Planetguard

Design Document

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Introduction

This document covers all of the high-level concepts of Planetguard.

Overview

Game Concept

Planetguard is a mission-based, simplified aerial combat game combined with tower defense elements. The player has extensive customization options for their fighter, including the fighter itself and the weapons and support items it is equipped with.

Setting

Planetguard is set in the distant future, where humans have colonized many (relatively) nearby star systems. Gameplay takes place throughout these star systems on planets, moons, in asteroid fields, and more.

Plot

Some years ago, Aliens invaded the Solar system, ousting humans from their home star system. Since then, the stellar colonies have been forced to defend themselves from further invasion of the aliens, likely attracted to the various signals and other unnatural activity produced by humans.

Observations indicate that the Aliens have turned the Solar system into a major hub for their species. With no option for a peaceful co-existence, a massive counter-offensive must be staged to eradicate the Aliens from the Solar system and drive them from the stellar neighborhood.

Tone

Planetguard has a somewhat dark yet clean tone. Grunge and grit is kept at a low level.

Platforms

Planetguard will work well on PC and many consoles. Controller/gamepad support is essential.

Gameplay

Common Concepts

The following concepts are shared throughout various aspects of gameplay. More detail about them will be provided in later sections.

Mission Points

Mission Points are both an experience and currency system used in Loadout Customization. They are gained from completing missions.

Rank

Earning certain amounts of mission points will increase the player's rank, which will unlock more things.

Threat Level

Threat Level is used to measure progression through systems, as well as represent the difficulty of a system or mission.

Enemy Variants

Enemies can come in 2 variants:

Shielded	Have energy shields that protect against conventional and explosive weaponry.
Armored	Heavily armored and are resilient against energy-based weaponry.

Non-Player Ally Units

Planetguard has a variety of non-player ally units that aid the player in completing their objective. The primary units are those specializing in anti-air or anti-ground combat.

Mission Selection

Star Map

The Star Map is the outer-most part of mission selection, displaying all of the star systems that are available to play.

Star Map Progression

Most of the star systems on the Star Map will start out locked. The player must progressively complete star systems in order to unlock new ones. The objective is to complete the final star system, which constitutes the end of the game.

