

## **LONE STAR**

" Lone Star " is a third-person (first-person) space simulation game for the PC that uses half arcade/half Newton physics game engine. Player can control many ships and can expend his wealth up to the whole empire. He is caught up in times of discoveries, mythical events and cruel wars between other nations throughout the galaxy, which are controlled by advanced AI.

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## **Introduction**

***This is the concept of the game I dream of, and do hope that some people will find it interesting. I tried to gather all good ideas I have thought of or met in some games to make a draft for an outstanding sandbox space simulator. I used some games, books and movies as inspiration: Star Wars, Star Trek, Battlestar Galactica, Warhammer 40k, Homeworld , Nexus: The Jupiter incident, Elite, Starshatter: The gathering storm, X series, Freelancer, Freespace, Space rangers, Distant Worlds, EVE online, Sword of the stars, Master of Orion and books of Aizek Asimov, Harry Harrison, Lois McMaster Bujold and others.***

***P.S. English is not my native language and I'm a bit far from fluent speaking, so I beg a pardon for all my mistakes in text and bad explanation of some aspects.***

***Enjoy.***

***Shuul***

### **Key features:**

- Sandbox gameplay;
- Player involving and dynamic story telling system;
- Physics based combat, involving capital ships and fighter wings;
- Possibility to have direct control on many different ship types;
- Build your own stations and even planetary facilities;
- Every game object (ship, weapon, station, etc) is produced from raw materials, nothing is spawned from nothing;
- Real economy, based on freighter convoy system, many possibilities for pirates;
- Fleet system; each capital ship is controlled by specific in-game character (Commander);
- Advanced strategic AI for every faction, good tactical combat AI;
- Personalization, you will met NPC that can become friends or foes for you, or even join your side as commander of one of your capital ships or fleet;
- Complex but not very hardcore (too much hardcore is not really fun).

### **Galaxy variants**

Galaxy **must be** procedurally generated (with possibility to save seed), have about 100-500 solar systems (can be defined at the game start). No need for terrain generating/rendering, as planet facilities and colonies are represented only on GUI.

Can be made in 2 different variants:

1. **Real-time** simulated galaxy, with solar systems that have many planets **with real physical orbits** (like in Elite 2,3 and others).
2. Galaxy with **static** planet orbits but solar systems are represented as HUGE sectors.

While the 1st variant is more real, it's much harder to implement and to maintain in-game balance of FUN-TRAVEL-CONTROL. On other hand, 2nd variant is much easier and have some good positive aspects, like easier to navigate and control ship, simpler GUI etc. ***I will use 2nd variant for the concept.***

## World/environment

The World is huge and dark place, where galaxy is closer to the end of its life, bright stars are more rare here, while Red giants or red/blue dwarfs are common, it's also possible to find black holes, pulsars, dead suns and cracked planets.

Earth - like planets are VERY rare, most colonies are built under domes or underground. Deep space construction is possible, most space stations are pirate outposts, monitoring stations or patrol bases for trade routes control.

The atmosphere of game is more closer to real space, dark and cold to the edges of the galaxy and much more colorful near its core. By "feeling" of space its closer to warhammer 40k universe, there is no hundreds of civilian ships roaming, no flying pink ponies and danger can wait at every planet or after each hyper jump.

It is even a bit mythical, you don't know what you will find at some location until you jump there or send scout, it can be a black hole, enemy stagnation point or even some alien derelict. Also it will have a very deep soundtrack, closer to Nexus Jupiter incident (<http://www.youtube.com/watch?v=8UZBE8duru0&feature=relmfu>) and Homeworld (<http://www.youtube.com/watch?v=btXnl7AGFg0>) music. Also [this video](#) has the best example of game feeling and combat I want to be present in game.



# Game aspects

## ***Plot***

You were born on the distant planet called , that rotates around small red star, and was cut off from civilization with bad location just in the middle of black hole cluster. Trading ship arrived approximately one time each 5 years, bringing goods and supplies, taking away everything that they can and few passengers. Basically, this planet was on its own, far away from any empire to control.

Almost half of your life you worked hard as engineer, but dreamed about something bigger, about interesting life, travelling through space, seeking for unknown... One time you heard an amazing legend about ancient times, when humanity just started to master space travelling, an anomaly appeared near one of few human colonies. It was a planet-sized sphere shining with fascinating blue light, so bright that from the surface it looked like a new sun...

After short time contact with that colony was lost, planet disappeared as well as shining sphere, nothing is known about its destiny. In next few decades many scientist explored that part of space, and they found nothing except one very old and huge ship wreck, that provided humanity with many new never seen before technologies... including *FTL* drive.

So at some day you decided to leave this place to take more from your life. Just before that you spent a lot of time studying piloting, as you wanted to become a star traveler.

When next trading convoy arrived you boarded one of few escort corvettes as passenger and get ready for new life.

When trading convoy was ready to make hyper jump you looked through illuminator to say good bye to your home, but you couldn't, you were terrified with what you saw, huge blue shining sphere showed up just behind your home planet, you feel like something is happening to you, your body was frozen... in next few second you lost conciseness.

You find yourself in damaged corvette, many dead bodies are laying around, just few of crew survived, you check ships chronometer and cannot believe at what you see, 30 years have passed since you left your planet...

And it looks like you are the only one who knows how to control this ship.

## ***Sandbox gameplay / replayability***

*Each galaxy is unique.* You can predefine some parameters like star count, physical size of the galaxy, resource richness, number of factions, starting difficulty, starting ship (corvette class), your position in the galaxy(outer-regions, galaxy core) etc.

At each start after galaxy generating game counts like some time passes at high speed (1 week) to give the world the possibilities to look alive even at the beginning.

You are not bounded to some actions at the start of the game , but will receive some plot tips when game progresses.

## ***Faction system***

At each game start player can predefine the number of Major factions/empires, minimum is 3, maximum should be around 6. In perfection there must be unique ship set for each of them, but 3-4 can do the job if some factions will be represented as branch or split off(rebels, etc) from the main empire colonies.

All of this factions are humans, aliens can be present in game as minor factions that try not to communicate with others, or have some specific attitude towards some factions.

Each of major faction starts with random ( or predefined) number of colonies and stations, as well as mines, ship count and characters.

Factions will have different state and political systems and this will dictate some diplomacy properties.

Government types:

Monarchy - a bit more aggressive, bonus to ship production, a bit less loyal characters

Republic - bonus to income,

Democracy - more loyal characters, bonus to harvesting.

Dictatorship - more aggressive, less loyal characters, bonus to ship and character count.

Factions will be able to build ships, stations, planetary facilities (not new colonies, as it will take YEARS). They have the same economy as player.

Minor factions can represent pirate clans, independent colonies, private corporations with their own stations and planetary facilities.

To be finished

### **Diplomacy**

They will have complex diplomacy system that is close to Civilization with ability to demand, threaten, declare wars, make pacts and alliances. BUT faction have to take some time to think, for more realism.

All factions, even minor ones, are controlled with strategic AI that has control over resources, stations, diplomacy, trade routes, fleets etc.

To be finished

## ***Characters***

This universe is full of characters that you will meet, communicate, trade and even become friends.

Every character is generated on colonies with some random characteristics, game flow will show if they are good enough for this captain to survive. Every ship starting from Frigate needs commander to operate, you will need to hire them or they can become your friends and join you with much lower wages.

Characteristics (10 points max, 5 is average):

*Loyalty* - this shows *approximate* attitude of this character to you, if he flies with you it will also represent how much he likes you, your decisions and can he or not betray you. It's not recommended to give valuable ship under command of character with low loyalty. If his loyalty to another faction is high it will be difficult to bribe him.

*Courage/will power* - shows how strong is this characters spirit. During combat, if this characters ship takes damage or he is losing it has much more chances to panic and try to get out of combat in random direction. After this happens he will be uncontrollable for some time.

*Thinking speed* - shows how fast he will respond on orders and take some decisions.

*Military Knowledge* - shows how good this person knows different ships and tactics, when this parameter is high enough he will know what guns and missiles to use, and where are weak points of enemy ships. Also he knows when it's better to retreat (not flee in panic, but tactical retreat to friendly forces and regroup) and how to command fighters better.

*Leadership* - every point increases ships command points for 2% (if assigned as fleet commander) .

*Combat experience* - he knows how to command men in combat, increases overall ship performance (weapon reload, shield recharge, thruster acceleration etc) by 1.5% per level. Starting level is 0.

All characteristic can be changed during gameplay

**To be finished**

## ***Economy***

There are universal credit system, every faction uses same money system.

Credits are used to pay maintain fee to ship crews, buy ships, weapons, raw materials, conduct research, trading goods etc.

***Raw materials*** - are extracted from planets or asteroids:

Crystals, Common metals, Heavy metals, Precious metals, Carbon fiber, Radioactive elements, Conductive elements, Inert gases.

All of raw materials are trade goods. Every faction uses this materials to build ships and stations, they will send trading convoy if they have resource shortages.

***Rare materials*** - can be extracted by special ship module(for any rare resource) from specific galaxy objects. They cannot be bought from the market, but can be sold for good price. Appears to be a contraband in all major factions.

***Null element*** - pulsars.

***Dark matter*** - black holes.

***Heavy plasma*** - Red giant stars.

***Heavy ions*** - blue dwarfs.

***Super conductive metals*** - small and large asteroids, active volcanic planets.



## Space travel / flight model / Physics

*Every ship in game is supplied with null-reactor, that eliminates high inertia and produces artificial gravity that also helps to avoid black holes if in not close proximity.*

Flight model for this game is more arcade but with some physical laws like inertia for large ships and acceleration that depends on their mass.

Ships are not designed to enter planet atmosphere, interaction with planets is made using transport beams.

When ships engine are off or damaged it will slowly decelerate until full stop.

All ships have vectoring thrusters, but they are very weak (never liked side thrusters exploit in X series, where some capital ships have weaker main thruster).

All ships have "maximum" speed, after reaching it they will continue to accelerate but with MUCH slower rate until it reaches total limit of 1,5 of maximum speed (drone can accelerate from 100 to 200 in 2 seconds, but from 600 to 700 in 30 seconds).

Every ship has a mass, which determines its acceleration and deceleration speed, as well as its maneuverability and damage taken/received from collision.

(Collision damage is not that big if masses of ships are too different, but if ship is destroyed the explosion in close proximity can deal large amount of damage)

### **Hyper space**

Hyper space jumps are possible to quantum leap technology used in FTL drives, instantly warping ship through space.

The closes comparison is Battlestar Galactica and Starshatter: the gathering storm, where ships were jumping with nice flashing light after FTL drive charging.

Jump is possible only after plotting course by navigation computer(jump to another solar system takes 50% more time to calculate if system is unknown and 25% if known) that can be done in the same time when drive is charging. For navigating purposes computer needs some kind of object, doesn't matters if it's a planet, station or radar signal source. Computing course totally depends on ships size and mass, larger ship take much more time to calculate safe route. For example Heavy scout fighter needs around 5 seconds to plot course, while frigate will be ready to jump in 1,5 minutes only and battleship in about 5 minutes.

