-op action.

Corey- Refine game logic.

Leo- Refine gameplay

Thomas- Focus on adding more levels and overseeing the quality of gameplay.

Christian- Coordinate the music/sound effort.

## **Contributions/Responsibilities**

Corey Kubo- Controls Programmer

Leo Wu- Game Engine Programmer

Rob Olson- Tools & Assets Programmer

Thomas Iu- Game Designer and Artist.

Christian Higley- Lead Artist and Music Director.

## **What we will be learning**

Thomas Iu- I will be learning how to make 2D vector graphics and sprites in Flash and prepare them for animation in a game.

Christian Higley- I will be learning how to make 2D sprites and/or vector graphics and how they are implemented in a game.

Corey Kubo- I will be learning how to use Flash and how to work in a team where each person's respective skills will help develop a solution to what we're doing.

Rob Olson- I will be learning game programming in the Adobe Flash environment. In order to do this I will need to become very accustomed to Actionscript 3 and the development process for creating games in Flash. To go the extra mile I will also be researching networking in Flash and the possibility of adding co-op play to our game.

Leo Wu- I will be getting familiar with Adobe Flash ActionScript. I will be learning how to build a 2-d engine. I will also be researching on simple particle effects after I get a prototype engine running.