

LIGHT HAWKS

Light Hawks is a game of spaceship adventure, inspired by the *Knight Hawks* game created by Douglas Niles for TSR back in 1983. While the Light in *Light Hawks* can be taken as a reference to *Light Speed* or *Laser Light*, it was largely chosen because it sounds like Knight and the system itself is similar to yet lighter than the original *Knight Hawks* (which was considered pretty light for its time). If you are inspired by rocket science level mathematical equations then this isn't the game for you. While there is some math involved, there's not a single square root to be found within its pages.

Sorry about that (*but not really*).

With this said, *Light Hawks* along with its companion game *Free Frontiers* are *Real Playing Games*. Their goal isn't to simulate reality but give you the feeling of something real. To that end we did use the reality of space travel as an inspiration behind the game's mechanics and only cut corners to keep it playable. Ultimately, the purpose of *Light Hawks* is to get your *Free Frontiers* characters into space and give them a easy way of traveling between the stars. Do not trust it when it comes to actual rocket science.

Light Hawks does piggy-back on *Free Frontiers* so you should familiarize yourself with that game before attempting to play this one. Concepts like characters and percentile rolls are used here but not explained. Otherwise, keep reading. If you have ever dreamt of owning your own spaceship, you're going to like this.

What You Need

Free Frontiers. Our character-based RPG of sci-fi adventure. Consider it the core rules of the game. *Light Hawks* is an extension of them.

Polyhedral Dice. While you can get by with just a single set of polyhedral dice containing a d4, d6, d8, d10, d12, d20, and d00 the game plays best when each player has their own set of dice.

Paper & Pencils. The game is largely played with paper and pencil. It helps to have access to a printer as well as the internet. Download the Vessel Sheet pdf packet from our website at: <http://www.chameleondream.com/freefrontiers>

Maps and Minis? The original Knight Hawks was essentially a board game that used a map and chits. Light Hawks is more of an RPG with the option to play with maps and minis. You don't need minis to play the game but they do help.

Math. Knowing that sci-fi rpgs have a bad habit of going crazy with the math we've done what we can to keep it under control. Still, it doesn't hurt to have a calculator on hand, especially when creating ships.

Unless something says otherwise, **round down** any decimal the game leaves you with. *Just lop it off.* A 3.14159265358979 rounds down to 3.

Spacers. The galaxy is chock full of people who have never left the planet they were born on. They have lived their whole lives on that rock, will probably die on it, and they are fine with that. Then there are others, those saddled with a hankering for interstellar adventure. People who have no home world or cannot decide which world feels like home. They dream of space and are prone to wander for light years at a time. Some may even have started to suspect that their home is not on any one planet but out there in space, where the sky is always starlit and gravity comes and goes with the firing of an engine. These people we call **Spacers**. They have a culture all their own, and if you are reading this book?

That be you my friend.

That be you.

SAMPLE VESSEL

To get you started, here is a slightly used Adventure Scout we happened to have on hand for your party to take a spin in. Brand new spaceships can be quite expensive, but like all vehicles much of that sticker price is lost as soon as you blast off the lot. Thanks to the growing demand for private space travel, cheap old junkers can be found scattered throughout the cosmos. Some are in significantly better shape than others, so be sure to give any vehicle you come upon a complete overhaul before taking it out into space.

All sales are final!

[filled in vehicle sheet of a beat up Adventure Scout]

Name. The name of the ship, often emblazoned on its side.

Class. If the ship was modeled after some kind of stock ship such as the Adventure Scout, that is its class.

Hull. Hull size is a measure of how big it is from 1 to 20.

Captain. The name of the character in command of it.

Affiliation. The name of any group the ship is associated with.

Pilot. The score you check when piloting the ship. See *Piloting* in *Space Travel* for more on this.

INI. The die you roll to see who goes first in combat.

AD. AD stands for *Acceleration / Deceleration*. It is the most your ship can speed up or slow down in one turn.

TR. TR stands for *Turning Rate*. When using miniatures on a hex grid this is the total number of facings your vessel can turn over the course of a round.

Target. A measure of how hard or easy the ship is to hit in combat.

Speed. This is where you record your speed once the game starts moving. It is recommended that every time you change speeds you lightly erase the previous speed and write in the new one on top of it. Once that spot gets too smudged to use, move to the right and use that space instead.

Fuel. Every time you change your speed by 1 point, up or down, you burn 1 load of fuel. Mark this with roman hash marks to the right of your total fuel count.

Spaceships do not naturally slow down. Be careful not to accelerate to a speed that you do not have the fuel to slow down from. Otherwise you will have to hit the escape pods to keep from flying on at that speed into the infinite darkness forever.

Every time you burn 10 loads of fuel, add 1 point to the Maintenance Clock at the bottom of the page.

Attacks. These are the ship's weapon systems. Hit is what you roll to hit with it. DMG is the damage a single success does. Dir tells us the direction the weapon is firing in. Aspects tells us anything else we might want to know about the weapon. More on this will be covered in *Space Combat*.

Shields. These are the force fields you have protecting the ship. They work just like character force fields except they deal in heavy point damage.