Drive charging speed depends on its quality(different marks) and ships reactor output.

There is FTL drive classification based on their active warping range from 1 charge:

Class 5 - 1 LY (light years) Very short range drive, most solar systems are further then 3-4 LYs, but due to small size and energy consumption it was possible to mount them on fighters which made them a perfect scouts.

Class 4 - 10 LY Mostly outdated FTL drive but due to small energy consumption, fast recharge and low cost many private corporations mount it on their corvette and frigate class ships. Can be found on board of old and decommissioned ships.

Class 3 - 20 LY The most common drive type, almost all transport ships and corvettes use this one.

Class 2 - 30 LY Almost all military grade frigates and destroyers are equipped with this type of drive, it consumes a lot of energy and is much harder to produce, so it cost much more.

Class 1 - 40 LY Masterpiece in FTL drive engineering. Consumes enormous energy quantity and needs more time charge than any other type, but only this monsters can produce quantum sphere large enough for ships like cruisers, battleships and carriers.

FTL drives of other classes (2,5; 3,2; etc) can be found though out the galaxy like modified versions by private companies or pirates. Also FTL drive can be upgraded at research station

## Flight control

There is 2 ways to control your ship.

1. Standard first person steering, using mouse and keyboard or joystick. Usually used to pilot Heavy fighters, most corvettes and frigates when making precise spinal guns shot.

2. Helm-like, 3rd person control with keyboard or joystick, where you define the vector where ship must turn. The best example of this type of control is Starshatter: The gathering storm. Cannot be used to steer fighter.

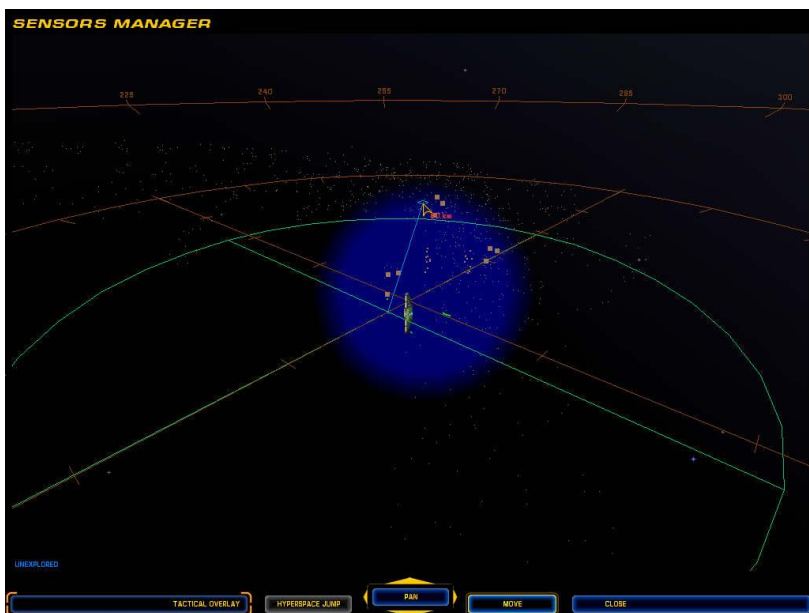


## *Space exploration / Scanning*

While travelling in space or trying to find something valuable in this dangerous galaxy you must be aware of what you can find.

First of all, if you want to use your jump drive, you need to have some kind of material object or directional signal. For this purposes every ship has built-in scanner that has different scanning time, range and power depending on ships hull and its components, additional modules.

When you visit solar system for the first time (or you didn't buy navigational maps) you don't know what planets and objects are there. So you start scanning. The process looks very similar to scanning with only your ship in EVE online. Tactical and scanning map will look like Homeworld had, with possibility to easily select destination and "altitude of movement and jump".



EVERY scanner is able to scan all big planets and moons, except very small ones that are far from you. Scanning result depends on objects mass and distance from scanning ship. If many objects are near one to another in more than 500 km their masses are summed and on scanner they will look like 1 bigger object. After finishing scanning your computer can

determine type of the object : celestial body, magnetic signal (ships) or space anomaly.

After that you can use this signals as jump destination, selecting approximate distance from exit point, "altitude" and direction that you want to face.

To jump to next **unknown** solar system you will have to plot course to it, that takes 50% more time and you will jump to this systems star. Jumping to any celestial body of known system takes 25% more time than in-system jump.

## Celestial bodies

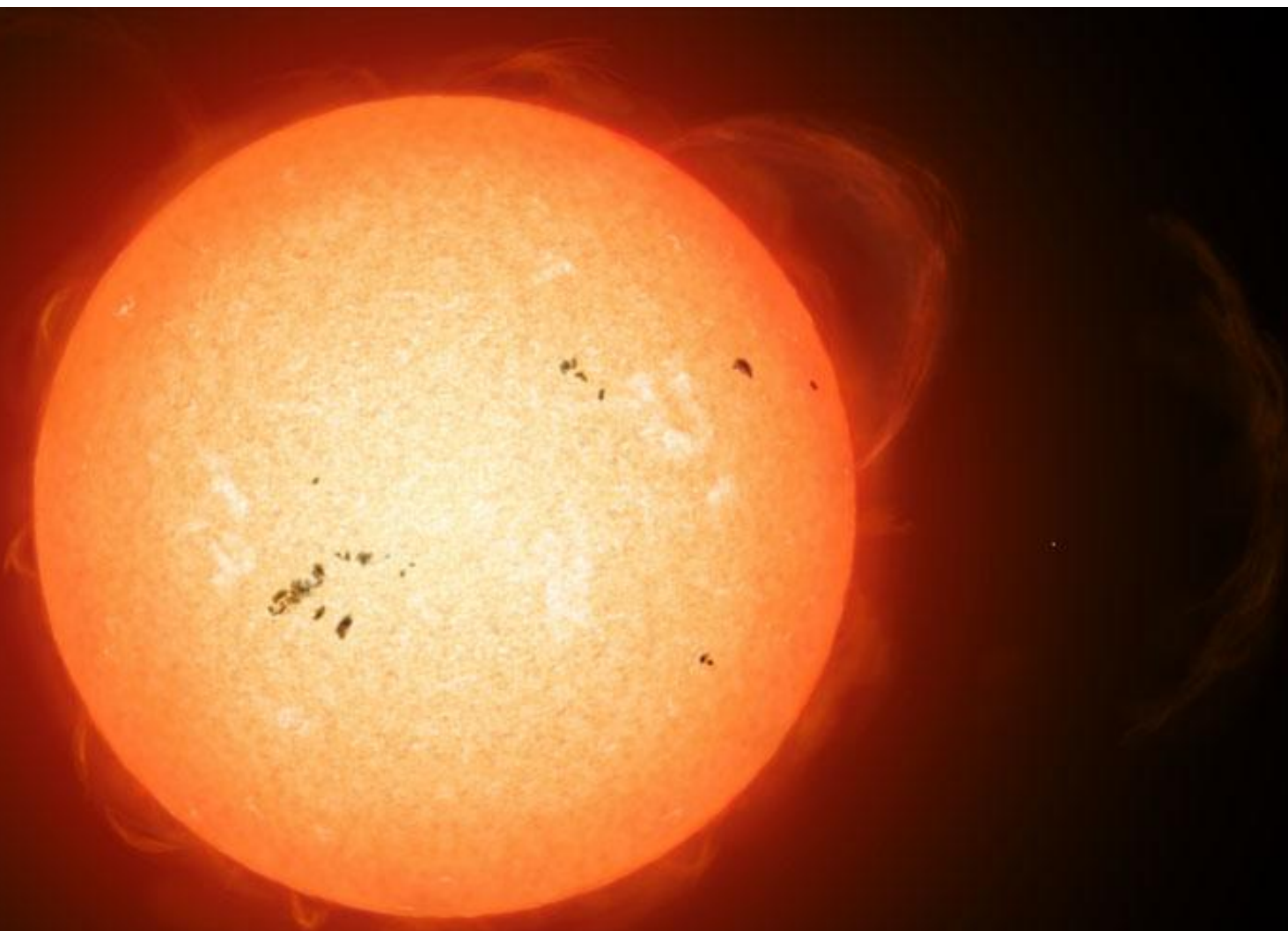
You will meet many beautiful planets and danger anomalies that you would like to avoid.

*Stars* - you will use them a lot while jumping to unknown systems and harvesting resources. But be aware that staying close to them for long period can collapse your shields and melt your armor. Depending on star type you can collect heavy plasma or heavy ions form them.

*Planets* - one of the main aspects of the game, you will explore them for minerals, build your bases on them and conquer them.

Continental - to find that type of planet is true luck and miracle. Terraforming other planets is very expensive and takes hundreds of years, but this one can support life on its own. It has reach mineral deposits and its possible to build 2 times larger bases on them.

Desert/barren - dead planets with no or very thin atmosphere, have low resource richness of heavy and precious metals, but a lot of common metals.



Ocean - beautiful blue planets, rich of carbon fiber and conductive metals. Due to water supply base can be 25% larger.

Volcanic - planet with very active core, dangerous for any life. Have very rich deposits of heavy metals. Due to dangerous environment max base size is 50% smaller.

Thick atmosphere - a Venus-like planets with heavy, dangerous atmosphere with unending lightning storms and poison in the air. Very rich for inert gases. Due to dangerous environment max base size is 25% smaller.