Star system unlocking follows a branching path, where completion of one star system will unlock one or more new star systems. Players can choose to complete every star system that they unlock, or simply go the fastest path to get to the end. Care should be taken that each path has the same general gameplay length.
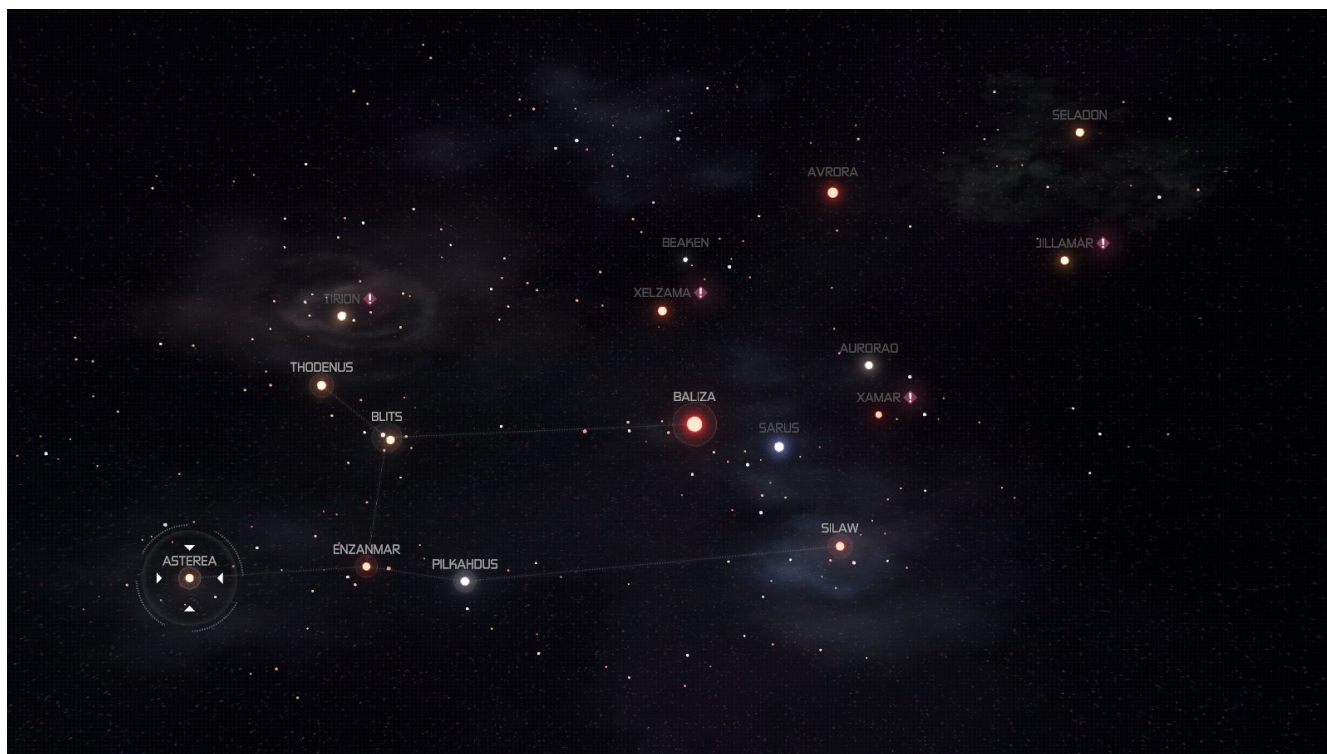
Figure 1: Star Map concept. Progression moves from bottom-left to top-right. Lines between star systems denote links to unlocked star systems. Note the 3 branches already available.
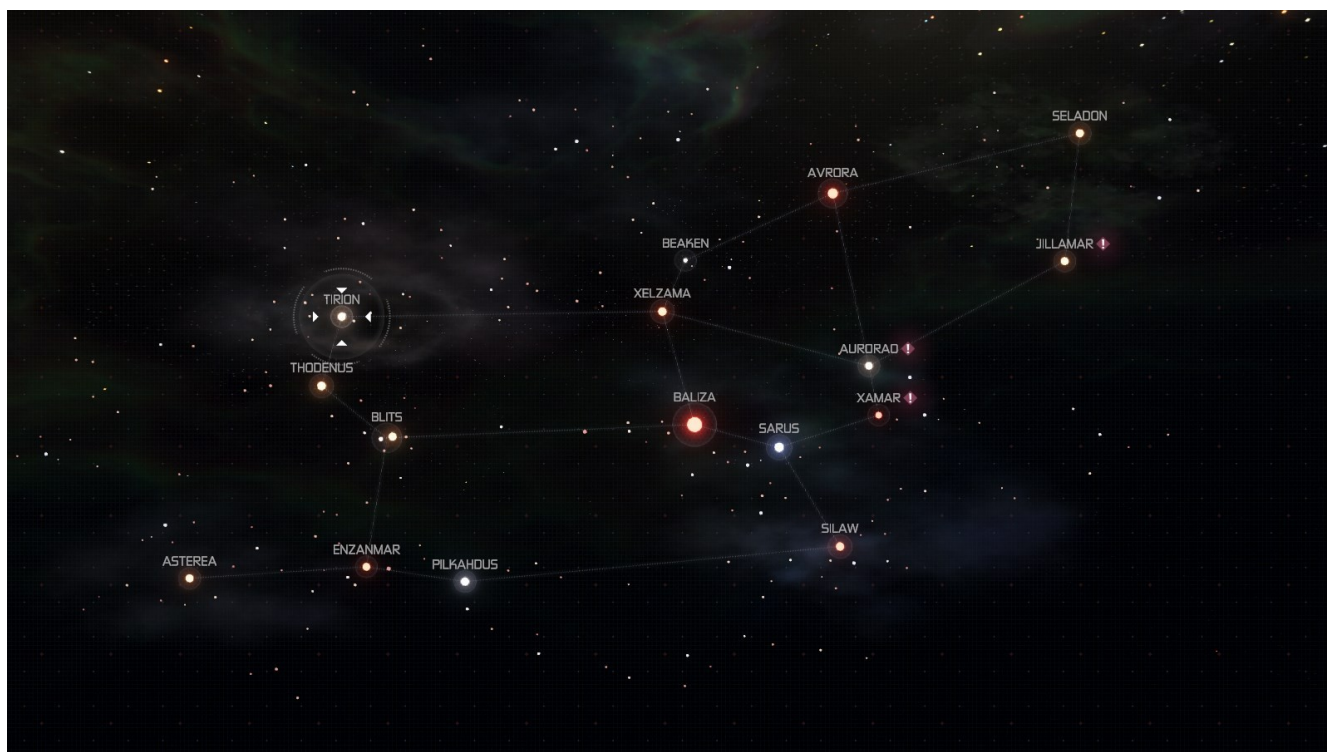
Figure 2: The same Star Map concept, but with all systems unlocked. Note that each path has (almost) the same number of systems (8 or 9 in this case)