Defenses. These are mostly masking screens that surround your ship in a protective cloud of ice crystals. ICMs are rocket pods you fire to intercept in-bound missiles.

Energy. Unlike a character's power supply, ships use **High-Energy Units**, also known as **HEU**, where each is equal to 100 of the EU used by characters. The number next to Energy is the maximum amount your batteries can hold. Drain on the power supply is kept track of using Roman hash marks to the right of it. Once your drain equals your battery capacity you are out of juice. Normal electronics will continue to work, but nothing requiring energy units will work.

Recharge Rate is the number of HEU your ship's engines recharge during combat. Think of it as the number of hash marks you erase at the end of each round.

Maintenance Clock. Spaceships need to be routinely overhauled to keep everything running ship-shape. Think of the maintenance clock as a measure of just how badly you are in need of an overhaul. Every **1 MC** is called an **hour**, and every ten hours put on the clock is cause for a roll on the Malfunctions table. *You do not want to do this.* See *Maintenance* in *Space Travel* for more.

Handling. This is a modifier which tells us just how hard it is to fly the ship. It should be factored into the ship's Pilot score when a new pilot takes command of the vessel.

Hull Points. The right side of the ship sheet is all about recording damage. It starts with space for keeping track of hull point damage.

Breach is the amount of damage it takes for an attack to breach your hull. This is used by boarding parties and attacks targeting specific parts of the ship.

Stressed is the amount of damage that it takes to cause the ship to start to buckle under the stress of movement. At this point, the ship's hull will take damage any time the ship changes speed or direction.

Destroyed is the total amount of damage the ship can take before breaking up, if not exploding.

Engine Damage. As your engines take damage it loses the ability speed up and slow down. Start with the largest AD and record damage backwards to AD 1. Every time you take enough damage to equal the number written beside the AD move to the next lowest AD. Once your AD 1 is gone your engines are shot and you can no longer change speeds or turn.

Note that this represents the total damage your engines can take. It is not the number of engines attached to your ship.

Components. Anything with an HP entry which isn't the ship's hull or engines should get an entry in the ship's Components list, especially weapons and ammo. Use the space on the back of the sheet just in case you run out of room.

All ammo, no matter what it is, has 1 hp per shot. Every time you fire off a shot mark it down as a point of damage. Once your ammo damage equals its hp the weapon is out of ammo.

SPACE TRAVEL

There are two kinds of travel when dealing with spaceships, *Engine-based* and *Hyperspace*. Engine-based travel uses controlled explosions to propel a vehicle through space by way of sheer force. Engine travel has greatly evolved over time but it could never seem to beat the vast distances that separate the stars.

Hyperspace travel is a relatively new phenomenon that uses something called a *Void Field Generator* or **VFG** to bend dark matter around a vehicle and remove the resistance which enforces the speed of light as the fastest anything can go. With hyperspace travel a ship seems to blink out of reality in one place and blink back in mere moments later somewhere else. This happens no matter how vast or obstructed the distance between the two places happens to be.

Ironically enough, hyperspace travel is a little too fast. It takes approximately 13.14159... seconds to travel one light year, making it nearly impossible to shut down the field and emerge from the void in exactly the spot you want to be in. You may end up close but there will always be a decent amount of engine-based travel left to go before you arrive at your destination. For this reason, void fields can only safely be used in the vast emptiness of space, lest you accidentally re-materialize inside something on re-entry.

The ship's pilot deals with the engines. The ship's astrogator deals with hyperspace travel. All ships come with a computer containing a powerful artificial intelligence to help maintain the ship. Outfit yours with a Piloting or Astrogation program and the computer can fulfill either position. Give it both and the ship can fly itself.

Piloting

Spaceship pilots need sharp minds, quick reflexes and nerves of steel. When you become a ship's pilot, combine your character's Base Pilot score along with your Space Pilot skill bonus as well as the ship's Handling modifier. Write the total in under Pilot on your ship sheet.

Pilot = Base Pilot + Space Pilot + Handling

What you have for a score needs to be 10% or greater for you to have any chance of flying the ship. The pilot score also gives us the ship's INI die. Any score greater than 100% uses the d12.

100: d12

75: d10

50: d8

25: d6

10: d4

INI is used to settle initiative in space combat. When command of the ship changes hands, both Pilot and INI should be recalculated to match whoever is at the helm. This includes handing control of the ship over to the ship's computer.

Computers. If your computer does not have its own stats (they can be characters in *Free Frontiers*) use the computer's level to find its Base Pilot score.

Level 1 = 10%

Level 2 = 20%

Level 3 = 30%

Level 4 = 40%

Level 5 = 50%

Level 6 = 60%

Level 6 = 70%

As for the Pilot skill it gets a +10 for each level of Pilot program. So a level 2 computer running a level 2 Pilot program will have Pilot 50% (that is Ability 30% + Skill 20) before the handling of the ship is factored in. The same thing should be done for any crew position the computer takes over such as Astrogator or Gunner.