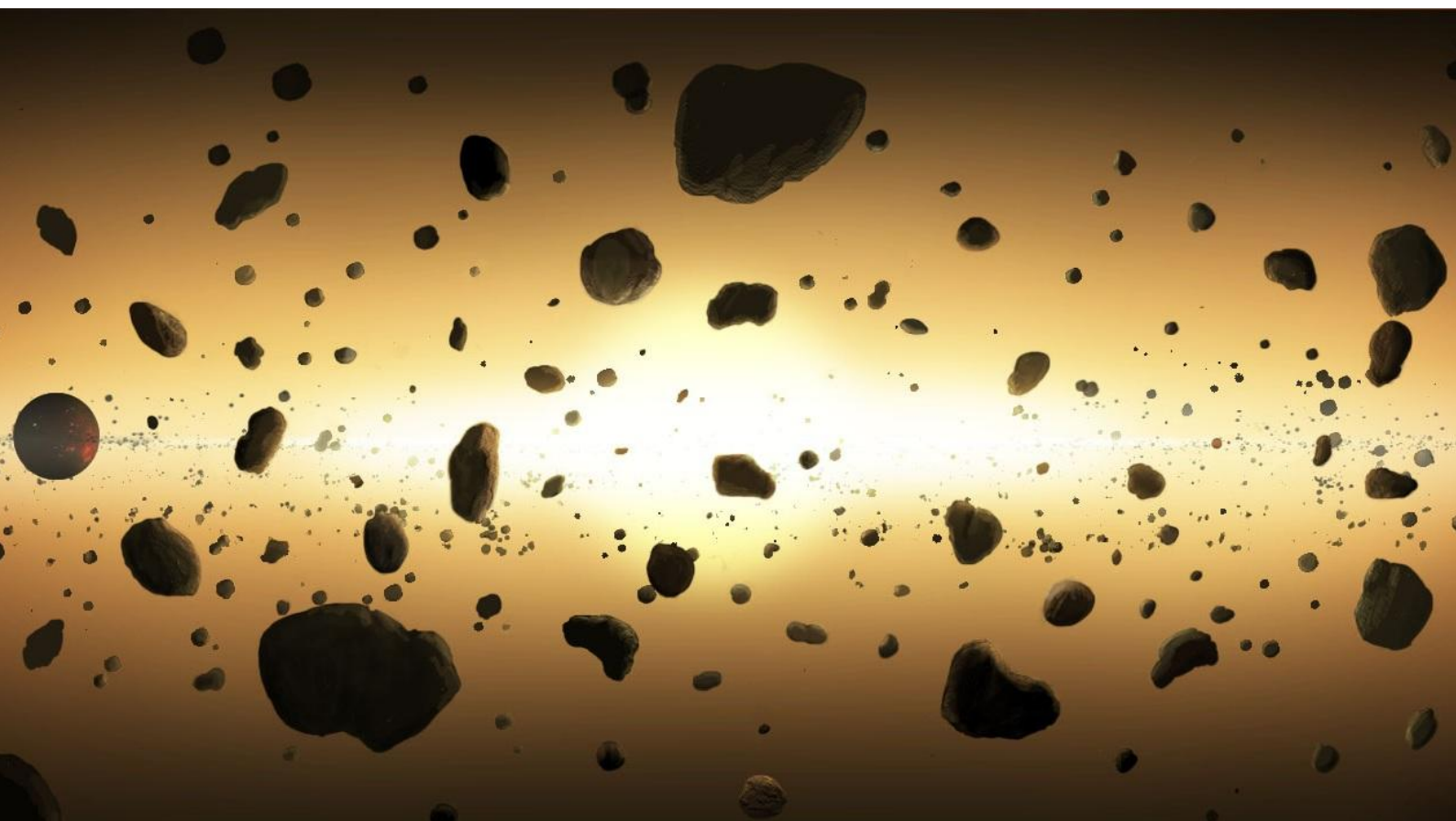
Gas giants/Storm - one of the galaxies wonders, huge and beautiful planets. Cannot be colonized.

*Large asteroids belts* - can be found on stars orbit, where planet was destroyed. Usually you will find few quite large asteroids with different resources in them, sometimes even quite reach, and you will be able to build mining station on them. The good side of that is that you don't really need planet to extract resources.

If you are lucky enough it's possible to find some kind of derelict in asteroid belts

*Anomalies* - galaxy wonders, beautiful and sometimes deadly, you must be ready to act quickly if you plan visit one of them.

Black holes - they are silent killers, while built-in ships null-reactor will give you some time to recharge your FTL drive, it's a very bad idea to stay there longer then its

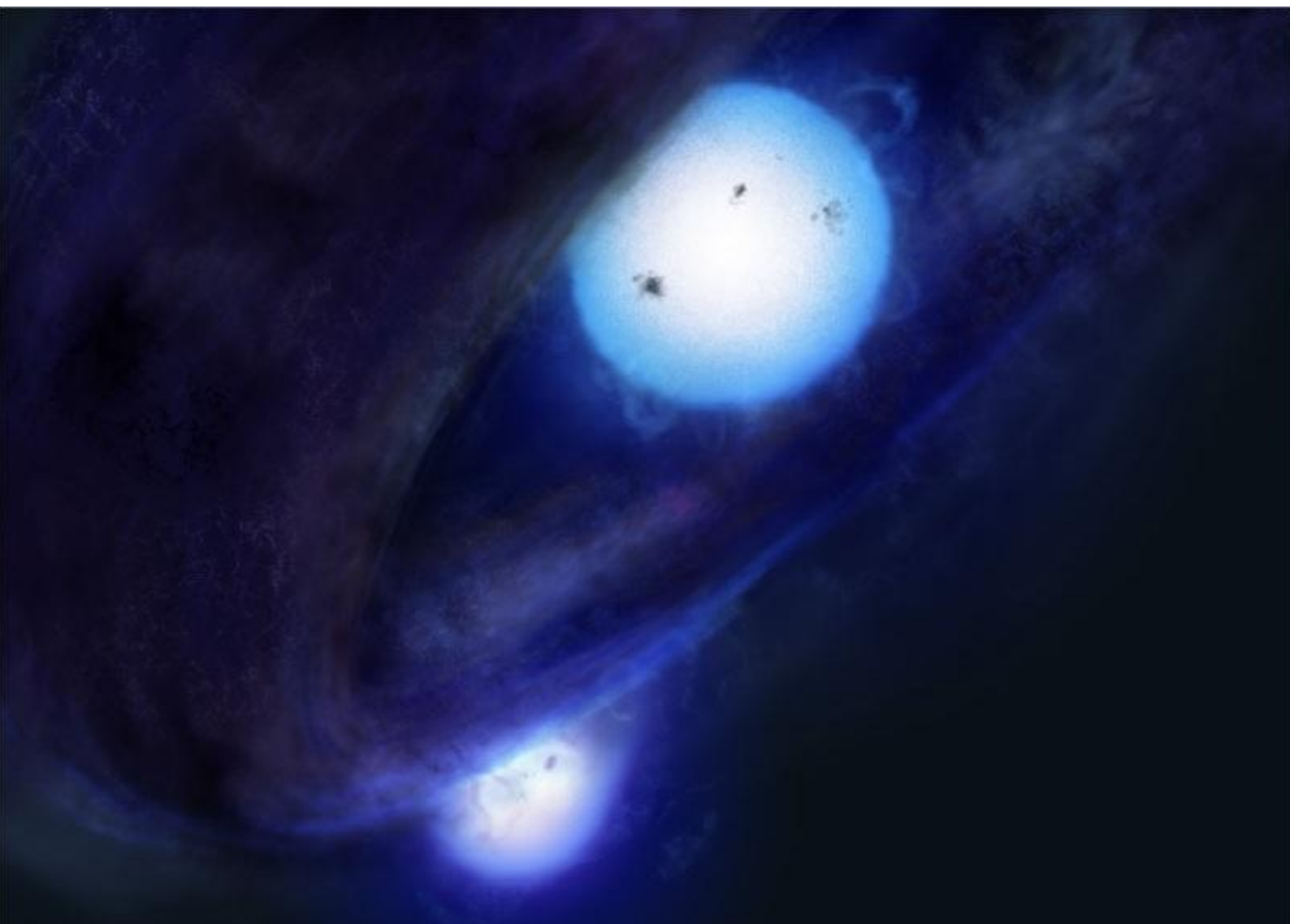


indented to. If your shields will be damaged or collapsed it will tear armor from your ship and consume you. Dark-matter can be harvested here, but it's a very dangerous task.

Pulsar - it will collapse any not adopted shielding in few seconds, after that your ship will be disabled with power energy, light and radiation waves. Just special ships dare to jump to systems with this small but harmful stars, being a source of null-element pulsar can make you a rich man or a dead man.

*Wormholes* - time and space anomalies, that can lead you to unknown places or distant corner of the galaxy.

Sometimes, you will find strange readings on your scanner, especially near anomalies, that can show you to strange places, nebulas, artificial formations or even alien derelicts, who knows ;)



## ***Colonies / planetary and orbital facilities / production***

*Nothing is build from nothing.*

***Colony (colonized planet)*** - planet that has very developed infrastructure, many cities and big population, cannot be built in normal way.

Every Colony has HQ station on its orbit that is needed to capture and maintain it.

***Planetary facilities (installations)*** - can be built at any non-hostile planet. Must be built by Construction Ship that remains stationary on orbit after launch of construction bots. Take raw materials to build. Every facility consumes energy, workers and planet control points.

Buildable facilities:

*Command center* - hub for all other buildings, its destruction stops operation of the whole facility. All facilities can be built in a defined area around CC. After construction spawns beacon directly on top of it on planets orbit for navigating. Beacon can be detected by enemies in close proximity (planets orbit). Provides control points.

*Housing complex* - determines how many workers available. Not required on Colonies.

*Energy station* - produces energy for other buildings. Not required on Colonies.

*Transport platform* - allows transportation of goods to/from planet's surface using transport beam. Can be used only in close proximity to command centers orbital beacon.

*Mine* - harvests some amount of all available resources that depends on planet resource richness (  $20(\text{per size}) * \text{resource}\%$ ). Can select what materials to harvest. Have different sizes.

*Storage* - provides storage for raw materials and built components. Not required on Colonies, they have VERY large storage.

*Weapon production facility* - can produce few components (fighter weapon components, small weapon components, large weapon components). Needs just raw materials.

*Weapon assembly plant* - builds weapons from blueprints, needs weapon components and some rare materials (depends on blueprint).

*Hull production facility* - produces hull components (fighter hulls, small, medium and large hull component). Needs just raw materials.

*Shield* - gives moderate protection from direct orbital bombardment. Covers just small area. Gives time to organize reinforcements.

*Missile defense platform* - surface-space missile array. Consumes a lot of energy and CP.

*Gun platform* - heavy cannon based on surface with advanced targeting systems and formidable power but with low reload rate. Consumes a lot of energy and CP.

***Space stations*** - can be built on orbit of planet or moon by Construction ship. Takes just raw materials to build. Almost every station consumes control points.

Station variants:

*HQ station* (Command station) - when build and there are no enemy HQs or colonies in solar system gives you control over it. Has good weapon load, fighter hangars and large ship docks. Provides control points for Solar system.

*Shipyards (small, medium, large)* - can build small(medium, large) ship hulls from blueprints. Needs hull components and some rare materials (depends on blueprint). Medium and large variants can be built only near planetary beacon with working CC. Small shipyard doesn't need control points.

*Weapon assembly station* - builds weapons from blueprints, needs weapon components and some rare materials (depends on blueprint).

*Production station* - serves like weapon and hull production facility on planet, but takes more time to produce something. Requires raw materials. can produce only one type of component at a time.

*Defense stations (few sizes)* - has fighter hangars, large ship docks and good weapon load. Can be built at any planet's orbit. Self-sustaining. Can be detected by enemy in solar system due to heavy energy signature (detection radius depends on size). Limit: 1 for planet orbit.

*Monitoring station(patrol base)* - has fighter hangars, few large ship docks and moderate weapons load. Advanced scanners and radars, can detect enemy fleets

(even small ships) in solar system. Can be built at any planets orbit. Self-sustaining. Has moderate storage. Can serve as first HQ for player. Doesn't need control points. Limit: 1 per solar system.

*Research station* - small station with laboratories and just few sensors and weapons. Can be detected only in close proximity. Can be built at any planets orbit. Self-sustaining. Requires raw materials, components and some rare resources to conduct research. Doesn't need control points. Only 1 is allowed at any time.