System View

The System View displays the components (i.e. stars, planets, moons) of a single star system.

System Progression

Threat Level

The primary goal to complete a system is to reduce the overall threat level of the system to a certain threshold. Reducing the threat level is done by completing missions in the system.

Once the threat level has reached the defined threshold, the system is considered complete, and each system linked to it will be unlocked. The player can choose to complete every mission in the system to reduce the threat level to "Neutralized".

Mission Unlocking

All missions in a system may not be unlocked from the start. Some missions may require other mission(s) be completed before they become visible.

Figure 3: System View concept (missing threat level indicator)

Mission View

Mission view focuses on a singular planet, moon, or other object and displays the missions available there.

Threat Level

Threat level in the context of a mission denotes its difficulty. Lower threat level is less difficult, higher threat level is more difficult.

Reconnaissance

Reconnaissance is an important informational element that provides guidance as to what challenges a player can expect to face in a particular mission. This includes:

- A general estimate of the types of enemies.
- Mission area information like mission area size.

The player should use this information to make informed decisions when choosing their loadout.

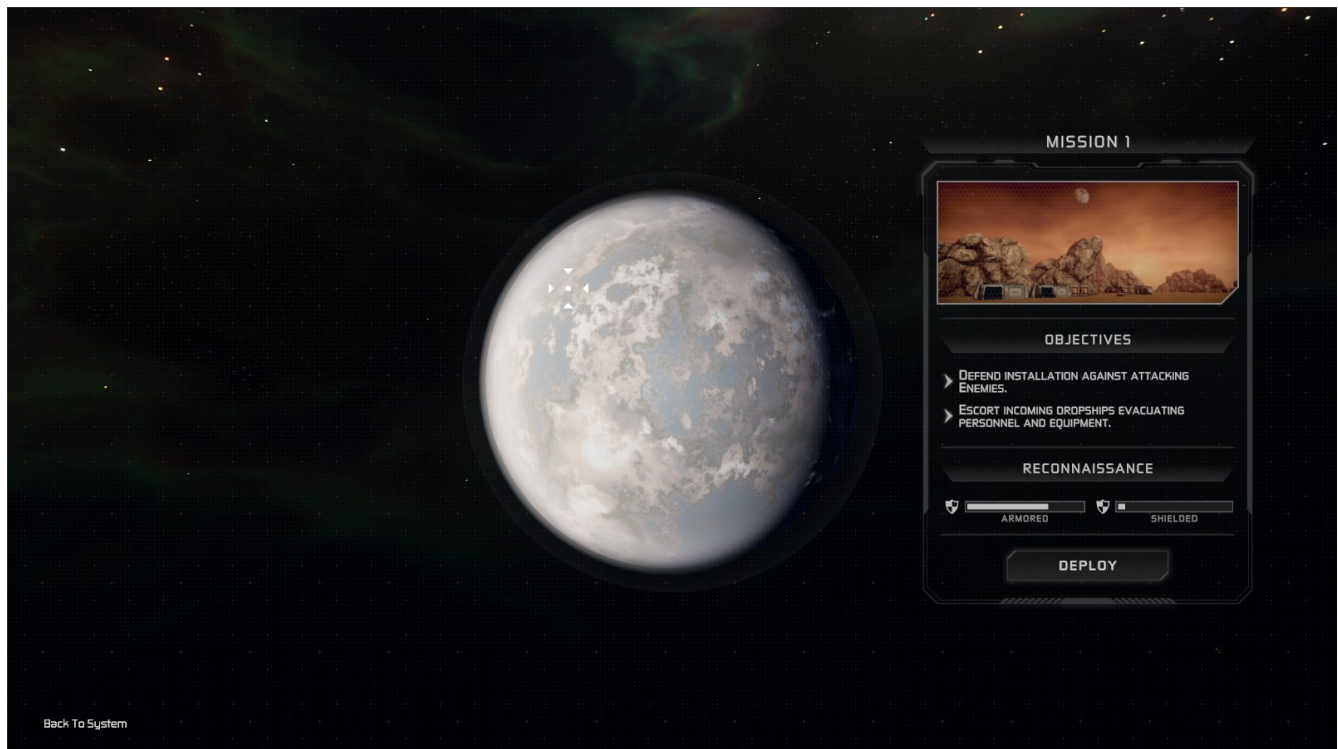Reconnaissance will not always be available, which will force the player to prepare adequately for any threat.

