



SPACEYARD SCRAPPERS

2-D GAME DESIGN DOCUMENT

Abstract

This game design document describes the details for a Vertical Scrolling Shoot 'em up (AKA shump or STG) video game that will be based around concepts from the board game Galaxy Trucker.

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0.0 Version History

Version #	Implemented By	Revision Date	Approved By	Approval Date	Reason
1.0	<i>Ed</i>	<i>10/11/16</i>	<i>Ed</i>	<i>10/11/16</i>	<i>Initial version</i>
1.1	<i>Ed</i>	<i>10/21/16</i>	<i>Ed</i>	<i>10/21/16</i>	<i>Updates after Peer Review</i>
2.0	<i>Ed</i>	<i>11/3/16</i>	<i>Ed</i>	<i>11/3/16</i>	<i>Final Changes</i>

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1.0 Executive Summary

This game design document describes the details for a Vertical Scrolling Shoot 'em up (AKA shump or STG) video game. The main premise of this game will be to fly through space and encounter various types of enemies while trying to destroy them with your spaceship. Once the enemies are destroyed, they will drop various powerups that can be used to upgrade your ship to help you advance through the waves.

Some names being considered for this game are:

- Scrapyard Junkers
- Spaceyard Scrappers
- Scrapping Through Space

1.1 Characters

Note: Names of these characters might change and sprites may change over the course of the project.

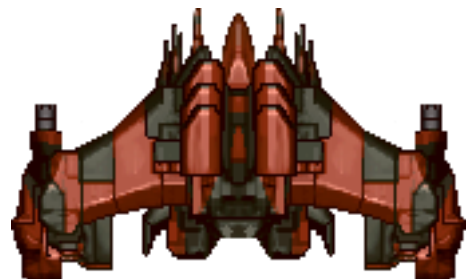
Player controlled ship – this will be the main character of the game which the user will control to fight the enemies throughout space.

- Health: 3
- Type: Player Controlled
- Gun Layout: 2 turrents that can be upgraded with powerups
- Points Worth: N/A
- Max Speed: 5
- Fire Delay: 0.25 that can be upgraded up to 0.10 with powerups



Red 1st Wave Ship

- Health: 2
- Type: AI
- Gun Layout: 1 shot
- Points Worth: 75 points
- Max Speed: 1
- Fire Delay: 5



Yellow 2nd Wave Ship

- Health: 10
- Type: AI
- Gun Layout: 3 shot at 20 degree angles
- Points Worth: 100 points
- Max Speed: 1
- Fire Delay: 2



Blue 3rd Wave Ship

- Health: 20
- Type: AI
- Gun Layout: 5 shot at 20 degree angles
- Points Worth: 200 points
- Max Speed: 1
- Fire Delay: 2



Final boss ship

- Health: 50
- Type: AI
- Gun Layout: 9 shot at 20 degree angles
- Points Worth: 1000 points
- Max Speed: .75
- Fire Delay: 1.5



Asteroids

- Health: 1
- Type: AI
- Gun Layout: N/A
- Points Worth: 50 points
- Max Speed: 3
- Fire Delay: N/A



Powerups – various items that will fall off of the destroyed ships. Some of these items can include health increases and rate of fire increases.



1.2 Story

Due to the nature of this game genre the story to this game will not be the main focal point. The main goal of this game is to be a “pick up and play” shoot ‘em up vertical scrolling shooter game that just throws you into the action with little to no story.

1.3 Theme

This game is about futuristic science fiction adventures in space. So, the aesthetics of the game should match this and immerse the player into the universe by the means of the sprites, music, sfx, animations and the background scenery. Futuristic color schemes and a great UI will help with the immersion factor for this game.

1.4 Story Progression / Level Summary

The game will start with the player controlled ship flying through open space and various hazards and ships will start to spawn. As time goes on the more and more difficult ships will spawn. The spawner will be as follows:

1. Asteroid
 - a. Spawns 1 every 1 sec
 - b. Waits 1 sec at the start
2. Red Ship
 - a. Spawns 1 every 5 sec
 - b. Waits 3 sec at the start
3. Yellow Ship
 - a. Spawns 3 every 15 sec
 - b. Waits 12 sec at the start
4. Blue Ship
 - a. Spawns 2 every 25 sec
 - b. Waits 45 sec at the start
5. Green Ship
 - a. Spawns 1 every 60 sec
 - b. Waits 60 sec at the start

2.0 Gameplay, Look and Feel

A quick summary of the gameplay of this game is that you are in a spaceship that you move around and shoot at the enemy spaceships in a shoot 'em up style. There is infinite ammo so you can hold the fire button down and only worry about dodging the obstacles. After destroying enemies, they will have a chance to drop various powerups that if collected will enhance your spaceship in various ways. Some of those ways include more reduced fire delay or more health. The player will start with 3 health and has no max health. The game will keep track of points and will also show the current high score. The player's health and current power level will be shown to let the player know how they are doing on powerups.

2.1 Goals

Gameplay (short term): Defeat the enemy spaceships and advance to the next zone.

Overall (long term): Return to your home world after being stranded on a random planet.