*Asteroid mining station* - can mine raw materials from asteroid, has fighter hangars. Can select what materials to harvest. Harvesting rate depends on asteroid resource richness. Can be build ONLY on large asteroids, which are quite rare.

Each facility and station has few variants that needs to be unlocked through research or buy/steal blueprint.

Every Major faction has a *capital planet* that is defended so heavily (heavy orbital stations) that it is nearly impossible to destroy the guardians, that serves as protection from total annihilation of faction. Also, when Faction has shortage on some kind of resource for a long period, this planets will start to produce very small amount of it, to protect economy from total stalling.

All other colonies can be captured by defeating all of orbital defenses, and planetary facilities (cities on planet will not be destroyed) and building HQ station on orbit.

### ***Building/Constructing***

To build either space station or planetary building you will need construction ship(CS) that becomes immobile while building. It has large material storage and consumes 10% of needed materials for every 10% of construction progress. Materials can be transferred to it from other ships.



To start building a planetary facility CS should be at almost minimum orbit above the planet. Then you enter construction screen that looks a bit like in EVE online, where you select place where to build command center that provides control area and control points. Every building

can be built *only* in control area and require enough energy and work power, buildings

can be built even if they do not meet requirements, but they will not be active.



All building can be seen only after scanning while orbiting planet. After scanning you can see building

icons on planet surface and try to bombard them (the most effective weapon is heavy turrets, spinal mounts and missiles due to orbiting range is about 100-120 km). Missiles and planetary guns can fire automatically on the target that bombards colony or nearest target.

Example of complex:

Name of building	CP usage	Energy usage	Work power usage	Effect
Control center	+200	0	0	-
Energy station	5	+100	5	-
Energy station	5	+100	5	-
Housing complex	5	5	+100	-
Housing complex	5	5	+100	-
Mine medium(common metals)	20	10	10	CM 40/Hour
Mine medium(carbon fiber)	20	10	10	CF 20/hour (50% richness)
Mine medium(Heavy metals)	20	10	10	HM 60/hour (150% richness)
Mine Large (Conductive elements)	20	30	30	CE 80/hour (120% richness)
Shield	15	20	5	1000 points of hard shield
Transport platform	5	5	5	
Storage	5	5	10	+5000 tones storage
Hull production	15	20	10	Components 6,2,1/hour
Weapon production	15	15	15	Components 6,2,1/hour
Weapon assembly	15	15	15	Weapons 3,2,1/hour
Gun platform	30	50	15	-
Left	180	170	115	



## Ships

Every ship is built at shipyard using Hull components, raw materials and some rare materials (depends on blueprint).

There are 3 sizes of ships:

Small - fighter drones, heavy recon fighters and corvettes.

Medium - freighters, frigates and destroyers.

Large - cruisers, battleships and carriers.

All ships are divided to 2 categories: available on market and military grade.

Player cannot buy military grade ships in normal way, but he can reverse engineer damaged ships on research stations. Or he can buy them on pirate stations, but it's a great luck to find them there.

Ships that are available on free market are mostly freighters, old models of military ships, a bit better decommissioned military ships and ships designed for private and corporation use (police boats, customs control) etc.

## Ship Classes

**Fighter drones** - are small fighters that used in large numbers in any fleet and by any faction. They are designed to be fast and maneuverable. Don't have shields, small to medium armor. No FTL drive, totally depend on carrier ship. Mount 2-4 fighter class weapons, more heavier variants can have light missiles. 5-10 m in long axis. Cannot be piloted by player.





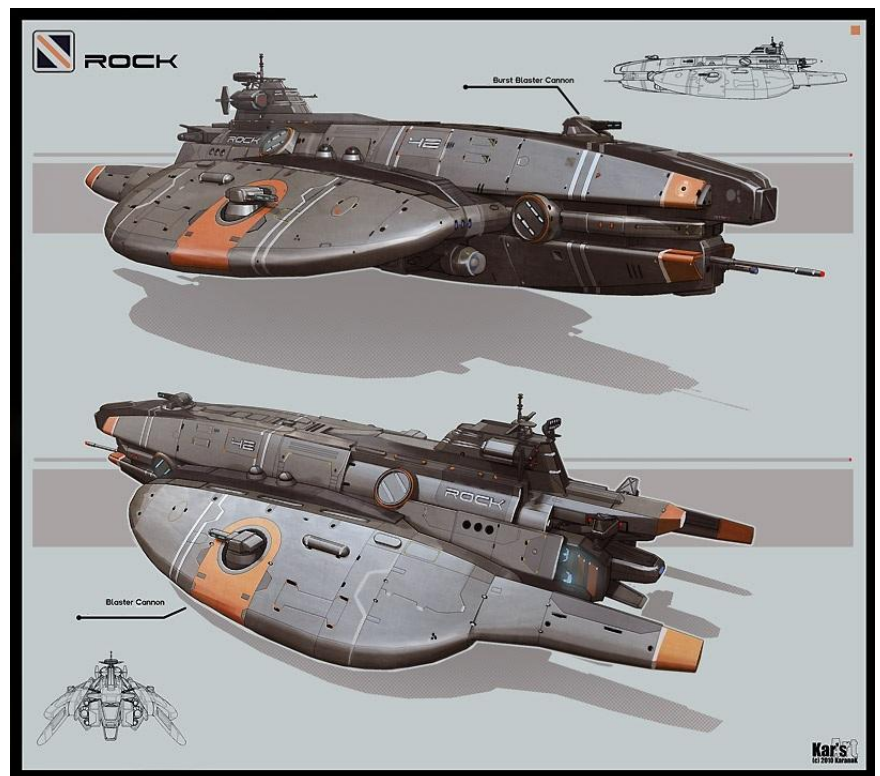
**Heavy recon fighters** - fighters with 1-2 pilots on board, usually used in strike groups or for fast scout operations. Have weak FTL drive of class 5 with fast recharge, can jump in solar system only, depend from carrier ship to travel to other solar

systems. No shields, moderate to heavy armor. Usually mount medium to heavy fighter weapons, some have light missile tubes and light turret mount. Moderate maneuverability. Much more expensive than fighter drones. 10-15 m in long axis.

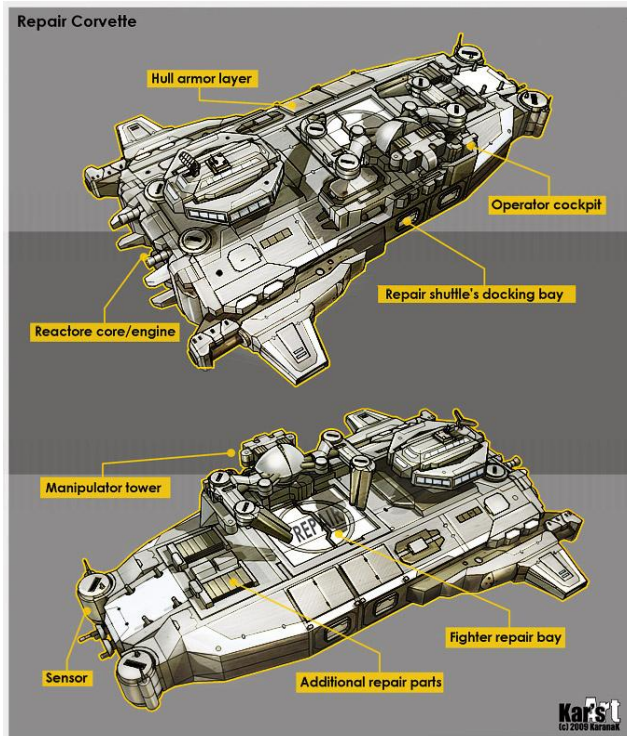
**Corvettes** - fire support and logistics ships, crew is 15-20 persons. Used for patrols and trade convoy escort. Almost all corvettes mount Class 3 FTL drive. Most used ships in galaxy. Corvette "Horizon" was the first ship that use FTL drive to travel through solar system, but shortly after first test it disappeared without trace. Around 50-80 meters in long axis.

Sub-classes:

*Main battle corvette* - Ship with good shields and armor, has 3-4 light anti-fighter/missile turrets, 2 medium main caliber turrets and 1 light missile tube that can use interceptor missiles or long-range missiles. Has dock for 2-4 fighter drones. Escort almost any fleet for point defense purposes. Most commonly used corvettes in convoys.



*Gunship* - heavily armored ship with spinal mounted heavy cannon (some military grade ships can mount energy weapons in this slot), and few light to medium turrets. Are more maneuverable than other corvettes. Usually don't have docking bay. Designed to strike more heavier ships such as frigates.



*Logistics corvettes* - ships with special modules built in their hull, such as repair dock for fighters, sensor station, rare resources gathering module, hyperspace inhibitor module, command systems etc. Usually have weak armor, moderate shields and few anti-fighter/missile light turrets.

Corvettes are the first ship class that have damageable systems, such as: main thrusters, FTL drive, fire control and sensors.

Every corvette has only 1 damage control/repair system.

## Frigates

Frigates are the backbone of any fleet, they are the most numerous military ships, can provide good fire support and fighter covering. Crew is around 50-150. Majority mount class 2 or 3 FTL drive. Around 450 - 600 meters in long axis.

Sub-classes:

*Patrol Frigate* - designed to be self-sustaining in long patrol flights, have moderate armor and shields, good thrusters, around 5-6 small turrets and up to 8 medium turret mounts, usually have 1 or 2 light or medium missile tubes. Can take aboard 1 Corvette, 2-3 heavy fighters and around 10-12 drones. Widely used in convoy escorts.

*Assault frigates* - just like corvette gunships, have better armor, more powerful maneuvering thrusters and usually 2 spinal mounted heavy guns, and just basic turret defense. Usually have small hangar for 5 drones and no fighters.



