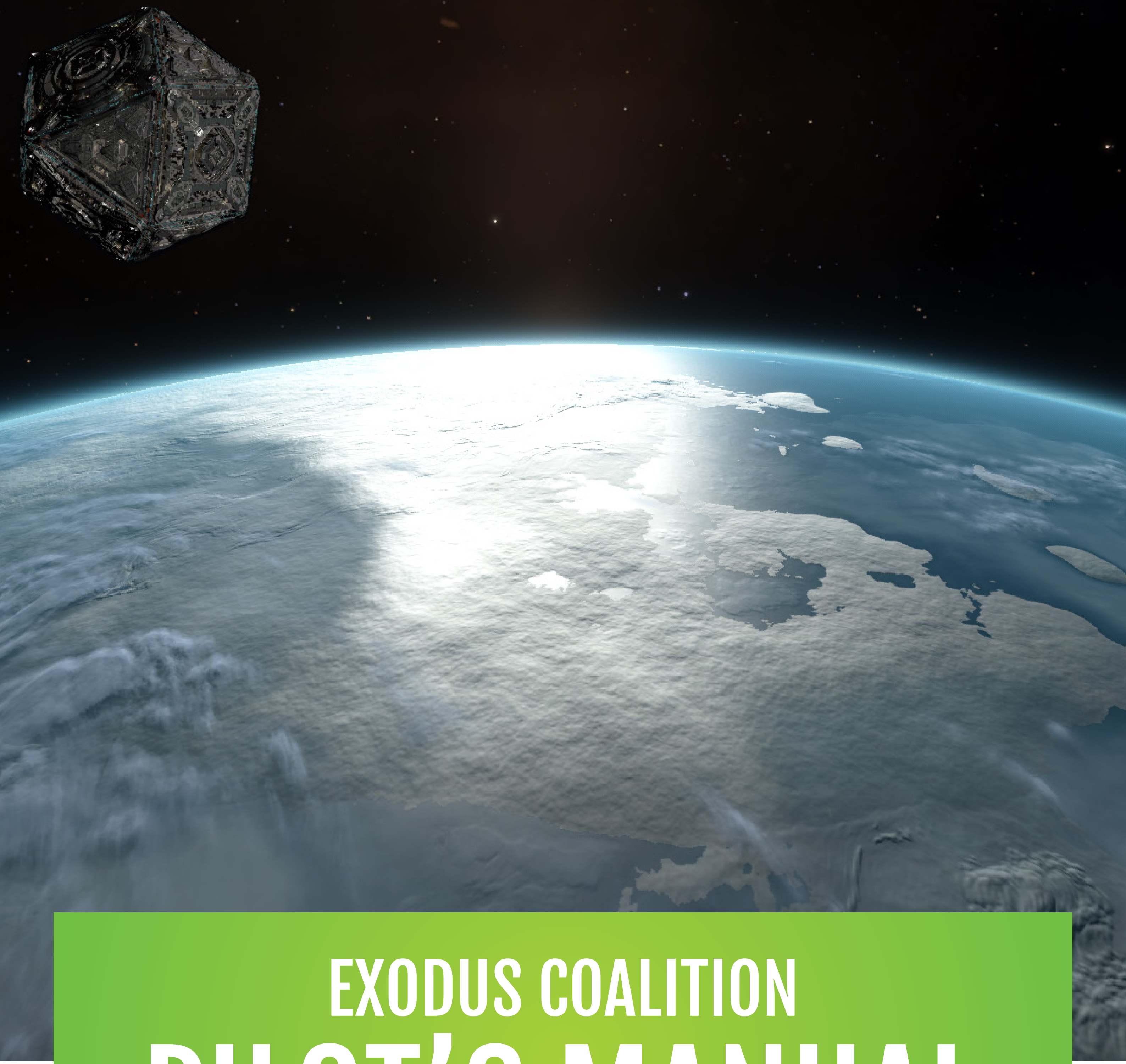

EXODUS COALITION
PILOT'S MANUAL

A comprehensive player's guide to Elite: Dangerous.
Learn everything from basic controls to advanced game mechanics and dominate space!

2nd Edition

AARON STARR, EXO JOINT CHIEF OF STAFF

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2nd Edition, Revision 2, Updated 5/26/17.

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Letter from the author

An introduction to the Pilot's Guide.

Greetings, commander, and welcome to EXO. Whether you are an experienced pilot or a novice, this manual will be a useful tool in your endeavor to expand the influence of our faction and free nearby systems from the shackles of the Old Powers. You'll soon find that EXO has members of every profession, and we strongly encourage all of you to seek out the activities that interest you the most. If this is your first time stepping into the cockpit, our guide will not only provide you with instructions for conducting basic maneuvers and maintaining the structural integrity of your vessel, but will also contain lessons for conducting operations across the full spectrum of occupations.

If you're a seasoned veteran of the void, you can still benefit from perusing this document for tips on how to become even more proficient at your trade, or by studying a style that you haven't experimented with before. Doubtless, there are many mysteries beyond the scope of this manual, as well as methods that have not yet been discovered. However, we hope that it serves as a useful component of your continued training, and we welcome any criticism or suggestions that you may have.

Special thanks to CMDR DrunkRenegade12, EXO's Wing Commander and an author of several sections in this book, as well as Geech MD, a fellow Joint Chief of Staff and my publisher and layout designer.

Best of luck to all of you; fly safe, commanders.

Aaron Starr, Author

Aaron Starr, Author
The EXO Joint Chief of Staff heading the wing's exploration division, CMDR Aaron Starr also leads GalCop's Colonial Defense Commission, the largest organization within the Colonia Migration Initiative. He is the creator and primary author of this guide.

Chapter 1

Pilot's Basic Course

What's in this chapter?

1. *Brief introduction to the game and the pilot's manual.*
2. *An introduction to Holo-Me and character creation.*
3. *An explanation of basic game controls and key bindings.*
4. *How to use the camera suite.*
5. *Power distribution and pip management.*
6. *How to dock your ship at a station.*
7. *Principles of zero gravity flight and a discussion of vectoring, thrust, and rotational motion.*
8. *Regular drive, supercruise, and hyperspace jumping.*
9. *Piece by piece instruction on every element of the user-interface, including all computer panels in the ship's interior as well as system and galaxy map utilities.*
10. *An overview of outfitting, an explanation of the various categories of modules and how to find sellers, and tips on useful modules to purchase in the early game, especially the fuel scoop.*

> *Astronomy compels the soul to look upward, and leads us from this world to another.*
>
> *Plato, The Republic, 342 BC*

Welcome to Elite: Dangerous, pilot!

CONGRATULATIONS, YOU FINALLY OWN YOUR first ship! Well, you took out a loan for it, anyway. As you step into the cockpit, a few thoughts are probably going through your head. You might be thinking, “how the hell am I supposed to fly something with this many buttons?” Or perhaps, “why are there loose wires hanging from the roof?”

Don't be alarmed; many commanders before you have entertained similar thoughts, and this segment of the EXO Pilot's Manual (EPM) will provide you with everything you need to get on your feet (note: you must remain seated at all times when operating your spacecraft).

You are encouraged to complete the training modules within the game itself, as they will walk you through some basic controls and mechanics. Additionally, the first time you enter the main game, the pre-flight checks will run you through the default controller setup. These are both a good start before you begin reading the Pilot's Guide, but still, many players find these tutorials to be inadequate to truly understand the basic game mechanics. We will begin the guide with the assumption that you will be able to mostly figure out which button does what using the in-game controls menu and the aforementioned tutorials, but all important concepts will be explained in depth from here on out.

One more word before we begin - this is a game with a notoriously steep learning curve, and patience is key. We believe that patience will pay enormous dividends, as this game has brought us more enjoyment than any other. We're glad that you've decided to take the plunge, and we hope to see you out in the skies.

* * *

Holo-Me

AS YOU MIGHT IMAGINE, COSMETIC surgery in the 31st century is incredibly lifelike. So much so, in fact, that you can alter your appearance however you like, free of charge. This is definitely the best place to start in your career as a member of the Pilot's Federation; after all, first impressions matter a whole lot more when your life hangs in the balance.

In order to construct the ideal version of yourself, simply access the "Holo-Me" button on the first page of the right-hand user interface panel. You can also find this button in the station menu while docked. Once selected, the software will boot up, providing you with a number of customizable options for your flight suit, body, and face. You can choose a preset appearance, and expand upon most options by clicking the "+" button near the labels.

Though it may require some trial-and-error, you'll find this new feature more than adequate at producing a wide range of design options for all your aesthetic needs. Whether you're a hideous pirate or the lead singer of a galactic boy band, "Holo-Me" has you covered.

* * *

Camera Suite

AS YOUR GALACTIC JOURNEY UNFOLDS, you will encounter countless sights and scenes that you may wish to capture for posterity. To this end, your ship comes equipped with a standard issue camera suite, capable of photographing your ship's interior and exterior from all angles.

The camera suite has two basic modes - fixed camera and free camera. When you first enter the camera suite, your camera will be in fixed mode. You can cycle through a variety of stock views including various "selfie" angles of all cockpit seats, shots around the interior of the ship, and various angles of the exterior of the ship from the front, rear, side, above, and below.

You can achieve more flexibility to pursue your photographic inspiration by pressing a button to enter free camera mode. This mode allows you to fly the camera around in space using the cardinal camera movements of pan, tilt, truck, dolly, pedestal, lean, zoom, and focus. To correlate these to the flight controls of your ship, panning and tilting are analogous to yaw and pitch. Trucking is similar to lateral thrust, while dollying is analogous to forward and reverse thrust. Pedestal movements are like using the vertical thrusters. Zooming and focusing have no flight analogy, but should be fairly simple to understand. Zooming in increases the focal length of your lens, making faraway objects appear larger and closer.

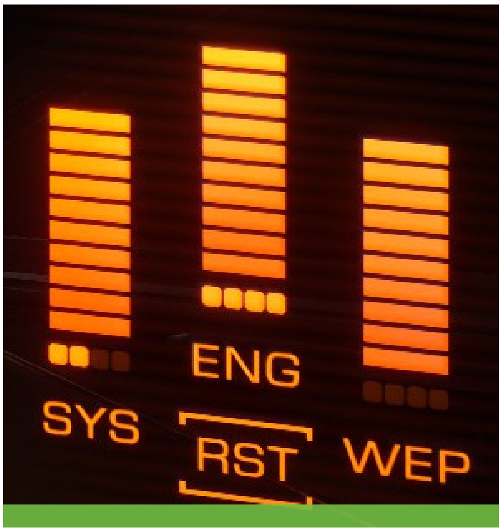
Focusing the camera means adjusting the distance between the lens and the sensor in order to make the light coming from a particular distance converge on the sensor. In practice, this means making objects a certain distance away appear the clearest by setting a focus point. Also important to focusing the camera is Depth of Field, which is the distance between the nearest and farthest objects in a scene that appear acceptably sharp in an image. In your camera suite, this is represented by the Blur percentage. At 0% blur, the Depth of Field is infinite, meaning everything in your image will be perfectly in focus, regardless of what distance you set for the focus point. As the Blur increases, the Depth of Field decreases, and the focus point remains clear while the rest of the image becomes progressively blurrier.

One final word - the standard controls for the camera suite are counter-intuitive, particularly if you are used to the standard flight controls for your ship. You may therefore find the default camera suite controls to be difficult and unwieldy, and we offer these mappings as an alternative which might be easier to master.

* * *

Zero Gravity Flight

THOUGH IT IS PERHAPS THE most difficult and time-consuming aspect of becoming a proficient pilot, binding the cockpit keys to your controller or your HOTAS in an intentional, meaningful way will save you time and money for the rest of your career. Unfortunately, there is no "easy" answer to the question of what the best method for going about this tedious process truly is. What works for one pilot may not be ideal for another, so it's important to take your time when deciding how to organize your space. Test your layout, and make adjustments as necessary. Efficiency is key, and only you can be the judge of whether something is a help or a hindrance to your flying. Once you feel comfortable with your control scheme, however, this section will walk you through the basics of piloting your ship in outer space.



POWER DISTRIBUTION:

Every ship has a single fusion reactor that powers all of its subsystems. It is possible, however, to alter how much of that power is used by each of the vessel's three main functions. These include the systems (SYS), the engines (ENG), and the weapons (WEP). The systems primarily feed energy to the shield generator, while the engine power determines how fast the ship can travel. Each of these power distribution lines has a maximum of four "pips" that can be diverted through them. Due to optimization parameters, only six of these can be controlled by the helm. However, each additional crew member can assign a "pip" of their own, bringing the maximum total count to eight.

The amount of power that you divert to each of the above three categories will determine the vessel's performance in any corresponding tasks. For instance, your shields will absorb up to three times more damage if you divert maximum power to systems- and they'll recharge more quickly, as well. Learn to continuously shift your power distribution to meet the demands of each situation. You'll gain a significant advantage by channeling power from a function that isn't actively being used and assigning it to a more critical area.

LINEAR MOTION:

VECTORING:

In outer space, there's no gravity to hinder you. While atmospheric vehicles are generally restricted to moving faster or slower in a forward-facing direction, there are no such limits for your ship. In fact, there are three separate planes that you can traverse- the horizontal, the vertical, and the lateral.

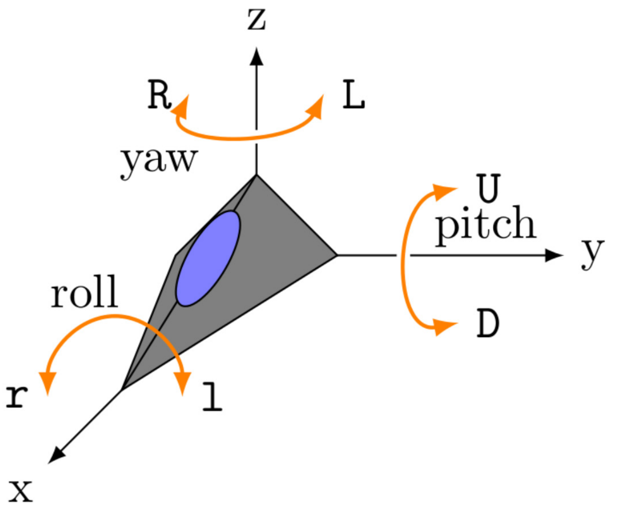
This may seem obvious, but it is essential that you learn to use all three of these vectors as a fluid system of motion. By interacting with multiple inputs on your control device simultaneously, you can fly in any direction you wish while keeping your cockpit facing the same way.

THROTTLE:

Each ship is equipped with plasma induction drives of varying capabilities, and these differences manifest themselves in the wide range of speeds that can be achieved by different combinations of vessels and thrusters. You can't continue to accelerate indefinitely; there's a limit. However, you can always divert power to your engines and boost to achieve higher velocities. Additionally, there are a few other methods for improving the maximum linear speed of your vessel by allowing an experienced engineer to tune its drives, but we'll cover all of that later.

ROTATIONAL MOTION:

Aside from propelling your ship in any direction that you wish, thrusters can also be used to adjust the orientation of your vessel. The terms for this are "pitch," "yaw," and "roll." Pitch alters the vertical attitude of the ship's nose, while yaw rotates the ship laterally. Obviously, the roll controls your horizontal orientation. All three of these controls should be used fluidly in combination with the ship's linear thrust to achieve the best results.



FLIGHT ASSIST:

Piloting in a Zero Gravity environment can be extremely disorienting, and it takes time to adjust after a long stay on terra firma. Because momentum is conserved, each thrust vector must be countered by an equal and opposite force in order to eliminate a vessel's motion relative to a given reference point. For these reasons, modern manufacturers have equipped their ships with a flight assist computer, which automatically counters directional motion in the absence of an active command.

To put it plainly, the flight assist computer allows a spacecraft to be flown like an atmospheric vehicle. Most of the time, this system is extremely convenient, and it's even turned on by default. However, you may benefit from turning the flight assist off in certain instances. For example, the system can sometimes become a hindrance during combat scenarios because it restricts the ship's ability to sustain fluid motion while maintaining a weapons lock on the enemy. Later on, we'll cover the recommended methods for flying with your flight assist turned off. For now, feel free to experiment with it in a safe location with few obstacles and plenty of room.

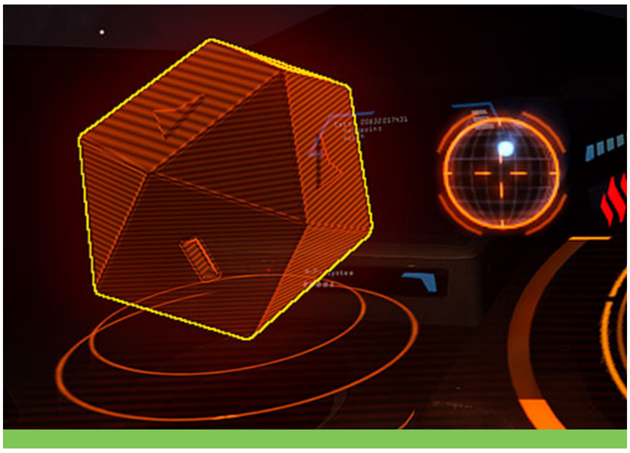
* * *

Docking

SOMETIMES REFERRED TO AS "CONTROLLED collision," docking is one of the most difficult skills for new pilots to acquire. Luckily, there are a few tricks that can make it a great deal easier. So, before you disgrace yourself by smattering the remains of your vessel across the back end of an orbital station, we recommend that you give this section a once-over.

The first thing to consider when attempting to dock is your flight controls. Depending on your input method (i.e., controller, mouse/keyboard, joystick), you may find that the bindings used for normal flight do not function well for landing. If this is the case, simply re-enter the "controls" tab in the game menu and customize the "alternate flight controls" portion to fit your needs. Don't forget to assign a button for switching between the two methods!

Despite the fact that each pad is numbered, it can often be hard to locate its whereabouts inside a large station. Thankfully, the navigation ball on your HUD will point you in the right direction. To successfully rendezvous with a landing pad, you'll need to orient your ship in the correct direction.



Look for the raised metal blast shields at the end of the pad; these should always be at the rear of your ship.

Another good rule of thumb is to keep your speed below 100 m/s when approaching a station or outpost. While there are technically no penalties for speeding, you will be fined for colliding with another spacecraft, should you happen to be traveling faster than the aforementioned velocity. Of course, that's not the only reason to take it slowly. It will also help you make timelier corrections to your flight path and avoid damage if you happen to overshoot your landing pad.

For some, docking may become an enjoyable aspect of the spacefaring experience. For others, it may remain a cumbersome chore. If this is the case, don't be dismayed; there's hope for you yet, and it comes in the form of a docking computer. This handy little utility will assume control of your vessel and complete a (usually) flawless landing, leaving you free to finish your Chai Latte and enjoy the view.

* * *

Navigation

HOPEFULLY YOU'RE GETTING USED TO piloting your ship within the confines of time and space. Don't be disappointed if it's still a bit tricky; it takes a great deal of patience to master the art of zero gravity flight. However, if you want to travel to a different planet or star system, you'll have to use your Frame Shift Drive. These incredible pieces of technology were created with the help of a peculiar archaeological discovery on Mars many centuries ago, and no one really knows exactly how they work. However, FSDs can operate in two different stages that make travel much, much faster.

SUPERCRUISE:

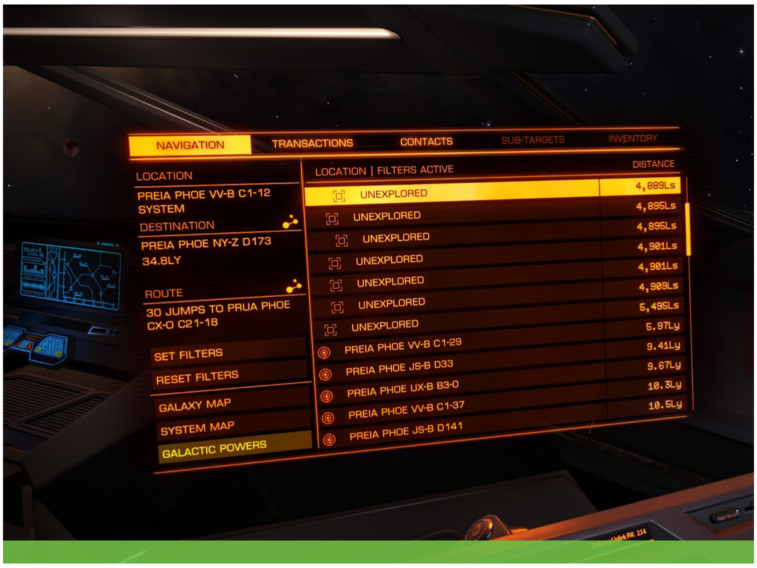
This mode compresses space around your ship, allowing it to ride the "wave" at relative velocities much greater than the speed of light. However, Supercruise is limited to interplanetary travel, and is affected by the gravity wells created by bodies of mass. Because of this, you can't travel to another system while in Supercruise, and your speed will be reduced incrementally the closer you are to planets, moons, or stars. In fact, if you're too close to any other object more massive than your ship (i.e., an orbital station, an asteroid, or a large vessel), you will be "mass locked." In order to initiate a jump into Supercruise or Hyperspace, you'll have to increase the distance between your ship and the body of mass that's locking you.

HYPERSPACE JUMPS:

Unlike supercruise, H-jumps act as a near-instantaneous mode of travel between two star systems. Instead of compressing only the space near your ship to form a spacetime "wave," the FSD compresses all of the space between the system that you're in and the star you're going towards during an H-jump. This feat consumes an immense amount of hydrogen fuel, and is limited greatly by your ship's total mass as well as the relative size of your FSD. To increase your vessel's range, you can purchase a higher grade Frame Shift Drive and/or use class D internal components in the rest of your ship's core internal compartments, since they have the lowest mass. Finally, here's one important safety tip: **if you turn flight assist off before engaging your FSD, you will drop into each subsequent system at the minimum supercruise velocity (30 km/s). This may save you from crashing into a star!**

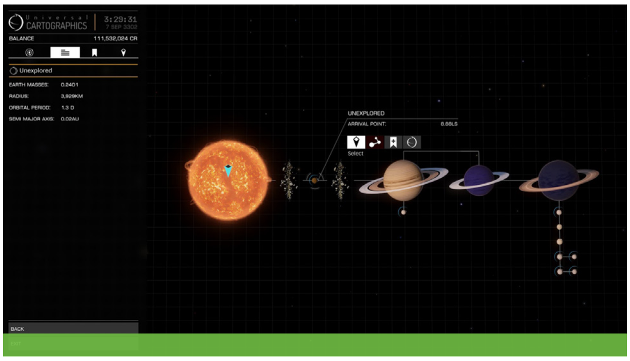
USER INTERFACE:

Scientific explanations aside, the most important aspect of navigation resides in the comfort of your cockpit. Your ship's onboard flight computer has a number of different programs to assist you in getting from point A to point B in one piece (disclaimer: you may not always arrive in one piece). There are three primary tools that correspond with the two different FSD modes covered earlier.


NAVIGATION
TRANSACTIONS
CONTACTS
SUB-TARGETS
INVENTORY
LOCATION
PREIA PHOE VV-B C1-12 SYSTEM
DESTINATION
PREIA PHOE NY-Z D173
34.8LY
ROUTE
30 JUMPS TO PRUA PHOE CX-O C21-18
SET FILTERS
RESET FILTERS
GALAXY MAP
SYSTEM MAP
GALACTIC POWERS
LOCATION | FILTERS ACTIVE
DISTANCE
UNEXPLORED 4,889Ls
UNEXPLORED 4,895Ls
UNEXPLORED 4,895Ls
UNEXPLORED 4,901Ls
UNEXPLORED 4,901Ls
UNEXPLORED 4,909Ls
UNEXPLORED 5,495Ls
UNEXPLORED 5.97Ly
PREIA PHOE VV-B C1-29 9.41Ly
PREIA PHOE JS-B D33 9.67Ly
PREIA PHOE UX-B B3-0 10.3Ly
PREIA PHOE VV-B C1-37 10.5Ly
PREIA PHOE JS-B D141

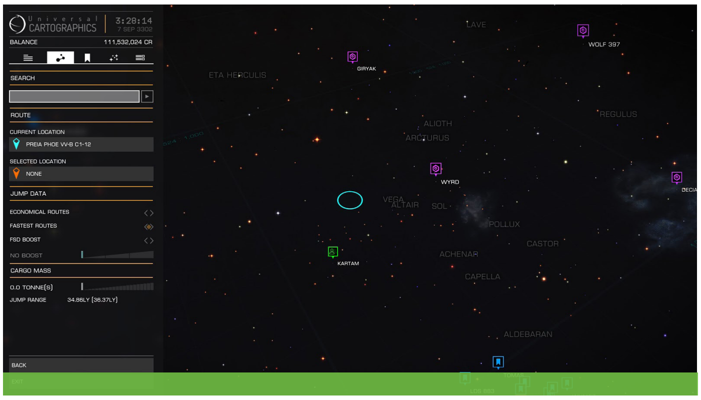
NAVIGATION PANEL:

The most accessible tool can be found in the "navigation" tab of your leftmost user interface panel. This readout lists the stars, asteroid belts, planets, moons, and stations within the system that you are currently in. It also provides a list of nearby star systems. These items can be filtered via the "set filters" and "reset filters" buttons just above the galaxy map tab on the left side of the panel, shown above. Within the bubble of human inhabited space, most system data is common knowledge. This means that object names will appear automatically on your navigation panel. However, the vast majority of systems in the galaxy are unexplored, and you'll need a discovery scanner and a detailed surface scanner in order to log them in your ship's databanks for future reference (or to sell).


Universal CARTOGRAPHICS
3:29:31
BALANCE
111,532,024 CR
Unexplored
EARTH MASSES: 0.2401
RADIUS: 3,929KM
ORBITAL PERIOD: 1.3 D
SEMI MAJOR AXIS: 0.03AU
UNEXPLORED
ARRIVAL POINT:
Select
BACK

SYSTEM MAP:

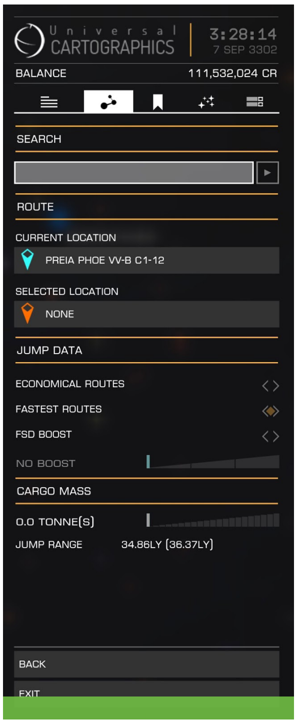
Another useful function of your nav computer is the system map. This feature, also located in the navigation tab on the left user interface display, brings up a detailed graphic with information about each item contained within your current system. An example is provided for your reference to the left. Any system that has been scanned can be viewed via the galaxy map (which we'll cover shortly) no matter what location it is accessed from. This function is extremely useful for identifying unexplored objects, and for scouting out stations and outposts.



GALAXY MAP:

In order to travel between star systems, you'll need to use the galaxy map. While it may appear daunting at first (there are 400 billion stars in the Milky Way!), the program is actually very easy to use with a little practice and a bit of technical know-how.