2.2 User Skills

1. Quick reaction time
2. Strategy
3. Manage resources
4. Memory

2.3 Player Roles and Actions

The player will be controlling only one spaceship to fight off the enemy spaceships. The various elements of the ship may change due to these upgrades, for instance if more engine boosters are found then the ship will move quicker and if more lasers are found the ship will fire more sets up shots or maybe change the type of projectile. The objective is to try to kill as many enemies as possible while trying to stay alive. Depending on how many enemies the user kills, the score will change and will be used as a high score device to see if other users can best one another.

2.4 Items and power-ups

Double Lazer – When picking up the double lazer looking powerup, the ships fire delay will be decreased by 0.02 (starting from 0.25) to a max of 0.1 total fire delay.



Shields/Health – When picking up the shield looking powerup, the ship will increase the total health by one with no max.



2.5 Progression and challenge

The player will start out with two lazars and 3 health. The max lazer upgrade is power level 7 and the max health is unlimited to grant a steep learning curve. Upon destruction of the enemy ships, there will be a 25% chance that either a double lazer or a shield health powerup will drop. There could be a rare chance that both powerups drop from killing an enemy ship. All enemy ships have the same chance to drop a powerup.

As the game goes on harder enemies will spawn with higher hit points, faster moving, or shooting more lazars that would need to be dodged. Also some ships may spawn more at a time or in different wave sets. When more enemies start spawning together it will make the game harder to survive due to the shear amount of action going on.

2.6 Appearance / UI

The basic art style for this game will be a futuristic space theme. So, for the background it will be various stars and planets as the player flies around. In some areas, there might be space stations that the player either flies through or flies past.

For the enemy ships as discussed in the 1.1 Characters section, they will have 1 of 4 different colors. The enemy color lazars will be red in color for the projectile. Upon destruction of the ship an explosion animation will spawn.

When the ships reaches a health value of 2 the ship will turn yellow, and if the ship health values reaches 1 the ship will turn red to alert the player that they will die soon.



Title Screen



In game Screenshot



On Death Final Score Screen



2.7 Losing

The player loses the game as soon as they die when they have no health remaining. It will show the final score that the player received. After that the game will start up again from the beginning and allow the player to start over. Each playthrough will be unique due to the random spawns and drop rates.

2.8 Music and Sounds

The sounds will include various explosion noises and laser noises. These sounds will be triggered by either the enemy ship when they either shoot or die. The same concept applies to the player controlled ship. In the background a slight upbeat techno space music will be played when the player is advancing through the level.

2.9 Strategies and Motivations

For the player, the basic strategy for the player would be to just stay alive while constantly shooting your lasers at the enemies. The player will be able to move and shoot at the same time which will allow new players to quickly pick up the game and play. For more advanced tactics, the user will attempt to maintain not taking damage and collecting the powerups and health to help overcome the impending doom. Overall strategy is quite simple, stay alive as long as you can while destroying all the enemy ships.

2.10 Controls

Here are the controls of the game:

- Move Up – W / Arrow Key Up
- Move Down – S / Arrow Key Down
- Move Left – A / Arrow Key Left
- Move Right – D / Arrow Key Right
- Shoot – Space / Left Mouse Click

- Start game - Z
- Xbox controller support:
 - B to start game
 - Left analog stick to move
 - A to shoot

More controls may be added when the game is being developed.

3.0 Development Specification

Initially, the game will be a PC exclusive with the possibility of going onto Android. The PC version will be an executable with the chance of being in a HTML format for the game. The game will be only 1 person playing at the time for now with the possibility of going to two people alternating playing the game.

3.1 Hardware

The game will be designed and programmed on my home computer which is running 20gbs of ram, a 970 gtx gpu, and an i7 cpu. As for the requirements for this game, hopefully they are as small as possible since this game is essentially an arcade game. If the game needs to run in a web browser, then the game will be designed to work in that platform. As for android possible expansion, the game will be optimized to run on various phones with the different OS versions.

3.2 Software

The software being used to create the game will be Unity and with some other text editing software. As for the operating system being used on the design work station it will be Windows 10. The game will try to support as many different windows OS's as possible but at a minimum support windows 10. As for the possible Android expansion, a similar approach will be used to accommodate the most recent OS version and will try to go as far as possible down the OS levels. This will allow people with older phones to still be able to play the game since it is so simple. For the potential in browser game, the game will be playable in firefox and chrome.

3.3 Algorithm Style

The algorithm style that this game will use is pathfinding algorithms for the enemy ships. Certain squads will fly in and shoot in patterns to try to destroy the player's ship. As for the bosses, they will have unique game mechanics and AI built into the functions of the boss. More specific algorithms will be researched and used when the game is being programmed. The enemy ships will be dumb and just fly in a specific pattern and not try to dodge any fire from the player controlled ship.

3.4 Hardware & Software Requirements

- 1GB RAM
- 1GHz processor
- Any NVIDIA or Radeon graphics card with at least 512M GDDR
- 50MB hard disk space
- Windows 7 / 8 / 10

4.0 Possible Additional Features

Here are some additional features that can be added to the game:

- Multiplayer (Co-op)

- More items
- More hazards
- More enemy ships
- More levels
- Endless battle mode
- Hard mode
- Different ship layouts
- Allow the player to choose where ship pieces' go