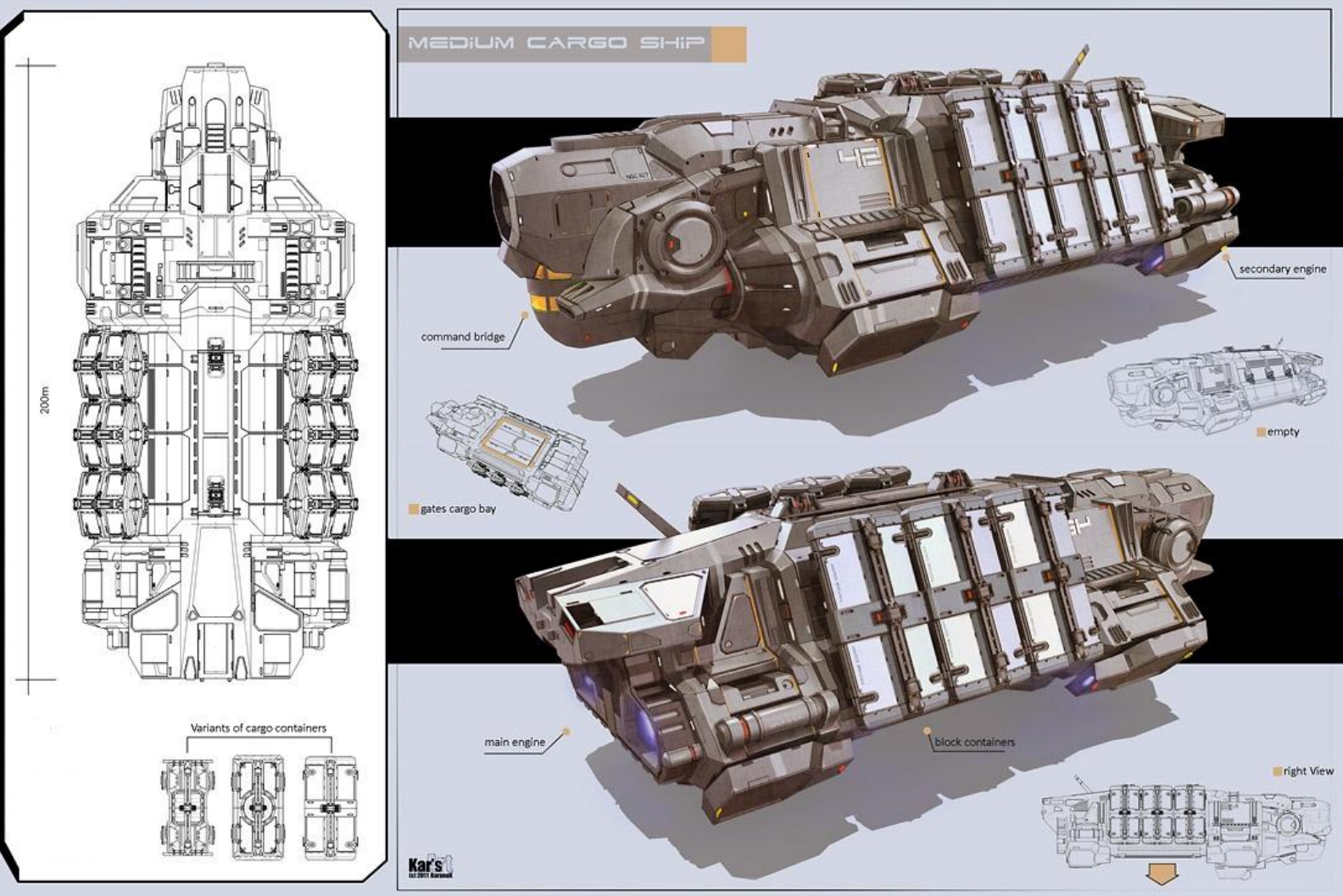
*Fighter support frigates* - don't have medium caliber guns, which they compensate with large hangars. Can carry about 20-25 drones and up to 5 fighters. Has 4-6 small turrets and single missile tube.

Frigates have such damageable sub-systems: main thrusters, FTL drive, sensors, Shield arrays(forward and backward), fire control (1 per port, starboard and forward guns), reactor, navigational computer. All frigates have 2 damage control/repair system.

Every frigate needs a commander character to operate.

## Freighters/transport ships

Freighter ships are used to transport goods in trade convoys, they have big mass and good thrusting system, almost lack armor and have weak to moderate shielding. Mount Class 3 FTL drive. Many freighters can be found on free market. Some models can have hangars for 5 drones and few turrets, even medium ones. Some pirates and bounty hunters can be found piloting well armed transport ships to ambush enemies.



Freighters have such damageable sub-systems: main thrusters, FTL drive, fire control, navigational computer. All freighters and transport ships have 1 damage control/repair system.

Construction ship also counts like transport with built-in construction mechanisms and drones.

## **Destroyers**

More rare ships in the galaxy, designed to withstand heavy attack. Can bring great firepower to the battlefield. Mostly used for long range striking with artillery cannons and missile volleys. Mount Class 2 FTL drive. Are much slower than frigates. Crew contains 250-300 persons. Approximately 1 km in long axis.

Sub-classes:

*Main battle destroyer* - designed to be all-round fighters, with good shielding and armoring, mount 6-8 light turrets, 4-6 medium turrets and 2-4 heavy turrets, some models also have 1-2 missile or heavy missile tubes. Can carry 10-25 drones and 5-8 heavy fighters and 2 corvettes.

*Guided missile destroyer* - suited for long range attack on medium, large ships and defense installations, mount 3-4 heavy missile tubes, 4-6 light turrets, 4-6 medium turrets for anti-corvette/frigate defense. Has moderate armoring and shielding. Has docks for 10 drones and 2 heavy fighters.

Destroyers have such damageable sub-systems: main thrusters, auxiliary thrusters, FTL drive, sensors, shield arrays(1 per rear, middle and forward part of the ship), fire control (1 per port, starboard and forward/rear guns), reactor, missile control system, navigational computer. All destroyers have 2 damage control/repair systems.

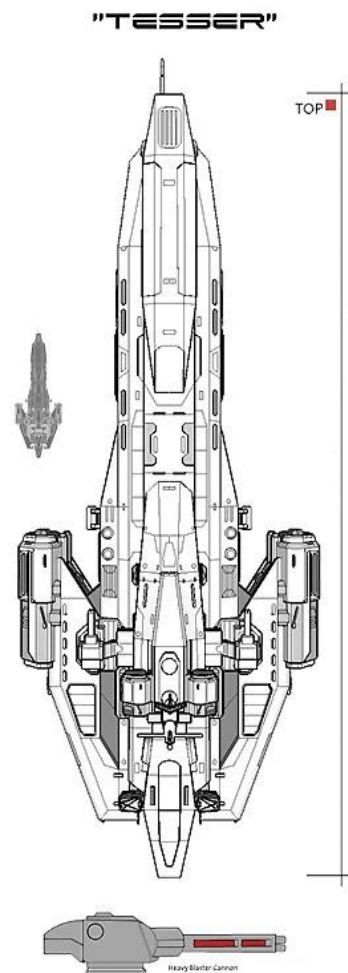
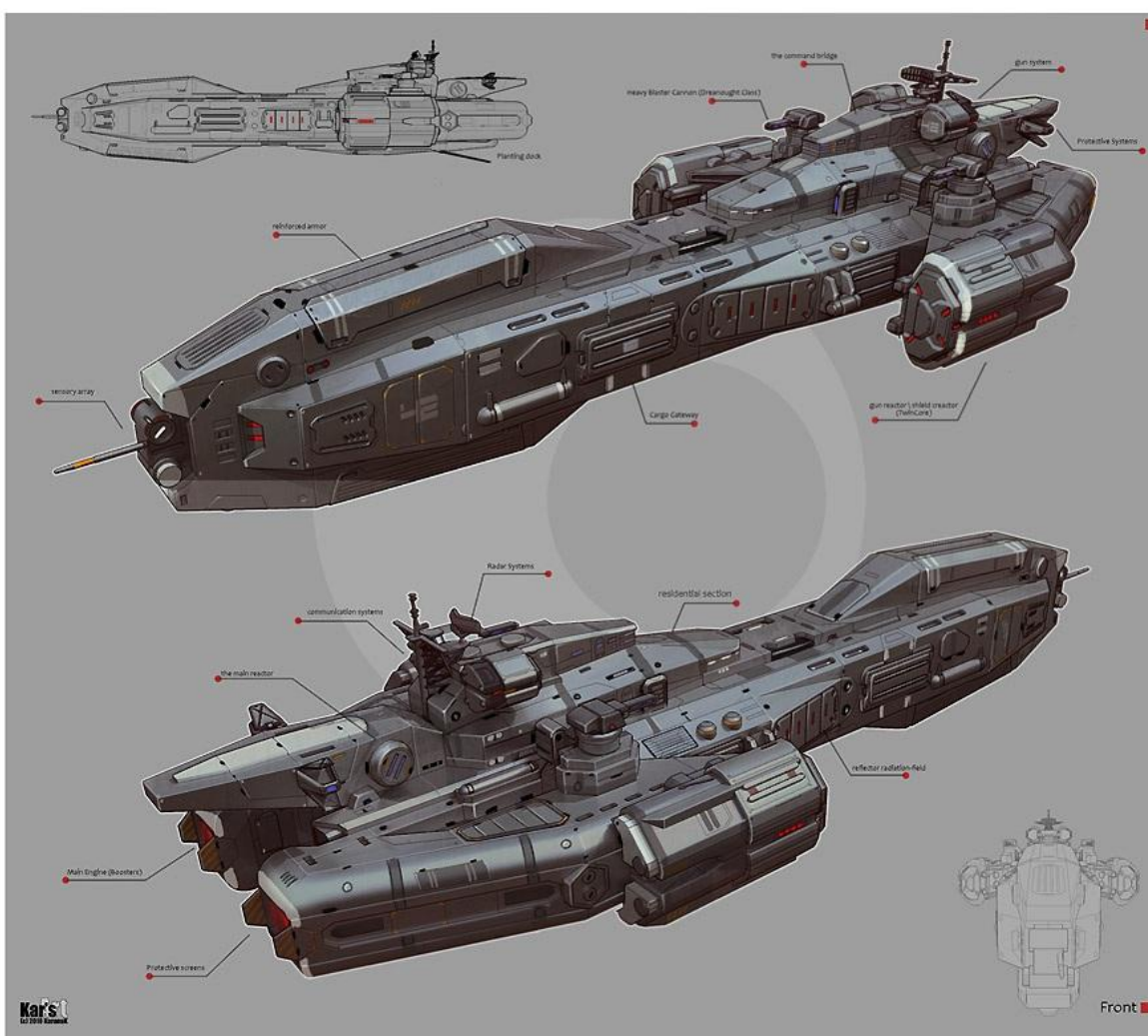
Every destroyer needs a commander character to operate.

## **Cruisers**

Designed to be a siege platforms against orbital installations. Very rare ships due to their cost, they usually serve as fleet flagships. Have very good shielding and armor, mount Class 1 FTL drive. Have enormous mass and are a bit slower than destroyers. Crew counts about 400 persons. Approximately 1,5 - 2 km in long axis.

Sub-classes:

*Command ship* - very robust ships with great shielding. Usually mount 6-8 light turrets, 6-8 medium turrets, about 6 heavy turrets and 2-4 heavy missile tubes. Can carry 20-30 drones, up to 10 fighters and 4 corvettes. Has advanced sensors and command system.



*Siege cruisers* - heavily armored and with better thrusters. Lack large hangars, can have only 10-15 drones aboard. Mount 1 siege-class cannon or beam, 4-6 light turrets and 2-4 heavy turrets.

Cruisers have such damageable sub-systems: main thrusters, auxiliary thrusters, FTL drive, sensors, auxiliary sensors, shield arrays(1 per rear, middle and forward part of the ship), fire control (1 per port, starboard, forward and rear guns), reactor, missile control system. All cruisers have 2 damage control/repair systems.