Unlike the system map, which is two dimensional, the galaxy map is three dimensional. You can maneuver your cursor across the X-Y plane and along the Z axis using your default controls, or you can map them to a more convenient layout if you like. Additionally, you can zoom in or out. Note below that there are a few different markers above certain systems. Green markers indicate the location of a commander on your friends list. Purple markers indicate the location of a prominent engineer. Blue markers denote systems that you have tagged with the bookmark function, which can be accessed simply by clicking on any star. You can locate and even rename your bookmarks using the bookmark tab, which is the third tab in the panel on the left side of the map. Finally, yellow markers indicate the location of a community goal (not depicted in the image below). These are updated automatically as events are announced or completed.



3:28:14 7 SEP 3302

BALANCE 111,532,024 CR

CURRENT LOCATION PREIA PHOE VV-B C1-12

SELECTED LOCATION NONE

NO BOOST

0.0 TONNE(S)

JUMP RANGE 34.86LY (36.37LY)

On the left side of the galaxy map (and to the right of this paragraph), you will find a toolbar with a number of useful functions. These are essential for navigating the vast expanses of interstellar space.

The top tabs, from left to right, are:
1) System Information
2) Route Planning
3) Bookmarked Systems
4) Filters
5) Powerplay

For the beginner pilot, the most useful tabs are the second, third, and fourth.The second tab will help you to plot routes to other systems using your FSD to make a series of jumps. The third tab holds a collection of bookmarked systems, which is helpful in case you find a system you'd like to remembe. The third tab helps you to filter which stars appear on your galaxy map, which is useful if you are looking for a system with particular characteristics. The most common use of this utility is to find stars which can be scooped for fuel. This is discussed later in this chapter in the explanation of Fuel Scoops in the Outfitting section.

In order to plan a route, simply click on the star you wish to travel to and select the icon that looks like the corresponding tab on the toolbar. Note that you cannot currently plan a route greater than 1000 light years. In the toolbar, you may choose between three types of travel: economical, fastest, and FSD boost. The first will plot a route that uses the smallest possible amount of fuel by sacrificing the average distance per jump. The second option uses much more fuel, but takes advantage your ship's maximum FSD range. The final option allows you to make a boosted jump by injecting specific materials into your drive (we'll cover this at a later time). Once you select the route planning icon, the navigation computer will find the most efficient course for your vessel.

WHETHER YOU'RE JUST MAKING A short trip to purchase new parts for your ship, or circumnavigating the entire galaxy, these fundamentals will set you on the path to success. **But remember, no matter where you're going, DON'T FORGET TO BRING A FUEL SCOOP!**

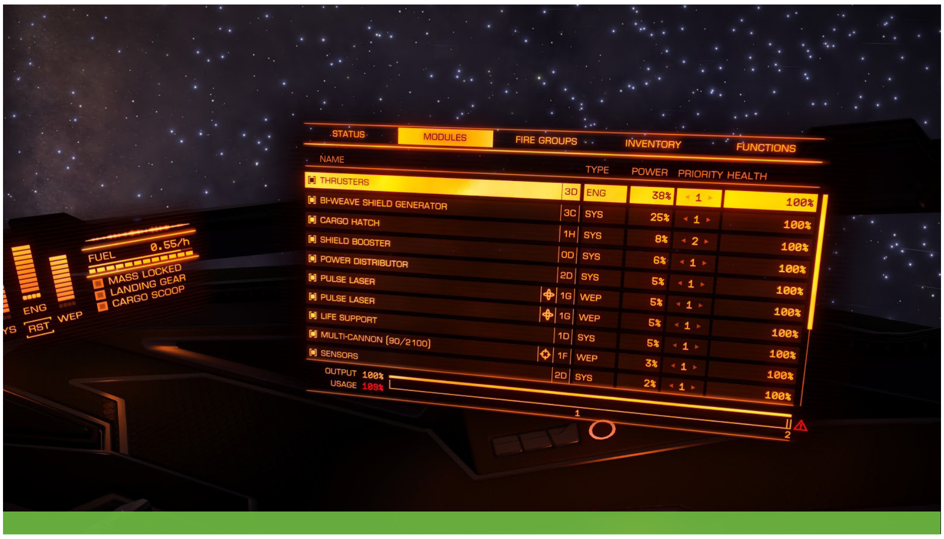
* * *

Outfitting

AT THIS POINT, YOU MAY be wondering why your sidewinder handles like a petrified tortoise and has the jump range of a fat woman with plantar fasciitis. The answer lies in the poor quality of its stock components, but don't worry. In the next few pages, you'll learn everything you need to know about outfitting. Even if you've already earned enough credits to purchase a new ship, this segment of the guide will provide you with valuable information about outfitting any vessel. **(An important note: systems that are controlled or exploited by Li Yong Rui sell all of their ships and modules at a 15% discount.)**

EXPERIMENTATION:

Outfitting can be difficult, since you won't always be able to tell if all of your ship's internal systems will function well together until you've taken it for a test flight. While that may not be a bad idea, it's also a time consuming way to experiment with different components. Luckily, there are two helpful databases that allow you to try out various builds, without having to leave the station. Both http://edshipyard.com and https://coriolis.edcd.io can be used to determine the compatability of your vessel's modules. These programs will also help you to determine how many credits you need to properly outfit your ship. Be careful when you're purchasing a shiny new spacecraft- proper outfitting usually costs about three times more credits than the base price of a given vessel, and you'll also need enough funds to cover a potential insurance rebuy! No matter what you fly, however, you can check which modules you have installed and access information about them from the right panel of your UI, as shown below.



NAME		TYPE	POWER	PRIORITY	HEALTH
THRUSTERS	3D	ENG	38%	1	100%
BI-WEAVE SHIELD GENERATOR	3C	SYS	25%	1	100%
CARGO HATCH	1H	SYS	8%	2	100%
SHIELD BOOSTER	0D	SYS	6%	1	100%
POWER DISTRIBUTOR	2D	SYS	5%	1	100%
PULSE LASER	1G	WEP	5%	1	100%
PULSE LASER	1G	WEP	5%	1	100%
LIFE SUPPORT	1D	SYS	5%	1	100%
MULTI-CANNON (90/2100)	1F	WEP	3%	1	100%
SENSORS	2D	SYS	2%	1	100%

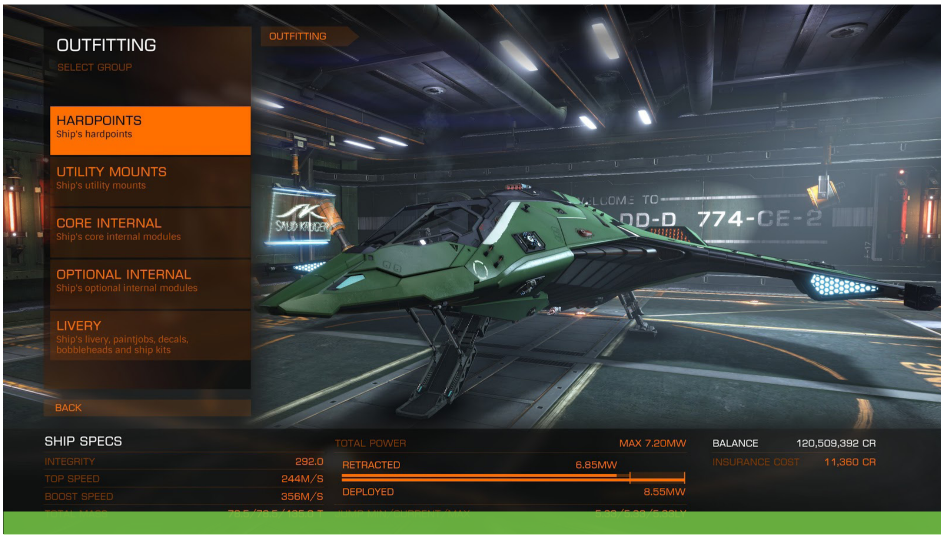
OUTPUT 100%
USAGE 109%

PURCHASE LOCATIONS:

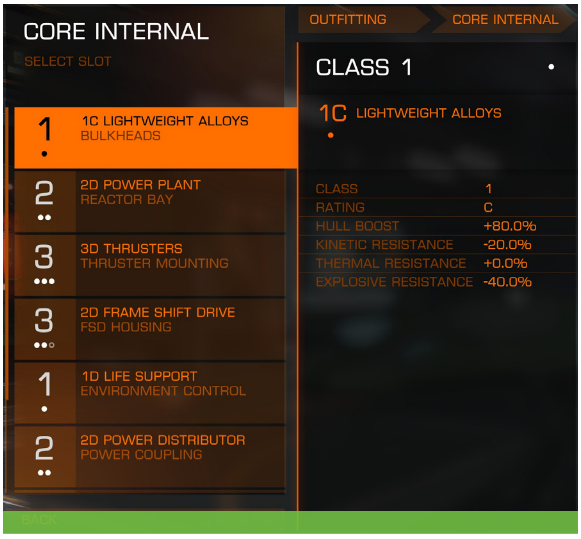
Now that you've experimented with a few possible module arrangements, it's time to purchase and install them on your ship. But wait! Where can you buy them? An orbital station? Outposts? Surface outposts? The answer is simple: It depends entirely on what you're looking for. And because the galactic economy is constantly changing, a system that sells a certain module one week may not have it the next. If that were the whole story, upgrading your hardware would be an incredible pain. Luckily, there is yet another tool that will greatly reduce the hassle of finding parts. https://eddb.io/ provides a continuously updated record of all the modules sold at just about every station inside the "bubble" of human inhabited space. To access this function, simply click on the "Stations" tab and fill out the form that appears. You can specify things like your current location, your minimum landing pad size, and much more. The program will retrieve a list of stations that sell your desired module(s), organized by their proximity to your location. EDDB can process a multitude of other inquiries, but we'll cover those later on.

MODULE TYPES:

Modules are categorized by both form and function. There are four primary types: Core Internal, Optional Internal, Hardpoints, and Utility Mounts. Modules come in various sizes, and are labeled with the numbers 1-8 from smallest to largest. Utilities that can be attached to the hull of your ship are labeled with a "0," since they are not large enough to be classified as internal components. Each part of your ship also has a class label ranging from A to I, in order of decreasing performance (the exceptions being some class I utility mounts and hardpoints). The mass of each component is determined both by its size and class. Class A modules have the same mass as class C and E modules, while class B modules have the most mass and class D modules are always the lightest. Below you will find a description of each category and an exhaustive list of subcomponents.


OUTFITTING
SELECT GROUP
OUTFITTING
HARDPOINTS
Ship's hardpoints
UTILITY MOUNTS
Ship's utility mounts
CORE INTERNAL
Ship's core internal modules
OPTIONAL INTERNAL
Ship's optional internal modules
LIVERY
Ship's livery, paintjobs, decals, bobbleheads and ship kits
BACK
SHIP SPECS
TOTAL POWER

INTEGRITY 292.0
TOP SPEED 244M/S
BOOST SPEED 356M/S
MAX 7.20MW
RETRACTED 6.85MW
DEPLOYED 8.55MW
BALANCE 120,509,392 CR
INSURANCE COST 11,360 CR


CORE INTERNAL
SELECT SLOT
OUTFITTING
CORE INTERNAL
1 1C LIGHTWEIGHT ALLOYS
BULKHEADS
2 2D POWER PLANT
REACTOR BAY
3 3D THRUSTERS
THRUSTER MOUNTING
3 2D FRAME SHIFT DRIVE
FSD HOUSING
1 1D LIFE SUPPORT
ENVIRONMENT CONTROL
2 2D POWER DISTRIBUTOR
POWER COUPLING
CLASS 1
1C LIGHTWEIGHT ALLOYS

CLASS 1
RATING C
HULL BOOST +80.0%
KINETIC RESISTANCE -20.0%
THERMAL RESISTANCE +0.0%
EXPLOSIVE RESISTANCE -40.0%

CORE INTERNAL COMPONENTS:

These modules are required for the basic operation of your vessel. They include the bulkheads, power plant, thrusters, frame shift drive, life support, power distributor, sensors, and the primary fuel tank.

BULKHEADS determine the basic hull strength of your ship. There are five types: lightweight alloy, reinforced alloy, military grade composite (MGC), mirrored surface composite (MSC), and reactive surface composite (RSC). For non-combat ships, you are encouraged to use lightweight alloy bulkheads, since they provide the greatest

FSD range at the cost of hull strength. For combat ships, MGC (best all-around hull strength), MSC (better against thermal weapons), or RSC (better against kinetic weapons) are recommended. Reinforced alloy should be avoided, as it does not facilitate the same jump ranges of lightweight alloy nor the hull strength of MGC.

POWER PLANTS keep all of your ship's systems running. Class A units have the best heat management, which means that they will help you avoid damage from fuel scooping close to a star or from firing thermal weapons for a long period of time. However, all other module attributes conform with the ones discussed at the beginning of this chapter.

THRUSTERS propel your ship through the vacuum of space and allow you to perform various maneuvers. Thruster efficiency increases with class, as does speed (within the same size group).

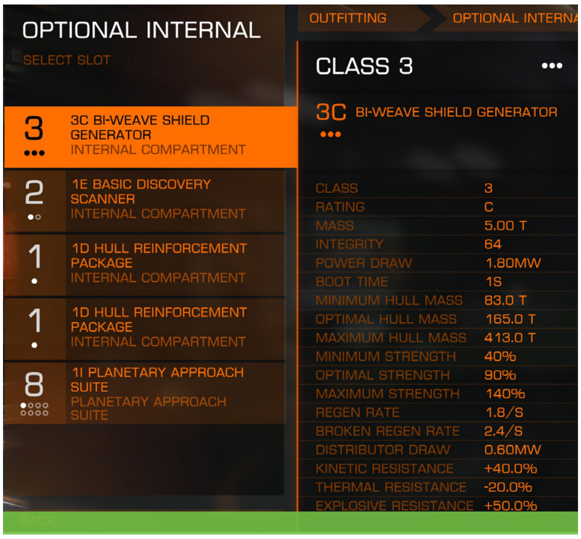
FRAME SHIFT DRIVES (FSDS) are used to travel at hyper-relativistic speeds. Each FSD is rated for a specific optimal mass. The difference between this value and your ship's total mass (including all internal modules) determines the maximum jump range that it can achieve.

LIFE SUPPORT determines the amount of emergency oxygen your ship is able to provide in the event of a canopy breach. Each ship can only be outfitted with one size of life support, though the EO2 capacity can be improved by equipping a higher class module.

POWER DISTRIBUTORS channel the electricity produced by your power plant to the numerous systems spread across your ship. Distributors are controlled by the "pips" on your heads up display (HUD) toward the front right side of your cockpit.

SENSORS detect objects within range of your vessel and provide data about their internal structure. The higher a sensor's class, the wider its range is. Once it has finished scanning another ship, your sensor suite will display a detailed list of its internal components in the left panel of the UI.

PRIMARY FUEL TANKS of various sizes are present on every available ship model. They house the hydrogen required to operate your ship's power plant and frame shift drive. Sometimes, the base range of your vessel will prove inconvenient. If you find this to be the case, you can equip additional fuel tanks in your optional internal compartments. We'll discuss this shortly.


OPTIONAL INTERNAL
SELECT SLOT
3
3C BI-WEAVE SHIELD GENERATOR
INTERNAL COMPARTMENT
2
1E BASIC DISCOVERY SCANNER
INTERNAL COMPARTMENT
1
1D HULL REINFORCEMENT PACKAGE
INTERNAL COMPARTMENT
1
1D HULL REINFORCEMENT PACKAGE
INTERNAL COMPARTMENT
8
1I PLANETARY APPROACH SUITE
PLANETARY APPROACH SUITE
BACK
OUTFITTING
OPTIONAL INTERNA
CLASS 3
3C BI-WEAVE SHIELD GENERATOR

CLASS	3
RATING	C
MASS	5.00 T
INTEGRITY	64
POWER DRAW	1.80MW
BOOT TIME	1S
MINIMUM HULL MASS	83.0 T
OPTIMAL HULL MASS	165.0 T
MAXIMUM HULL MASS	413.0 T
MINIMUM STRENGTH	40%
OPTIMAL STRENGTH	90%
MAXIMUM STRENGTH	140%
REGEN RATE	1.8/S
BROKEN REGEN RATE	2.4/S
DISTRIBUTOR DRAW	0.60MW
KINETIC RESISTANCE	+40.0%
THERMAL RESISTANCE	-20.0%
EXPLOSIVE RESISTANCE	+50.0%

OPTIONAL INTERNAL COMPONENTS:

Apart from its core systems, each ship also has room for a wide array of optional modules. As with all types of outfitting, the combination you choose should be tailored to the role you expect your ship to fulfill. Below is a list of the possible optional internal modules, and a brief description of each.

AUTO FIELD-MAINTENANCE UNITS are used to repair ship modules. They can be activated at any time and in any location; however, each AMFU has limited ammunition, which is used up during the repair process. In order to refill these reserves, you must either access the restock services at an orbital station, or use prospected materials to synthesize them. AMFUs have negligible mass, but their power requirements are significant.

CARGO RACKS provide vessels with an organized, secure internal system for transporting canisters of goods across the galaxy. The Pilot's Federation requires all marketable items to be stored in these compartments during transit.

LIMPET CONTROLLERS are specialized systems that program limpet drones to perform specific functions. There are four available variations of these devices: collector limpet controllers (CLC), prospector limpet controllers (PLC), fuel transfer limpet controllers (FLC), and hatch breaker limpet controllers (HLC). CLCs gather resources within range of their host ship and stow them in the cargo hold. PLCs provide detailed information about the composition of asteroids, which they latch onto after being launched. FLCs can be sent to deliver fuel to another nearby ship (Note: this fuel will be siphoned from your vessel's reserves upon activation). HLCs seek out and override a hostile ship's cargo hatch, causing it to eject a limited amount of stored canisters. Limpets can be purchased via the restock service in most orbital stations.

DOCKING COMPUTERS can be activated near orbital stations and surface outposts. They automate the docking process, allowing you to sit back, relax, and enjoy the view.

FRAME SHIFT DRIVE INTERDICTORS are used to pull ships out of supercruise. When activated within range of another pilot's vessel, they form a gravity tether. If the user is able to maintain a close lock on the target ship, the interdiction will succeed, and both pilots will drop from supercruise in the same location.

FUEL SCOOPS are used to gather hydrogen fuel from the corona of main sequence (O, B, A, F, G, K, and most type M) stars. Both the size and class of the fuel scoop determines the speed at which it is able to fill the ship's fuel tank. They have negligible mass, and low power requirements. **It is strongly recommended that you equip a fuel scoop on your vessel; if you attempt to complete a journey without one, regardless of the distance, you run the risk of becoming stranded in regions without main sequence stars.**

FUEL TANKS may be added as optional internal modules to increase the total distance your ship can travel before refueling. However, these tanks add mass to your vessel when filled, and therefore slightly decrease its maximum (single) jump range.

HULL REINFORCEMENT PACKAGES (HRP) increase the strength of your vessel's hull. The maximum size available is 5. Class G HRPs are lighter, and provide better protection than the less expensive class H HRPs. However, both types add substantial mass to your ship, and do not increase the resilience of your internal modules.

MODULE REINFORCEMENT PACKAGES (MRP) improve the integrity of a ship's subcomponents, rather than its outer hull. They are relatively inexpensive, and come in sizes 1-5. Class D MRPs absorb a large portion of module damage, but have a low total resistance capacity (and can thus be depleted over a short period of time). Class E MRPs absorb a smaller percentage of incoming module damage, but have a higher total resistance capacity.

PLANETARY VEHICLE HANGARS (PVH) provide storage for surface reconnaissance vehicles (SRV). They come in sizes 2, 4, and 6, and are able to store 1, 2, and 4 SRVs, respectively. Only two classes of PVHs are available: class H hangars require only a small amount of power to operate, but have relatively high mass. Conversely, class G hangars require significant amounts of power, but have low mass.

REFINERIES are used to process mined materials. Every refinery has a different number of bins based on its size and class, which can each store one type of mineral at a time. The bins must be filled with enough of their respective element in order for them to produce a corresponding canister.

SCANNERS come in two variations, both of which are necessary for effective exploration. Discovery scanners detect and retrieve generic information about a system's stellar objects, while Detailed surface scanners provide data about individual bodies of mass. Detailed surface scanners activate automatically when they are within range of a selected object that is directly in front of your ship (Note: scanning range correlates directly with the target's mass); however, discovery scanners must be added to a fire group in the right hand panel of your UI. Discovery scanners have three additional variations: basic, intermediate, and advanced. Basic discovery scanners have a maximum range of 500 light seconds, intermediate discovery scanners have a range of 1,000 light seconds, and advanced discovery scanners have no range limitations whatsoever within a given system.

SHIELD CELL BANKS (SCB) recharge your ship's shields when activated. SCBs do not initialize instantaneously, and the amount of power imparted to the shields, as well as the duration of the transfer, are determined by the module's size and class. SCBs require a great deal of power to function, and generally have a high mass.

SHIELD GENERATORS act as an energy barrier, and protect your ship from collisions and weapons fire. The strength of a shield is determined primarily by its size and class, and is measured in Megajoules (MJ). However, due to differences in hull mass and surface area, each ship model has a different base shield strength value, which significantly impacts the maximum strength of whichever shield generator you decide to install. There are three types of shield generators: standard, bi-weave, and prismatic. Standard shield generators have moderate recharge rates and decent energy output. Bi-weave shield generators sacrifice some base strength for a faster recharge rate. Both standard and bi-weave generators are available to all pilots, regardless of rank or affiliation. Prismatic shield generators have a slower recharge rate, and have 100% more mass than standard shield generators of the same size. However, their maximum strength is much higher. Prismatics can only be purchased by pilots pledged to Aisling Duval who have, at a minimum, remained loyal to her for at least four weeks and earned rank 3 status by collecting 750 merits. Later on, we will discuss Power Play features in greater depth.

PASSENGER CABINS allow you to transport civilians, scientists, and government officials to their desired destinations. They come in four varieties: economy class, business class, first class, and luxury. Economy class cabins are available in sizes 2-6, while business class cabins can only be found in sizes 3-6. First class cabins are available in sizes 4-6. Luxury cabins can only be purchased in size 5 or size 6. Higher class cabins usually attract wealthier customers, but their lavish interiors mean that they cannot accommodate the same number of passengers that lower class cabins can.

FIGHTER HANGARS can be stocked with small, non-FSD capable ships. They come in sizes 5, 6, and 7. Size 5 hangars can hold two chalks of eight fighters, size 6 hangars can hold three, and size 7 hangars are able to house four. Three different models of fighter spacecraft are currently being marketed: The F63 Condor, the GU97 Imperial Fighter, and the independently developed Taipan. Each model is available in a number of different "pre-packaged" loadouts.

UTILITY MOUNTS:

Every ship is equipped with at least one mounting point for external systems. There are a variety of utilities that can be installed on these mounts, and each of them performs a unique and useful function that can greatly improve your ship's performance. Below, you'll find a list of all available utilities and a description of their purpose.

CHAFF LAUNCHERS dispense heated flakes of metal to confuse enemy targeting computers and prevent other pilots from locking onto your ship with scanners or gimballed/turreted weapons for a short period of time.

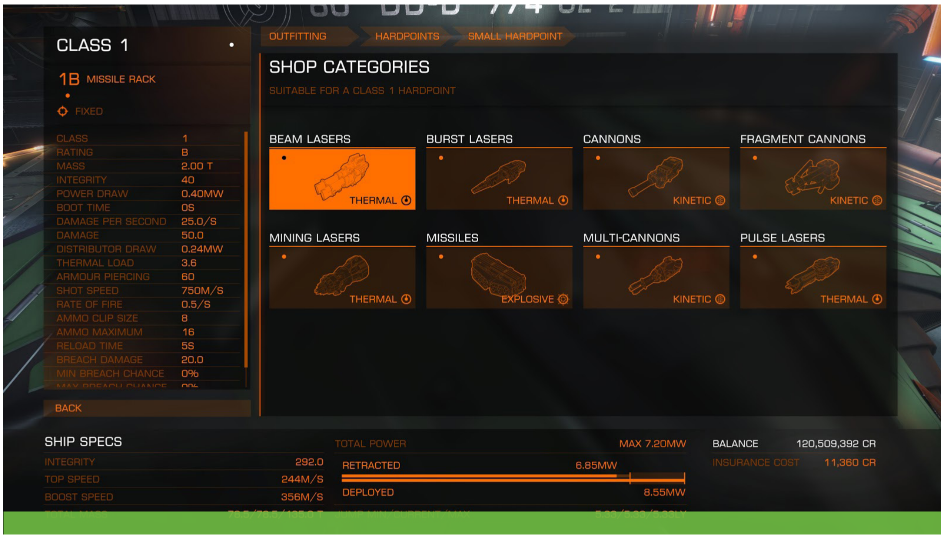
ELECTRONIC COUNTERMEASURES send out a jamming signal that prevents guided missiles and torpedoes from maintaining a lock on your ship. They employ an active defense protocol, and broadcast the signal constantly while powered on.

HEAT SINK LAUNCHERS (HSL) siphon heat from a vessel's systems and store it in a coil cartridge, which is then ejected. Each HSL comes standard with three cartridges, and must be reloaded at an orbital station or a surface outpost once they are spent.

POINT DEFENSE TURRETS (PDT) employ a passive defense protocol, and engage mines, missiles, and torpedoes that come within range of your vessel. Unlike Electronic Countermeasures, which cannot deter dumbfire missiles, the effectiveness of PDTs is limited only by their field of view and finite ammunition reserves.

SCANNERS attached to the external utility mounts of your ship fulfill different functions than the scanners available for internal installation. Utility scanners come in three varieties: manifest scanners (MS), frame shift wake scanners (FWS), and kill warrant scanners (KWS). MS are used to determine the contents of another vessel's cargo racks. FWS provide data about the trajectory and destination of ships based on their frame shift wake signatures. They may be used to track down a potential target. KWS communicate with the Pilot's Federation Database and cross reference system records to determine whether a targeted pilot has a standing bounty in any other location. The class of each scanner determines its maximum range. However, higher class scanners also require much more power to operate.

SHIELD BOOSTERS resonate synchronously with the energy grid of your vessel's shield generator, amplifying its integrity and providing a percentage increase to its effective power output. Higher class shield boosters provide a substantial amount of amplification, but require more power than lower class mounts.



CLASS 1

1B MISSILE RACK

FIXED

CLASS	1
RATING	B
MASS	2.00 T
INTEGRITY	40
POWER DRAW	0.40MW
BOOT TIME	0S
DAMAGE PER SECOND	25.0/S
DAMAGE	50.0
DISTRIBUTOR DRAW	0.24MW
THERMAL LOAD	3.6
ARMOUR PIERCING	60
SHOT SPEED	750M/S
RATE OF FIRE	0.5/S
AMMO CLIP SIZE	8
AMMO MAXIMUM	16
RELOAD TIME	5S
BREACH DAMAGE	20.0
MIN BREACH CHANCE	0%

SHIP SPECS

INTEGRITY	292.0
TOP SPEED	244M/S
BOOST SPEED	356M/S

TOTAL POWER MAX 7.20MW

RETRACTED 6.85MW

DEPLOYED 8.55MW

BALANCE 120,509,392 CR

INSURANCE COST 11,360 CR

HARDPOINTS:

Every spacecraft comes standard with housing for at least one weapon. Most larger ships can equip a multitude of various armaments. There are four sizes of systems: small, medium, large, and huge. They are usually abbreviated with the numbers 1-4, in the same fashion as other ship modules. Not all weapon types are available in every size, however.

In addition to their size and type, each system also has a class rating. These do not correspond to performance in the same way that other modules do, but rather give a general idea of how effective a given configuration is relative to weapons of a different size or type.

