# Game Specification

This is the game specification for the Javascript Canvas Space Game. It is a demonstration of a number of different ideas applied to game development.

## Finished Game

The idea of the game is to combine a number of game styles into one, these are:

* Asteroid combat: controlling a ship and fighting off other ships
* Ship switching: you can switch between different ships to control if you feel like you want to play a different role.
* Squadron control: controlling a number of non-playable characters.
* Drawing based control of allied ships.
* Trombone scope effects

## Potential future features

* 4X Explore, Expand, Exploit, Exterminate
* Real Time Strategy: collection resources and building structures

## Current ideas

Need to come up with a collision detection reaction. I am thinking of:

* A ship with a higher momentum will ‘bounce’ slightly off the other ship.

Basic AI: Bog standard AI functionality that is found in most games of this kind where the enemy characters merely approach and attack the player without regard to any overall strategy. This is implemented by homing in on a ship and attacking when the distance is small enough.

# How the AI works

The AI is very simplistic. Each ship has a queue of instructions that it has decided to complete, in order. Any instruction can lead to more instructions.

1. Acquire target: This collects details such as the angle of the target.
2. Begin Rotating ship to face target.
3. Calculate acceleration and de-acceleration duration.

Rock Paper Scissor style play: One way to enforce game balancing is to make every ship have a strengths and weaknesses. A real game which has this kind of balancing is rock paper scissors.

1. Rock > Scissors
2. Scissors > Paper
3. Paper > Rock
4. Rock > Scissors
5. Fighter > Bomber
6. Bomber > Cruiser
7. Cruiser > Frigate
8. Frigate > Fighter

This style of play should not be called into action that often. It should be possible for player or AI to overcome the weaknesses of the ship they pilot.

AI Experience: An AI controlled ship gets better the more units it dispatches.

Programmed Manoeuvres: There are a number of manoeuvres built into the game that the AI will execute against the player but also other AI units. Each manoeuvre could have a designed weakness to another so that the game is balanced.

AI Path Control: A more advanced idea is to try and predict where the player will be in the future and apply acceleration efficiently in the direction to meet the player.

Damage Zones: A ship can have multiple zones that can be potentially damaged. These zones would affect the functionality of the ship.

Static or very slow masses that exert gravity: It would be nice to be able to sling shot around a planet to go somewhere faster.

Planet landing: The point intersecting the circle should relate to a place on the planet:

Ship lands

Planet spins as player moves

Hinged ships: some ships could be hinged, such as a long miner ship that has many segmented body or ships that can change shape to fit a purpose. Richard says this is not possible in space.

## Features currently implemented

* Bomber ship, Fighter ship
* Hit detection on multiple parts of a mass.