Hyperspace Travel

Just as the ancient sea-farers used constellations to navigate the oceans at night, spacers use constellations to find their way around space. Only these are not constellations of stars but constellations of galaxies and quasars that have positions as fixed to the sky of our galaxy as stars are fixed to the sky of a planet. The problem is that these distant celestial bodies are generally fainter than stars and nearly impossible to identify with an atmosphere in the way.

Astrodomes. To do celestial navigation right you need to head out into space and do the astrogation there. All ships come with an astrodome which is a small computerized array of observational equipment suited to the task. It doesn't matter how good you are at astrogation, you won't get far without an astrodome. Anyone who jumps to hyperspace

without one will be permanently lost in space, jumping from place to place, always landing light years away from anywhere and unable to get their bearings.

Never leave home without an astrodome!

Destination. The farther away your destination is the harder the navigation becomes, taking a -1 for every light year of distance. No penalty is taken when traveling less than one light year.

Destination = -1 per Light Year of Distance.

Time. Even with the help of an astrodome making these observations and calculations takes at least 1 hour to do right. This can be sped up in an emergency but doing so will complicate the jump check.

Time Spent	Astrogation Modifier
1 hour	-0
40 minutes	-10
30 minutes	-20
20 minutes	-30
10 minutes	-40
1 minute	-50
10 rounds	-60

Ten rounds (thirty seconds) is as quick as it gets. At that point the astrogator isn't plotting a course so much as turning on the *Void Field Generator* and hoping for the best. It always takes at least six rounds for the VFG to create a field and go.

Jump to Hyperspace! Void Field Generators work by stretching normal space around a ship. You don't actually fire your engines to move. The field works by collapsing behind you, propelling the ship forward at a constant rate of 13.14159... seconds per light year. Unhindered by inertia or any sort of resistance, ships travel far faster than the speed of light. *Sometimes a little too fast.* The trick to astrogation is to tell the computer when to shut down the void field at precisely the right moment to keep from over-shooting your destination.

Check: 1/2 Intellect + Astrogation - Destination - Time.

3: 1d10 megs away.

2: 2d10 megs away.

1: 3d10 megs away.

L: 1d100 megs away.

H: 2d100 megs away.

C: Obliteration!

Meg is short for ***megameter***, one of which is equal to 1000 kilometers. This is used to figure out how long you will need to travel by engine to make that final leg of the journey. For more on this see the next section on *Engine Travel*.

Into The Void. The Void isn't a place. It's called the Void because after an initial blast of what appears to be streaking starlight, look out any porthole and all you will see is darkness. There is no way to navigate and you will not be able to see or communicate with anything beyond the void field, including other ships that may be jumping through hyperspace alongside you.

Inside the Void things get weird quick. Being separated from the rest of the universe, the fabric of space/time inside the ship easily distorts. Sounds will stretch, colors shift and pulse. People often report vivid hallucinations and wild dreams that last far longer than the actual time spent inside the void. Stay in there too long and the bonds that hold matter together slowly begin to dissolve.

Void Sickness. Gamewise every occupant, organic and digital, will take 1d6i in damage from entering the void and another 1d6i after every 10 light years traveled through it. The ship itself adds 1 hour to its maintenance clock. *Nothing protects against this.*

Light Years Traveled	Damage	Hours
0 to 10	1d6i	1 MC
11 to 20	2d6i	2 MC
21 to 30	3d6i	3 MC
31 to 40	4d6i	4 MC
41 to 50	5d6i	5 MC

So any trip through the void does 1d6i to each of the ship's occupants and puts 1 hour on the ship's Maintenance Clock. An eleven light year jump increases this to 2d6i and 2 MC hours. The trip itself takes roughly 143 seconds.

The Milky Way is approximately 100,000 light years wide. Anyone trying to cross it in a single jump would take 10,000d6i in damage, add 10,000 hours to the ship's maintenance clock, be gone for 15 days, and probably emerge as a loose stew of subatomic particles on the other end.

Void Hopping. Most Astrogators make a number of jumps to travel truly long distances, usually no more than 10 light years at a time. This lessens the destination penalty. It also lengthens the journey as it requires time between jumps spent finding ones bearings and making another astrogation check.

Gamewise, instead of telling us how far we are from our destination, void hopping sets us up with a modifier for the next jump.

S: Next Jump +5 per success.

L: Next Jump -10.

H: Next Jump -20.

C: Obliteration!

These bonuses and penalties **do not** accumulate. They only apply to the very next jump the ship makes. Only the very last jump the ship makes will tell us just how close it is to its destination.

Out of the Void. Despite the amazing speed at which void travel happens, there are no G-forces involved and the ship will emerge from the void with a burst of light but moving at the exact the same speed at which it entered it.

Unfortunately, space is not quite as empty as it may seem and there is always the chance that you might rematerialize from hyper-space inside a solid object or with something solid caught inside the ship itself. This often leads to *Obliteration*.

Obliteration! When an Obliteration result is rolled up, the Astrogator should make a Luck check to see just how much damage the ship has taken.

Check: Luck.

3: 1d10 damage.

2: 2d10 damage.

1: 5d10 damage.

L: 1d100 damage.

H: 2d100 damage.

C: Total Destruction!

Total Destruction means exactly that. The ship explodes and is gone. If the ship somehow survives then use the Hard Fail result of the previous check to figure out just how far it is from its destination or what its next jump modifier will be.