Most hardpoints have three different mounting options: fixed, gimballed, and turreted. Fixed weapons are locked into a single position, and must be aimed by directing the nose of your ship toward the intended target. They do more damage, but require more power than gimballed or turreted weapons of the same type and size. Gimballed weapons also possess a forward field of fire, but have onboard tracking capabilities for locking onto targets. Gimballed mounting allows you to engage targets that are not directly centered in your field of view. They have a balanced damage/power ratio. Turreted weapons can operate autonomously, and are able to rotate 360 degrees and elevate 90 degrees, giving them the ability to engage targets that cannot be seen from your ship's cockpit.

Weapons are also classified by the type of damage they deal. There are three different categories of damage: thermal, kinetic, and explosive. Thermal weapons do more damage to a ship's shields than to its hull. Kinetic weapons are not as effective against shields, but are able to penetrate a ship's hull and deal damage to its internal modules. Explosive munitions are exceptionally effective at damaging the hull of another vessel, but are generally ineffective against shields and internal modules. There are also some weapons that deal both thermal and kinetic damage. The list below uses these damage categories to organize every available weapon and describe their individual attributes and options.

THERMAL WEAPONS include three types of lasers, which are available in sizes 1-4. Sizes 1-3 can be purchased in fixed, gimballed, or turreted configurations. Size 4 lasers can only be mounted in fixed or gimballed configurations.

Beam Lasers emit a continuous beam of focused energy. They are more effective against shield than other lasers, but less effective against hulls and modules.

Burst Lasers emit sequenced bursts of three charged energy pulses. They have balanced effectiveness against shields, hulls, and modules compared to the other available types of lasers.

Pulse Lasers emit single, charged energy pulses in rapid succession. They are more effective against hulls and modules than other lasers, but less effective against shields.

KINETIC WEAPONS include cannons, multi-cannons, and fragment cannons. Unlike lasers, which travel at the speed of light, kinetic weapons rely on projectiles. For this reason, they do not reach their destination immediately after being fired, and must be aimed in front of the target's path to intercept them successfully. Cannons and multi-cannons are available in sizes 1-4, while fragment cannons are only available in sizes 1-3. Cannons can be purchased in fixed, gimballed, or turreted configurations for sizes 1-3, but can only be mounted in fixed or gimballed configurations for size 4. Multi-cannons can be purchased in fixed, gimballed, or turreted configurations for sizes 1 and 2, but can only be mounted in fixed or gimballed configurations for sizes 3 and 4. Fragment cannons can be purchased in all configurations for sizes 1-3.

Cannons propel large caliber munitions at relatively high velocities through a single barrel. They deal substantial amounts of damage per round, but have a low rate of fire.

Multi-cannons propel small caliber munitions at relatively high velocities through a rotating, cylindrical arrangement of multiple barrels. They deal only a small amount of damage per round, but have a high rate of fire.

Fragment Cannons propel canisters of shrapnel at relatively high velocities. They deal substantial damage at close range, but quickly become ineffective at greater distances due to the spread of their munitions.

EXPLOSIVE WEAPONS include missiles, torpedoes, and mines. These are only available in sizes 1 and 2, and cannot be mounted in the same manner as other weapons.

Missile Racks house and launch rocket propelled warheads that travel slowly and deal extremely large amounts of damage to ship hulls. They are available in two varieties: dumbfire and seeker. Dumbfire missiles travel at higher velocities, but cannot track enemy ships. Instead, they fire in a straight line. Conversely, seeker missiles travel at slightly lower velocities and are able to track and intercept moving targets. Because of the additional hardware required to accomplish this task, seeker racks cannot house as many warheads as dumbfire racks.

Torpedo Pylons can only carry 1-2 large warheads. However, torpedoes are devastating when used effectively. All torpedoes have advanced onboard targeting systems that allow them to track and intercept moving vessels. However, their velocity is much lower than dumbfire or seeker missiles.

Mine Launchers deploy ordinance with proximity fuses, which deal damage to other ships that venture too close.

AS YOU EXPERIMENT WITH VARIOUS modules, utilities, and weapons, you'll start to learn which configurations are the best fit for your style. Often, it takes a good deal of trial and error before you become comfortable with a given ship loadout. Don't give up!

* * *

Chapter 2

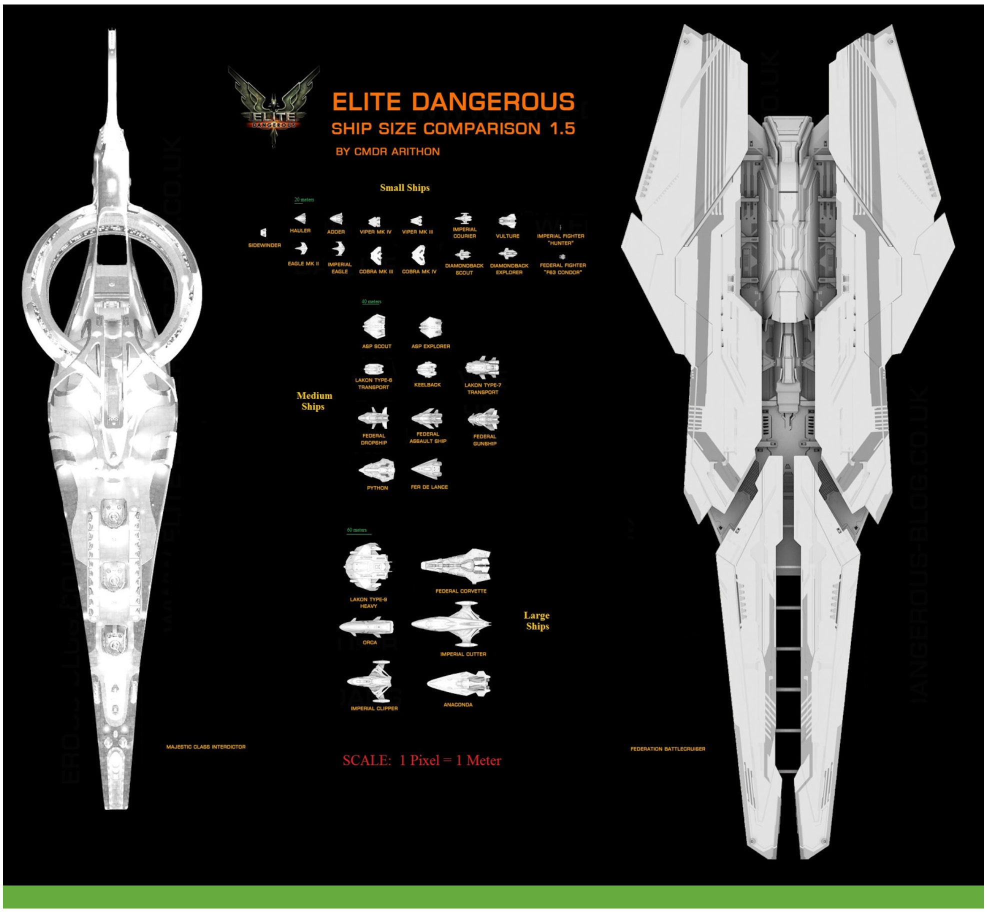
Ships

What's in this chapter?

1. *Categorization of all available ships by size.*
2. *Purchase and sale of ships, and the best locations to do so.*
3. *A listing of prices for all available ships, and a discussion regarding ship insurance and the rebuy cost involved when a ship is destroyed.*
4. *Recommended best uses for each ship, and an explanation of which ships are ideal for various professions and purposes.*
5. *The history behind each ship and a link to any video advertisments that have been produced for those ships.*
6. *Links to additional information about each ship.*

> ” *The contemplation of celestial things will make a man both speak and think more sublimely and magnificently when he descends to human affairs.*
>
> *Marcus Tullius Cicero, c. 30 BC*

Ships


ELITE DANGEROUS
ELITE DANGEROUS
SHIP SIZE COMPARISON 1.5
BY CMDR ARITHON
Small Ships
20 meters
SIDEWINDER
HAULER
ADDER
VIPER MK IV
VIPER MK III
IMPERIAL COURIER
VULTURE
IMPERIAL FIGHTER "HUNTER"
EAGLE MK II
IMPERIAL EAGLE
COBRA MK III
COBRA MK IV
DIAMONDBACK SCOUT
DIAMONDBACK EXPLORER
FEDERAL FIGHTER "F63 CONDOR"
40 meters
Medium Ships
ASP SCOUT
ASP EXPLORER
LAKON TYPE-6 TRANSPORT
KEELBACK
LAKON TYPE-7 TRANSPORT
FEDERAL DROPSHIP
FEDERAL ASSAULT SHIP
FEDERAL GUNSHIP
PYTHON
FER DE LANCE
60 meters
Large Ships
LAKON TYPE-9 HEAVY
FEDERAL CORVETTE
ORCA
IMPERIAL CUTTER
IMPERIAL CLIPPER
ANACONDA
MAJESTIC CLASS INTERDICTOR
FEDERATION BATTLECRUISER
SCALE: 1 Pixel = 1 Meter

FINALLY, YOU'VE EARNED ENOUGH CREDITS to buy a new ship. Sure, the Sidewinder was... fun. But it's time to move on to bigger and better things.

You've now arrived at the crossroads of a difficult decision: which ship should you purchase? Unfortunately, there isn't an easy answer to this question. However, in the next section of this training manual, you'll find a detailed list of available models, as well as information about each one of them to set you on the right path.

For your convenience, they have been organized into three separate categories based on their landing pad requirements. The ships with green names in the lists below are the most highly endorsed models in their size group due to their outstanding performance in one or more functional area (i.e., multipurpose,

Important Notes:

Never pilot a vessel without enough credits to cover at least one insurance claim. If you can't afford a rebuy and your ship is destroyed, you lose it. Insurance claims cost 5% of total ship cost.

Systems that are controlled or exploited by Li Yong Rui sell all of their ships and modules at a 15% discount.

combat, freight, passenger, or exploration). Additionally, you will find one or more recommended use for each vessel based on six specific functions: Combat (Player vs Player or PvP), Bounty Hunting (Player vs Environment or PvE), Trade, Smuggling, Mining, Tourism, and Exploration. These are provided in descending order of capability. You can also obtain more information by clicking on any of the ships’ names.

Toward the beginning of your career, finances are likely to preclude you from purchasing the great majority of the ships that we discuss. Don’t be discouraged, however; your earning potential will accelerate tremendously as you move from the very small ships to those with more and more cargo capacity and/or combat capability, and there are several ways to earn credits quickly, which we shall discuss later. The end result is that the early game tends to feel slow, but earning your way toward the larger ships can be done more quickly than you might at first believe.

* * *

Small Ships:

WHEN YOU REALLY STOP TO think about it, even the tiniest FSD capable ships aren't actually all that small. Even a Sidewinder has a displacement of roughly 1,500 cubic meters! Currently, there are a vast array of small ships on the market, most of which are very affordable even to newer pilots. **The ships with green names are the ones which are the most highly recommended by the authors for their listed uses.**

ADDER (Multipurpose- 87,808 CR): This ship was tailored as a general utility vessel. The original model was first built in 2914 by Outworld Workshops and the type is now manufactured by Zorgon Peterson. Although lightly armed, it has more cargo capacity than a Sidewinder, and this ship can often be seen doing shuttle runs as well as light trading. The latest commercial can be viewed here. *(Recommended use: Exploration)*

COBRA MKIII (Multipurpose- 379,718 CR): The Cobra MkIII is a classic all purpose ship found throughout human space. The model was first built in Lave Cowell & MgRath shipyard in Lave in 3100. Despite its age, it remains a popular ship for lone pilots who value its balance of carrying capacity and ability in combat. The latest commercial can be viewed here. *(Recommended use: Smuggling, Bounty Hunting, Mining, Trade)*

COBRA MKIV (Multipurpose- 764,720 CR): The Cobra MkIV is Faulcon deLacy's development of the famous Cobra MkIII. It's heavier and slower than the MkIII, with the capacity for somewhat better upgrades at the cost of maneuverability. It is frankly a pointless purchase in nearly every way, though it has the largest cargo capacity of the small ships. *(Recommended use: Trade, Sell it and go back to the Cobra MKIII)*

DIAMONDBACK EXPLORER (Exploration- 1,894,760 CR): The Diamondback Explorer was Lakon Spaceways' response to criticism of the original Diamondback ship class. By extending the ship's frame, it allowed greater cargo capacity and so greater mission variety and endurance. It also brought the ship more into line as a smaller brother to the successful Asp line, although at a much more modest price range. The Explorer model can fulfill the same roles as its companion ship type, but is also able to operate as a fast transport and resupply vessel useful for supporting deep space operations in a hostile environment. The latest commercial can be viewed here. *(Recommended use: Exploration, Bounty Hunting)*

DIAMONDBACK SCOUT (Combat- 564,320 CR): The Diamondback Scout is Lakon Spaceways' specialist combat explorer vessel. Unlike its bigger brother, the Asp, the Diamondback isn't suited as an all rounder vessel. It is popular with elite recon and pathfinder units with navies throughout human space. Its relatively low cost also makes it a popular choice with independent pilots who appreciate its combat and exploration potential. *(Recommended use: Bounty Hunting, Combat)*

DOLPHIN (Passenger Liner- 1,337,323 CR): The Dolphin is the latest addition to Saud Kruger's line of luxury passenger ships. It’s a small vessel with a very low starter price aimed at commanders wishing to embark upon a role of a tourist pilot. As with the rest of the passenger liners, the Dolphin can fit all the necessary passenger suites ensuring maximum comfort for all on board. (Recommended use: Exploration, Tourism)

EAGLE MKII (Combat- 44,800 CR): The Eagle is a proven combat fighter with a distinguished history. It is one of the smallest fighters available with jump capability. It has the distinction of being the only ship that has been so successful, versions have been built for both the Federation and Imperial navies. This role has been superseded by the respective navies’ short range fighter programs, but the Eagle still sees extensive service across human space. Core Dynamics are no longer building these ships, but do still provide parts and servicing due to their popularity. The latest commercial can be viewed here. *(Recommended use: Bounty Hunting)*

STARPORT
A SAFER WAY TO TRADE
ZORGON PETERSON

HAULER (Freighter- 52,720 CR): The Hauler is Zorgon Peterson’s low level entry in the freighter market, and has been a big success. A large cargo capacity (for its size), cheap purchase price, and low running costs have made these the most popular small cargo ships in human space. The latest commercial can be viewed here. *(Recommended use: Exploration, Trade)*

IMPERIAL COURIER (Combat- 2,542,931 CR): This ship requires an Imperial Navy rank of "Master." The Imperial Courier epitomises elegance of form while packing a good punch. Officially the class is used to provide transport for officials that don't warrant the use of a Clipper, Cutter, or Interdictor. However its flexibility means that it fills many roles within the Imperial Navy and for prominent citizens. The latest commercial can be viewed here. *(Recommended use: Bounty Hunting, Combat, Smuggling)*

IMPERIAL EAGLE (Combat- 110,830 CR): The Imperial Eagle has seen service in the Imperial Navy and allied fleets for many years. The original Eagle is a multi-role fighter, whereas the Imperial version is geared more towards the interceptor role. It carries more powerful weaponry and is capable of higher speeds than the original, although at the expense of some of the original ship's famed maneuverability. The latest commercial can be viewed here. *(Recommended use: Bounty Hunting, Combat)*

SIDEWINDER MKI (Multipurpose- 32,000 CR): Most pilots start their careers in the Sidewinder. It is a classic ship design that has been in use (in various configurations) since 2982. Its original design was a light support ship, and it lacked jump capability. Modern compact drives have enabled jump-capable versions to be created, making this a useful all rounder. Some navies still use these ships as fighters and patrol craft. The latest commercial can be viewed here. *(Recommended use: Earning just enough credits to purchase a new ship)*

STARPORT
A SAFER WAY TO TRADE

VIPER MKIII (Combat- 142,931 CR): The Viper MkIII is the most recent development of the most successful fighter class ever built. The original Viper Defence Craft was designed by Faulcon Manspace in 2762 in the Reorte shipyards. The basic model was beefed up and released as the Viper II by Faulcon deLacy. The new Viper III is a revitalised model with a new, more armored look. It is a top class fighter found in many well-equipped police and naval forces. The latest commercial can be viewed here. *(Recommended use: Bounty Hunting)*

VIPER MKIV (Combat- 437,930 CR): Faulcon deLacy's Viper MkIV takes the MkIII model and beefs it up to a heavy fighter role. While it lacks the speed of the older ship, it enjoys much better protection from its shields and armor. With the capacity for a more capable powerplant and frame shift drive, the MkIV is also better suited for long-range patrols and rapid deployment. The powerplant upgrade potential supports greater customization for weapons and modules, making this a versatile fighter that would be an excellent addition to any navy or private-security concern. *(Recommended use: Bounty Hunting, Combat)*

VULTURE (Combat- 4,925,615 CR): The Vulture space superiority fighter sacrifices hardpoint flexibility for manoeuvrability. Advanced manufacturing techniques have allowed the Vulture to integrate large hardpoints into its relatively small frame, offsetting the ship's limited weapon count; but its nimble flight characteristics make it equally devastating against smaller targets. A limited cargo and passenger capability has not stopped it from becoming a preferred personal transport for those who like to project a certain attitude in their dealings. The latest commercial can be viewed here. *(Recommended use: Bounty Hunting, Combat)*

F63 CONDOR (Combat- 15,270 CR): Core Dynamics has developed these non-FSD capable fighter spacecraft for use with a large parent vessel. They can be stored in hangars of various sizes, and deployed to great effect in sorties. The Condor is exceptionally fast.

GU97 IMPERIAL FIGHTER (Combat- 15,270): Gutamaya has developed these non-FSD capable fighter spacecraft for use with a large parent vessel. They can be stored in hangars of various sizes, and deployed to great effect in sorties. The Imperial Fighter is exceptionally maneuverable.

TAIPAN (Combat- 15,270): Lakon Spaceways Core has developed these non-FSD capable fighter spacecraft for use with a large parent vessel. They can be stored in hangars of various sizes, and deployed to great effect in sorties. The Taipan is sturdier than its Federation and Imperial counterparts.

* * *

Medium Ships

BALANCE IS AN ELUSIVE FEATURE when it comes to spacecraft design. However, a number of manufacturers have successfully bridged the gap between the smaller, less expensive range of ships available to the average customer and the largest models, which are often too cumbersome or expensive even for the social elite. Regardless of price, many medium vessels remain relevant even for pilots who are able to afford their own planet. **The ships with green names are those medium sized vessels which are the most highly recommended by the authors.**

ASP EXPLORER (Exploration- 6,661,153 CR): The Asp Explorer is the civilian version of the military model Asp MkII (which first saw service in 2878). Lakon Spaceways now owns the licence to construct these ships and has marketed them heavily at customers looking for their first multi-crewed ships. The ship class has earned a solid reputation for long range missions and those requiring some discretion. The latest commercial can be viewed here. *(Recommended use: Exploration, Smuggling, Mining, Trade)*

ASP SCOUT (Exploration- 3,961,150 CR): Lakon Spaceways unveiled the Asp Scout in late 3301 as a cheaper alternative to the well-regarded Asp Explorer, and in terms of market it sits between the Diamondback range and the Asp Explorer. It utilizes much of the same airframe as the Explorer, but the reduced hardpoint capacity (compared to its parent model) means it packs less of a punch. Test pilots reported that the mass reduction resulted in a vessel that handles better than the Asp Explorer while maintaining its impressive jump capability. *(Recommended use: Exploration, Bounty Hunting)*

FEDERAL ASSAULT SHIP (Combat- 19,814,210 CR): This ship requires a Federal Navy rank of "Chief Petty Officer." Many of Core Dynamics' customers desired more specific roles for their dropships, and the Assault Ship is a response to some of those demands. The Assault Ship is designed for a more combat intensive role than the original ship. It has improved manoeuvrability and weapon carrying capacity and placement. These additions come with a tradeoff: the FAS has smaller internals, making it less versatile, but better in its specialised role. *(Recommended use: Combat, Bounty Hunting)*

FEDERAL DROPSHIP (Multipurpose- 14,314,210 CR): This ship requires a Federal Navy rank of "Midshipman." The Federal Dropship is the Federation Navy's workhorse ship for tactical and special forces deployments. This is a well armoured and well armed ship capable of carrying large loads. Its versatile nature means that it is well suited to tackling even the most hostile environment. *(Recommended use: Bounty Hunting, Combat)*

FEDERAL GUNSHIP (Combat- 35,658,297 CR): This ship requires a Federal Navy rank of "Ensign." The Federal Gunship came from the desire for a supporting role in operations utilising the standard Dropship frame. It's primary role is fire support. The Dropship is tougher, and also supports higher rated modules, making it more versatile. *(Recommended use: Combat, Bounty Hunting)*

WARNING
LOW GRAVITY

FER-DE-LANCE (Combat- 51,567,040 CR): The Fer-de-Lance is another classic design that has now been in production for two centuries. The ship became famous for its popularity with top business executives and wealthy bounty hunters, being a fast, well armed vessel, with luxurious accommodation and high quality components fitted as standard. Early models were built by Zorgon Peterson, but more recently, limited numbers have been upgraded by Saud Kruger in a rare collaboration, resulting in even more lavish creations, without spoiling the original design and specification requirements. The latest commercial can be viewed here. *(Recommended use: Combat, Bounty Hunting)*

KEELBACK (Freighter- 3,126,150 CR): This is Lakon Spaceways new combat-trader class vessel, designed for hostile-environment deliveries and light support duties. It's based on the Type 6 frame but with extra weapon hardpoints. It has a reduced cargo capacity to support a higher class of powerplant, and can even accommodate a fighter bay. Its durability is improved by better defence capabilities for armor and shields. Its similar silhouette to the Type 6 makes it a suitable vessel for commerce, raiding, or convoy support. *(Recommended use: Smuggling, Trade, Mining)*

PYTHON (Multipurpose- 56,978,180 CR): Another classic design that has survived the centuries. The first vessel was constructed in 2700 by Whatt and Pritney Ship Constructions. With the demise of the company, and after various mergers and takeovers, the ship design is now owned by Faulcon deLacy. The ship remains the slow and sturdy craft it was originally famous for, and some smaller navies still use this class as a patrol cruiser (although tiny compared to the Imperial Interdictors and Federal Bat-

SAUD KRUGER
AN CITY

tlecruisers). The latest commercial can be viewed here. *(Recommended use: Combat, Smuggling, Trade, Bounty Hunting, Mining)*

TYPE-6 TRANSPORTER (Freighter-1,045,945 CR): Lakon Spaceways are famous for building dependable, jump-capable transport vessels. The Type 6 is their smallest commercially available model. It has limited combat capability, but is capable of transporting decent size loads for its size class. The latest commercial can be viewed here. *(Recommended use: Trade, Smuggling, Mining, Exploration)*

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Large Ships

A FEW OF THE MORE prestigious spacecraft manufacturers produce a limited number of civilian behemoths, available only to those with a substantial credit balance. These ships are designed to support relatively large crews, and can usually fend for themselves in combat situations. As opposed to previous sections, there are no green named large ships, as all are very well suited for their recommended uses.

ANACONDA (Multipurpose- 146,969,451 CR): The Anaconda is the pride of Faulcon deLacy's shipyards. The design was first manufactured in 2856 by RimLiner Galactic. After numerous mergers, the template was eventually purchased by Faulcon deLacy, who have made only minor changes to the classic design. The Anaconda is a versatile craft that can transport large cargos and pack a decent punch. Some smaller navies use the Anaconda in the light cruiser and frigate roles. The Anaconda can also be upgraded with a docking bay, allowing small fighters up to Sidewinder size to be carried and launched. The latest commercial can be viewed here. *(Recommended use: Exploration, Trade, Mining, Smuggling, Bounty Hunting, Combat)*

BELUGA LINER (Passenger Liner- 84,532,780 CR): Comparable to an Imperial Cutter in mass and even bulkier in volume, the Beluga is designed to carry passengers to their destination in comfort; only it and its smaller cousin, the Orca, can be equipped with Luxury Suite Cabin modules, allowing it to transport VIPs. Slow and cumbersome, the Beluga is difficult to maneuver inside a dock, but features a Class 7 Frame Shift Drive and a massive fuel tank that gives it an impressive travel range for long-distance cruises. This ship can be bought in 9 Ceti on "Fanning Vision" and in the Founders World. *(Recommended use: Tourism, Exploration, Mining)*

FEDERAL CORVETTE (Combat- 187,969,450 CR): This ship requires a Federal Navy rank of "Rear Admiral." The Federal Corvette is the smallest warship deployed by the Federation Navy. It is a quick, hard hitting vessel capable of transporting cargo and personnel. Its versatility makes it the most common vessel in the Federation Navy. It can be found everywhere: on long range patrols, peacekeeping missions, pirate suppression operations- in fact, anywhere the navy wishes to maintain a solid presence without deploying one of the Farragut class Battlecruisers. It is possible, but extremely rare, for a private citizen to own one of these vessels. This ship can carry and deploy two small fighter class ships. The latest commercial can be viewed here. *(Recommended use: Combat, Bounty Hunting)*

IMPERIAL CLIPPER (Multipurpose- 22,295,860 CR): This ship requires an Imperial Navy rank of "Baron." The Imperial Clipper is the quintessential Imperial ship. Because of its balance of Speed, Luxury and strength, it is used for transporting valuable items and important personnel across the Empire. *(Recommended use: Trade, Smuggling, Mining)*

IMPERIAL CUTTER (Multipurpose- 208,969,451 CR): This ship requires an Imperial Navy rank of "Duke." The Imperial Cutter fulfills a similar role as the Corvette for the Imperial Navy. The design philosophy reflects Imperial sensibilities, as it is faster and more elegant than the Corvette, but doesn't quite match it in firepower. As with other Imperial warships, the cutter is also used for projecting soft power via diplomatic missions and support for friendly factions. It is possible, although rare, for a well connected client or patron to own one of these ships. Like the Corvette, it can deploy two small fighter class ships. *(Recommended use: Trade, Smuggling, Mining, Combat)*

ORCA (Passenger Liner- 48,539,887 CR): Saud Kruger are famed for their range of luxury passenger vessels. This is their top-of-the-line vessel (although they do offer custom built vessels that are bigger), and is capable of carrying passengers in extreme comfort and elegance. For its size and class, it's also quite capable of defending itself. *(Recommended use: Tourism, Mining, Exploration)*

TYPE-7 TRANSPORTER (Freighter- 17,472,252 CR): The Type 7 Transporter is Lakon Spaceways' medium size transport vessel. This is a new model, released in 3290. It's slow, but moves a lot of tonnage for its size. *(Recommended use: Trade, Mining, Smuggling)*

TYPE-9 HEAVY (Freighter- 76,555,842 CR): The Type-9 Heavy is Lakon Spaceways' large freighter class. This ship is built to transport large cargos, a job it does very well; but it doesn't handle well in a fight. *(Recommended use: Trade, Mining)*

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Chapter 3

Combat

What's in this chapter?