Figure 4: Mission view concept (missing threat level indicator)

Loadout Customization

Loadout customization entails the player's ability to choose the fighter they fly, as well as the weapons and support attachments that they use for a given mission.

Fighters

First, the player must choose the fighter they wish to use for the mission. Each fighter they can choose from has certain advantages and disadvantages.

Stats

Fighters have a number of stats:

Health	Base amount of damage the fighter can take before being destroyed.
Shield	An energy shield that serves as a rechargeable extension to the base health.
Speed	How fast the fighter can fly.
Turning	How quickly the fighter can turn.
Responsiveness	How "snappy" the turning feels. Low responsiveness feels more heavy or "floaty".

Attachment Points

Fighters have a varying number of attachment points of different sizes. The more attachment points, the greater capabilities the fighter can have.

Unlocking

New fighters are automatically unlocked as the player increases their rank.

Attachments

Sizes

Attachments come in 3 sizes:

Small	Have low output but very high capacity. Good for constant use.
Medium	Moderate output with moderate capacity. Good for occasional use.
Large	High output with low capacity. Reserved for special situations. May have unique effects such as area damage.

Weapons

Weapons are the primary type of attachment.

Weapon Types

Weapons come in various types.

Conventional	Fires ordinary solid projectiles.
Energy	Fires condensed energized particles. Usually will have some amount of ammo regeneration.
Explosive	Fires projectiles that explode on impact. Often will have an area of effect.

Weapon Effectiveness

Weapon types are effective against certain enemy variants.

Shielded	Energy
Armored	Conventional Explosive

All weapon types are equally effective against a normal enemy (i.e. neither shielded or armored).

Support

Support attachments offer various passive buffs. Some examples of this might be:

- Boosting stats of weapons of a specific type.

- Increasing certain fighter stats.

Non-Player Units

In addition to their own craft, players have the ability to add and upgrade attachments on the non-player anti-air and anti-ground units.

Unlocking

New attachments are unlocked through a combination of mission points and rank.

Attachments will only become available once the player reaches a designated rank.

Once available, the attachment can be purchased with mission points.

Combat

Once the player has chosen their loadout, they are deployed into the mission.

Flight Controls

Planetguard uses simplified flight controls. This means that the player does not have to worry about rolling and pitching their fighter to fly. All the player has to worry about is turning left and right and going up and down.

Boost

Fighters have the ability to boost for short periods of time. This significantly increases their speed and allows the player to quickly traverse the level if needed. Boost recharges over time.