Engine Travel

There was a time before hyperspace travel when engines were the only way to get around. Most of this travel was confined to one's solar system. A few large generational ships were shot off to the near-by stars but most were never heard from again. Compared to hyperspace travel, engine-based travel is an exceedingly slow yet necessary way to get around.

Knauts. How long does a journey by engines take? That depends on how fast you travel. At what is known as Orbital Scale, speed is measured in **Knauts** where each is **6 megameters per hour**, aka 6000 kph. To give you a frame of reference, most modern jet fighters have a top speed of about 3000 kph or half a knaut.

- 1 Knaut = 6 megs per hour.
- 2 Knaut = 12 megs per hour.
- 3 Knaut = 18 megs per hour.
- 4 Knaut = 24 megs per hour.
- 5 Knaut = 30 megs per hour.

One nice thing about space is that once you speed up there is nothing to slow you down. However, both speeding up and slowing down burns fuel and spaceship fuel is both expensive and in limited supply.

Fuel Loads. A fuel load is the amount of fuel a ship burns to increase or decrease its speed by 1 knaut.

- 1 Fuel Load = 1 Knaut of Changed Speed.

Burn 5 fuel loads to reach 5 knauts of speed and you will be traveling 30,000 kph. At the end of the journey you will need to burn another 5 loads to slow down. It doesn't matter how far you travel, in the end it takes 10 fuel loads total to make the trip.

Are We There Yet? After coming out of hyperspace, should you find yourself with 17 megameters left to go, you could burn 2 fuel loads to make the journey with one knaut of speed. That is 1 fuel load to speed up to one knaut and 1 fuel load to eventually slow back down from it. One knaut travels 6 megs per hour so it will take a little less than three hours to complete the trip ($17 / 6 = 2.83$).

Burn 4 fuel loads to travel at two knauts (2 loads to speed up and 2 loads to slow down) i.e. *12 megs per hour*, and the journey will take a little over an hour ($17 / 12 = 1.41$).

Burn 6 fuel loads to travel at three knauts, *18 megs per hour*, and you can make the trip in just under an hour ($17 / 18 = 0.94$).

Speed Kills! No dice are rolled for long distance engine travel. Just figure out the fuel burn and go there. However! You should never accelerate to a speed you do not have the fuel to decelerate down from. The last thing you want is to speed up to 30,000 kph and have no way to slam on the brakes. Most ships will not let you do that since it means certain death for the crew.

Zero Speed. It's good to note that "zero speed" is not a full stop. Not unless you want it to be. Zero speed is any speed less than 1 meg per hour. Speeding up or slowing down in zero speed does burn some fuel, but like turning it does not burn enough to matter.

Maintenance Clock. All ships come with a maintenance clock. Every **10 fuel loads** you burn adds **1 hour** to the clock. Every time you amass 10 hours on the clock you need to roll on the Malfunctions table to see if anything has gone wrong. More on this will be covered later in *Maintenance*.

Docking

A space dock is a parking slip at a space station that a ship can float into, tie up at and stay for a while. Docking space is limited and the larger your vessel is the harder a time you will have finding a dock to fit it. Ships with a hull size of 10 or greater often have to pull into orbit somewhere near-by and use a shuttle craft to travel to and from the station.

Pulling into or out of space dock can be nerve-wracking. Typically it takes 1d10 minutes to do. When time is of the essence this can be shortened to 2d10 rounds for a **Pilot -10**. Docking requires slow meticulous movement and can only be done by a ship with a current speed of zero.

Check: Pilot

Mods: 1d10 minutes or 2d10 rounds at -10.

S: You do it!

L: Try again at -10.

H: Scrape does 1d10 damage to ship and station.

C: Slam does 3d10 damage to ship and station.

When trying to dock, a light fail will force you to circle around and try again, using up another stint of time leading to the docking attempt. Hard fail or crash and you hit the

dock with enough force to do some damage to both your ship and the station. *The dock master will not be happy!*

Unfortunately, inertia fields need to be lowered to dock a ship and cannot be used to protect the ship or the station one is docking at.

Landings & Take Offs

To make a landing or take-off from a solid surface your ship needs landing gear. Any ship attempting this without landing gear will take **5d10** to the hull of the ship. Inertia fields can protect against this but they only absorb half the damage. Otherwise, landing a spacecraft is a lot like docking one but a little less forgiving and with a few new factors to take into consideration.

Gravity. The heavier a planet's gravity is the harder it will be for both landings and take-offs. The modifier is a -10 per 0.5g of gravity where 1.0g is Earth-like gravity, and 2.0g is double Earth's gravity.

Gravity	Modifier
3.0g	-60
2.5g	-50
2.0g	-40
1.5g	-30
1.0g	-20
0.5g	-10
0.0g	-0

If a planet's gravity does not cleanly fit into these denominations, use whichever one comes closest. Treat a 1.7g as a 1.5g, and a 1.8g as a 2.0g.

Atmosphere. The atmosphere surrounding a planet can also present problems. Aerodynamically designed ships handle it better than Standard ones. The more cloud ridden and stormy the atmosphere is the harder it will be to fly through.