1. *Introduction to ship vs ship combat and its role in the E:D universe.*
2. *Discussion of bounty hunting as the most efficient way to earn money via combat, including tips on effective ships and load-outs, good locations for bounty hunting and advice on where to find high concentrations of wanted criminals, and tactics to promote efficient bounty collection and survival.*
3. *Explanation of the role of conflict zones (CZ), how to pledge to a warring faction and engage in the conflict, and the different combat bond values of the various ships which might be found in a CZ.*
4. *An introduction to player vs player (PvP), tips on ships, load-outs, tactics, and effective maneuvers. Be aware, PvP action is highly risky and likely to result in death for inexperienced pilots.*

> *The Universe, so far as we can observe it, is a wonderful and immense engine; its extent, its order, its beauty, its cruelty, makes it alike impressive.*
>
> *George Santayana, The Life of Reason, 1916*

Combat

THE RISKIEST JOBS USUALLY HAVE the highest payouts. If you've got an itchy trigger finger and a love for adrenaline, there are plenty of combat related contracts out there that can satisfy your thirst for a good fight. The following portion of this training manual contains a wealth of pertinent information to help prepare you for any engagement. With practice, you'll be well on your way to becoming an outer space ace.

Combat can be divided into two major categories: player vs environment (PvE) and player vs player (PvP). PvE combat is the easier of the two for new players to find success, and can be undertaken with relatively small ships with relatively inexpensive outfitting. PvE generally describes all combat against non-player-controlled (NPC) pilots, which are identified on the player's radar as a solid square (hardpoints stowed) or triangle (hardpoints deployed), while PvP combat occurs only against other players identified on the radar as a hollow square or triangle.

Though PvE can refer to any engagement with NPCs, in general it describes one of two chief activities: bounty hunting and engagement in Conflict Zones (CZs). Bounty hunting uses Elite: Dangerous' bounty system, whereby criminal activity results in a bounty which can be claimed by killing the criminal. Combat Zones, on the other hand, are chaotic warzones where factions vie for control of a system. PvP can of course occur in either of these instances as well, or it may occur outside of these contexts as part of recreational duels, interfaction conflicts, or simply crossing the path of a player who is out for blood.

Bounty Hunting

EVERY CRIMINAL HAS A PRICE. Fortunately, that saying goes both ways: the most experienced pirates usually have the highest bounties on their heads. Because of the sheer number of populated systems that exist within the bubble of human space and the relative autonomy of most ship owners, the galaxy is rife with crime. Wanted individuals can be found in a diverse assortment of locations. This portion of the guide will walk you through the basics of bounty hunting, but it will also provide some tips and tricks that may be news to you, even if you are an experienced pilot. The first segment will cover hardware requirements, while the second part will describe the best locations for finding high value targets. Finally, the last section will convey information about the safest and most efficient methods for conducting your hunts.

SHIP REQUIREMENTS:

While there's no perfect loadout for a bounty hunting ship, there are a few modules that you'll need if you want to maximize your profit and improve your chances of survival.

KILL WARRANT SCANNER:

Regardless of ship size or module class, you should always equip your vessel with one of these devices if you intend to bounty hunt. KWS add a significant amount of credits to each pirate's "value" by scanning them for bounties posted in other systems. If you don't use one of these, you'll miss out on a substantial amount of profit!

COMBAT PROFICIENT VESSEL:

Within the "Ships" chapter of this manual, you can find detailed information about each model's combat capabilities. In fact, each ship has a specific rating for its bounty hunting utility. It would be in your best interest to choose one of the recommended options if you're planning on attacking pirates. A few notable examples include the Viper MkIII, the Vulture, and the Python. With the exception of its sensors and life support, you should ensure that your ship's core internal compartments are all equipped with grade A modules.

APPROPRIATE WEAPONS LOADOUT:

Generally, experienced bounty hunters use armaments that have sufficient ammunition reserves to retain firepower during long patrols. While plasma accelerators and railguns have high damage outputs, for example, their low ammo capacities prevent them from being useful for bounty hunting. Instead, lasers and kinetic weapons such as multi-cannons are recommended.

LOCATIONS:

Pirates can be found in two primary locations: navigation beacons and resource extraction sites- though wanted ships can sometimes turn up in supercruise or within unknown signal sources (USS), as well.

NAVIGATION BEACONS:

Every inhabited system has a nav beacon to direct the flow of incoming hyperspace traffic. Often, pirates use these areas to confiscate goods from unsuspecting freighters. While these nav beacons can be viable bounty hunting locations in systems that do not have extraction economies, it is generally more lucrative to conduct patrols within resource extraction sites.

RESOURCE EXTRACTION SITES (RES):

These designated mining zones can be found in systems with extraction economies, and are usually located within the rings of gas giant planets. Because the minerals obtained from metallic asteroids are so valuable, most pirates choose to conduct their business in RES. Extraction sites come in four types: Low-RES, RES (standard), Hi-RES, and Hazardous-RES. Low, standard, and high RES are listed in order of increasing danger levels and system security presence. However, hazardous RES have no security presence, and are therefore favored by the deadliest pirates.

The risks associated with extraction sites are generally outweighed by the potential for profit, and for this reason most bounty hunters prefer them to nav beacons. If you are confident in your abilities, Haz-RES are the most lucrative option; however, for less experienced pilots, Hi-RES are strongly recommended. Both Hi-RES and Hazardous-RES can be found in EXO's home system, Wolf 1301. Hunting there is a great way to make some credits and boost our faction's influence at the same time.

TACTICS:

Besides the basic principles covered in earlier sections of this guide, there are a few important skills specific to bounty hunting that will drastically improve your chances of success.

TARGET ACQUISITION:

The fastest way to find wanted pilots is to sift through your contacts list (left panel of the HUD) for combat-oriented vessels. After finding a potential pirate, move in for a scan. Before engaging a target, make sure that you're up for the challenge. If your ship is destroyed, any unclaimed bounties will be lost, so it's often better to ignore pirates in large wings. The amount of credits awarded for eliminating a wanted vessel depends mainly on its size; however, the competency of the pilot is also a key factor. Generally, the higher a pirate's combat rating, and the larger their ship, the more their bounty will be worth. If you are hunting in a RES with a system security presence, wait for them to engage a hostile ship before commencing your attack. You'll still receive the full bounty when the target is destroyed, and the syssec will speed up the job significantly. This is a useful way to destroy larger targets if you're piloting a small vessel.

TARGET ENGAGEMENT:

Pirates won't attack you as long as you don't have any cargo in your hold. Use this to your advantage by initiating the attack from the rear of your quarry, and be sure to target their power plant by cycling through the subsystems list. **Be sure to wait until "Wanted" appears on your**

scanner readout before attacking - if you haven't fully scanned and identified the enemy ship before you attack, you will be regarded as having assaulted an innocent and will become wanted yourself. As soon as its PP is disabled, the enemy ship will become completely immobile, and you can then finish it off at your leisure. If you're using gimballed weapons and the target releases chaff, you can continue to engage them by deselecting their ship and aiming manually until your targeting computers are able to re-establish a lock. Additionally, try to keep your vessel out of the enemy's field of fire by flying with flight assist off.

AT THE END OF A long patrol, make sure you turn in all the bounties that you collect to a station controlled by EXO. Some of them can only be claimed within the same system as they were acquired, but EXO bounties can be used to boost our influence in any of the many systems that we've expanded to. We'll cover this in greater detail in the Background Simulation chapter later on.

* * *

Conflict Zones

WARS ERUPT FREQUENTLY THROUGHOUT INHABITED space as factions vie for power in contested systems. Conflict zones (CZ) spring up near key locations within these regions, and the battles that take place there often last for days. Combat Zones are either High or Low Intensity, which describe the number of ships which will be encountered. Additionally, High Intensity CZs may contain a Capital class ship, which requires teamwork and strategy to take out several sub-targets in order to rout.

Upon entering a CZ, you can choose to fight for one of the two groups by accessing the “choose faction” button in the functions tab from the right hand panel of your HUD. Once you make your selection, every ship in the CZ will be marked as either friendly or hostile, depending on their allegiance. Hostile targets will actively seek to eliminate you, and reinforcements for both sides will continue to arrive until the war ends. The best strategy is to remain close to the bulk of friendly forces and pick off isolated enemies. For each ship you destroy, you’ll be given a combat bond. The value of each bond is determined by the type of ship it was awarded for. Below is a list of bond prices:

Ship ---------------- Reward (CR)
Imperial Fighter ----------- 4,600
F63 Condor ---------------- 4,600
Eagle MkII ----------------- 9,200
Cobra MkIII --------------- 18,400
Imperial Courier --------- 18,400
Viper MkIII / MkIV ------- 23,000
Asp Scout ---------------- 27,600
Asp Explorer ------------- 32,200
Vulture ------------------- 41,400
Imperial Clipper --------- 50,600
Federal Dropship -------- 50,600
Federal Assault Ship ----- 50,600
Python -------------------- 59,800
Anaconda ----------------- 91,080
Federal Corvette --------- 101,200
Imperial Cutter ---------- 101,200

OCCASIONALLY, WARS OF EXPANSION OCCUR between EXO and other minor factions as we liberate nearby systems from the corruption of the Old Powers. During these campaigns, it is critical that all affiliated commanders deploy to the CZs and turn in as many bonds as possible at the nearest station.

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Player vs Player Combat

SO YOU HAVE THE BASICS of combat down, thanks to the experience you gained while bounty hunting. But what about fighting against another commander? PvP, while similar at its core, is very different than fighting against the common pirates (NPCs) you find in resource extraction sites. When facing opponents certified by the Pilot's Federation (players), you'll have to overcome constant chaff, unique loadouts, expert power management, and more. In this section, we will discuss the basics of PvP, which will allow you to hone your skills and become increasingly proficient at this type of advanced combat. Below, you'll find information about numerous aspects of PvP combat, including loadouts, tactics, and maneuvers. We encourage you to practice these methods with friendly commanders before you risk engaging an experienced enemy, and you should always follow the Golden Rule regardless of your opponent: **NEVER FLY WITHOUT ENOUGH CREDITS FOR A REBUY!**

LOADOUTS:

Pilot's Federation commanders (players) are usually much more skilled than unregistered pilots (NPCs), so your ship's loadout will need to be highly specialized.

WEAPONS:

Earlier in this guide, you learned about the different available weapons. We showed you the strengths and weaknesses of each type, and made some suggestions about how to optimize your hardpoints for Bounty Hunting. However, your loadout should be configured differently if you're planning to engage another commander in combat. Fixed weapons are preferred for PvP, since your enemies will likely chaff at very frequent intervals. However, some pilots still use gimballed mounts. Turrets are also effective when installed on the sides of larger ships, and are fantastic counters to any enemies using silent running.

THERMAL: These weapons have a high power draw, and will drain your capacitor quickly. They are recommended primarily for ships with larger power distributors, and should be used sparingly. Running an all-thermal loadout is not recommended. Due to their almost instantaneous time-to-hit, thermal weapons are the easiest type to use with fixed mounts.

KINETIC: These weapons have a low power draw, and will therefore drain your capacitor more slowly than thermal weapons. They are highly recommended for any ship, since they provide more freedom for power management, which we will discuss in more detail later. Kinetic weapons have a much longer time-to-hit, so aiming on fixed mounts is more difficult than thermic weapons. Kinetic weapons with turreted mounts are extremely effective when installed on stealth ships.
EXPLOSIVE: These weapons should be reserved for when the enemy's shields go down. They have fantastic splash damage, and can devastate a ship's hull if countermeasures are absent.

UTILITIES:

Depending on the style you choose to use against other commanders, you may need to swap out your ship's utilities. Sometimes, the right selection can mean the difference between life and death.

SHIELD BOOSTERS: If you plan on using a conventional loadout (as opposed to a stealth build), and your ship has adequate power, most of your utility mounts should be equipped with grade A shield boosters. These will buy you time in a fight, and allow you to outlast your enemy.
HEAT SINKS: For stealth builds that rely on silent running, or any build that uses Shield Cell Banks (which produce a lot of heat), heat sinks are a necessity. Make sure you map them to a button/switch that is easily accessible, so your ship doesn't overheat!
FRAME SHIFT WAKE SCANNERS: When the battle is won, and the enemy tries to run, the FWS will allow you to track them down and finish the job. However, an alternative method, which does not require a FWS, will be discussed shortly.
CHAFF: Although the majority of commanders employ fixed hardpoint configurations for PvP, some opponents will rely heavily on gimballed weapons. In these cases, using a chaff launcher will provide a significant advantage.
COUNTERMEASURES/POINT DEFENSE: These utilities are highly recommended for larger vessels. They provide effective protection against missiles and torpedoes, which are otherwise difficult to avoid in ships with less maneuverability and speed. Remember: countermeasures are omnidirectional and always active, but can only disable seeker missiles and torpedoes. Point defense, on the other hand, has an ammunition limit and a restricted field of fire (depending on where it is mounted), but can engage and destroy all explosive munitions that come within its range.

OPTIONAL INTERNALS:

Like utilities, your choice of internal modules should complement the intended role of your ship. Additionally, some ships are designed to function more effectively with certain loadouts than others, so it's important that you choose wisely.

SHIELD GENERATORS: When outfitting a ship for PvP, many players forget that shield generators are optional. For stealth builds, replacing the generator with another hull reinforcement package might be beneficial. If you plan on using a conventional loadout, grade A shields are essential. However, Bi-weave shield generators may be useful on a pseudo-stealth build. We'll cover these three styles later on.

SHIELD CELL BANKS: For medium-large ships with conventional loadouts, SCBs are an absolute necessity. Generally, you should equip the biggest grade A banks that your ship can hold in 2-6 of its largest compartments.

HULL REINFORCEMENT PACKAGES: These are especially useful for stealth builds. Always use grade D HRPs.

FRAME SHIFT DRIVE INTERDICTORS: Don't wait to be engaged by the enemy; take the fight to them!

TACTICS:

While it would be impossible to include a comprehensive list of tactics for PvP combat, the most important aspects can be broken down into three main categories: styles, engagement methods, and defensive measures.

STYLES:

For our purposes, "style" refers to the way you decide to use your ship for combat. As we discussed earlier, outfitting plays a key role in determining whether or not you will be able to successfully employ a given style. We have divided these into three main options: conventional, stealth, and pseudo-stealth. You will probably need to experiment with each of these in order to determine which one your ship is best suited to perform. Not only that, but stealth and pseudo stealth vessels generally require a great deal of skill to employ effectively, so you may want to practice them thoroughly before using them against a real opponent.

CONVENTIONAL: This style focuses on raw shield strength and survivability. For smaller ships, shield cell banks are optional, but not recommended. Conversely, medium and large ships should be outfitted with a full complement of SCBs. Additionally, it is advisable to equip at least two heat sink launchers to prevent systems from overheating during the energy transfer. Make sure you map your SCBs to an easily accessible location, and only keep 1-2 of them activated at any given time to conserve charges and keep heat production within manageable parameters. Always activate your SCBs before shield levels drop to one bar, since they take a couple of seconds to boot up before initiating the energy transfer. Any unused internal compartments should be fitted with hull reinforcement packages.

STEALTH: By using your ship's silent running capabilities, you can mask its thermal signature and disappear from enemy sensors. However, this process requires the exhaust vents to be shut, causing a buildup of heat that can cause severe internal damage if left unchecked. Heat sink launchers are therefore necessary components of a stealth vessel, and should be used periodically to keep the heat below 100%. When outfitting a ship to be used for this style of combat, it is recommended that you forgo shields in favor of an additional hull reinforcement package. These are extremely effective for ships that rely on silent running, since individuals cannot be targeted by enemies unless they are able to maintain a sensor lock. While this style can be extremely useful in the hands of an experience pilot, it is difficult to master. Additionally, stealth is most effective for small and medium vessels; larger ships are visible even with silent running engaged, and can easily be targeted by experienced adversaries.

PSEUDO-STEALTH: This hybrid style uses a combination of shields and stealth to change the tempo of the sortie as the situation evolves. By forgoing SCBs in favor of HRPs, you can switch to silent running as soon as your shields drop to confuse the enemy and reduce the amount of damage to your hull and internal modules. There are two options for this style. You can either equip a Bi-weave shield generator and disengage silent running as soon as your heat levels become critical to let your shields recharge, or you can equip a grade A shield generator and use heat sinks to remain cloaked for the remainder of the engagement. For slower ships, the latter option is usually better. However, faster vessels are able to take advantage of Bi-weaves' quick recovery time and remain out of the enemy's range until their shields are back online. At times, this style may be useful even for a ship that is not intentionally equipped for it. Depending on your opponent's weapons array, you may find it useful to use silent running periodically if you run out of SCBs and your shields go offline.

ENGAGEMENT METHODS:

The deciding factor in a fight often manifests itself before the first shot is even fired. The manner in which you first engage your adversary can either set you up for success, or doom you to fail. There are three rules of thumb listed below that will help you avoid costly mistakes.

BE THE INITIATOR: Have a firm plan in mind before the sortie begins, and don't let your enemy get the jump on you. If you're interdicting your opponent, be ready to disable his FSD should he decide to run. If you're being interdicted, submit and deploy your hardpoints immediately. Don't try to evade- the initiator is always more disoriented by the drop than the target, and you will conserve module and hull integrity by submitting.

MANAGE YOUR PIPS: **If your shields are online, you should ALWAYS have four pips assigned to the ship's systems.** There is little to no benefit in keeping 1, 2, or even 3 pips assigned to systems while you are actively taking fire. The remaining two pips should be switched between your engines and your weapons as the situation demands.

If you are using a stealth build, NO POWER should be diverted to your ship's systems. Instead, all available power should be distributed between the engines and the weapons. For pseudo-stealth vessels, four pips should be assigned to systems until your shields drop, at which time all power should be split between the engines and the weapons in the same manner as a stealth ship. In all cases, it is highly recommended that you actively make changes to the power distribution over the course of the battle, as necessary.

DON'T RELY ON FLIGHT ASSIST: Much earlier in this manual, you were introduced to FA. We mentioned that, at times, it would be beneficial for you to turn FA off in order to preserve momentum, and maneuver more effectively in combat scenarios. The truth is, you MUST learn to fly in this manner if you want to be successful during PvP engagements. Turning your flight assist off causes your ship's flight pattern to become much less predictable to your opponent, especially if they are using fixed weapons. It also makes it easier to keep your ship pointed at the enemy while moving in any direction. There's no need to keep FA off 100% of the time, but you do need to become comfortable flying without it in a fight!

DEFENSIVE MEASURES:

Sometimes, you may find yourself outmatched, and in need of a hasty retreat. Other times, you may want to avoid combat altogether. For the most part, hostile commanders don't care. They will try their damndest to hunt you down, blast your ship into tiny pieces, and scatter your remains throughout every known Lagrange point in the system. We recommend that you observe the following suggestions to prevent this from happening.

ESCAPING A FIGHT: "To the death" is not always a desirable option, especially if the insurance cost of your ship is extremely high. Chances are, your shields will be offline by the time you finally make the decision to withdraw. Transfer all power to engines, and boost directly towards your opponent, so that you fly past them. This will force them to make a 180 degree turn, which will buy you some time and increase the distance between your spacecraft. Continue boosting as frequently a possible, and quickly cycle through the list of systems in the navigation tab of your left UI panel until you find one that lines up with your current direction of travel. Once you arrive at your destination, immediately drop from supercruise and select any other system from your navigation tab. Charge your FSD, and make the jump. This will prevent your opponent from tracking you, since a high wake within a low wake cannot be scanned if it is completed before they drop out of supercruise.

AVOIDING A FIGHT: Occasionally, hostile commanders will attempt to interdict you at the most inconvenient times. If you're flying a freighter, or awaiting reinforcements, you'll need to evade. Should the enemy succeed in interdicting you, follow the steps in part i. above to escape. However, there is also a method for avoiding the fight entirely. Slow your ship in supercruise to 30 km/s, and keep your nose pointed at your adversary. Eventually, they will pass behind you in an attempt to flank your vessel and initiate the interdiction. As soon as this occurs, drop from supercruise and immediately select one of the systems in the navigation tab of your left UI panel. Charge your FSD, and make the jump. If your enemy drops into the low wake after you've already left, they won't be able to see your destination. If they do arrive in time to see you make the H-jump, simply drop out of supercruise once you arrive in your target system, and immediately jump to another destination. Repeat this process until you are no longer being followed.

MANEUVERS (Adapted from CMDR Shrinkshooter's Guide):

While strategy does play a key role in determining the outcome of a sortie, your skill as a pilot is even more important. The following maneuvers will drastically improve your abilities, and should be rehearsed until they become second nature to you.

TURNING:

Almost every maneuver will require you to employ efficient turns. By now, you should already be aware that, regardless of its make and model, vertical thrusters produce much more force on a ship than lateral thrusters do. Because of this, you should always use pitch, rather than yaw, for all of your turns. Additionally, almost all of your maneuvers should be conducted with FA off during PvP combat. You can increase the speed of your turns further by reducing your throttle until it sits just within the "blue" zone (or roughly 60-70%). This equalizes the vessel's thrust distribution, making its pitch more responsive at the expense of some forward acceleration. Finally, by boosting just before turning FA off, you can improve your vessel's turn rate even more.

This is known informally as a "boost turn."

POWER SLIDE:

This maneuver allows you to stay within a larger or slower opponent's "blind spot." If used correctly, it will give you a clear shot at their ship and prevent them from targeting yours. To initiate the power slide, face your target and reduce throttle to around 50%. As you approach, thrust downward and pitch upward at the same time (Figure 1). Continue in a circular pattern, adjusting vertical thrust as necessary (Figure 2).

Figure 1

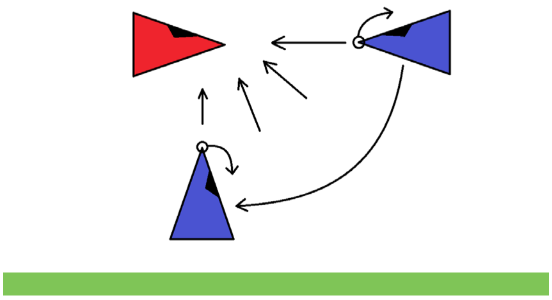
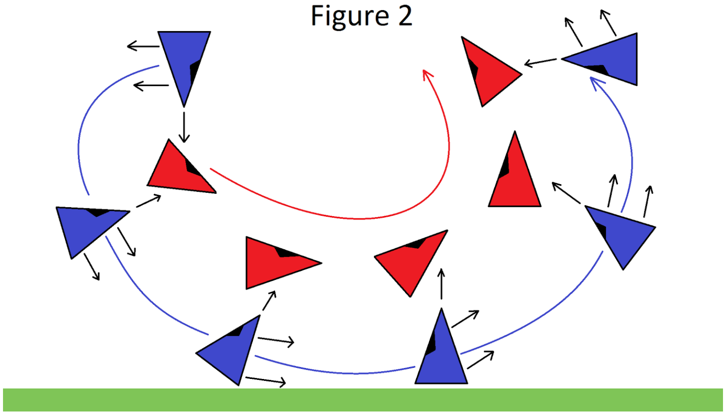


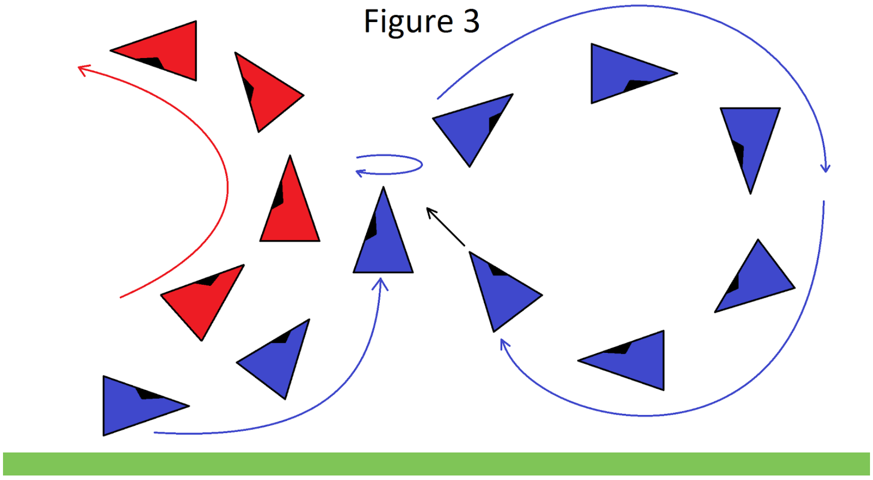
Figure 2



SPLIT LOTUS:

If your opponent's ship is faster or more maneuverable than yours, this technique might come in handy. The split lotus should be initiated when the enemy ship begins to outturn your vessel. In cases like these, the boost turn can also be effective; however, it may not be possible depending on the amount of engine power available. To initiate the split lotus, rotate your ship 180 degrees at the apex of your arc, and then pitch upward (which is really downward relative to your previous flight path). Follow this turn all the way through to put distance between you and your adversary (Figure 3). When employed successfully, this maneuver will allow you to obtain a lock on your enemy, regardless of their ship's agility.

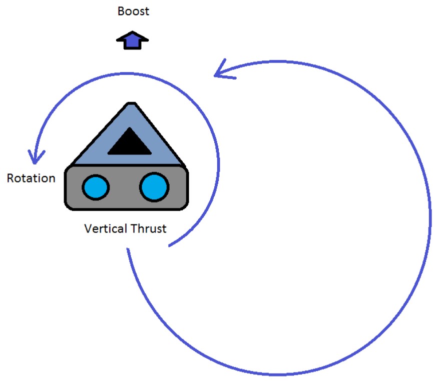
Figure 3



CORKSCREW:

This technique is simple, yet extremely effective. It can be used to reduce the amount of damage taken while approaching an enemy vessel from the front, or to evade pursuit during a tactical withdrawal. In either case, you must turn FA off to perform the corkscrew. To begin, use an engine boost to maximize your forward velocity. Next, apply vertical thrust in either direction while rotating your ship slowly to achieve a circular flight pattern. This will force your opponent to oscillate their ship in order to maintain a weapons lock, and it will help you evade the majority of their kinetic and explosive ordnance.

Figure 4



BY IMPLEMENTING THE TACTICS AND maneuvers presented above, you will be well equipped to cope with a multitude of combat situations. Practice them often, and don't be afraid to come up with variations of your own! Over time, you'll grow more in tune with your ship's capabilities. In addition to improving your skill level, however, you'll also need to make good use of the various engineers throughout the galaxy. Their services are essential if you plan on defeating other experienced pilots. But don't worry! We'll cover this soon enough.

* * *

Chapter 4

Trade

What’s in this chapter?

1. *Overview of the economic activities and professions available to Elite: Dangerous pilots.*
2. *Rare Goods trading as an early income source, capable of high profits with relatively limited cargo capacity.*
3. *Bulk Trading with a large ship on a back-and-forth short trade route as the backbone of the galactic economy and a simple and easy yet tedious way to generate revenue.*
4. *Mining as a highly profitable economic activity which is also more engaging and active than typical bulk trading.*
5. *Smuggling and mission-stacking as a high-risk, high-reward method to bolster a credit balance.*

> *This most excellent canopy, the air, look you, this brave o — erhanging firmament, this majestical roof fretted with golden fire.*
>
> *William Shakespeare, Hamlet, c. 1600*

Trade

THE ECONOMIC CONDITION OF INHABITED space is constantly changing. Businesses from all over the galaxy compete for resources, driving some systems into poverty, and turning others into industrial powerhouses. Thanks to your Pilot's Federation license, you are free to engage in commercial activities within any sector.

In this section of the manual, we will discuss a number of lucrative economic activities. The four primary sections include rare goods trading, bulk hauling, mining, and smuggling. Even if you consider yourself a combat oriented pilot, these skills will allow you to fund your next hardware upgrade. Besides, logistical activities cover a wide variety of risk levels; whether you're looking for a spell of relaxation or a dose of adrenaline, the business sector of the galaxy has it all! Regardless of how you intend to trade, remember to wing up with other commanders. You'll receive a modest dividend from their profits, as long as you're nearby when the sale is made!