However, boosting will cause the fighter to overheat, and so cannot be active for long periods. If the player boosts for too long, it will overheat and the player will not be able to boost until it cools completely.

Brake

Fighters can also brake to significantly slow themselves and increase their turning speed. Brake can be active indefinitely.

Evasive Maneuvers

Evasive maneuvers are special maneuvers the player can perform while flying. These are usually very quick maneuvers, sharper than the player can normally fly, that can be used to evade enemies or projectiles, or quickly change direction. Some potential evasive maneuvers are:

- Barrel Roll
- Loop
- Immelmann turn

Weapon Selection

Players have a simple list of weapons based on their loadout that they can quickly switch between.

Objectives

Missions consist of a series of objectives. Examples of objectives include:

- Defend one or more buildings.

- Provide an escort for a Dropship or other ally.

- Seek and destroy one or more targets.

These objectives may be active throughout the entire mission, or may become active at designated points in the mission.

Enemies

Players will face a diverse mixture of enemies in missions. Enemies will typically continuously spawn outside of the play area and make their way to the battle zone, attacking ally units and structures.

Each enemy type will have unique stats and behaviors that challenge the player to combat them effectively.

Bosses

Occasionally a very strong enemy will appear that takes considerable effort to defeat. These bosses may appear at the end of a mission, or may have a mission dedicated to fighting them.

Non-Player Units

A key part of combat is making players feel like they are a part in a larger battle. Having many non-player units can help accomplish this.

Dropships

Dropships are large units that primarily serve as mechanisms for the following:

- Escort objectives.

- Dropping off additional mobile units.

- Dropping off additional resources (i.e. power cells).

Dropships come with their own built-in defenses, but usually not enough to hold their own against attacking forces.

Mobile Anti-Ground

Mobile anti-ground units serve as the primary non-player defense against ground units. These units are well-armored and have highly damaging weapons. However the weapons, usually some type of heavy cannon, is not well suited for evasive aerial targets.

Mobile Anti-Air

Mobile anti-air units serve as the primary non-player defense against aerial units. They are equipped with weapons such as homing missiles that are well suited for attacking aerial units.

Turrets

Turrets are stationary anti-air installations that are found at many bases and colonies. They are moderately effective at defending against both ground and air units.

Tractor Beam and Mobile Units

Player fighters come equipped with a tractor beam that can be used to pick up and move mobile units.

This enables the player to move units to strategic locations in order to most effectively complete their objective.

Production of Units and Restocks

While playing a mission, players have the ability to collect resources and allocate them to producing more units to help defend, or to replenish their own health and ammo.

Power Cells

Power Cells are the "currency" used to produce units, restock, and power turrets. They are physical objects that can be picked up with the tractor beam and taken to designated locations.

Restocking

Power cells can be taken to a designated building to restock the player's ammo and shields. This occurs immediately, and the power cell will be consumed.

Producing Units

Power cells can also be taken to designated buildings to produce mobile anti-ground or anti-air units. Once dropped off, there is a delay before the unit is actually made available for pickup.

Powering Turrets

Turrets use energy cells for their power. In many cases a turret will already have a power cell. However in other cases a power cell may need to be provided.

Health, Shield, & Armor

Health, Shield, and Armor are important parts of all units in combat.

Health

Health is the base amount of hit points for a unit. Health cannot be restored, even by restocking. The only exception being specific attachments that grant health regeneration.

Shields

Shields serve as an extension of Health that can regenerate over time.

However, shields have a limited number of hits they can take before they break. Once broken, the shield offers no protection and a unit's health is directly damaged. After a delay the shield will begin recharging to full power.

Shields do not take much damage from Conventional and Explosive weapons, but are damaged effectively with Energy weapons.

Armor

Armor serves as a constant damage reduction to a unit's Health. It greatly reduces damage taken from Energy weapons, and mildly reduces damage taken from Conventional and Explosive weapons. It does not get depleted. The more armor a unit has, the more damage reduction.