Atmosphere	Aerodynamic	Standard
None	-0	-0
Thin	-5	-10
Medium	-10	-20
Thick	-15	-30
Turbulent	-20	-40

Rough	-25	-50
Brutal	-30	-60
Hurricane	-35	-70

It takes about 1 minute to ascend or descend through one megameter of atmosphere. Slowing this down to 5 minutes per meg adds a +10 to the check. Speeding it up to 30 seconds per meg causes a -10.

Engine Types. Certain engines are better suited to landings and take-offs than others. **Chemical** engines are the most brutal and tend to shake a ship mercilessly. **Fusion** engines are far more forgiving and provide smooth slide in and out of the sky. **Fission** engines are a little worse and they irradiate the landing/take-off area. It will be unsafe to move through this radiation without a protective suit for as many days as the ship has points of Thrust. **Ion** engines will falter and fail if taken into any atmosphere thicker than thin.

Engine	Modifier
Chemical	-20
Fusion	+10
Fission	+0 (irradiates area, # of days = thrust count)
Ion	-10 for a thin atmosphere, -50 for everything else.

Landings. To land a ship on a solid surface make a Pilot check plus factors for gravity, atmosphere and engine type.

Check: Pilot + Gravity + Atmosphere + Engine Type

S: You land successfully!

L: Rough Landing, does 2d10 damage to the ship.

H: Hard Landing, does 5d10 damage to the ship.

C: Crash Landing! does 10d10 damage to the ship.

Take-Offs. Taking-off from a solid surface is almost as dangerous as landing on one. A light fail will give you another chance to get it right, otherwise your lift-off ends with the vehicle crashing back to the planet's surface.

Check: Pilot + Gravity + Atmosphere + Engine Type

S: You take off successfully!

L: Unsteady Flight! Try again at -10.

H: Hard Landing, does 5d10 to the ship.

C: Crash! Does 10d10 damage to the ship.

Fuel Burn. Landings always burn 1 load of fuel to control the descent. Take-offs require more fuel. You burn 1 fuel load for every megameter of atmosphere you ascend through multiplied by the planet's gravity.

Landing = 1 Fuel Load

Take-Off = Megameters Ascent x Gravity

The atmosphere of planet Earth is 10 megameters thick. With a gravity of 1.0g it takes 10 fuel loads for a take-off. Decrease the gravity to 0.7g and now it only takes 7 fuel loads.

Both take-offs and landings require a minimum of 1 fuel load, even in zero gravity with no atmosphere a take-off will burn fuel. Counter to this, it takes no fuel to dock at a space station. Yes the engines will fire a bit to move the craft around but not enough to matter.

SPACE COMBAT

Space combat is very similar to character combat with a few extra bells and whistles thrown in. It moves in rounds, each of which is just three seconds long, long enough for each crew member to do one thing. The pilot of the craft usually makes evasive maneuvers while the rest fire the ship's weapons. Unless something says otherwise, each weapon requires one character to fire it and can only be fired once per round.

Detection

Space is big and empty, making it very hard to launch a surprise attack. A ship's astrodome, when not helping the astrogator, will constantly monitor the ship's surroundings and notify the crew of any approaching ship, informing you of its:

Hull Size

Class

Current Speed

Affiliation

Obvious Damage State

Outstanding Weaponry

Beacon signals are often used to broadcast a ship's affiliation, usually an allegiance to a corporate or military force. Of course, beacons can be turned off or rigged to send out the wrong signal. For more on this see *Beacons in Adventure*.

Scanning. When deemed necessary, the astrogator can use the astrodome to scan an approaching ship, basically X-raying its contents. Only one ship may be scanned per round and that ship will notice it. Being scanned is often taken as a gesture of hostile intent. What you discover depends on a check made by the Astrogator.

Check: Sense + Astrogation.

4: Crew Size, Concealed Weapons & Shields.

3: Maintenance Clock. Remaining Power, Fuel and Ammo.

2: Alert Status, Shields and other Defenses, Outstanding Component Damage.

1: Hull Points and Engine Damage, AD, TR, Weapon Systems.

C: Fried the Astrodome!

Note that each success builds on the previous one, so at four successes you will know anything you could have learned with any lesser success, such as the ship's alert status or AD.

If the scanned ship is using a *Scrambler* the scan check will take a **-40** however there is no hiding the fact that a scrambler is in use, which means the ship is probably hiding something.

Hail the Ship. Analog signals can be used to hail any ship within range, opening up audio and video communication between the two bridges if desired. It is left to the ship being hailed to decide whether they want to respond with video, just audio, or not at all.

Red Alert! Red Alert is a warning the ship's captain gives to the crew to prepare itself for battle. How long it takes for the ship to respond depends on the size of the crew:

Crew Count Time To Readiness

1	0 rounds
2 to 5	1 round
5 to 10	2 rounds
10 to 20	3 rounds
20 or more	4 rounds

This is time *given* to the crew to prepare themselves, often by strapping into a battle station so they don't get tossed about like rag dolls by sudden changes in g-force. Any captain who enters combat before the time to readiness has passed should roll a 1d20 to see how many generic crew members have been lost.