* * *

Rare Goods

CERTAIN SYSTEMS PRODUCE EXCLUSIVE COMMODITIES that are extremely valuable in other locations due to their limited availability. Generally, these goods can only be purchased in small quantities, and must be hauled great distances to be sold for a substantial profit. Many pilots make a modest living transporting these rare goods across the galaxy, and the work is often attractive to newly licensed commanders since it doesn't require a large or expensive ship.

LOCATIONS:

Rare goods can be purchased in a multitude of locations. The list provided here is a good place to start. However, if the minor faction that produces the commodity loses control of their system, the rare good will no longer be available. Because of this, the list is constantly changing.

ROUTES:

The amount of profit you can make from any rare commodity reaches a maximum about 160 LY away from the system you purchased it in. This means that even the most efficient routes will require long travel times, so it's best to use a small or medium ship with considerable jump range for your trade runs. The best strategy for route planning involves finding four or more systems with rare goods that are arrayed in a thin, polygonal fashion. Ideally, the locations should be chosen so that they form two "clusters" about 160 LY apart from one another. Stop at every system in the first cluster and purchase as much of each rare commodity as possible. When you arrive at the second cluster, sell all of your cargo, and repeat the process.

OUTFITTING:

Make sure you purchase the largest available grade A FSD for your vessel. The rest of its core internal mounts should be fitted with grade D components. Your largest optional internal compartments should be equipped with cargo racks in order to optimize the value of each trip between clusters. Use two of the smaller compartments for a grade A fuel scoop and a grade D shield generator. Running a lightly shielded build without weapons is certainly a risk, but your goal while freighting rare goods should be to avoid hostilities altogether. The shields primarily serve as a precaution against docking incidents.

* * *

Bulk Hauling

PERHAPS ONE OF THE MOST common professions in the modern era, the transportation of commercially available products both sustains and develops the galaxy's economy. While the income associated with space trucking can be rather modest, it is probably the simplest and safest occupation available. Unfortunately, to be successful in this line of work, you'll have to own a relatively large vessel. The profit per ton (PPT) for bulk hauling is low, so without a ship that has room for a substantial amount of cargo, you won't make enough for it to be worth your time.

CARGO SELECTION:

The rule of thumb for choosing which commodity to transport revolves around the concept of supply and demand: purchase goods from systems with a surplus of them. The more tonnage available, the less the cost will be per unit. Generally speaking, this can be predicted by looking at the type of economy in a given system. In the BGS chapter of this guide, we will discuss these in more detail. However, for now, it is enough to know that the most abundant commodities in a given system always correlate directly with its economic classification. For instance, a high tech orbital station will usually have a surplus of tech-related goods, but may not sell agricultural products.

For these reasons, the reverse is also true: systems have a higher demand for commodities that they do not produce. Most often, high value goods will have the greatest difference in price between the location you buy them at, and the place you choose to sell. A good way to determine whether you're getting a good deal or not is to look at the "galactic average" price that is displayed on the commodities market screen, which can be accessed when you dock at a station or outpost. If the galactic average price is much higher than the station's price for a given item, you may want to buy. If it's much lower, than it may be a good place to sell. Instead of traveling to hundreds of systems in order to find the highest payouts, we recommend that you use this tool. It is constantly updated to provide you with relevant information about the location and price of every commercially available commodity in the galaxy.

ROUTES:

While it may be easy to find a single hop route (A to B) using the list mentioned above, you'll need more than that to maximize your profit. Luckily, the same database provides two different functions that can optimize trade routes based on user input. The first option calculates loop routes. These involve two separate systems whose economies exhibit complementarity. Loop routes involve buying and selling at both locations to increase trade dividends. The second option calculates multiple hop routes. These can include up to six separate stops. The program will attempt to form a loop from this data, as long as it's feasible based on the other parameters. For both of these options, you may manually select certain commodities that you wish to transport, or allow the program to decide for you. Note that the less variables you choose to specify, the easier it will be for the software to maximize the route's PPT.

OUTFITTING:

Unlike rare goods trading, bulk hauling requires large ships with ample cargo space. For this reason, the Python, Type-7, Type-9, Anaconda and the Imperial Cutter are highly recommended models. With the exception of its FSD, all of your vessel's core internal compartments should be fitted with grade D components. You should purchase the largest grade A FSD available for your ship, and ensure that no weapons are installed. The largest optional internal compartments should be equipped with cargo racks, but you should also leave room for a grade A fuel scoop and a grade D shield generator. Remember, your goal is to avoid contact with hostiles, so these weak shields are intended only to prevent damage in the event of a docking incident.

IT MAY NOT BE GLAMOROUS, but bulk hauling is the backbone of the galactic economy. Though you may need to pursue other activities in order to afford a vessel capable of moving substantial tonnage, there may come a day when you discover the joys of long range transport. If not, we completely understand.

◆

Mining

A FAMOUS MEMBER OF THE Exodus Coalition once said, "A spinning asteroid gathers no moss." Aside from being entirely correct, he also pointed out an aspect of this profession that is commonly overlooked: it's a viable (and enjoyable) option for pilots of all experience levels, regardless of their credit balance. Though mining does require a few special pieces of equipment, the entry cost is extremely low. An added bonus is that the profit scales intuitively based on the size of your ship and the quality of your gear. It may not be exciting, but mining is certainly serene... and lucrative. The steps below will walk you through the process of outfitting your ship, locating a prime asteroid ring, and mining the hell out of some rocks.

OUTFITTING:

Unlike trading, mining requires a set of specialized equipment to extract, collect, and process the minerals contained within asteroids. The basic requirements are as follows: 1) mining lasers, 2) prospector limpet controller, 3) collector limpet controller, 4) refinery, and 5) cargo racks. The quantity and type of these items needed depends entirely on the type of spacecraft you own. For this reason, we have provided example loadouts for a few of the ships most commonly used for mining:

A. Asp Explorer
B. Type-6 Transporter
C. Type-7 Transporter
D. Anaconda
E. Federal Corvette (we lied; this isn't a commonly used mining ship...)
F. Imperial Cutter

Don't forget to fill about two thirds of your cargo hold with limpets before departing; they can be purchased while you are docked via the station restock function. It takes a large number of these to prospect for mineral rich asteroids, so you'll free up plenty of cargo space for the refined products as you search.

LOCATIONS:

A few minerals, which are used to unlock specific engineered upgrades or to fulfill a specific mission (Methanol Monohydrate Crystals, Liquid Oxygen, Methane Clathrate, Water, Hydrogen Peroxide, Bromellite, or Lithium Hydroxide), can only be found in ice rings. However, mining is best conducted in pristine metallic planetary rings (PMRs). Though it is by no means exhaustive, this list of PMRs is a good place to start. Remember that each of a planet's rings has a different composition. The metallic ring is almost always the thin, silver one closest to the planet. Once you identify one of these, you can either drop down manually in an arbitrary location within the metallic ring, or lock onto a resource extraction site. RES have a slightly higher abundance of rare minerals and are said to offer a bonus of additional fragments per asteroid, but they also attract pirates, as we discussed earlier on. As far as maximizing the efficiency of your time spent mining, it is quite difficult to assess whether the RES bonus is worth the time lost to defense against pirates. For this reason, whether to mine in RES sites or at random locations in the ring is somewhat controversial. If your ship is not capable of defending itself if attacked by pirates, or if you prefer peace and quiet while mining, you may wish to avoid the RES. On the other hand, if the RES bonuses are important to you, and you don't mind the excitement of mining with pirates on your scanners, the RES may be for you. If you are a new player, the authors recommend avoiding the RES at least until you feel competent.

TECHNIQUES:

There are nine minerals that can be found in metallic rings. They are listed below in order of value from greatest to least:

1) Painite
2) Platinum
3) Palladium
4) Gold
5) Osmium
6) Silver
7) Bertrandite
8) Indite
9) Gallite

The most lucrative method is to focus exclusively on the first three minerals on this list. However, it is also recommended that you accept as many mining missions from nearby stations as possible before you depart. These often involve requests for minerals that are not in the top three, so be sure to keep the lower value products necessary for the completion of your missions.

PROSPECTING:

Once you reach a metallic ring, aim your vessel at an asteroid, and fire one limpet from your prospector limpet controller. Target your limpet to view the mineral content of the rock. If it contains more than 10% painite, platinum, and/or palladium, it is worth your time. Otherwise, repeat the prospecting process until you find a high value asteroid.

DRILLING:
When you find a suitable rock, deploy as many collector limpets as possible, and open your ship's cargo hatch. Keep the prospector limpet selected so that you can determine when the asteroid's mineral supply is exhausted. Begin drilling with your mining lasers, and periodically check your refinery bins. Expel unwanted minerals before the process is complete so that you don't have to eject canisters later on in order to make room for more valuable cargo. Once you finish mining an asteroid, begin prospecting again. Repeat this process until your cargo racks are full of painite, platinum, and palladium. If your bays become full, and you notice that you are carrying too many limpets or a few less valuable commodities, simply eject them while thrusting downward at full speed. This will destroy the canisters and prevent your collector limpets from placing them back in your cargo hold. Finally, take some wingmates with you if you decide to mine! Every asteroid holds the same amount of minerals for each commander. By bringing just one friend along, you are effectively doubling the potential profit from a high value rock. Additionally, prospecting is significantly easier in a large group.

MARKETING:
Use this tool to find a profitable market for your mined commodities. Keep in mind that time is money; don't travel for an hour to gain an extra 100 CR/ton. You'll earn much more by selling everything quickly and returning to the ring for another bout.

SMOOTH TUNES AND AN OUNCE of onionhead will go a long way toward perfecting your mining experience. Few other professions offer a comparable mix of serenity and cash, so if you haven't tried it yet... you should. No one can love you harder than a rock, and take our word for it - 50% painite hurts so good.

* * *

Smuggling

SPACE COMBAT ISN'T THE ONLY way to get an adrenaline fix. In fact, many pilots maintain that smuggling is the pinnacle of risky business. Regardless of your viewpoint, however, there is no denying that this is the fast track for striking it rich. In this portion of the guide, we will provide you with a number of methods for completing what one member of EXO calls, "missions of extreme discretion." For our purposes, we will not cover black market smuggling in this section, since it is essentially the same as bulk hauling with the added requirement of... well, a black market. Instead, we'll focus on long range smuggling missions.

OUTFITTING:

Any ship with a good jump range and enough space for at least 64 canisters of cargo can be used for smuggling. The two most famous, and arguably the best vessels in this line of work, are the Asp Explorer and the Anaconda. For smaller ships, smuggling loadouts should closely resemble those used in the transport of rare commodities. Similarly, larger ships should apply the same principles prescribed for bulk hauling. Grade D components, aside from the FSD, are necessary to keep your vessel's mass low and its jump range as high as possible. The key difference in both cases is this: every smuggling ship should mount a strong shield generator and the largest grade A thrusters possible. If there are illegal goods in your ship's cargo hold, security vessels and pirates alike will ceaselessly attempt to interdict you. While it's best to avoid these interdictions entirely by jumping quickly between each system, there will come a time when you are no longer able to evade. In these cases, it's usually best to submit to the interdiction, boost away, and engage your FSD for the next H-jump. Without grade A thrusters and substantial shield strength, you won't be able to escape such scenarios. **Also, do not forget to equip a sufficient fuel scoop.** Without extra fuel tanks, which will weigh your ship down and take up valuable cargo space, you will not be able to traverse the long distances required by smuggling contracts unless you have a decent scoop.

LOCATIONS:

As a rule, the further a smuggling mission requires you to travel, the more profit per ton (PPT) you'll receive. Because of this, the best locations from which to accept missions are those that lie 300-400 LY away from Sol. Three infamously lucrative places are Robigo, Sothis, and Ceos; however, you can search here to find a multitude of other options. Simply select Sol as your reference system, and click the "last" tab to view markets that are sufficiently distant from it. Because of the constant economic fluctuations across the galaxy, the "best" system for smuggling will frequently change. For this reason, you should consistently check with other commanders in EXO to find out where they've had recent success.

TECHNIQUES:

At first, the missions available to you may not seem worthwhile. This is because the more profitable ones are only available to pilots with a high trade rank who are on friendly or allied terms with the system's controlling minor faction. Thankfully, both of these things can be obtained by smuggling.

MISSION SELECTION:

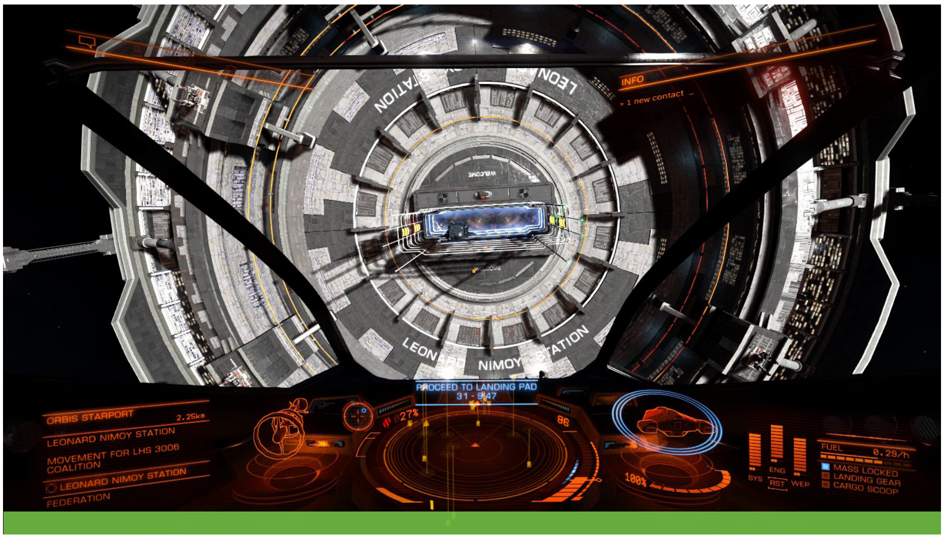
When you reach a system on the border of inhabited space that you wish to smuggle from, you'll need to accept numerous missions in order to make the trip profitable. If you're in a small ship, look for ones with a high PPT. For larger ships, it is usually fine to accept missions purely based on their payout, regardless of how much cargo they require you to transport. Once you've accepted all of the desired jobs, log out to the main menu and log back in using a different game mode (i.e., solo vs. open vs. private group). This will usually refresh the mission board. Continue doing this until you've accepted enough missions to fill your cargo hold. Keep an eye out for jobs with identical destinations; even if one of them doesn't pay as much as you'd like, it won't add any time to your trip since you'll have to stop there anyway.

TRANSPORT:

When you're ready to make some deliveries, ensure that you plan an efficient route through all of the mission objectives so that you loop back around for a shorter return trip. While en route, do not loiter before making each jump. Watch your comms, and try to fuel scoop only when there are no pirates or security ships in pursuit. If someone tries to interdict you, submit immediately. Boost away from them, and make the next H-jump as soon as your FSD cools down. **If your ship is scanned, you will fail all of your missions**; it is critical that you stay more than two kilometers away from all security vessels should you happen to be interdicted.

DELIVERY:

The following docking methods will help you evade the security vessels that conduct patrols near most stations. Note that silent running may be used to further improve your chances of successfully avoiding a scan. Chaff, however, is useless against them.



ORBITAL STATIONS:

Make your final supercruise approach so that your ship is in between the station and the planetary body that it orbits. The planet should be directly behind you, and the station should be directly in front. This alignment will ensure that your vessel always drops out of supercruise so that it is facing the star port's entrance. Boost toward the slot, and request docking as soon as you approach within 7.5 km. Enter as quickly as you can without crashing, in order to avoid being scanned. Once inside, station security ships will not be able to complete or initiate any scans on your vessel. Proceed with standard docking procedures, and turn in all relevant missions via the mission board.

ORBITAL OUTPOSTS: Under no circumstance should you attempt to dock with a military outpost, even if you discover that one of your missions requires it. Security vessels will be able to scan your ship, even after you have entered the hangar. Civilian outposts, conversely, do not scan inbound or outbound spacecraft. You may approach them in supercruise from any direction, since they do not have entrance slots.
SURFACE OUTPOSTS: Treat surface outposts with caution, and enter the hangar as quickly as possible after docking. It is unusual for security ships to conduct scans near these bases, but it may occur if you loiter for too long before landing. If you're uncomfortable with the standard procedures for orbiting a planet and/or making a descent to its surface, please reference the Pilot's Advanced Course in this guide.

DODGING INTERDICTIONS AND AVOIDING SCANS while transporting illicit cargo takes a significant amount of skill. If you are just starting out, be prepared for some setbacks and frustration. The more you smuggle, the easier it will become. As your reputation and trade rank improve, so too will the quality of available missions.

* * *

Chapter 5

Exploration

What's in this chapter?

1. *How to outfit your exploration ship, both for armed and unarmed journeys.*
2. *Advanced navigation techniques including fuel management, route plotting, neutron and white dwarf supercharging of your FSD, and approaching the galactic core.*
3. *Long-distance ventures such as barnacle farming or galactic tourism missions.*
4. *Data acquisition and cartography sales.*

> *Equipped with his five senses, man explores the universe around him and calls the adventure Science.*
>
> *Edwin Hubble, The Nature of Science, 1954.*

Exploration

AT SOME POINT, YOU MAY find yourself so preoccupied by the frantic business of the local cluster, that you lose sight of how incredible the universe really is. If you ever feel beleaguered by the daily toil of your mundane career, the life of an explorer may provide you with a welcome change of pace. When your FSD starts charging for the first jump on a long journey, the racket of civilization will quickly fade away. As the untouched beauty of the cosmos lurches into view, endless possibilities will begin springing up all around you (some call this phenomenon "space madness"). In this segment of the training manual, we'll provide you with all the information you need to traverse the furthest reaches of the galaxy, alone and (mostly) unafraid.

OUTFITTING:

There are two schools of thought when it comes to exploration loadouts. The first maintains that the potential dangers associated with the unknown regions of space necessitate the use of combat equipment. The second viewpoint values jump range over protection, and advises against the use of weapons or armor. In general, however, both sides of the debate agree that defensive half-measures are essentially useless; thus, there is little room for middle ground when it comes to deciding how you want to equip yourself for a long range adventure. **Nevertheless, there are five modules that are essential for all exploration vessels, regardless of which style you wish to pursue.** Listed in no particular order, they are 1) a **FUEL SCOOP**, 2) an **ADVANCED DISCOVERY SCANNER**, 3) a **DETAILED SURFACE SCANNER**, 4) an **AUTO FIELD MAINTENANCE UNIT**, and 5) a **PLANETARY VEHICLE HANGAR**.

COMBAT EXPLORATION:

This method of outfitting differs from that of general purpose combat, in that it accounts for the distinct lack of logistical support available in deep space. For this reason, combat exploration loadouts call for a greater level of dependence on shields and energy weapons, in lieu of kinetic or explosive hardpoints (which have limited ammunition). Regardless of which ship you intend to use, we recommend that you forgo SCBs and HRPs, and use only lightweight bulkheads. Instead, purchase a strong shield generator (preferably prismatic), and use boosters to increase its durability. Make sure you install the largest grade A power plant, distributor, FSD, and thrusters that your ship can accommodate. The one exception to this is that, if you have access to an engineer who is able to provide an overcharged power plant upgrade, you should use a smaller module to reduce the mass of your vessel. We also recommend that you install grade D sensors and life support, since the benefits of having grade A models do not outweigh the decrease in jump range that they will cause. With respect to utility mounts, heat sink launchers can be useful for protecting your ship during close encounters with stars or gravitational anomalies.

UNARMED EXPLORATION:

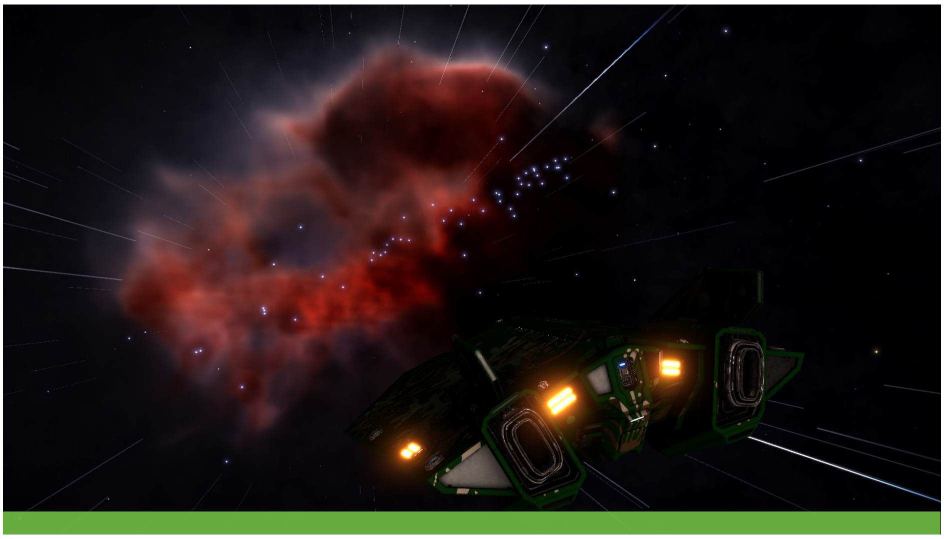
The main intent of this type of loadout is to minimize your ship's mass by retaining only the bare necessities for deep space travel. Purchase a grade D sensor suite, life support system, and power distributor.

Always install a grade A power plant, since it will help prevent your vessel from overheating when you fuel scoop. However, choose the smallest model that is still able to accommodate the rest of your ship's systems. If you're worried about landing on high gravity planets, you may benefit from grade A thrusters. However, grade D thrusters can handle most situations, and are significantly lighter and less expensive than their grade A counterparts.

Depending on the regions you wish to explore, extra fuel tanks can also be extremely useful. However, most exploration vessels are capable of making five to six maximum range H-jumps before they need to refuel. A notable exception to this principle is the Anaconda, which should always be equipped with (at least) one additional 32 ton fuel tank. For unarmed builds, your shield generator does not need to meet combat specifications. A small, class D model is recommended for protection against minor collisions. With respect to utility mounts, heat sink launchers can be useful for protecting your ship during close encounters with stars or gravitational anomalies.

ADVANCED NAVIGATION:

One of the most important aspects of exploration is the effective use of your galaxy map. Long trips require expert planning, especially if they cross through dangerous regions of space. Running out of fuel 30,000 LY from Sol will, at best, delay you significantly while you wait for a rescue; at worst, you will lose both your ship and all of your invaluable exploration data. Below are some methods for avoiding such a deplorable fate.



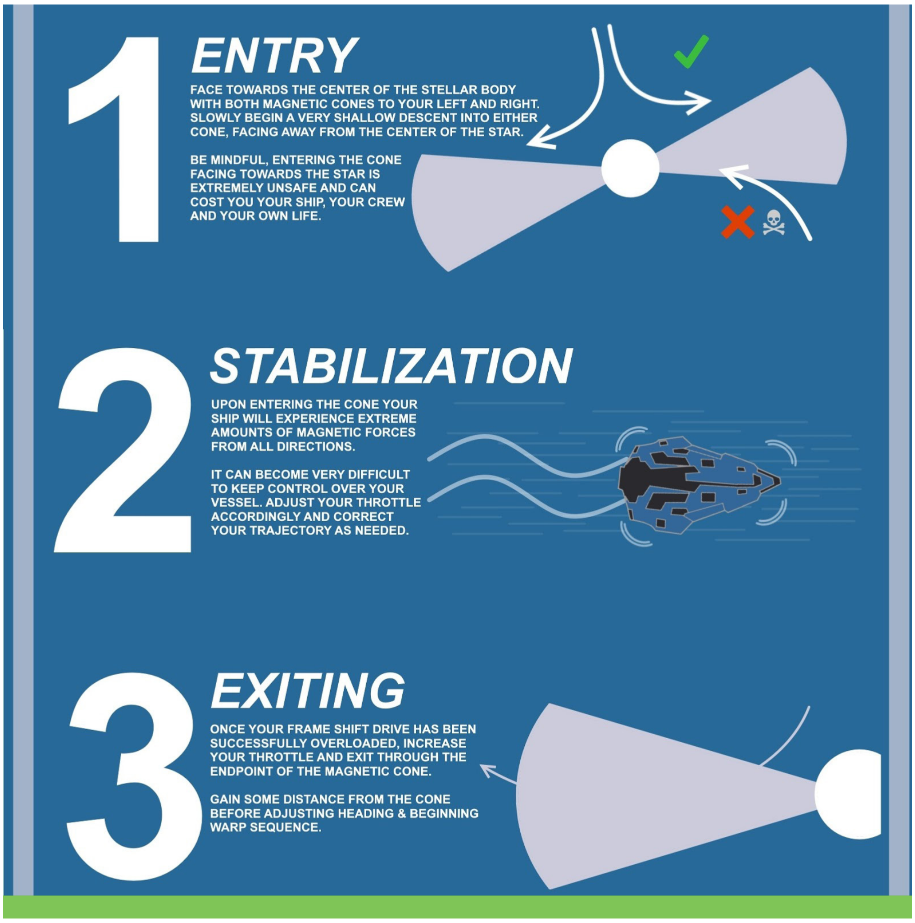
FUEL MANAGEMENT:

Earlier in this guide, we

briefly covered the use of galaxy map filters. As an explorer, the star class filter is by far the most critical asset in your proverbial inventory. Certain regions of space have low stellar density, and a prevalence of red and brown dwarfs (spectral classes L, T, Y, and sometimes M). If you blindly plot a route through such an area, the likelihood that your vessel will run out of fuel drastically increases. Use the filter to search for scoopable stars. O, B, A, F, G, K, and some class M stars are hydrogen rich, main sequence stellar bodies that can be used for refueling. Just remember this adage: "Oh, Be A Fine Girl- Kiss Me!" (**NB**: The Fuel Rats, an organization which offers emergency refueling to unfortunate pilots who run out, offer the alternate mnemonic of "KGB FOAM.")

NEUTRON/WHITE DWARF JUMPS:

You can use the magnetic cones emanating from neutron stars and white dwarfs to "supercharge" your ship's frame shift drive. Neutron stars provide a 300% boost, while white dwarfs are only able to add a meagre 50% to the maximum jump range of your vessel. The diagram below depicts the proper way to enter and exit the plasma jet (special thanks to CMDR MackTheHunter for his contribution).



1 ENTRY

FACE TOWARDS THE CENTER OF THE STELLAR BODY WITH BOTH MAGNETIC CONES TO YOUR LEFT AND RIGHT. SLOWLY BEGIN A VERY SHALLOW DESCENT INTO EITHER CONE, FACING AWAY FROM THE CENTER OF THE STAR.

BE MINDFUL, ENTERING THE CONE FACING TOWARDS THE STAR IS EXTREMELY UNSAFE AND CAN COST YOU YOUR SHIP, YOUR CREW AND YOUR OWN LIFE.

2 STABILIZATION

UPON ENTERING THE CONE YOUR SHIP WILL EXPERIENCE EXTREME AMOUNTS OF MAGNETIC FORCES FROM ALL DIRECTIONS.

IT CAN BECOME VERY DIFFICULT TO KEEP CONTROL OVER YOUR VESSEL. ADJUST YOUR THROTTLE ACCORDINGLY AND CORRECT YOUR TRAJECTORY AS NEEDED.

3 EXITING

ONCE YOUR FRAME SHIFT DRIVE HAS BEEN SUCCESSFULLY OVERLOADED, INCREASE YOUR THROTTLE AND EXIT THROUGH THE ENDPOINT OF THE MAGNETIC CONE.