Every cruiser needs a commander character to operate.

## Battleships

Gigantic beast build with one purpose: annihilation. Due to their production times and price you can meet only few of them, and not every empire can afford such expenses. Their main weaponry is heavy turrets array that can reach 15-20 guns. But they lack good logistics capabilities and anti-fighter/corvette weaponry. Usually supported by a fleet of smaller ships. Mount Class 1 FTL drive. Fighter bays are quite small for such big machine: 30 drones and 5 fighters. Crew counts approximately 600-700 persons. Can be 2-3 km in long axis.

Have such damageable sub-systems: main thrusters, auxiliary thrusters, FTL drive, sensors, auxiliary sensors, shield arrays (2 per rear, middle and forward part of the ship), fire control (2 per port, starboard, forward and rear guns), reactor, auxiliary reactor. Have 3 damage control/repair systems.

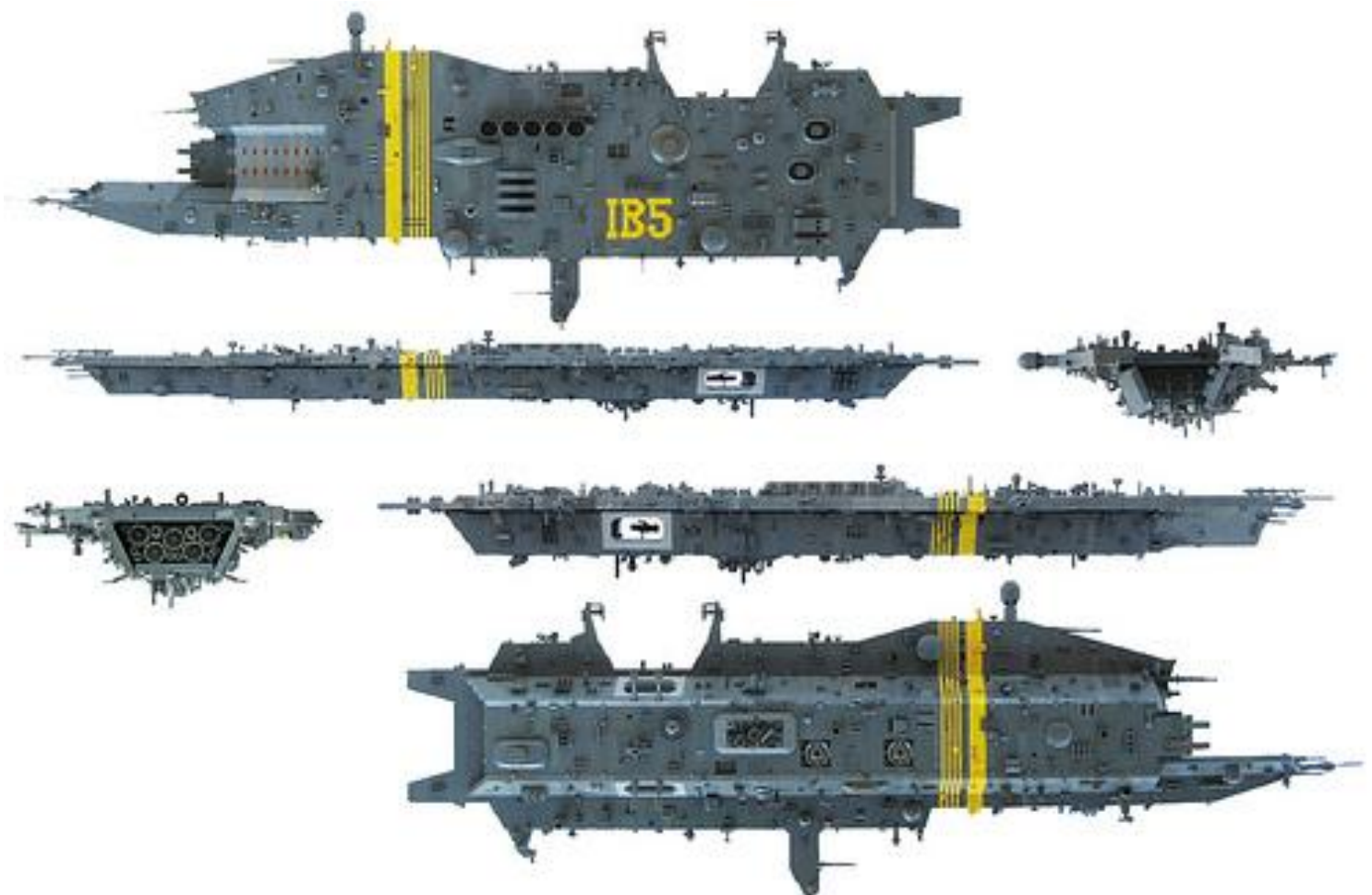
Needs a commander character to operate.

## Carriers

Huge hulls with enormously big hangars: up to 50-70 drones, 20-25 fighters, 5-7 corvettes and 2 fully armed frigates or freighter ships. Every faction has at least one of them. Usually act as Empire flagship. Can withstand fleet attack on its own, having 10-15 light turrets, 10 medium and heavy turrets and few missile tubes. Mount Class 1 FTL drive. Crew counts approximately 800 persons. Can be 2-3 km in long axis.

Have such damageable sub-systems: main thrusters, auxiliary thrusters, FTL drive, sensors, auxiliary sensors, shield arrays (2 per rear, middle and forward part of the ship), fire control (2 per port, starboard, forward and rear guns), reactor, auxiliary reactor. Have 3 damage control/repair systems.

Needs a commander character to operate.



## Shuttle

Shuttle is small ship with no weapons, moderate speed and Class 5 FTL drive with basic optical sensors. Can dock to any corvette, freighter and all larger ships. Does not take hangar bay slot and is built-in on every ship after production. Used for personnel transportation in solar system and as escape pod for ship crew.

## Ship production and assigning / Shipyards

Any ship must be constructed on the shipyard of appropriate size. There must be an appropriate blueprint and materials.

Ships are built in section by section order, so shipyard consumes 10% of materials available in the storage to complete every 10% of ship's hull. Construction can be paused on every 10% step or cancelled (only 60% of materials are retrieved).

After construction of ship completed it is added to shipyards dock/hangar, if there is no free room it stays at construction bay and don't allows new ships to be built.

Any ship can be moved to HQ and marked for sale.

Shipyards are also used for ship reconfiguration, repairs, special module replacement and fleet formations. All small ships are built with predefined weapon systems, but larger ships must be mounted with turrets of appropriate size. Weapon and modules change are instant.

Examples of blueprint:

*Cyclops* - heavy fighter drone, armed with 1 light auto cannon.

Production cycle: 10 minutes. Production quantity: 2

Resources: small hull components - 5 units	radioactive elements - 0,001 tones
small weap. components - 2 units	crystals - 0,01 tones
common metals - 2 tones	heavy metals - 2 tones
carbon fiber - 1 tone	heavy plasma - 1 unit

## Saint - patrol frigate

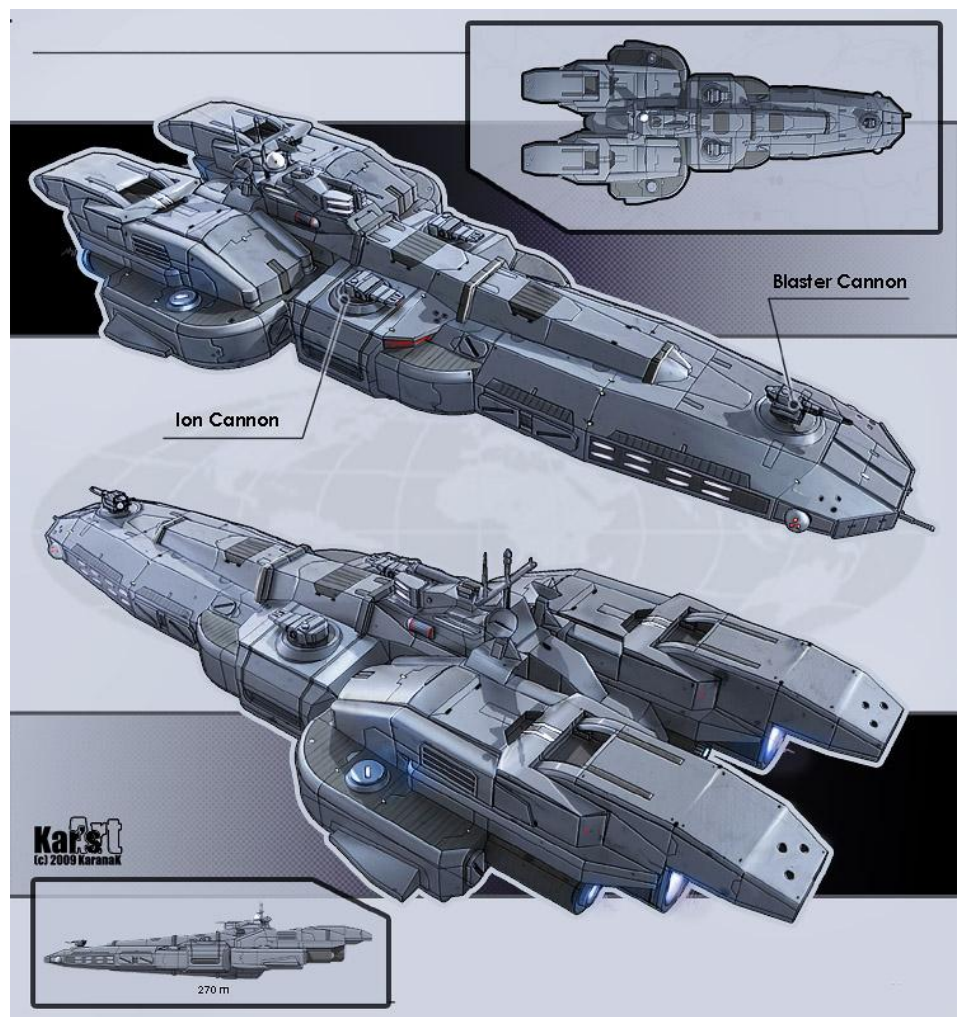
Production cycle: 12 hours. Production quantity: 1

Resources: medium hull components - 7 units      radioactive elements - 0,5 tones  
precious metals- 5 tones                              crystals - 0,1 tones  
common metals - 190 tones                        heavy metals - 30 tones  
carbon fiber - 40 tone                              conductive elements - 10 tones  
super conductive metals - 1 unit

Weapon in this frigate is not build-in so and needs to be constructed separately and mounted.

Special logistic corvette can be bought/constructed to salvage wrecks of ships. In the process of salvaging corvette also performs reverse engineering if there is no blueprint for such ship.

Depending on size of the ship and your luck(process is a bit randomized) it may take from 3 to 20 ship wrecks to get a full blueprint.



## Fleet system

Player can create Fleets from any ships that he posses.

*Yes, 1 ship can also be a fleet.* It's a managing tool to simplify process of command and supply when you have many ships.