01: None. **18:** 1 Lost. **19:** 2 Lost. **20:** 3 Lost.

If you don't have any generic crew members, have everyone on board make a **Luck** check. The lowest rollers take their place, being hit by **1d20b** in damage.

Sneak Attack! Two ways in which making an ambush in space is possible lies in either hiding behind an asteroid until an opponent is close enough to attack, or by using a cloaking field to make the ship mostly invisible. The Astrogator should make a **Sense Save + Astrogation** -20 if ones opponent is hidden behind an asteroid or a -40 when cloaked.

If successful the ship is noticed before it can attack. Otherwise a sneak attack can be made. During this round the crew of the ship under attack can do nothing but panic.

Initiative

Just like character combat, at the start of each round, the pilot of each ship rolls its initiative die. *There are no initiative modifiers.* The ship with the highest roll attacks first. Everyone on board that ship should make their action for the round. Once done the ship's initiative die is taken off the table and the next ship gets to go.

If a player or GM is in control of more than one ship they should roll one die for each die type used by the ships. So if three attacking ships all use a d8 the GM should roll one d8 and use the same roll for each ship.

When two or more player ships roll the same number they cordially decide who attacks first. When a player and the GM roll the same number, the player's ship always attacks first.

Surprise! During the first round of combat, any ship that has not gone to *Red Alert* and rolls a 1 for initiative has been caught by surprise. Take that ship's die off the table as the ship and its crew are unable to do anything during that round.

Beats? Beats still matter to each *individual* member of a ship's crew. This means that if a crew member spazzes out trying to do too many things at once it will only effect that character. The characters around that character may grow annoyed by their enthusiasm but they won't take a penalty from it.

Most ship activities take 1 beat to accomplish, so it is easy enough to have each crew member do one thing per round and ignore the matter of beats. However, a pilot attempting to make evasive maneuvers and fire a weapon would take 2 beats and both checks would suffer a -5 beat penalty.

Ship weapons are often fired from a console of sorts. Only one weapon can be fired by one character at a time and that weapon can only be fired once per round.

Movement

Unless you are using minis, range and distance are ignored. If you are close enough to fire on an enemy ship then they are close enough to fire on you. If you are looking for a bit more granularity to this extent, see the rules for *Miniatures*.

Current Speed. Speed is still a concern and unless the CM says otherwise, everyone starts with a current speed of zero. This is not the same as stopped. It just means that you are traveling 1 knaut or less.

Evasive Maneuvers. Evasive Maneuvers is where you boogie the ship about in an attempt to make her a harder target to hit. This is something the pilot does and it turns any attack made on the ship into a **Hit vs Pilot** challenge. Like a dodging character, it is a reaction, you do not need to win initiative to make evasive maneuvers. Just declare it when attacked and it will protect you from all attacks until the end of the round.

The big drawback to making evasive maneuvers is that the g-forces and erratic movement will jostle your own crew about, causing them to take a **-10** to everything they do from that point until the end of the round. By expecting what is coming, the pilot does not suffer this penalty.

Stress Damage. Take more than half of your ship's HP in damage and she becomes **stressed**. The ship has lost so much structural integrity it will begin to hatch stress fractures whenever it turns, changes speed, or attempts evasive maneuvers, providing its current speed is greater than zero.

Gamewise, any time a stressed ship does anything other than move in a straight line, it should take **Stress Damage** equal to half its hull size (minimum 1 point).

Stress Damage = $\frac{1}{2}$ Hull Size, minimum 1.

Outrunning an Opponent. When trying to outrun an opponent, speed does matter. AD is the most you can increase your speed in one round. Keep in mind that each point of AD used to speed up or slow down will burn 1 fuel unit.

For the actual outrun, at the end of each round, compare your current speed to the speed of your pursuer and jot down the difference. Once you have build up 20 points of speed difference you have outrun your opponent.

Jumping To Hyperspace. Ships with a Void Field Generator can attempt an emergency jump into hyperspace. At the very least this takes six rounds to do and is covered in *Hyperspace Travel*.

One thing which makes hyperspace confounding to the authorities is that unlike engine travel, once a ship disappears into the void there is no way to track them, discern which direction they shot off in, or figure out how far they went. Gone is gone, perhaps never to be seen again.

Attack

Each weapon on a ship can fire **once per round** and needs someone to aim and fire it. A ship's computer can multi-task but it suffers a -5 for every additional task it is asked to do per round. Piloting the ship or firing off a weapon it can do without problem. Ask it to pilot the ship and fire off three weapons and the computer will take a -15 for the three extra tasks.

Declare. Declare what weapon your character will fire and at which opponent. Energy weapons drain the ship's power supply every time they are fired. If you don't have the power for it, the weapon won't fire. Projectile weapons come with an ammo count. Every shot depletes this by 1 until empty. Gauss weapons drain your power supply and have a limited supply of ammo. Once out of either the gun won't fire.