GAIN SOME DISTANCE FROM THE CONE BEFORE ADJUSTING HEADING & BEGINNING WARP SEQUENCE.

GALACTIC CORE:

Many pilots travel to the supermassive black hole at the center of the Milky Way: Sagittarius A*. However, the extremely high stellar density in this region prevents most navigational computers from processing the usual 1000 LY routes. To avoid this, limit your plot distance to 500 LY or less when you approach within 5,000 LY of the core. Your systems will function much more smoothly, and crash less often.

BARNACLE FARMING:

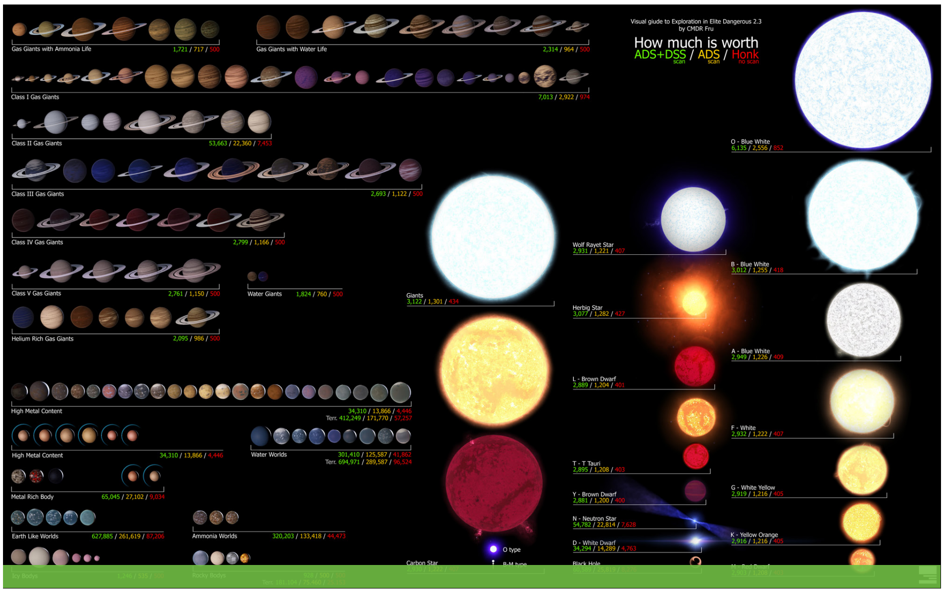
In recent years, the discovery of alien biological entities, colloquially called "barnacles," has triggered a number of security incidents between the major powers. A unique material known as "meta-alloy" is produced by these structures, and has been shown to outperform any other known combination of elements in terms of both strength and durability. Pilots from all across inhabited space have mined this resource incessantly, causing many of the barnacles to die out temporarily while their metabolic functions slowly repair the damage. Meta-alloys are useful for "curing" the peculiar technological infection that plagues orbital stations that become inundated with Unknown Artefacts- yet another mysterious alien object. The alloys are also required to access the services of certain engineers. At any rate, should you wish to visit the barnacles, this list of their known locations is a good place to start.

PASSENGER TRANSPORT:

The Pilot's Federation has recently given its members permission to partake in the tourism and transportation industry. Various cabins are now available, and can be installed on almost any medium or large vessel. Economy, Business, and First Class cabins are compatible with any ship that has at least one unused, size four internal compartment. Luxury cabins are also available, but only for the Dolphin, Orca and Beluga Liner. Most orbital stations have a constant stream of prospective passengers, who can be accessed via the passengers' lounge. Generally, the higher paying contracts will either require you to provide lavish accommodations, or to traverse great distances- sometimes, they will demand both. Each contract also comes with a few unique criteria, so be sure to read carefully before signing on the dotted line. Some of your passengers will become greatly displeased if you are scanned or incur a bounty, and this may reduce your earnings- or even worse, invalidate the contract.

DATA ACQUISITION:

As you venture far and wide, keep an eye out for new discoveries! The system map will provide you with everything you need to streamline the process. Each time you make a hyperspace jump, use your advanced discovery scanner to identify all of the system’s stellar and planetary objects. If needed, approach the main star and begin fuel scooping. Then, open up the system map and look for any rare, undiscovered items. You can determine whether something is undiscovered or not by hovering over it with your cursor; if a commander’s name appears in the description that pops up, the data for that object has already been logged by someone else. This doesn’t necessarily mean that you shouldn’t scan it, too- all data has a base value, regardless of whether or not it is a first discovery. However, if you happen to be the first pilot to conduct a detailed surface scan of a given object and sell the data, you will receive 50% more credits.



DISCOVERY VALUES:

To decide whether something is worth scanning, you should consider both its proximity and its cartographic value. This chart will help you identify bodies by their hologram, while this link will help you determine what type of objects you are looking at in your system map, as well as a rough estimate of their rarity. Undiscovered black holes, neutron stars, earth like worlds, and ammonia worlds are always worth scanning, regardless of how far away they are from the system’s jump-in point. Class IV and V gas giants, water worlds, and terraformable worlds of any kind should be scanned if you can reach them within a reasonable amount of time.

TERRAFORMABLE PLANETS:

In order to determine whether a planet is likely terraformable, look at the temperature of the star it orbits, as well as the distance between the two bodies. Most planets that fall within the circumstellar habitable zone (CHZ) of their system are candidates for terraforming. The Sun has a CHZ of about 400-600 light seconds (Earth is 500 LS away from Sol), but these measurements change drastically depending on the temperature of the parent star. An educated guess is usually the most efficient way to judge whether or not something is worth scanning, but the list below provides some certified estimates of CHZs to assist you.

Blue-white stars (class A and B): 800-1,200 LS
White-yellow stars (class F): 600-800 LS
Yellow-orange stars (class G): 400-600 LS
Orange-red stars (class K): 300-400 LS
Red stars (class M): 100-200 LS

Note that if a planet orbits any star in a system other than the primary stellar body, its orbital radius will not be visible until after it is scanned. Unfortunately, this means that there is no way to visually judge whether it might be terraformable from the system map.

NEUTRON FARMING:

By selecting only the “non-sequence” option in your galaxy map star filter, systems with neutron stars or black holes will become visible. The galaxy has a number of “neutron fields” in various locations that can be farmed for high value data. This practice is extremely useful if you wish to increase your exploration rank. The more credits you make by selling cartographic information, the faster you will be promoted.

BE PREPARED TO WITNESS SOME amazing sights as you push the boundaries of the great unknown; but for the love of Dave, **BRING A GODDAMN FUEL SCOOP!**

* * *

Chapter 6

Background Simulation

What's in this chapter?

1. *An overview of the background simulator and what it governs within the Elite: Dangerous galaxy.*
2. *A listing of important BGS states and their implications.*
3. *Methods of boosting influence including cartographic data sales, bounty hunting, bulk trading, and mission completion.*
4. *Methods of undermining influence including black market sales, murder, combat bond sales, and failing missions.*

> *You're in charge, but don't touch the controls.*
>
> *Russian Cosmonaut, Mir Space Station, 1996*

Background Simulation

WE SINCERELY APOLOGIZE (IN ADVANCE) for the immense headache that you will inevitably experience after reading through this next chapter of the manual. There's really no way to mitigate the complexity of a galactic system that determines the dynamic influence levels of every minor faction. Nevertheless, we will do our very best to organize all of this information in a way that is both convenient and succinct. If you have a question that isn't answered in this segment, the Diamond Frogs have composed a comprehensive BGS guide, which is kept up to date by their diligent numbers crew. It is a well organized and incredibly useful document.

OVERVIEW:

Every inhabited system contains one or more minor factions. These entities are, more or less, the political fabric of the galaxy. Every action taken by a commander in the Pilot's Federation (i.e., you) alters the influence levels of factions in a given system. The scope and nature of this impact is determined by a multitude of factors, but it is always a zero sum game. When one group gains influence, another group loses it.

These values can be obtained via the navigation tab of your holographic cockpit interface. The galaxy map provides information about the controlling faction of each system. You can see this by hovering over a star and selecting the overview tab. By clicking on the system map, you can also access a list of every local faction. Additionally, moving your cursor over a station or an outpost in this view will reveal the influence levels and faction authority for that sector. Each inhabited system has one main station or outpost, which is always overseen by the system's controlling faction. Additional structures can be owned by any of the other minor factions in the system, though it is also possible for a group to control more than one station.

In order to govern more than one system, a faction must accumulate enough wealth and influence to trigger an expansion. During this phase, they will be inserted into a nearby system (chosen by RNGesus). If the group is then able to increase their influence in the new system so that it surpasses that of the controlling faction's, one of two events will occur. Either an election will be held to determine whether the new faction has enough power to govern the system, or a war will ensue.

IMPORTANT FACTION STATES:

BOOM: A period of economic growth; trade increases influence at twice the usual rate.

BUST: A period of economic decline; trade has no effect on influence levels.

CIVIL UNREST: A period of public dissatisfaction; collected bounties increase influence at twice the usual rate.

FAMINE: A period of starvation; combat related tasks and missions have no effect on influence levels, but trade involving edible commodities increases influence at twice the usual rate.

OUTBREAK: A period of disease and panic; combat related tasks and missions have no effect on influence levels, but trade involving medicinal commodities increases influence at twice the usual rate.

LOCKDOWN: A period of martial law; influence levels remain static for the duration of the lockdown, and many station services become unavailable.

EXPANSION: A period of political ambition; wealth is expended to insert faction representatives into an adjacent system's bureaucracy.

INVESTMENT: A period of development; if no viable system can be found during a state of expansion, wealth will be accumulated to expand the faction's reach, in preparation for their next attempt.

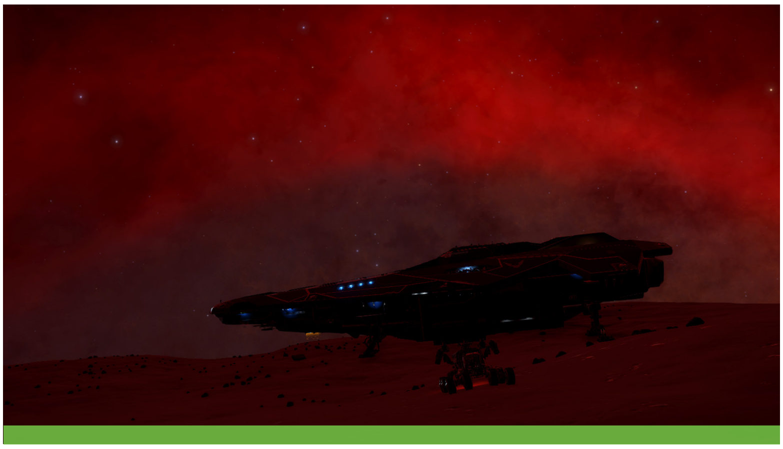
CIVIL WAR: A period of internal strife; if two factions' influence levels become roughly equal, they may clash for control of a station or outpost.

ELECTION: A period of political uncertainty; in some cases, system control can be determined "democratically," rather than through war.

WAR: A period of conquest; if a faction expands into another system and raises their influence above 60%, a war for control will usually ensue.

BOOSTING INFLUENCE:

There are a number of activities that have a positive effect on a specific minor faction's influence. However, by helping one group, you'll be indirectly hindering another. Because of this, influence-boosting tactics should be used carefully and intentionally. The following measures are generally used to bolster a group that is already holding the reins of a given system, in order to maintain the status quo (war is always the exception).



CARTOGRAPHIC DATA SALES:

This activity significantly increases the influence level of the faction that controls the station at which the sale is made. The maximum contribution per capita per day is approximately ten million credits of profit. Please contact an EXO operations officer if you are returning from a long exploration trip; they will be able to tell you which system(s) need an influence boost.

BOUNTY SALES:

Turning in bounties for the system's controlling faction contributes a small amount to their influence level, and also prevents or diminishes the effects and duration of both civil unrest and lockdowns. However, redeeming Federation, Empire, or Alliance bounties does not necessarily assist the controlling faction. Instead, it benefits any minor factions that are aligned with one of the aforementioned Superpowers. For this reason, EXO leadership requests that you turn in Superpower bounties outside of our faction's jurisdiction. The maximum contribution per capita per day is probably around five million credits of profit, though the exact amount is unknown.

COMBAT BOND SALES:

This activity significantly increases the influence level of the faction for which the vouchers were issued, and it also reduces civil unrest. Whenever EXO goes to war in a given system, it is crucial that you cash in as many combat bonds as possible to secure a decisive victory. If you don't know much about conflict zones, please refer to the earlier chapter on combat.

LEGAL TRADE:

Selling legal commodities at a station or an outpost owned by the controlling faction contributes a small amount to their influence level. Trade, in sufficient quantities, can also end an economic bust, initiate an economic boom, and prevent both famines and outbreaks. This increases the amount of profit that can be obtained from further sales within the system, and improves the controlling faction's probability of expanding.

COMPLETING MISSIONS:

By accomplishing tasks for a minor faction, you can significantly increase their influence in a given system.

UNDERMINING INFLUENCE:

These tasks are useful for upsetting the distribution of power in a given system. Although undermining is often considered distasteful, it can usually be justified as a preamble to the liberation of an oppressed minority. The basic function of these activities is to reduce the influence of a controlling faction, though they often includes aggressive measures for opposing all but one group in a system. Undermining can be used to cause war or election for control of a system.

SMUGGLING:

Just like legal trade, selling illegal commodities prevents economic busts and contributes to economic booms (unless the cargo happens to be weapons). However, it always works against the controlling faction, and decreases their influence in a given system.

MURDER:

The destruction of civilian ships that are aligned with a minor faction will significantly reduce that group's influence in a given system. The destruction of authority vessels, however, can only lower the controlling faction's influence. In all its forms, murder causes both civil unrest and system-wide lockdowns if the perpetrators are not brought to justice.

COMBAT BOND SALES:

Sometimes, enemy factions will engage in wars against neutral groups. By destroying hostile ships and cashing in the bounties, you can reduce the influence level of EXO's adversaries.

FAILING MISSIONS:

By accepting and failing missions from a minor faction, you can significantly reduce their influence level in a given system.

THE BGS IS EXTREMELY COMPLEX, and there are still many unknown elements in its mysterious gearbox of intricacy and terror. If you're ever unsure about whether a certain action will help or harm EXO, please contact one of our operations officers, or take a look at the expanded BGS guide linked at the top of this chapter.

* * *

Chapter 7

Powerplay

What’s in this chapter?

1. *An overview of the concept of powerplay.*
2. *Powerplay modules and their acquisition.*
3. *Assassination as a merit-farming technique.*
4. *Crime sweeps and military strikes on behalf of a powerplay faction.*
5. *Preparation, expansion, and fortification.*
6. *Links to further information on powerplay. EXO is independent of the galactic powers, so it does not come into play very much for EXO pilots beyond what is needed to acquire specialty modules, but further information is available by clicking the hyperlinks in this chapter.*

> *The sky is the daily bread of the eyes.*
>
> *Ralph Waldo Emerson, journal entry, 25 May 1843*

Powerplay

A FEW INDIVIDUALS IN THE bubble have acquired enough wealth and influence to effectively control vast swaths of space. Some of them are aligned with one of the three major factions: the Federation, Empire, or Alliance. However, there are also a number of powers that choose to operate independently. Members of the Pilot's Federation may pledge allegiance to any of these powers, and can access unique modules or hardpoints by earning "merits" to increase their rating. However, these rewards are only available to those who remain loyal to a single figurehead for at least four weeks. Powerplay is broken down into cycles, which last for seven days and reset each Thursday. While EXO is an independent faction, all of its pilots are free to support whichever power they choose. A complete list of Powers, as well as their exclusive rewards, can be found here.

OVERVIEW:

The intricacies of Power Play do not directly apply to the day to day operations of the Exodus Coalition. For this reason, we won't cover them in depth. However, if you want to know more, this guide is a good place to start. If you still have questions, here is an excellent post that may clear things up.

MODULE ACQUISITION:

Each Power has a unique module or hardpoint that is only available to commanders who 1) achieve rating 3 or higher, and 2) remain loyal to the faction for at least four weeks. In order to improve your PP rating, you'll need to farm merits, which act as a measure of your overall contribution the the goals of your Power's leader. These can be obtained a few different ways.

ASSASSINATION:

This is perhaps the most popular method for merit farming. First, find an anarchic system exploited by a hostile PP faction. For example, if you are pledged to Aisling Duval, any non-imperial pilots will be labeled as enemies. Once you've found such a place, look for hostile vessels in supercruise, and interdict them. You will receive 30 merits for every confirmed kill.

COMBAT:

When two Powers are vying for control over a given system, a special conflict zone will often appear. Usually, they will show up on your navigation panel as "crime sweeps," or "military strikes." You will receive 10 merits for every hostile ship that you destroy in these areas.

EXPANSION / FORTIFICATION:

You can also earn merits by transporting propaganda from either 1) your Power's home system to a fortification target, or 2) a control system to an expansion target. These can be viewed using the Power Play filter in your galaxy map panel. One ton of propaganda is worth one merit, though there is a limit to the amount of material you can withdraw at one time that corresponds to your rating. These limits can, however, be bypassed with credits if you wish to speed up the process.

Once you're done farming, don't forget to claim your merits at one of the PP faction's control systems. It takes a minimum of 750 merits to obtain rating 3, and your accrued balance will be halved each cycle. This means that you can't rest on your laurels. It is imperative that you wait at least three weeks before farming merits, so they don't go to waste.

SOME REWARDS ARE WORTH THE trouble of dipping temporarily into the world of Power Play, and others aren't. Prismatic Shields, for instance, are almost a necessity on large combat vessels, while the Mining Lance is an embarrassment of a weapon. However, many individuals enjoy contributing to the ever-changing landscape of the galaxy. While it may sometimes be mundane, PP does indeed have a significant effect on the layout of the human-inhabited bubble.

* * *

Chapter 8

Pilot's Advanced Course

What's in this chapter?

1. *Overview of seasonal updates to Elite: Dangerous including Horizons and The Guardians.*
2. *Planetary landing techniques and caveats.*
3. *Surface Recon Vehicle operation, surface prospecting guide, and waveform scanner explanation.*
4. *Engineers discussion, from basics of unlocking engineers and material collection to the generation of high-level upgrades with special effects and the use of favors.*
5. *Crew resource management for the purposes of ship-launched fighters and intergalactic tourism.*
6. *Additional information to be added as new updates are released.*

> BEEP...... BEEP...... BEEP...... BEEP......
>
> *Sputnik, October 1957*

Pilot's Advanced Course

WELL DONE, PILOT! YOU'VE SUFFERED through some pretty heavy reading. At this point, we've covered most of the basic flight mechanics, as well as some of the scientific and economic workings of the galaxy.

From this point onward, we will focus on some of the more complicated aspects of the game, which have been added by recent technological advancements such as "Horizons" and "The Guardians." These updates include landable planets, surface recon vehicles and surface prospecting, engineers who can upgrade your ship's stock modules, galactic tourism, and hirable NPC crews to operate ship-launched fighters.

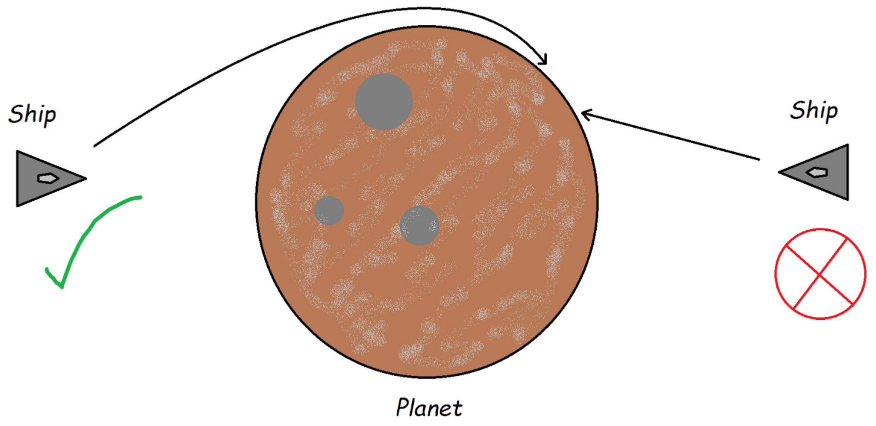
As new discoveries (read: game expansions) are released to the public, this section will be continuously updated. For this reason, we will move through the next segment's content in chronological order of release. Updates will be made public by way of announcements on Reddit, Twitter, Exowing.com, and The Weekly Dive, EXO's weekly periodical.

* * *

Planetary Landings

EVERY SHIP IS NOW MARKETED with a standard equipped Planetary Approach Suite (PAS), enabling them to approach and land on the surface of any non-atmospheric planet. These are denoted by a small, blue arc in the System Map. Once you've found a planet to land on, you'll need to follow a series of steps to ensure a safe descent. **Note: if you want to drive around on the surface of a planet, you'll need to outfit your ship with a Surface Recon Vehicle (SRV) Bay, and stock it with at least one SRV.**

To land on a planet, you must first select it as a target, and approach it while in supercruise. Keep your throttle in the blue region to avoid a high velocity warp collision. Once you get within a certain distance, you will enter Orbital Cruise, and your HUD will change to reveal a new instrument in the center of the screen. The largest part of this readout is the Heading Display, which indicates your elevation in degrees above or below the horizon. To the right of that display, there is a vertical slider which indicates your current altitude above the planetary surface. Try to maintain a heading of less than 25 degrees below the horizon. Once you hit a certain altitude (this varies depending on the mass and diameter of the planet), you will drop from Orbital Cruise and enter Glide Mode, which is a transition phase between hyperspace and subspace flight. If your heading is too steep and your altitude begins to drop quickly, or if your throttle is set above the blue region, you run the risk of traveling too fast to enter Glide Mode. If this occurs, you will drop out of supercruise high above the surface, which will limit you to the top speed of your subspace drives for the remainder of the descent.



Continue to maintain a heading of less than 30 degrees below the horizon throughout your glide. At an altitude of around 7km, your ship will drop out of Glide Mode and transition to its subspace drives. Be very cautious for the remainder of your descent, as the gravity of the planet will cause your vessel to handle differently. In addition to your thrust indicator, your PAS also provides a vertical speed indicator, which will turn yellow or red if you are in danger of splattering into the planet. Planets, of course, have differing degrees of gravity- a factor which may take some time to become accustomed to.

When approaching a planetary station, the procedures are no different than those used for docking at an orbital station. If you plan to land on the surface of the planet itself, however, you will need to find a suitably smooth area. To do this, approach the surface slowly, and cut your speed to just a few meters per second. Deploy your landing gear, maintain a heading parallel to the horizon, and use vertical thrusters to control your altitude. Your radar screen will be replaced by a surface layout, which will show a blue ship and orange terrain. When sensors detect a surface that is flat enough for landing, the terrain will turn blue, as well. At this point, gently descend onto the surface using your vertical thrusters. Continue until your landing gear locks with the planet surface- an event denoted by a HUD notification, clunking noises, and the sounds of your ship's engines powering down. To take off again, simply apply upwards thrust until your drives are fully spooled.

DON'T BE UPSET IF IT takes you a few tries to get the hang of things! Landing on a planet is a skill that comes with practice. Mistakes will be made, and rebuys will be paid; but before you know it, you'll be gliding in like a pro.

* * *

Surface Recon Vehicle

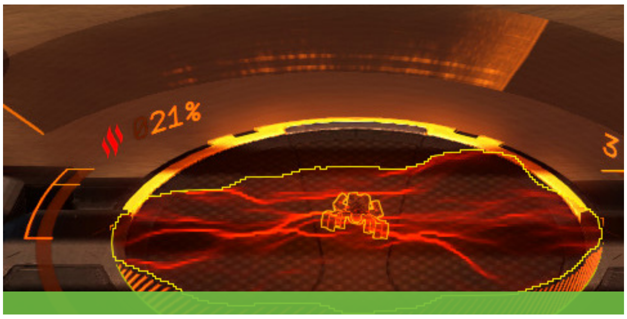
OKAY, YOU'VE LANDED; NOW WHAT? Hop in your SRV and gallivant around the planet, of course! An SRV, or Surface Reconnaissance Vehicle, is a small buggy stored inside a special bay on board your ship. In order to drive an SRV around the planet, you'll need to outfit your vessel with an SRV Bay, and stock it with an SRV. Currently, there is only one variety of SRV, called the Scarab; so don't go to other stations seeking different models!

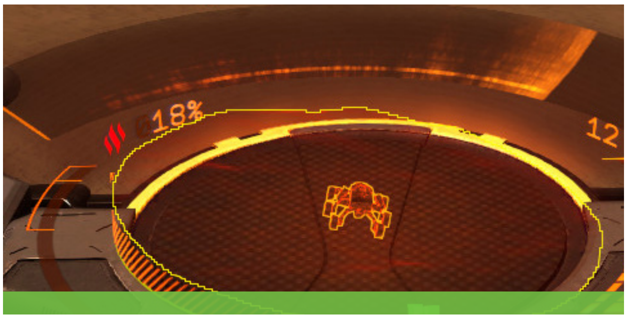
BASIC OPERATION:

Once you've got an SRV or two aboard your ship- and you've landed safely- look down to interact with your planetary hangar computer, which is directly below your main HUD. Tab over to the SRV menu and choose "deploy." You will then enter your SRV and drop out of the bottom of your ship. You are now free to cruise around! Driving the SRV is fairly intuitive, but bear in mind that your SRV will be damaged by rolling or dropping with force onto the surface, regardless of whether its shields are active. To mitigate hard falls, your SRV has a vertical thruster which can be used to slow your descent. Once you've driven far enough away from your ship, it will leave the planet surface, but it can be recalled using the SRV computer directly below the main HUD. You can also dismiss your ship here, which is a good way to prevent it from being destroyed by hostile pilots in your absence. To return to your ship, approach it from the rear, and under the glowing orange light. Then, use the SRV computer to initiate the stowage sequence.

SURFACE PROSPECTING:

Exploring planets by prospecting for materials and commodities on the surface is the primary function of the SRV. Thankfully, your vehicle comes standard equipped with a wave scanner to detect anomalies. However, it can be difficult to identify objects until you've grown accustomed to the patterns of lines and noises that the scanner makes. But let's not get ahead of ourselves. Before you even land on a planet, you should already know which materials can be found on it. As long as you've conducted a detailed surface scan, this information will be available in your system map. Once you've found a rock that looks promising, you'll need to find as many mesosiderites and metallic meteorites as possible. Both of these manifest themselves as lower, scratching sounds when detected by your scanner. Below are examples of the line patterns:





When you discover one of these sources, drive towards the center of the bar(s) until you see a white square appear on your terrain map. Lock onto this object, and fire your plasma repeater at it until it shatters. The rock will break apart, releasing a variety of materials that can be scooped up by your SRV. Should you experience bad luck finding either of these points of interest (POI), try driving into a different topographical region. For example, if you can't find anything useful in a hilly area, try searching in a flatter one. If you are having difficulty using the wave scanner and aren't sure which noises and line patterns correspond to a specific object, you can learn more about interpreting the wave scanner using this online utility.