Fleets can be formed only when all ships are in the same solar system. When creating a fleet player designates a command ship for it, it can be any type of ship excluding fighters, drones and freighters.

The size of a fleet totally depends on command ship. Command ship provides command points that can be boosted with character skills or special modules. CS also consumes CP. Fighters and drones don't consume CP.

Ship hull	CP needed	CP provided without bonuses (if set as CS)
Corvette	1	4
Command Corvette	1	7
Frigate	4	12
Destroyer	10	35
Cruiser	25	45
Command cruiser	25	55
Battleship	55	80
Carrier	55	100
Freighter/transport	2	-

Player can set fleet formation. Fleet jump distance depends on the ship with lowest FTL drive class. When jumping, whole fleet waits for all fighters to dock(unless ordered otherwise), FTL drives charged and navigational computers finish calculation, and then all ships jump simultaneously. To exit point fleet jumps in its predefined formation.

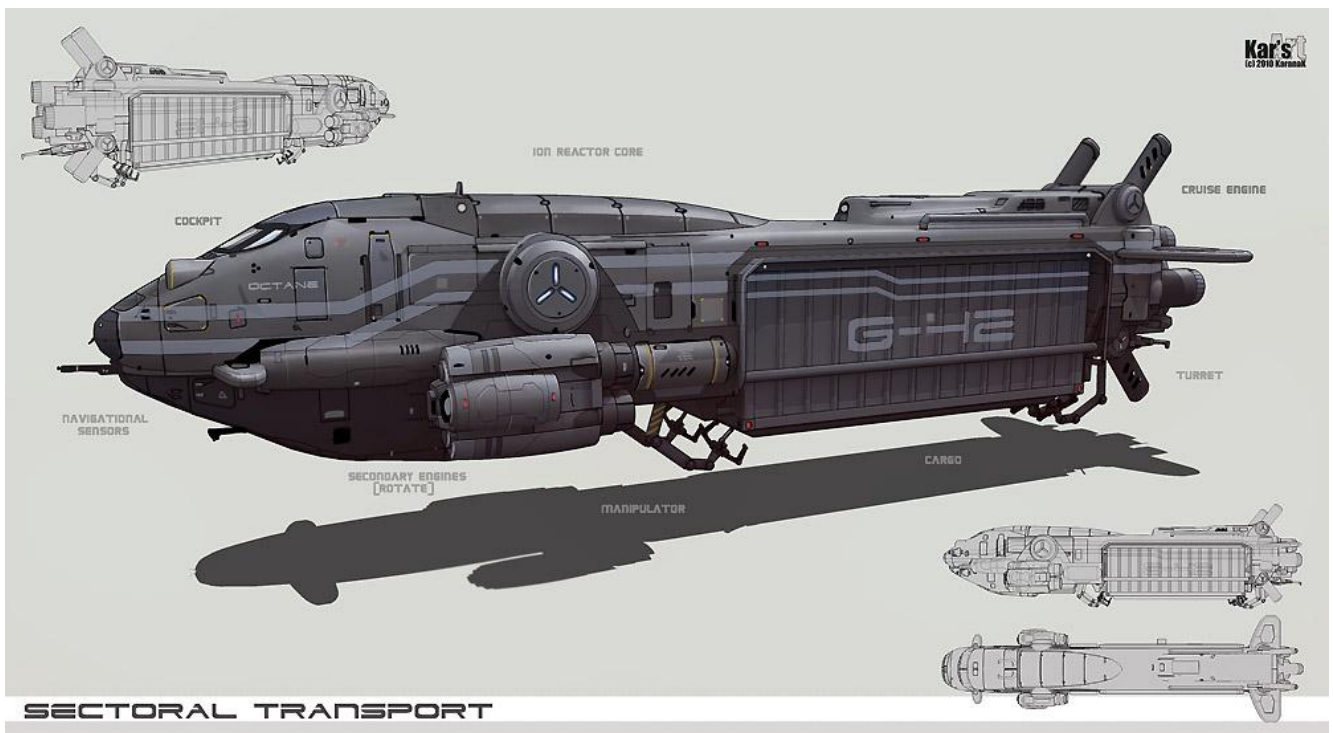
When player assigns fighter drones and heavy fighters to the fleet without selecting ship, they are evenly distributed between all ships in fleet, trying to match that are already on board.

## ***Trade route / Convoy system***

Factions and player can build/buy freighter ships to trade/transport goods. When convoy is organized player defines type of convoy: Repeatable or One-time

Example of Repeatable route :

1. Load at 'Sigma planet production station' with 100% cargo of fighter weapon module system.
2. Unload at planet Dune, wait for load of 400 units of Light fighter weapons.
3. Unload at 'Sigma planet small shipyard'.
4. Repeat.



Example of One-time route:

1. Load at 'Sigma planet production station' with 600 units of fighter weapon modules.
2. Unload and sell 100 % cargo of fighter weapons modules at planet Kindzadza.
3. Return to station 'Sigma patrol base' for further orders.

100% cargo means full cargo of ALL assigned transport ships.

50% means half of total sum of cargo of ALL assigned transport ships, even if some of them are empty and others are fully loaded.

Player can assign any quantity of transports and escort ships (Corvette class is minimum size for convoy) to trade/transport route.

All ships in convoy will jump at the same time and will wait for all ships to load/unload before proceeding with further orders. Jump distance is based on the smallest in the convoy.

# Weapons

All weapons, excluding fighter weapons, are produced at weapon assembly plant. For construction they also require blueprints that can be bought on the market, weapon components and raw materials.

Every weapon in game can be mounted in appropriate weapon slot depending on size. Fighters have built-in weapons that cannot be changed.

All weapons have predefined parameters, that can be changed a bit on research station.

Weapons are divided to 3 categories: ballistic, energy and missiles.

**Ballistic weapons** are easy to produce and maintain, they do not require powerful reactor and are the most popular weapons in the universe. Depending on model they can have different reload rate, precision and damage. There are also hybrid type of guns, that fire ballistic but consumes energy to launch projectile, such as: rail guns, gauss cannons, heavy mass drivers etc.

Example:

## *Light turret AA flack cannon*

Power needed	15
Mount slot	Light turret
Turn rate	60 ° / second
Rate of fire	120 / minute
Volley	2 projectiles
Projectile speed	8 km / sec
Dispersion for 1km	0,2 m
Damage	10-15
Area	10 m
Max range	6 km
Armor penetration	1
Armor damage	80 %
Shield damage	40 %
Hull damage	150 %

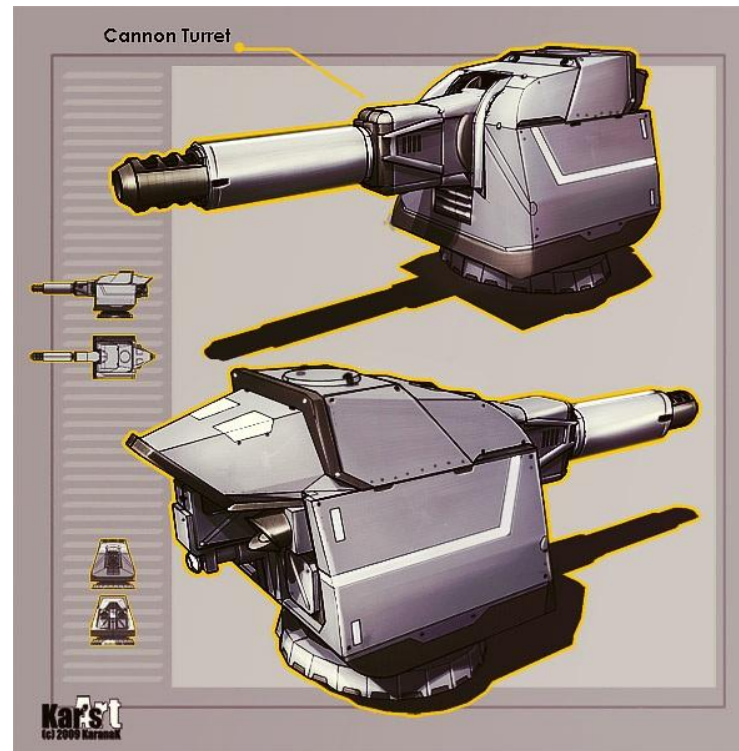
Special properties: proximity detonation (10 m)



### 600 mm HE single-barreled cannon

Power needed	65
Mount slot	Medium turret
Turn rate	20 ° / second
Rate of fire	15 / minute
Volley	1 projectile
Projectile speed	7 km /sec
Dispersion for 1km	0,4 m
Damage	80-100
Area	25 m
Max range	27 km
Armor penetration	3
Armor damage	60 %
Shield damage	50%
Hull damage	250 %

Special properties: proximity detonation (20m)



### Heavy sabot rail gun

Power needed	300
Mount slot	Heavy turret
Turn rate	3 ° / second
Rate of fire	4 / minute
Volley	1 projectile
Projectile speed	25 km / sec
Dispersion for 1km	0,05 m
Damage	350-600
Area	0
Max range	120 km
Armor penetration	5
Armor damage	120 %
Shield damage	110%
Hull damage	100 %

Special properties: high kinetic energy.

**Energy weapons** are very expensive but powerful, they also require a lot of energy to operate and have long reload



period due to cooling problems. They are used mostly on military grade ships. They also are more effective against enemies armor. There are many weapon models available to fulfill different roles.

*Light plasma-blaster cannon*

Power needed	40
Mount slot	Light turret
Turn rate	40° / second
Rate of fire	5 / minute
Volley	1 projectile
Projectile speed	6 km/sec
Dispersion for 1km	0,1 m
Damage	20-50
Area	2m
Max range	9 km
Armor penetration	3
Armor damage	160 %
Shield damage	60%
Hull damage	90 %

Special properties: high-temperature.

*Ion pulse cannon*

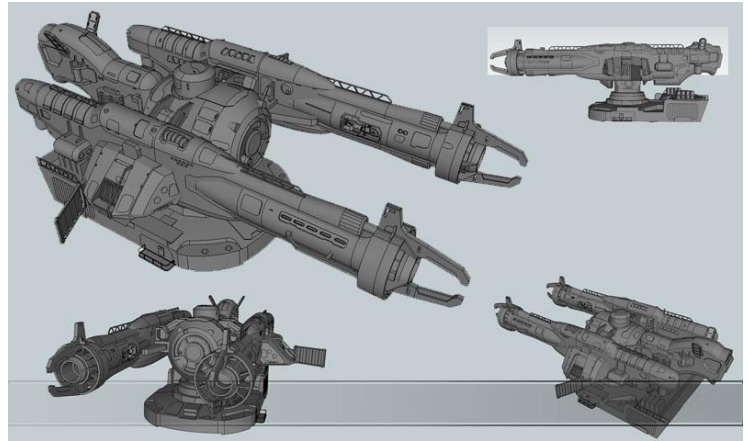
Power needed	140
Mount slot	Medium turret
Turn rate	22° / second
Rate of fire	18 / minute
Volley	1 projectile
Projectile speed	10 km/sec
Dispersion for 1km	0,1 m
Damage	100-145
Area	4 m
Max range	22 km
Armor penetration	2
Armor damage	40 %
Shield damage	160%
Hull damage	70 %

Special properties: Ion weapon.