Direction. A weapon's **Dir** is a two or three letter code that tells us the direction it fires in. The five direction codes are:

FF = Fires Forward

FL = Fires Left

FR = Fires Right

FS = Fires Stern (Rear)

RT = Rotating Turret

If any of these has a C before them that indicates a concealed weapon which takes 1 round to pop out of the ship's hull before it can be used. While an RT can fire in any direction, the other directions are fixed. When trying to outrun an opponent, you can only fire FS weapons at your pursuers or FF weapons if you are in pursuit. During a dog fight where no one is trying to outrun anyone all weapons may be used.

Targeting Locations. Normally, you aim at a ship, fire the weapon and the attack damages its hull when it hits. However, you may also try to attack specific parts of a ship but doing so will bring on a hit penalty:

Engines -10

Weapons -20

Shield/Screen Generators -20

Choose to do this and if the attack hits, it first needs to do enough damage to the hull to breach it. This is the ship's **Breach Point**. After that, any remaining damage enters the ship to destroy the targeted component.

Target. Nearly all ships come with a target modifier of some sort, making them harder or easier to hit. This will always apply to your hit roll, including attempts to target specific locations. So trying to target the engines on a small ship with a Target -10 will leave you with a Target -30 penalty.

Roll to Hit. Add up your modifiers and apply them to the Hit % of the weapon you are firing. Roll equal to or under the percentage and it hits. Success multiplies the damage the weapon does, which can be found under DMG.

Defend

Most spaceships are defended by force fields often called **shields**. They work the same way they do for characters but on a much larger scale. All ship shields deal in heavy point damage.

Albedo = protects against lasers.

Energy = protects against particle weapons.

Inertia = protects against solid objects like asteroids and rockets.

It takes one round and one character action to raise a ship's shields. At the end of that first round it will drain its burn number from the ship's power supply and use it to protect against all attacks made in the coming round. If the shield cannot get the HEU it needs it will shut down, leaving the ship vulnerable.

So if your ship has *Inertia 3d10* then its burn number is the number of dice rolled, in this case 3. During the round in which the shields were raised it offers no protection, but it does burn 3 HEU at the end of it. In the next round it will subtract 3d10 from every inertia based attack to come its way. The shield will continue to burn 3 HEU at the end of each round whether it is used or not. Should the power supply ever go empty the shield will drop and it will take another round to raise it back up again once the energy for it is there.

Armor? Ships do not have armor in the same way that characters do. You can reinforce a ship's hull to increase its hull points but that is about it. Some ships have a **Reflective Hull** which only takes **half** damage from laser fire.

Countermeasures. As a reaction you may launch countermeasures to try and destroy an inbound projectile. This is no easy feat. Make a Hit roll minus the following depending on the projectile.

Torpedo = -15

Assault Rocket = -20

Rocket Battery = -30

So a Laser Battery attempting to shoot down an in-bound Torpedo would make a Hit -15. Succeed and the missile is destroyed.

Interceptor Missiles or ICMs are clusters of small missiles designed to intercept an inbound projectile and cause it to explode before impact. One ICM can be launched against each attack. These are too small to do any damage as a weapon but gain a +10 when used as countermeasures.

Deploy Screens. Screens are essentially snow guns that spray a chemical mist around a ship which flash freezes into a cloud of crystals. It takes one round to deploy a screen before it can be used. Screens do not work inside an atmosphere. The targeting modifiers they create depend on the screen itself:

Albedo: Lasers -30

Electron: Electron -30, Proton +10

Proton: Proton -30, Electron +10

Flux: No Disruptor or Tractor Beams. However, Electron, Proton, Gauss Guns and Missiles get a +10

You can only have one type of screen deployed at a time. The cloud will stay with you as long as the ship does not turn, change speeds or attempt evasive maneuvers.

Attempting to fire a weapon through a screen that is currently protecting the ship will take the screen's penalty to the shot. Should the shot receive a bonus, that weapon will arc back to hit the ship for a single success of damage.

So firing an Electron Battery through an Electron Screen will take a -30. Firing a Proton Battery through an Electron screen will cause it to damage the ship that fired it. The one exception being Gauss and Missiles fired through a Flux screen. These will simply fly wildly off course and not hit anything.

Taking Damage

There is no damage type or wear & tear for ships. Instead they have a set amount of Hull Points representing the damage the ship can take with two different damage states.

Stressed. Once damage reaches this point the ship will start taking stress damage (equal to **half its hull size**, minimum 1) any time it turns or changes speed, providing its current speed is not zero.

Destroyed. Once the damage reaches this point the ship is destroyed. If it hasn't already exploded it will break apart into a flaming smatter of space junk and be gone.

Component Damage. Every hit will always do the ship's Breach point in damage to its hull. After that you get to choose where the rest of the damage goes. It could damage the engines, blow out some components or continue to damage the hull – just as long as it goes somewhere.

Engine Damage reduces your ship's AD, hindering its ability to speed up or slow down. Start with the greatest amount of AD and count backwards towards 1. Once AD 1 is gone your engines are shot and you can no longer accelerate, decelerate or turn.

Component Damage is recorded in the component table. You can distribute the damage anywhere, but once the damage equals an item's HP the component is shot and will no longer work. ICMs go off like fireworks but do no damage to the ship. Masking screens leak chemicals all over the place. Destroyed energy weapons simply cease to work.