COMBAT:

At this point in time, there really aren't any tried and true tactics to SRV combat. The best advice is to... well, not do it. If you find yourself beset by hostile ships while in your SRV, you may as well smile and wave, because you're going to die. However, some missions require data to be downloaded from surface outposts, or for certain core systems to be dismantled. An SRV is often the quickest and easiest tool for these types of jobs. Some outposts possess security measures, which often include skimmers and goliaths- two types of armed, robotic sentries. If you find yourself face to face with these in an SRV, the best way to deal with them is by switching to turret mode. The location of the control for this will vary based on your key mapping. Once initiated, this mode will give you control of your plasma repeater, and allow you to slew it independently from the rest of the SRV. This makes targeting enemies much, much easier. Additionally, make sure you lock onto hostiles before engaging them, so that the turret can use its aim--assist functionality. Continue moving around if you're being attacked- the SRV's shields and hull are not strong enough to take much punishment.

NEVER DEPLOY YOUR SRV IN orbit. I really shouldn't have to say that, but it's happened. Seriously. EXO pushes the boundaries of human achievement, but we don't want any of you to be on the receiving end of a Darwin Award. Stay on the laughing end.

* * *

Engineers

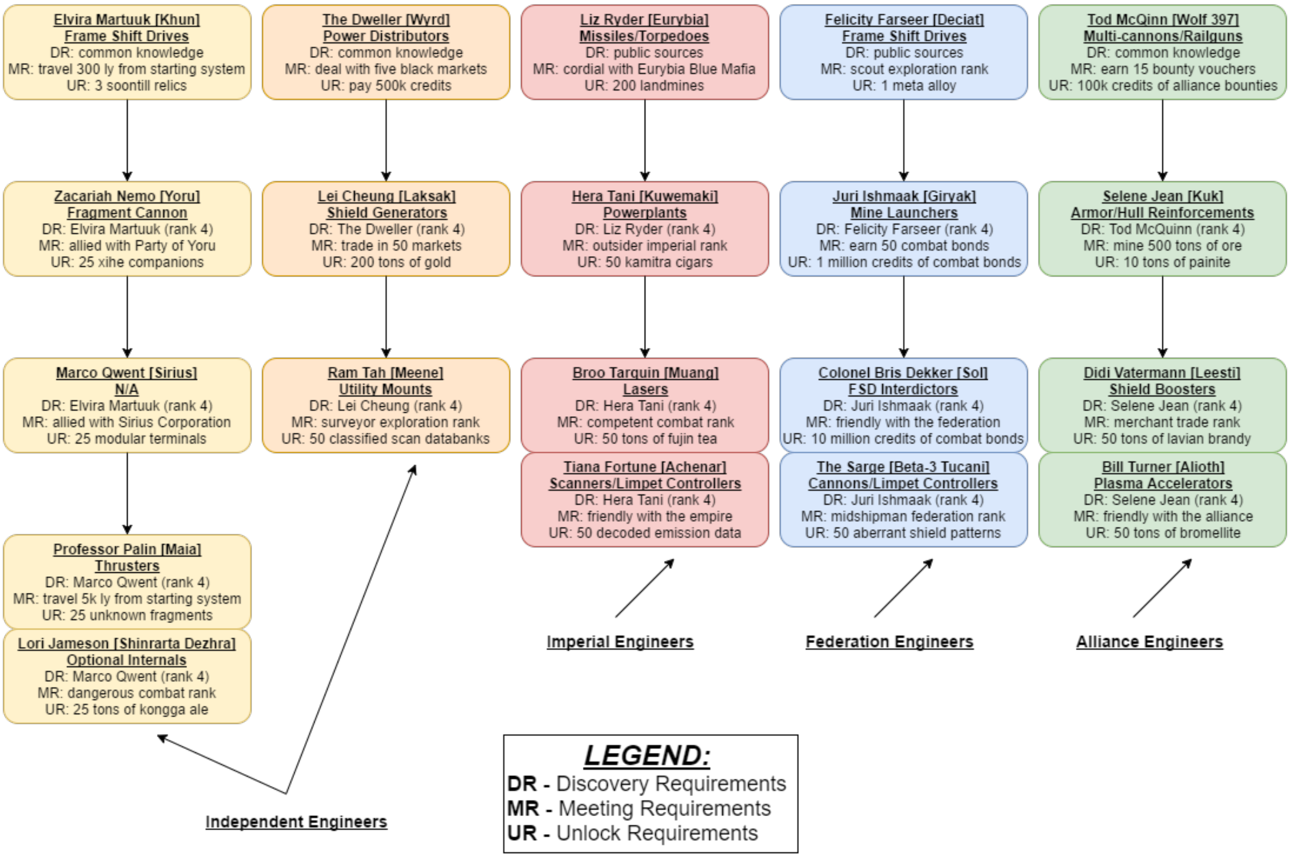
I CAN'T SEE THE FUTURE, but I can predict one thing with absolute certainty: if this is your first time diving into the hell that is engineering, you're about to lose a lot of salt. Most of it will leave your body in the form of tears, but a good deal of it will be poured into social media outlets. Trust me, we've all been through it. Nevertheless, the modifications that can be obtained from these reclusive experts are truly incredible. They'll take your ship farther, make it faster, and protect it better than you ever thought possible. This portion of the manual will provide you with the information you need to make good use of the engineers' various services, but keep one thing in mind: you will still have to invest hundreds of hours into the process if you want the results to be satisfactory. For real- if you currently enjoy what you're doing, please don't involve yourself with the engineering process. It will ruin your life.

OVERVIEW:

The basic principle behind engineering is simple: if you befriend the right people and collect the necessary materials, they'll perform an upgrade on one of your ship's modules or hardpoints. The execution of this principle, however, is incredibly complicated. Each engineer has a specific set of requirements that must be met before you can earn their trust. Some cannot even be found at all until you've networked your way into their sphere of influence; and although each one of them has a unique skillset, many of their services overlap with one another. For this reason, it's extremely important that you form a plan before initiating the grind- it's not dissimilar to making a list before going grocery shopping. Engineers can provide better upgrades as you improve your reputation with them- either by crafting lower tier upgrades, or by contributing to their station economically (i.e., cartographic data, trade, or bounty/combat vouchers). Check the link provided in the next section to see which of these three activities apply to a given engineer.

MEET THE EXPERTS:

So who exactly are these engineers you've heard so much about? Good question! If you need detailed information, this link is probably your best bet. However, we have also provided a flowchart below for quick reference. Note that many engineers will only become available if you rank up your reputation with their acquaintances. Even if you don't particularly want a certain upgrade, you may still have to grind through a couple engineers in order to unlock the services you're interested in.


Elvira Martuuk [Khun]
Frame Shift Drives
DR: common knowledge
MR: travel 300 ly from starting system
UR: 3 soontill relics
The Dweller [Wyrd]
Power Distributors
DR: common knowledge
MR: deal with five black markets
UR: pay 500k credits
Liz Ryder [Eurybia]
Missiles/Torpedoes
DR: public sources
MR: cordial with Eurybia Blue Mafia
UR: 200 landmines
Felicity Farseer [Deciat]
Frame Shift Drives
DR: public sources
MR: scout exploration rank
UR: 1 meta alloy
Tod McQinn [Wolf 397]
Multi-cannons/Railguns
DR: common knowledge
MR: earn 15 bounty vouchers
UR: 100k credits of alliance bounties
Zacariah Nemo [Yoru]
Fragment Cannon
DR: Elvira Martuuk (rank 4)
MR: allied with Party of Yoru
UR: 25 xihe companions
Lei Cheung [Laksak]
Shield Generators
DR: The Dweller (rank 4)
MR: trade in 50 markets
UR: 200 tons of gold
Hera Tani [Kuwemaki]
Powerplants
DR: Liz Ryder (rank 4)
MR: outsider imperial rank
UR: 50 kamitra cigars
Juri Ishmaak [Giryak]
Mine Launchers
DR: Felicity Farseer (rank 4)
MR: earn 50 combat bonds
UR: 1 million credits of combat bonds
Selene Jean [Kuk]
Armor/Hull Reinforcements
DR: Tod McQuinn (rank 4)
MR: mine 500 tons of ore
UR: 10 tons of painite
Marco Qwent [Sirius]
N/A
DR: Elvira Martuuk (rank 4)
MR: allied with Sirius Corporation
UR: 25 modular terminals
Ram Tah [Meene]
Utility Mounts
DR: Lei Cheung (rank 4)
MR: surveyor exploration rank
UR: 50 classified scan databanks
Broo Tarquin [Muang]
Lasers
DR: Hera Tani (rank 4)
MR: competent combat rank
UR: 50 tons of fujin tea
Tiana Fortune [Achenar]
Scanners/Limpet Controllers
DR: Hera Tani (rank 4)
MR: friendly with the empire
UR: 50 decoded emission data
Colonel Bris Dekker [Sol]
FSD Interdictors
DR: Juri Ishmaak (rank 4)
MR: friendly with the federation
UR: 10 million credits of combat bonds
The Sarge [Beta-3 Tucani]
Cannons/Limpet Controllers
DR: Juri Ishmaak (rank 4)
MR: midshipman federation rank
UR: 50 aberrant shield patterns
Didi Vatermann [Leesti]
Shield Boosters
DR: Selene Jean (rank 4)
MR: merchant trade rank
UR: 50 tons of lavian brandy
Bill Turner [Alioth]
Plasma Accelerators
DR: Selene Jean (rank 4)
MR: friendly with the alliance
UR: 50 tons of bromellite
Professor Palin [Maia]
Thrusters
DR: Marco Qwent (rank 4)
MR: travel 5k ly from starting system
UR: 25 unknown fragments
Lori Jameson [Shinrarta Dezhra]
Optional Internals
DR: Marco Qwent (rank 4)
MR: dangerous combat rank
UR: 25 tons of kongga ale
Imperial Engineers
Federation Engineers
Alliance Engineers
Independent Engineers
LEGEND:
DR - Discovery Requirements
MR - Meeting Requirements
UR - Unlock Requirements

HUNTING FOR INGREDIENTS:

While some engineering commodities can only be obtained as mission rewards, most of the materials necessary for crafting your upgrades can be found scattered across the galaxy. This database is an excellent resource for locating them. Don't be discouraged if you can't seem to find a particular item; it often helps to shift your focus for a while, and come back to what you were doing after a refreshing break from the monotony.

RAW MATERIALS:

You'll need to go surface prospecting in order to find most raw materials. This database can be used to find planets that contain a specific element. Raw materials can also be obtained by mining, though there is little available information regarding the kinds of elements that can be found in various planetary rings. The best strategy, therefore, is to use the aforementioned database to find a planet with a relatively high concentration of the material you need, land on it, and begin surface prospecting. Rarer materials are more likely to be found in Metallic Meteorites and Mesoidorites, while more common materials are more likely to be found in Outcrops and Bronzite Chordites. If you're having trouble finding anything in your SRV, please reference the earlier discussion in this chapter about surface prospecting for some useful tips and tricks.

MANUFACTURED MATERIALS:

These components can be found in a multitude of locations, which vary based on their type and rarity. The table below is organized alphabetically, and designates all possible methods for obtaining the currently relevant engineering ingredients. The recommended options, which are printed in red for your convenience, were chosen from a significant (but NOT infallible) pool of experience. Inara is also an extremely useful resource for finding and tracking your materials.

Manufactured Material	Type	Location(s)
Biotech Conductors	Very rare	Mission reward
Chemical Distillery	Standard	Ship salvage (transport ships), Combat aftermath (high security), Resource extraction site
Chemical Manipulators	Rare	Ship salvage (transport ships), Combat aftermath, Surface POI
Chemical Processors	Common	Ship salvage (transport ships), Combat aftermath (high security), Mission reward, Resource extraction site
Compound Shielding	Rare	Conflict zones, Encoded/High grade emissions (high security), Mission reward
Conductive Ceramics	Standard	Ship salvage (transport ships), Combat aftermath (anarchy)
Conductive Components	Common	Ship salvage (transport ships), Combat aftermath (anarchy)
Conductive Polymers	Rare	Ship salvage (transport ships), Combat aftermath, Surface POI, Mission reward
Configurable Components	Rare	Ship salvage (transport ships), Combat aftermath (low security)
Core Dynamics Composites	Very rare	Conflict zones, High grade emissions (federation space)
Electrochemical Arrays	Standard	Conflict zones, Ship salvage (authority ships), Degraded/Encoded emissions (anarchy)
Exquisite Focus Crystals	Very rare	Mission reward
Focus Crystals	Standard	Conflict zones, Degraded/Encoded emissions (high security), Resource extraction site
Grid Resistors	Very common	Conflict zones, Ship salvage (authority ships), Degraded emissions, Mission reward
Heat Conduction Wiring	Very common	Ship salvage (transport ships), Combat aftermath, Mission reward
Heat Dispersion Plate	Common	Ship salvage (transport ships), Combat aftermath, Mission reward
Heat Exchangers	Standard	Ship salvage (transport ships), Combat aftermath (anarchy)
Heat Vanes	Rare	Ship salvage (transport ships), Combat aftermath, Mission reward
High Density Composites	Standard	Ship salvage (authority ships), Degraded/Encoded emissions (low security), Resource extraction site
Hybrid Capacitors	Common	Conflict zones, Ship salvage (authority ships), Degraded emissions, Mission reward
Imperial Shielding	Very rare	Mission reward, High grade emissions (imperial space)
Improvised Components	Very rare	High grade emissions (systems in civil unrest), Mission reward
Mechanical Components	Standard	Ship salvage (transport ships), Combat aftermath (low security)
Mechanical Equipment	Common	Ship salvage (transport ships), Combat aftermath
Mechanical Scrap	Very common	Ship salvage (transport ships), Combat aftermath, Mission reward
Military Grade Alloys	Very rare	High grade emissions (systems in civil war), Mission reward
Military Supercapacitors	Very rare	High grade emissions (systems in war), Mission reward
Pharmaceutical Isolators	Very rare	Encoded/High grade emissions (systems in outbreak), Mission reward
Phase Alloys	Standard	Conflict zones, Degraded/Encoded emissions (low security)
Polymer Capacitors	Rare	Conflict zones, Ship salvage (authority ships), Encoded/High grade emissions, Mission reward
Precipitated Alloys	Standard	Conflict zones, Ship salvage (authority ships), Mission reward, Resource extraction site
Proprietary Composites	Rare	Conflict zones, High grade emissions (federation space), Mission reward
Proto Heat Radiators	Very rare	Encoded/High grade emissions (systems in boom), Mission reward
Proto Light Alloys	Rare	Encoded/High grade emissions, Mission reward, Resource extraction site
Proto Radiolic Alloys	Very rare	High grade emissions (systems in boom)
Refined Focus Crystals	Rare	Encoded/High grade emissions (high security), Mission reward, Resource extraction site
Salvaged Alloys	Very common	Conflict zones, Degraded emissions
Shield Emitters	Common	Conflict zones, Degraded emissions
Shielding Sensors	Standard	Conflict zones, Degraded/Encoded emissions (high security), Mission reward
Thermic Alloys	Rare	Conflict zones, Mission reward
Unknown Fragments	Very rare	Destroy unknown artefacts located at pleiades sector AB-W B2-4 9A (-26.3772°, 97.6982°)
Worn Shield Emitters	Very common	Conflict zones, Degraded Emissions

If you encounter difficulties with any of the recommendations, don't be afraid to try something else on the list. Finally, you may notice a pattern in the table: most manufactured materials come from transport ships and conflict zones. For this reason, anarchies at war are often great places to spend some time "mat harvesting." By doing so, you'll often be able to acquire 75% or more of the items on your engineering recipes in a single system.

Please note that some of the rare (and very rare) materials will only spawn from destroyed combat/authority vessels with reasonable frequency if they are high ranking ships (i.e., dangerous or above). There is some anecdotal evidence that drops are determined not only by the type of ship (i.e, trade, combat, or authority), but also by the model (i.e., vulture, asp, t-7, etc.). For this reason, it may be useful to keep track of the materials you collect from various models, and seek out the same kind if you happen to need more in the future.

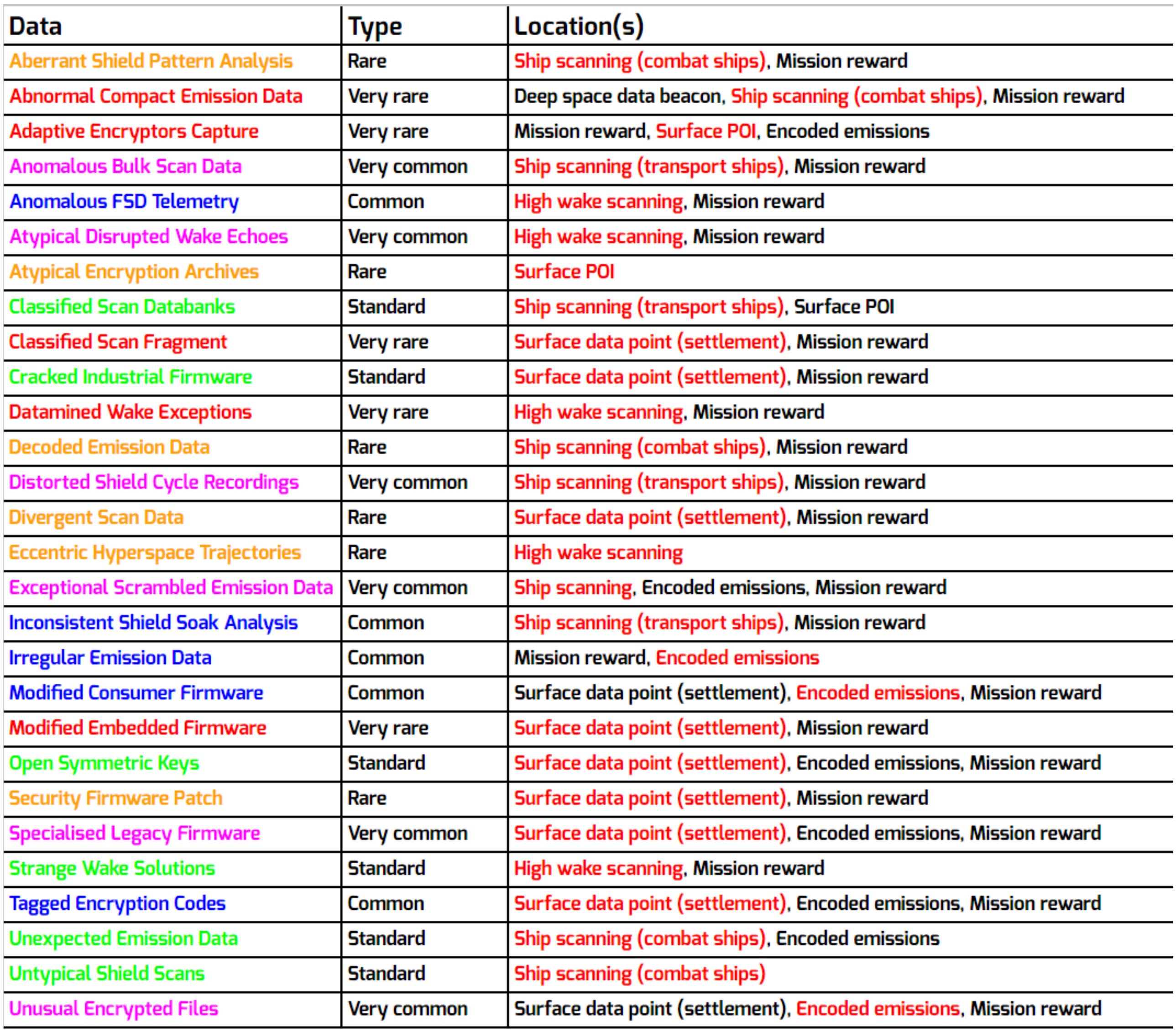
When searching for combat aftermath signal sources, try to stay within the system's trade lanes. These are essentially invisible routes between planets/stations that trade vessels use to transport their cargo efficiently. You will probably find these types of signal sources frequently as you hop between systems, so keep an eye out for them. They are nefariously hard to locate when you need them most.

Additionally, when looking for degraded, encoded, or high grade signal sources, fly a few thousand light seconds away from the main star. Vary your throttle, and change directions from time to time, but do not approach any planets. Continue this process in deep space until a signal source appears. If it's not the kind you're looking for, simply lock onto it and fly towards it with your throttle in the "blue zone." As you make your approach, more unknown signal sources will usually spawn around it.

DATA:
Some engineered upgrades require the use of unique information packages. Like other materials, data comes from many different sources. The table on the following page is organized alphabetically, and designates all possible methods for obtaining the currently relevant engineering ingredients.

Surface Data Point Scans are the way to find many of the more rare and useful types of data materials, and yet many pilots find this strategy very unfamiliar. Briefly, settlements on landable planets usually have a series of data points that, if all are scanned within a certain period of time, will provide data materials.

Surface data points come in many different shapes and sizes. However, the ones you're looking for are large (+++), medium security settlements of the industrial, scientific, or exploration layouts. Military settlements will kick the sh#$ out of you if you try to get anything from them. **A list of good settlements, as well as a step by step guide to scanning the data points within (and maps to assist you), can be found** **here.**



Data	Type	Location(s)
Aberrant Shield Pattern Analysis	Rare	Ship scanning (combat ships), Mission reward
Abnormal Compact Emission Data	Very rare	Deep space data beacon, Ship scanning (combat ships), Mission reward
Adaptive Encryptors Capture	Very rare	Mission reward, Surface POI, Encoded emissions
Anomalous Bulk Scan Data	Very common	Ship scanning (transport ships), Mission reward
Anomalous FSD Telemetry	Common	High wake scanning, Mission reward
Atypical Disrupted Wake Echoes	Very common	High wake scanning, Mission reward
Atypical Encryption Archives	Rare	Surface POI
Classified Scan Databanks	Standard	Ship scanning (transport ships), Surface POI
Classified Scan Fragment	Very rare	Surface data point (settlement), Mission reward
Cracked Industrial Firmware	Standard	Surface data point (settlement), Mission reward
Datamined Wake Exceptions	Very rare	High wake scanning, Mission reward
Decoded Emission Data	Rare	Ship scanning (combat ships), Mission reward
Distorted Shield Cycle Recordings	Very common	Ship scanning (transport ships), Mission reward
Divergent Scan Data	Rare	Surface data point (settlement), Mission reward
Eccentric Hyperspace Trajectories	Rare	High wake scanning
Exceptional Scrambled Emission Data	Very common	Ship scanning, Encoded emissions, Mission reward
Inconsistent Shield Soak Analysis	Common	Ship scanning (transport ships), Mission reward
Irregular Emission Data	Common	Mission reward, Encoded emissions
Modified Consumer Firmware	Common	Surface data point (settlement), Encoded emissions, Mission reward
Modified Embedded Firmware	Very rare	Surface data point (settlement), Mission reward
Open Symmetric Keys	Standard	Surface data point (settlement), Encoded emissions, Mission reward
Security Firmware Patch	Rare	Surface data point (settlement), Mission reward
Specialised Legacy Firmware	Very common	Surface data point (settlement), Encoded emissions, Mission reward
Strange Wake Solutions	Standard	High wake scanning, Mission reward
Tagged Encryption Codes	Common	Surface data point (settlement), Encoded emissions, Mission reward
Unexpected Emission Data	Standard	Ship scanning (combat ships), Encoded emissions
Untypical Shield Scans	Standard	Ship scanning (combat ships)
Unusual Encrypted Files	Very common	Surface data point (settlement), Encoded emissions, Mission reward

There is also a useful yet large and potentially cumbersome spreadsheet of all settlements here. To use the spreadsheet, click the "Filters" button, which appears next to the "Print" button on the toolbar, and select the type of firmware you are after. The general idea, however, is to scan all of the data points within the allotted time. Upon scanning the first beacon, the timer will start. The amount of time you have varies depending on the type of settlement. Make sure that you don’t scan any of the emergency alert beacons (your death will be swift), or become distracted by the core systems beacon (you’ll run out of time); the maps linked above will help you avoid them. Once you scan the final beacon, you will be awarded with a randomly assorted data package. Unfortunately, the settlements will not reset until the following galactic cycle.

Finally, it is highly recommended that you equip your “minivan ship” (whatever you use to hop around quickly and collect materials) with a frame shift wake scanner. Whenever you approach or leave a station, take a couple minutes to scan the high wakes- you’ll accrue some rare data over time, and save yourself from the grind of camping in one place for hours looking for datamined wake exceptions.

UPGRADE STRATEGIES:

The fastest way to rank up your reputation with an engineer is to craft module upgrades with them. Craft three modifications in each tier to unlock the next one. Even though you could theoretically reach tier 5 using nothing but tier 1 upgrades, it would take you around two years to do it. Once you've unlocked grade 5 modifications, the sky's the limit- as long as you can find the necessary components, that is. Usually, the ingredients needed for higher tier upgrades are more elusive. The most efficient way to improve your vessels is to choose one engineer at a time, make a list of all the components needed to reach rank 5, and conduct a single, massive scavenger hunt for all of them. Maximizing your reputation with the engineers is more than half the work; once you have access to the best available modifications, you can focus on collecting the rarer materials needed to perform those upgrades.

MODULES:

Wondering about what each module upgrade does, and which one you should choose? What follows is a brief guide to the various upgrades you can purchase. You'll see the module, the upgrades that are possible, which engineers offer the highest grade upgrades, and which experimental effects are available. Internal components also feature recommendations in green. These recommendations are meant for a standard combat build, though specialized builds or ships for other purposes than combat would certainly benefit from other combinations of upgrades.