*Heavy beam laser*

Power needed	470
Mount slot	Heavy turret
Turn rate	4° / second
Rate of fire	2 / minute
Volley	2 seconds
Projectile speed	beam
Dispersion for 1km	0,1 m
Damage	600-700
Area	0
Max range	75 km
Armor penetration	5
Armor damage	90 %
Shield damage	170%
Hull damage	70%

Special properties: beam.



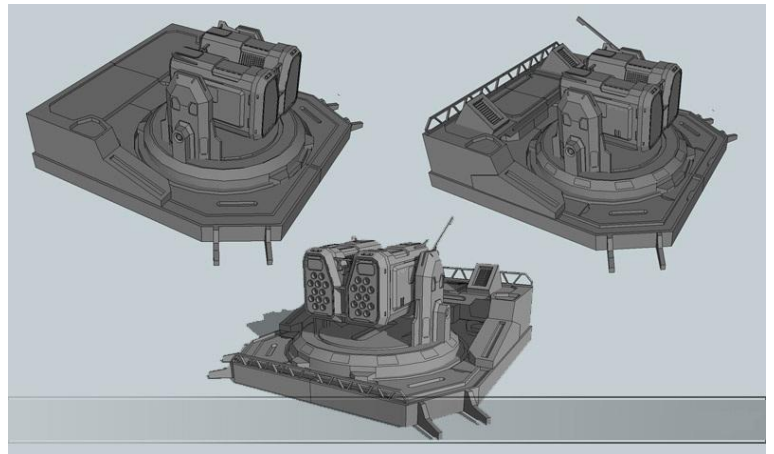
**Missiles** are specific weapon, they require a lot of resources to produce, have very long reload rate and depending on missile type are suited to hit specific targets. Can make precise hitting with guided missiles. Also unguided turreted platforms can be found on market, firing high speed short range high explosive rockets.

Example:

*Turreted kinetic rocket launcher*

Power needed	20
Mount slot	Light turret
Turn rate	30° / second
Rate of fire	8 / minute
Volley	5 projectiles
Projectile speed	10 km/sec
Dispersion for 1km	0,1 m
Damage	20-30
Area	6 m
Max range	20 km
Armor penetration	2
Armor damage	95 %
Shield damage	50%
Hull damage	110%

Special properties: high kinetic energy.



There is 4 different models of missile tubes: fighter, light, medium and heavy.

Every missile tube has constant reload type that **does not** depends on missile type.

30 sec -fighter, 60-light, 120-medium, 240-heavy.

Missile types:

EMP - anti-shield missiles, if hit armor or hull can disable ships engines for 5-15 seconds or increase on-board weapons reload time.

Kinetic - high speed missiles, low damage on shield but have very good armor penetration and can bypass it if lucky.

HE missiles - devastating against hull but useless against shields

HEAA - average damage to armor and hull, moderate armor penetration.

Name	Serpent
Type	HE
Tube slot	Fighter
Turn rate	85° / second
Speed	15 km / sec
Volley	2 missiles
Damage	15-20
Area	10 m
Max flight range	20 km
Armor penetration	1
Armor damage	80 %
Shield damage	30%
Hull damage	150%
Hull	10

Name	Nova torpedo
Type	HEAA
Tube slot	Heavy
Turn rate	10° / second
Speed	5 km /sec
Volley	1 missile
Damage	1500 - 2500
Area	500 m
Max flight range	350 km
Armor penetration	5
Armor damage	100 %
Shield damage	85 %
Hull damage	120 %
Hull	

### **Weapon grouping and targeting**

At any time weapons can be grouped (MechWarrior style) and regrouped for easy control. When you want some guns to shoot specific target, you need just to order this group to fire and point at a target (they will shoot directly at that part of ship that you pointed)

If target is out of range + 20% of max range weapon will try to shoot another enemy.

## **Weapon special abilities and parameters**

Area damage parameter dictates how big weapon projectiles explosion/shockwave is. Damage is 100 % in the center of area, 75% at half of radius and 25% at the corner.

High kinetic energy - when weapon penetrates armor it has 40% to bypass it and make direct hull hit.

Proximity detonation - projectile has magnetic detonator that is activated when passing near metal object.

High temperature - has +20% better armor penetration.

EM blast - releases EMP on hit, has small chance to make engines, shield regeneration or some random system to malfunction. Chance depends on damage and enemy ship size.

Ion weapon - designed to destroy shields, cannot damage hull and armor. Has much better chances to disable enemy systems and if powerful enough even disable its weapon systems for some time.

Beam - instant hit, +10% to armor penetration.

## ***On board systems and energy management***

Every ship has powerful null-reactor that provides enough energy for every system on the hull. Any ship commander have the possibility to adjust ships energy consumption by some systems, directly affecting its efficacy. Energy level is represented in %, when you change power supply for any system it will change 1% in second. Maximum safe energy level for system is 120%, max is 150%, but this system has chance to be overloaded and it must be restarted (drop energy level to 0 and start to regain it).

Systems where energy level can be changed:

*Thrusters* - the less power it has the less throttle it can give, it's quite dangerous to reduce power level of large ships engines, they will have problems maneuvering due to their high mass.

*Shields* - directly influences its recharge rate, if it drops lower than 30% it start to degrade.

*Weapon systems* - it influences tracking speed of turrets and reload rate a bit. Minimum operating level is 60%

*FTL drive* - influences recharge rate. Minimum operation level is 90%. If it drops lower then, it will stop to recharge and drop to zero recharge timer.

*Damage control* - influences repair speed.

*Special module* - depends on module.

## ***Defense and repair systems***

Every ship except the smallest one has 2 layers of defense before it will take direct hull hits: armor and shields. There is many types of shields and armor which are better suited for different roles

### **Shields**

Shield is an energy shell around the ship that protects it from space radiation, micro asteroids and, obviously, enemy weapon fire. They can be adjusted to protect specific ships side (top, bottom, forward, rear, port, starboard - 5% shields energy is transferred from one side to another per second )

Shield types that you can find:

1. Hard shield - surrounds the ship with thick ion-plasma field that has very high temperature and can melt any object that enters it in milliseconds, even enemy rockets and bullets. This type has just raw hit points system, when there 0 hp left it collapses damaging shields of nearby ships (in an area that equals to this ships long axis size). It becomes active only when recharged for 30% after collapsing.

2. Shell shield (Soft shield) - surrounds the ship with quite large electromagnetic bubble, this shield do not melt projectiles but it stops some of the them (70%) . This shield can last longer and even if some projectiles made it through it give enough time to repair systems to fix hull breaks. This type has more hit points than hard shield, but its advised to combine it with good armoring, due to some projectiles can still bypass it. Does not damage ships on collapse. It has 50% resistance to anomalies damage. It becomes active only when recharged for 50% after collapsing.

3. Null-shield - small specifically design null-reactor creates cube shield around ship. It uses gravity wall to stop and squeeze projectiles. Generally, it produces thousands of tiny black holes around ship. This is the most powerful shield, it has much more hit points than others, but its regeneration rate depends on shields hp, when its strength is more than 30% it regeneration rate is very small, up to 0 it has riches approximate level of hard shield. Damages other ships shields on collapse (in an area that is 2 times larger than this ships long axis size). It becomes active only when recharged for 30% after collapsing.

## Armor

Armoring is critical factor for ships survivability of ships, especially of fighters and drones. Armor plates have different thickness and resistance on different parts of ship's hull. Armor materials:

1. Very light armor - is used for most drones and fighters, very cheap and easy to repair and replace.
2. Light armor - a bit heavier version with some added heavy metals, usually protects fighters vulnerable points and not important corvette parts.
3. Medium armor - standard armor for Frigates and heavy corvettes.
4. Dense medium armor - used mostly on assault ships with spinal mounts to protect its forward side and on some destroyers.
5. Heavy armor - main defense on destroyers, cruisers and battleships.
6. Energized armor - uses same technology as in shell shields to protect the very surface of heavy armor that increases its hardness. Protects vulnerable parts of large capital ships.

To penetrate and bypass armor is 2 different things. When armor is bypassed projectile will directly damage hull, and if not - armor points. **If weapon does not penetrates armor, it does not damages anything.**

Weapons armor penetration parameter indicates what type of armor it can penetrate with 70% of success. If armor has greater index, it will reduce penetration by 20% and if index is smaller - increase it by 20%.

Every ship has global armor points for every side (top, bottom, forward, rear, port, starboard) and resistance. Some special points can have different resistance

Armor can be repaired. When it is depleted every shot will damage ships structure.

Example of Heavy patrol corvette:

Side	Resistance	Armor points
Top	2/ 4 on fire control	500
Bottom	3	400
Forward	4	700
Rear	2/3 on thrusters	450
Port	3	500
Starboard	3	500
Structure (hull)	0	2500

When structure reaches 0, ship will be destroyed without large explosion, but will crack apart. *If* during combat main reactor was damaged to more than 50%, ship will explode on destruction, damaging all ships in close proximity.

## **Repairing**

Some ships can have damage control (repair systems) that will fix damaged systems, modules and armor. Depending on ships hull this systems have different efficacy. Repair time also depends on damage done. Damage control systems cannot be destroyed or damaged. Ships commander can select what they will fix, or they can be set to automatic repairing, giving priority to special systems.

## ***Special modules***

Almost every ship (not fighters or drones) can have few special modules slots. This modules are produced directly on the shipyard (instantly) and require only raw and some rare materials. They can be damage during combat just like all other systems.

Modules list:

1. Additional repair system - adds one more repair system to the ship.
2. Additional shield arrays - adds 10% to shield hp and its regeneration rate.

3. Advanced sensors - doubles sensor power, reduces scanning time for 25%.
4. Command systems - +20% control points.
5. Jump inhibitor system - depending on ships size has different radius of effect, does not allows ANY (even friendly one) ship to jump. Activate only at 100% energy supply. Can be deactivated.
6. ECM system - depending on ships size has different power and radius of effect. Decreases enemy weapons accuracy, decreases enemy missiles turn speed and has chance to explode them.
7. ECCM system - depending on ships size has different power and radius of effect. Negates enemy ECM system effect.
8. FTL stabilization system - increases FTL recharge for 50% and navigation computer speed for 30%.
9. Secondary generator - increases power generation that helps to install more and heavier weaponry.
10. Some more :)

Something else to add here

# ***Credits***

Text - Shuul

Almost all arts and concepts - **KaranaK (thanks a lot for permission :-)** that will be used for awesome games Star Conflict and Empire: peripheral wars

Some pictures taken from different web sites:

www.novacelestia.com  
www.freakygaming.com  
and some others

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