World Design

Astronomical Accuracy

Astronomical accuracy is core to the world design philosophy of Planetguard. This means that every star system, planet, moon, etc should be designed in a realistic way. Of course, leniency can be given for the sake of aesthetic and thematic appeal, since maintaining accuracy is both challenging and artisically limiting.

Star Systems

The stars that make up the various star systems should be reasonably accurate to real world stellar physics.

In particular, the color, size, and brightness of stars should not be chosen at random. Referencing the **Hertzsprung–Russell diagram** is very useful for making sure a star's properties are within the realm of possibility, based what has been observed in the real world.
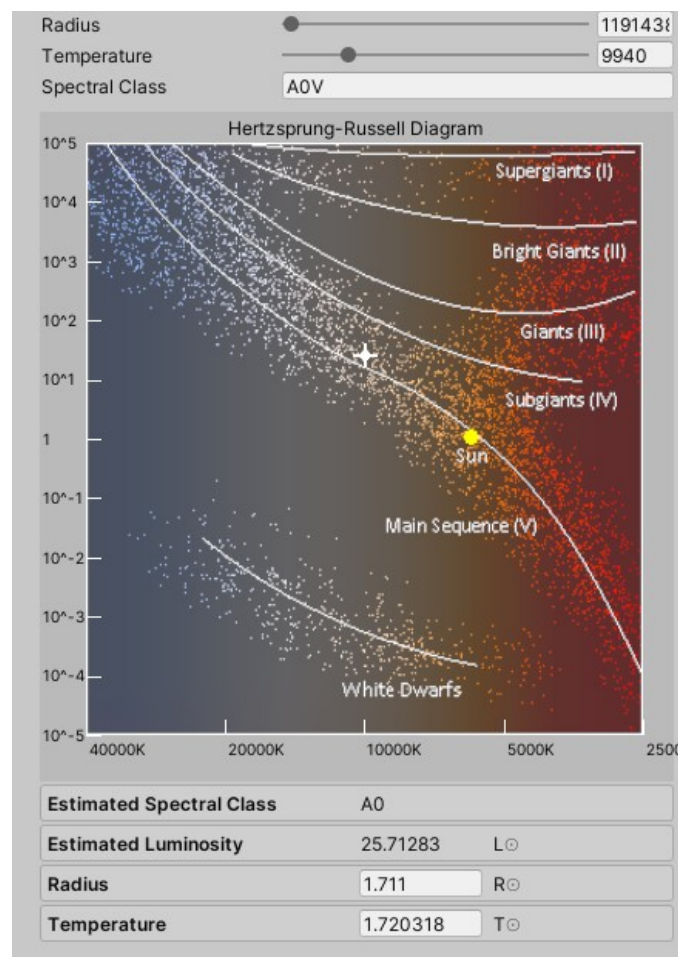

Figure 5: Editor utility for authoring stars, where various properties can be used as input.

Stellar life-cycle and the part it plays in a system should also be considered.

Planets, Moons, and Other Bodies

Similarly to stars, any other planets and moons should maintain a reasonable level of scientific accuracy. This includes considerations such as:

- Distance from their parent star and how it affects the planet's climate.

- The properties of their parent star, such as color and luminosity.

    - Vegetation on other planets may be strangely colored compared to Earth based on a star's properties: [What If We Could See Nature In Infrared? - YouTube](#)

- Atmospheric composition.

- Distance between a planet and its moons.

Human Settlements

Many missions will take place around human settlements, such as population centers, military bases, or important industrial locations.

Consideration must be given to why humans have decided to establish themselves at a particular location. Some examples of reasons are:

- Habitable climate

- Rich natural resources

- Research purposes

- Strategic locations for military purposes

Aliens

The Aliens are an advanced, extremely militaristic species.

Their anatomy is similar to that of Earth insects.

Their technology is heavily based on advanced genetic engineering and augmentation of their bodies. They genetically modify and enhance their own offspring to suit specific tasks in their society. In addition, they heavily augment themselves with technology to further enhance their capabilities.

The general idea is that the Aliens do not have the same ethics that keep humans from doing the same, so they fully embraced this evolutionary path.