CORE INTERNAL MODULES:

BULKHEADS (G5 available at Selene Jean):

- Blast Resistant - increases resistance to explosive weapons at the cost of resistance to kinetic and thermal weapons
- **Heavy Duty** - increases hull strength and modestly increases all resistances at the cost of increased mass
- Kinetic Resistant - increases resistance to kinetic weapons at the cost of resistance to explosive and

thermal weapons
- Lightweight - decreases mass and modestly increases all resistances at the cost of decreased hull strength
- Thermal Resistant - increases resistance to thermal weapons at the cost of resistance to kinetic and explosive weapons

FRAME SHIFT DRIVE (G5 available at Elvira Martuuk or Felicity Farseer):
- Faster Boot Sequence - FSD charges faster at the cost of module integrity, power draw, and heat
- **Increased Range** - increased jump range at the cost of module integrity, mass, and power draw
- Shielded - increased integrity and heat at the cost of reduced jump range and increased mass

LIFE SUPPORT (G4 available at Lori Jamison)

EXO
GUTAMAYA

- **Lightweight** - decreased mass at the cost of module integrity
- Reinforced - increased module integrity at the cost of mass
- Shielded - increased module integrity at the cost of heat

POWER DISTRIBUTOR (G5 available at The Dweller)
- **Charge Enhanced** - Significantly faster recharge at the cost of moderately reduced total capacity
- Engine Focused - Improved engine capacity and recharge rate at the cost of reduced system and weapon capacity and recharge rates
- High Charge Capacity - Increased system, engine, and weapons capacity at the cost of reduced recharge rates for all three
- Shielded - Increased module integrity at the cost of increased power draw.
- System Focused - Improved system capacity and recharge rate at the cost of reduced engine and weapon capacity and recharge rates
- Weapon Focused - Improved weapon capacity and recharge rate at the cost of reduced system and engine capacity and recharge rates

POWER PLANT (G5 available at Hera Tani)
- Armoured - Increased integrity and potential increase or reduction in heat efficiency, at the cost of increased mass
- Low Emissions - Improved heat efficiency at the cost of increased mass and reduced total power output
- **Overcharged** - Improved power generation at the cost of worsened heat efficiency and integrity

SENSORS (G5 available at Lei Cheung, Juri Ishmaak, Tiana Fortune, Bill Turner and Lori Jameson)
- **Lightweight** - markedly reduced mass at the cost of decreased scan angle and integrity
- Long Range - increased scan range at the cost of reduced scan angle and increased mass
- Wide Angle - increased scan angle at the cost of worsened range and power draw

THRUSTERS (G5 available at Professor Palin)
- **Clean** - Moderately increased speed, maneuverability, and heat generation at the cost of integrity and power draw
- **Dirty** - Markedly increased speed and maneuverability at the cost of integrity and significantly increased thermal load
- Reinforced - Increased integrity and reduced heat generation at the cost of mass, speed, and maneuverability

OPTIONAL INTERNAL MODULES

AUTO FIELD MAINTENANCE UNIT (G4 available at Lori Jameson)
- Shielded - increased integrity at the cost of power draw

DETAILED SURFACE SCANNER (G5 available at Lei Cheung, Juri Ishmaak, Tiana Fortune, Bill Turner and Lori Jameson)
- Fast Scan - increased scan rate at the cost of mass
- Long Range - increased scan range at the cost of mass
- Wide Angle - increased scan angle at the cost of mass

FRAME SHIFT DRIVE INTERDICTOR (G4 available at Colonel Bris Dekker)
- **Expanded Capture Arc** - improved effective angle at the cost of power draw and interdictor range
- Long Range - improved range at the cost of reduced capture arc and increased power draw and mass

FUEL SCOOP (G4 available at Lori Jameson)
- Shielded - Improved integrity at the cost of mass

HULL REINFORCEMENT PACKAGE (G5 available at Selene Jean)
- Blast Resistant - increases resistance to explosive weapons at the cost of resistance to kinetic and thermal weapons
- **Heavy Duty** - increases hull strength and modestly increases all resistances at the cost of increased mass
- **Kinetic Resistant** - increases resistance to kinetic weapons at the cost of resistance to explosive and thermal weapons
- Lightweight - decreases mass and modestly increases all resistances at the cost of decreased hull strength
- Thermal Resistant - increases resistance to thermal weapons at the cost of resistance to kinetic and explosive weapons

LIMPET CONTROLLERS (G5 available at Tiana Fortune and The Sarge)
- Lightweight - decreased mass at the cost of module integrity
- Reinforced - increased module integrity at the cost of mass

- Shielded - increased module integrity at the cost of heat

REFINERY (G4 available at Lori Jameson)

- Shielded - increased module integrity at the cost of power draw

SHIELD CELL BANK (G3 available at Lori Jameson)

- **Rapid Charge** - increased shield recharge rate and faster activation at the cost of reduced duration and slower boot up time
- **Specialized** - improved boot time and reduced heat generation at the cost of integrity and power draw

SHIELD GENERATOR (G5 available at Lei Chung)

- Enhanced Low Power - improved power draw and mass at the cost of integrity, with variable possible effects on total shield strength which are more favorable on lower-mass ships
- Kinetic Resistant - improved kinetic resistance and integrity at the cost of thermal resistance
- **Reinforced** - improved total shield strength and moderately improved resistances at the cost of worsened recharge rate and distributor draw - combine with shield boosters to maximize resistances and shield strength
- **Thermal Resistant** - improved thermal resistance and integrity at the cost of kinetic resistance - combine with shield boosters to maximize resistances and shield strength

UTILITY MOUNTS:

CHAFF LAUNCHER (G3 available at Ram Tah)

- Ammo Capacity - increased ammo capacity at the cost of mass and reload time
- Lightweight - improved mass at the cost of integrity
- Reinforced - improved integrity at the cost of mass
- Shielded - improved integrity at the cost of power draw

ELECTRONIC COUNTERMEASURE (G5 available at Ram Tah)

- Lightweight - improved mass at the cost of integrity
- Reinforced - improved integrity at the cost of mass
- Shielded - improved integrity at the cost of power draw

FRAME SHIFT WAKE SCANNER (G5 available at Tiana Fortune)

- Fast Scan - improved scan time at the cost of integrity and range

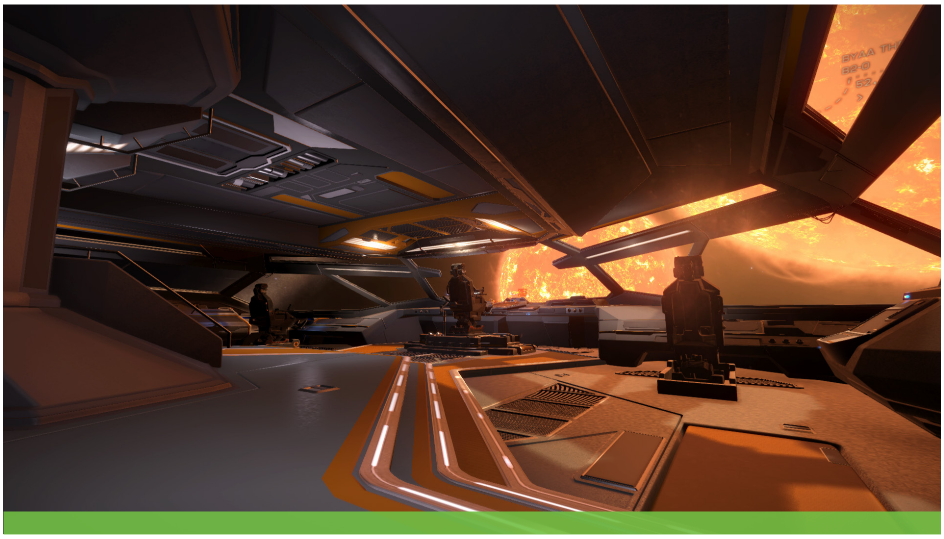
- Lightweight - improved mass at the cost of integrity
- Long Range - improved range at the cost of scan angle and power draw
- Reinforced - improved integrity at the cost of mass
- Shielded - improved integrity at the cost of power draw
- Wide Angle - improved scan angle at the cost of scan time and mass

HEAT SINK LAUNCHER (G3 available at Ram Tah)

- **Ammo Capacity** - increased ammo capacity at the cost of mass and reload time
- Lightweight - improved mass at the cost of integrity
- Reinforced - improved integrity at the cost of mass
- Shielded - improved integrity at the cost of power draw

KILL WARRANT SCANNER (G5 available at Tiana Fortune)

- Fast Scan - improved scan time at the cost of integrity and range
- Lightweight - improved mass at the cost of integrity
- Long Range - improved range at the cost of scan angle and power draw
- Reinforced - improved integrity at the cost of mass
- Shielded - improved integrity at the cost of power draw
- Wide Angle - improved scan angle at the cost of scan time and mass



MANIFEST SCANNER (G5 available at Tiana Fortune)

- Fast Scan - improved scan time at the cost of integrity and range
- Lightweight - improved mass at the cost of integrity
- Long Range - improved range at the cost of scan angle and power draw
- Reinforced - improved integrity at the cost of mass
- Shielded - improved integrity at the cost of power draw
- Wide Angle - improved scan angle at the cost of scan time and mass

POINT DEFENCE (G3 available at Ram Tah)

- Ammo Capacity - increased ammo capacity at the cost of mass and reload time
- Lightweight - improved mass at the cost of integrity
- Reinforced - improved integrity at the cost of mass
- Shielded - improved integrity at the cost of power draw

SHIELD BOOSTER (G5 available at Didi Vatermann)

- Blast Resistant - improved explosive resistance at the cost of kinetic and thermal resistance
- **Heavy Duty** - improved total shield boost and integrity at the cost of mass and power draw
- Kinetic Resistant - improved kinetic resistance at the cost of thermal and explosive resistance
- **Resistance Augmented** - improved resistances across all three categories at the cost of integrity and power draw
- **Thermal Resistant** - improved thermal resistance at teh cost of kinetic and explosive resistance

HARDPOINTS:

WEAPONS MODIFICATIONS ARE UNIQUE AMONG engineering upgrades in that they feature additional experimental effects which can be applied to each module. The experimental effects are just as important than the variety of upgrade. They happen spontaneously based on random chance, but you can also sacrifice two grades to generate the experimental effect of your choice. Therefore, the best way to upgrade your modules is to generate grade 5 modifications until you are satisfied with one, and then sacrifice the two grades for a "favor" from the engineer to get your desired experimental effect.

In the following section, weapon modifications are outlined as in previous sections, and experimental effects are listed afterwards.

BEAM LASER (G5 available at Broo Tarquin)

Modifications:

- **Efficient** - improved power draw, distributor draw and heat, with modestly improved damage
- Lightweight - improved mass, distributor draw, and power draw at the cost of integrity
- Long Range - improved range and damage fall-off at the cost of mass and power draw
- **Overcharged** - improved damage at the cost of reduced ammo clip size and distributor draw as well as reduced accuracy at grades below 5
- Short Ranged - increased damage at the cost of reduced range and worsened integrity and heat
- Sturdy - Improved integrity, armor piercing, and heat at the cost of mass

Experimental Effects:

- Concordant Sequence - A modification that causes weapon strikes to temporarily enhance the regeneration rate of a wingmans shield, at the cost of increased heat generation
- **Regeneration Sequence** - When the beam strikes a wingmans shield, it regenerates the shield instead of damaging it.
- Thermal Conduit - Experimental upgrade that increases damage output based on heat level of the firing ship.
- Thermal Shock - Articulated focus array designed to spread heat effectively. Strikes to shields and hull impart additional heat into the target.
- Thermal Vent - Experimental upgrade that increases heat dissipation when successfully striking a target, at the cost of increased heat generation when missing.

BURST LASER (G5 available at Broo Tarquin)

Modifications:

- **Efficient** - improved power draw, distributor draw and heat, with modestly improved damage
- **Focused** - improved range and armor piercing at the cost of rate of fire and heat
- Lightweight - improved mass, distributor draw, and power draw at the cost of integrity
- Long Range - improved range and damage fall-off at the cost of mass and power draw
- **Overcharged** - improved damage at the cost of reduced ammo clip size and distributor draw as well as reduced accuracy at grades below 5
- **Rapid Fire** - improved rate of fire, reload time, and distributor draw at the cost of damage and accuracy
- Short Ranged - increased damage at the cost of reduced range and worsened integrity and heat
- Sturdy - Improved integrity, armor piercing, and heat at the cost of mass

Experimental Effects:

- Concordant Sequence - A modification that causes weapon strikes to temporarily enhance the regeneration rate of a wingmans shield, at the cost of increased heat generation
- Inertial Impact - Experimental upgrade that increases damage and converts half of it to kinetic, at the cost of introducing aiming jitter.
- Phasing Sequence - A small amount of damage is able to bleed through shields and attack the targets hull directly, at the cost of minor damage reduction
- **Scramble Spectrum** - Experimental upgrade that allows hull strikes to potentially trigger random malfunctions on the target
- **Thermal Shock** - Articulated focus array designed to spread heat effectively. Strikes to shields and hull impart additional heat into the target.

CANNON (G5 available at The Sarge)

Modifications:

- Efficient - improved power draw, distributor draw and heat, with modestly improved damage
- High Capacity - improved maximum ammo and clip size at the cost of reload time, mass, and power draw
- Focused - improved range and armor piercing at the cost of rate of fire and heat
- Lightweight - improved mass, distributor draw, and power draw at the cost of integrity
- Long Range - improved range and damage fall-off at the cost of mass and power draw
- **Overcharged** - improved damage at the cost of reduced ammo clip size and distributor draw as well as reduced accuracy at grades below 5
- Rapid Fire - improved rate of fire, reload time, and distributor draw at the cost of damage and accuracy

- Short Ranged - increased damage at the cost of reduced range and worsened integrity and heat
- Sturdy - improved integrity, armor piercing, and heat at the cost of mass

Experimental Effects:

- Auto Loader - An experimental upgrade that automatically reloads the weapon, even when firing, at the cost of a reduced clip size.
- **Dispersal Field** - Experimental upgrade that causes successful strikes to temporarily confuse all gimbal and turret hardpoints on the target, at the cost of direct damage potential.
- Smart Rounds - Friend or foe targeting upgrade that causes rounds to self-destruct before damaging ships that are not currently targeted.
- Force Shell - A modification to allow firing of low explosive shells, designed to generate a propelling blast. Strikes to a target are capable of forcing ships off course, at the cost of shot accuracy.
- High Yield Shell - Modified munitions that convert a portion of damage to explosive, capable of hitting multiple internal modules if the attack breaches the hull, at the cost of a reduced fire rate.
- Thermal Cascade - Experimental munitions that interact with shields upon detonation, generating significant heat on the target. At the time of publication, Thermal Cascade Cannons are considered to be a cheap, dirty, broken mechanic, and a ship decked out with them is not befitting of an EXO pilot.

FRAGMENT CANNON (G5 available at Zachariah Nemo)

Modifications:

- **Double Shot** - improved number of shots per burst, burst rate, and clip size, at the cost of range
- Efficient - improved power draw, distributor draw and heat, with modestly improved damage
- High Capacity - improved maximum ammo and clip size at the cost of reload time, mass, and power draw
- Lightweight - improved mass, distributor draw, and power draw at the cost of integrity
- **Overcharged** - improved damage at the cost of reduced ammo clip size and distributor draw as well as reduced accuracy at grades below 5
- Rapid Fire - improved rate of fire, reload time, and distributor draw at the cost of damage and accuracy
- Sturdy - improved integrity, armor piercing, and heat at the cost of mass

Experimental Effects:

- **Corrosive Shell** - Experimental rounds that temporarily weaken hull hardness and increase all damage taken, at the cost of reduced ammo capacity.
- Dazzle Shell - Experimental shells that temporarily reduce a targets sensor acuity upon impact.
- **Incendiary Rounds** - Modified ammo system capable of delivering superheated rounds, increasing damage and converting a large portion to thermal.
- **Drag Munition** - Experimental munitions that disrupt engine exhaust flow on the target, temporarily preventing ENG power distribution from increasing thrust.
- Screening Shell - Modified firing and targeting mechanism, decreasing reload times and increasing effectiveness against munitions.

MINE LAUNCHER (G5 available at Juri Ishmaak)

Modifications:

- High Capacity - improved maximum ammo and clip size at the cost of reload time, mass, and power draw
- Lightweight - improved mass, distributor draw, and power draw at the cost of integrity
- Rapid Fire - improved rate of fire, reload time, and distributor draw at the cost of damage and accuracy
- Sturdy - improved integrity, armor piercing, and heat at the cost of mass

Experimental Effects:

- **Ion Disruptor** - Experimental munitions capable of disrupting a targets drives, causing them to reboot.
- **Overload Munitions** - Experimental munitions that converts a portion of explosive damage to thermal, at the cost of ammo capacity.
- Radiant Canister - Experimental munitions that apply significant heat to all targets caught in the blast radius. In addition, targets sensors are temporarily disrupted, at the cost of ammo capacity.
- Reverberating Cascade - Experimental munitions that overload shields on impact, directly damaging the shield generator.
- **Shift-Lock Canister** - Experimental munitions that cause all frame shift drives caught in the blast radius to reboot, at the cost of reduced damage.
- Emissive Munitions - Experimental upgrade that causes strikes to envelope the target in energetic particles, significantly aplifying its signature, at the cost of increasing heat generation for the attacker.

MISSILE RACK (G5 available at Liz Ryder)

Modifications:

- **High Capacity** - improved maximum ammo and clip size at the cost of reload time, mass, and power draw
- Lightweight - improved mass, distributor draw, and power draw at the cost of integrity
- Rapid Fire - improved rate of fire, reload time, and distributor draw at the cost of damage and accuracy
- **Sturdy** - improved integrity, armor piercing, and heat at the cost of mass

Experimental Effects:

- **Drag Munition** - Experimental munitions that disrupt engine exhaust flow on the target, temporarily preventing ENG power distribution from increasing thrust.
- Emissive Munitions - Experimental upgrade that causes strikes to envelope the target in energetic

particles, significantly aplifying its signature, at the cost of increasing heat generation for the attacker.
- Overload Munitions - Experimental munitions that converts a portion of explosive damage to thermal, at the cost of ammo capacity.
- Penetrator Munitions - Experimental munitions capable of penetrating hull to damage internal modules.
- **Thermal Cascade** - Experimental munitions that interact with shields upon detonation, generating significant heat on the target.
- **FSD Interrupt** - Experimental munitions that cause the frame shift drive on the impacted ship to reboot, at the cost of reduced damage.

MULTI-CANNON (G5 available at Tod "The Blaster" McQuinn)

Modifications:
- Efficient - improved power draw, distributor draw and heat, with modestly improved damage
- High Capacity - improved maximum ammo and clip size at the cost of reload time, mass, and power draw
- Focused - improved range and armor piercing at the cost of rate of fire and heat
- Lightweight - improved mass, distributor draw, and power draw at the cost of integrity
- Long Range - improved range and damage fall-off at the cost of mass and power draw
- **Overcharged** - improved damage at the cost of reduced ammo clip size and distributor draw as well as reduced accuracy at grades below 5
- **Rapid Fire** - improved rate of fire, reload time, and distributor draw at the cost of damage and accuracy
- Short Ranged - increased damage at the cost of reduced range and worsened integrity and heat
- Sturdy - improved integrity, armor piercing, and heat at the cost of mass

Experimental Effects:
- Auto Loader - An experimental upgrade that automatically reloads the weapon, even when firing, at the cost of a reduced clip size.
- **Corrosive Shell** - Experimental rounds that temporarily weaken hull hardness and increase all damage taken, at the cost of reduced ammo capacity.
- Emissive Munitions - Experimental upgrade that causes strikes to envelope the target in energetic particles, significantly aplifying its signature, at the cost of increasing heat generation for the attacker.
- **Incendiary Rounds** - Modified ammo system capable of delivering superheated rounds, increasing damage and converting a large portion to thermal.
- Smart Rounds - Friend or foe targeting upgrade that causes rounds to self-destruct before damaging ships that are not currently targeted.
- Thermal Shock - Articulated focus array designed to spread heat effectively. Strikes to shields and hull impart additional heat into the target.

PLASMA ACCELERATOR (G5 available at Bill Turner)

Modifications:

- **Efficient** - improved power draw, distributor draw and heat, with modestly improved damage
- Focused - improved range and armor piercing at the cost of rate of fire and heat
- Lightweight - improved mass, distributor draw, and power draw at the cost of integrity
- Long Range - improved range and damage fall-off at the cost of mass and power draw
- **Overcharged** - improved damage at the cost of reduced ammo clip size and distributor draw as well as reduced accuracy at grades below 5
- Rapid Fire - improved rate of fire, reload time, and distributor draw at the cost of damage and accuracy
- Short Ranged - increased damage at the cost of reduced range and worsened integrity and heat
- Sturdy - Improved integrity, armor piercing, and heat at the cost of mass

Experimental Effects:

- Dazzle Shell - Experimental shells that temporarily reduce a targets sensor acuity upon impact.
- **Dispersal Field** - Experimental upgrade that causes successful strikes to temporarily confuse all gimbal and turret hardpoints on the target, at the cost of direct damage potential.
- Phasing Sequence - A small amount of damage is able to bleed through shields and attack the targets hull directly, at the cost of minor damage reduction.
- **Target Lock Breaker** - Experimental upgrade that breaks target lock on successful strikes.
- Thermal Conduit - Experimental upgrade that increases damage output based on heat level of the firing ship.

PULSE LASER (G5 available at Broo Tarquin)

Modifications:

- **Efficient** - improved power draw, distributor draw and heat, with modestly improved damage
- **Focused** - improved range and armor piercing at the cost of rate of fire and heat
- Lightweight - improved mass, distributor draw, and power draw at the cost of integrity
- Long Range - improved range and damage fall-off at the cost of mass and power draw
- **Overcharged** - improved damage at the cost of reduced ammo clip size and distributor draw as well as reduced accuracy at grades below 5
- Rapid Fire - improved rate of fire, reload time, and distributor draw at the cost of damage and accuracy
- Sturdy - Improved integrity, armor piercing, and heat at the cost of mass

Experimental Effects:

- Concordant Sequence - A modification that causes weapon strikes to temporarily enhance the regeneration rate of a wingmans shield, at the cost of increased heat generation
- **Emissive Munitions** - Experimental upgrade that causes strikes to envelope the target in energetic particles, significantly aplifying its signature, at the cost of increasing heat generation for the attacker.
- Phasing Sequence - A small amount of damage is able to bleed through shields and attack the targets hull directly, at the cost of minor damage reduction
- **Scramble Spectrum** - Experimental upgrade that allows hull strikes to potentially trigger random malfunctions on the target
- Thermal Shock - Articulated focus array designed to spread heat effectively. Strikes to shields and hull impart additional heat into the target.

RAIL GUN (G5 available at Tod "The Blaster" McQuinn)

Modifications:

- **High Capacity** - improved maximum ammo and clip size at the cost of reload time, mass, and power draw
- Lightweight - improved mass, distributor draw, and power draw at the cost of integrity
- Rapid Fire - improved rate of fire, reload time, and distributor draw at the cost of damage and accuracy
- **Short Ranged** - increased damage at the cost of reduced range and worsened integrity and heat
- **Sturdy** - improved integrity, armor piercing, and heat at the cost of mass

Experimental Effects:

- **Feedback Cascade** - Rail slug energy charging mechanism, designed to interfere with shield cell operation. Strikes to a target deploying a shield cell will damage the shield cell bank and reduce shield cell restoration, at the cost of reduced damage from smaller rounds.
- Plasma Slug - Experimental upgrade allowing plasma slug ammo to be generated directly from ship fuel, at the cost of reduced damage.
- Super Penetrator - Experimental munitions that are capable of penetrating and damaging all modules along its trajectory, at the cost of increased reload times.

TORPEDO PYLON (G5 available at Liz Ryder)

Modifications:

- Lightweight - improved mass, distributor draw, and power draw at the cost of integrity
- **Sturdy** - improved integrity, armor piercing, and heat at the cost of mass

Experimental Effects:

- **Mass Lock Munition** - Experimental warheads incorporating frame shift technology. Successful detonation significantly inhibits charging for Supercruise.
- Penetrator Payload - Deep cut munitions are guaranteed to penetrate upon impact with hull and are capable of damaging multipe internal modules.
- Reverberating Cascade - Experimental munitions that overload shields on impact, directly damaging the shield generator.

SYNTHESIS:

Here's a little nugget of information that will blow your mind: you can use most of the materials found on planet surfaces to synthesize a multitude of things aboard your ship! From ammunition, to FSD range boosts, to SRV field repairs, you can do it all. If you're curious, this page lists the available options, as well as the ingredients needed to produce them.

ALONG THE WAY, YOU MAY find that some of your lower tier upgrades do the trick, and that's okay! There are no universal goals for engineering, so as long as you're happy with the improvements to your ship, you may not feel the need to continue grinding. The key to all of this is taking frequent breaks; many a commander has hung up his flight suit over the emotional trauma of collecting modular terminals for days on end. Don't be a victim of the grind.

◆

Crew Management

BRINGING PILOTS TO WORK ABOARD your ship is a smart move, as long as you have a fighter bay for NPC pilots or extra seats for multicrew sessions. Crew members can man the turrets, pilot ship launched fighters, and the NPC crew can even manage your main vessel, should you wish to fly one of the tiny fighters yourself.

MULTICREW:

IT GETS LONELY IN SPACE, as any seasoned pilot can attest. Luckily, you don't have to go it alone. Researchers have recently advanced the field of holographic technology so greatly, that you can now maintain a telepresence in any ship across the galaxy- provided it has enough space. This has opened the door to new and exciting possibilities, as players are now able to assist one another in a variety of activities that were previously made difficult by the limitations of under-crewed vessels. Along with the new telepresence capability, recent hardware upgrades also improved the power distribution efficiency of all ships, allowing player crew members to assign an additional "pip" to any of the three core systems. Listed below are all possible crew positions, as well as some information about the roles and responsibilities of each.

HELM:

The helm pilots the ship, controls fixed and gimballed weapons, and directs NPC (non-player character) crew members. Only the owner of a vessel or a hired NPC may operate the helm.

PASSENGER:

Generally, this is nothing more than a placeholder for crew members who need to switch positions. A passenger can do virtually nothing to assist the helm. This role may, however, be useful for exploration or scouting, since the passenger is capable of functioning as a navigator by accessing the galaxy map and plotting routes.

GUNNER:

A ship's turrets, missiles, torpedos, and a small selection of other modules such as shield cell banks and heat sink launchers may be controlled by the gunner with the helm's authorization. To be successful, gunners must assign their own fire groups and bind the weapons control switch to an easily accessible key or button. The gunner station provides an additional "pip," which can be assigned at the discretion of the commander with that role.

FIGHTER CONTROL:

As long as the mothership is equipped with a fighter hangar, crew members can use them by selecting this role. In some of the larger vessels, two players can pilot fighters simultaneously. The fighter con station provides an additional "pip," which can be assigned at the discretion of the commander with that role.

NPC CREW:

NPC CREW MEMBERS CAN BE hired from any Crew Lounge available in the Station Services menu. You can hire up to three crew members at a time, but can only bring along one per fighter bay. The crew members that you have hired will follow you from station to station, and will be available to board your ship at any starport you visit, regardless of where they were hired.

WAGE SCALING:

Currently, prospective pilots are differentiated by their skill level, which can be anywhere from harmless to expert. To hire a crew member, you must pay them an initial fee that correlates directly with their skill; harmless pilots request 15,000 credits up front, while expert pilots require a 150,000 credit bonus. Additionally, each pilot must sign an employment contract, which dictates the percentage of your profit they will keep as wages. Although you can hire up to three crew members, only one of them can be active at any given time. However, even inactive members of your crew will receive a share of your profit, so it is inadvisable to employ more than one at a time. Additionally, crew members can improve their level of competence by serving aboard your vessel during combat. For this reason, it is entirely possible to "train" a harmless pilot all the way up through the ranks, while keeping their wages at a much lower level than they would be if you hired a more experienced crew member directly. Though it may take some time and dedication, this method is preferable in the long run because it will save you a large sum of credits.

ISSUING ORDERS:

By using the console directly underneath of the radar HUD, you can command your crew member to perform various actions. This console is available on both your parent vessel and its ship launched counterpart. A special thanks to CMDR Masark for his contribution to this section.

ATTACK ORDERS:
These commands can be used to direct your crew member during a sortie.
DEFEND: Your crew member will engage hostiles only if you or they are fired upon (default command).
ATTACK TARGET: Your crew member will attack your target.
ENGAGE AT WILL: Your crew member will attack whichever target they believe to be the greatest threat.
MAINTAIN FORMATION: Your crew member will stay in formation with you and ignore any attacks.

MOVEMENT ORDERS:
FOLLOW ME: Your crew member will follow you closely (default command).
HOLD POSITION: Your crew member will hold their position.
RECALL FIGHTER: Your crew member will dock with the parent vessel (only available if you are piloting the parent vessel).
SWITCH: Your crew member will switch roles with you.

THE ACADEMY ENTRANCE EXAMS ARE rumored to have become something of a joke recently, so you may not be satisfied by the intelligence level of your copilot. However, there is one small measure of solace for you: should your ship be destroyed for any reason, there is only one escape pod on board. Obviously, you'll be using it.

* * *

Thank you!

You've now reached the conclusion of the Exodus Coalition Pilot's Guide. We sincerely hope that you've benefitted from the knowledge we've endeavored to share. This book was a labor of love for all involved, and we ask that if you find it useful, please share it with your friends and faction to help us disseminate it widely.

The guide is now in its second edition, and despite revisions and updates, we are likely to have missed some important tips and topics. If you feel that important information has been left out or would like to contribute to the writing of this guide, please feel free to get in touch with EXO leadership or author Aaron Starr. Thank you for reading, and fly safe, commanders!

Aaron Starr, Author

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