Destroyed rockets and missiles explode doing a single success of damage to the ship. Battery packs and fuel cells will likewise explode only this time completely destroying the ship. It is highly recommended that you save these for last so you can go out with a bang.

Recoil

The Recoil phase is often called the *Recharge* phase because that is the major thing which happens to all ships. Otherwise they are the same thing. Anything that happens once per round is handled at the end of the round after everyone has gone.

Recharge. Your ship's **Recharge Rate** is the amount of energy drain you erase from your sheet at the end of each round.

MINIATURES

The miniatures rules are an extension of everything you just read about Space Combat. Even if you choose not to use them, often it helps to use miniatures for the sole purpose of keeping track of who is fighting who.

Time & Space. Probably the hardest thing to wrap ones head around when playing Light Hawks is just how big space is and how fast everything is moving. Miniatures help with this, but you are going to need a very large hex map as well as one miniature per ship.

1 Hex = 5 Kilometers.

1 Round = 3 Seconds.

Scaling Up. You may scale up to larger maps by increasing the size of the hex in tandem with the length of the round. The movement rules remain the same but combat cannot happen over such broad distances.

Hex Size	Round
100 Kilometers	1 Minute
1 Megameter	10 Minutes
6 Megameters	1 Hour
144 Megameters	1 Day

Mini Placement. When a battle happens, it is up to the CM to decide where the ships will start on the map. The hexes should be large enough to contain a single mini.

Dog Fighting Range. Note that 5 kilometers is a lot of space. When two or more vessels are in the same hex, mark that spot and move them off the map to a separate sheet of paper representing the hex as a whole. As long as they remain in that space they are at dog fighting range and distance no longer applies to them.

Detection. The only thing that changes with the detection rules is the distance at which detection can happen. Astrodomes will scan a ship's surroundings up to **20 hexes** out, aka 100 kilometers.

Movement. At the start of your turn, decide if you want to speed up, slow down or remain the same. Speed is measured in *Knauts* which is also a measure of *Hexes Per Round*. So if you are traveling with a speed of 5 Knauts you must move 5 hexes.

Changing Speed. AD is the most a ship can speed up or slow down in one round. Change your speed before moving the ship and write your new speed on the ship sheet. Mark off 1 spent fuel load per point of AD used.

Top Speed? Until you begin to approach the speed of light, there is **no top speed** for spaceships, but you **must** move your entire speed in hexes every round. If this moves you off the map it means you have left the battle, escaping into space, aka outrunning your opponent.

Of course, if your opponent persists in chasing you there is nothing stopping the CM from getting out a new section of map to deal with it. As with non-mini combat, if you can place **20 hexes** between yourself and the opposition you may escape.

Turning. A ship should always face the flat side of a hex (never a point). To turn you slide forward one hex and then pivot left or right to the desired facing.

[illustration]

TR is the total number of times per round that you can pivot while moving. If your speed is 1 or greater you may only pivot once per hex. With a speed of zero you may pivot more than once but are still limited by your TR to the number hex facings you can change.

A agile Adventure Scout with TR 4 can almost pivot a full circle, changing four hex facings per turn. At speed zero it can do this all inside of one hex. Meanwhile a clunky Heavy Cruiser with TR 1 can only pivot one hex facing at any speed.

While you do need to fire the engines to make a turn, unlike changing speeds this does not burn enough fuel to matter. If the damage state of your ship is **Stressed** or worse you will take stress damage to your hull with every pivot.

Evasive Maneuvers. Nothing changes with evasive maneuvers. However, it is good to realize that the evasive maneuvering happens *inside* a hex. It has nothing to do with the number of hex facings a ship has turned while moving.

Range. Range is the number of hexes separating you and your opponent. To find it, count the shortest route of hexes between the two ships, ignoring your own hex and including the hex your opponent occupies. Two ships in adjacent hexes are 1 hex apart. Two ships in the same hex are 0 hexes apart. When using miniatures on a map with 1 inch hexes it is often easier to use a tape measure and count inches instead of hexes.

[ill, 5 hex range]

R# is the effect of range has on a weapon's ability to hit. It is the number of hexes needed to bring on a Hit -5. A gauss gun with R3 will take a -5 for every three hexes it fires across.

RM# stands for **Range Max**, the number attached to it is the greatest number of hexes a weapon can strike across. A torpedo with RM8 cannot hit anything more than 8 hexes away.

Direction. Direction refers to a mini's placement on the map in reference to another and the way the ship is facing. As with normal combat it makes no difference when dog fighting in the same hex.

Countermeasures. Range does not matter unless you are in a different ship and trying to knock out a missile flying towards some other ship. In this case the range is the distance between your ship and the one you are trying to protect.

ADVENTURE

The Adventure section is for events and activities that only occasionally come up during the game.

Asteroids

Asteroid fields are broad stretches of space filled with floating clusters of rock. Trying to fly through an asteroid field requires a Pilot check. Firing off your weapons to help to clear out some of the rocks brings a bonus to the check equal to the amount of damage done in a single round. Opposing this is double your Hull Size. Succeed and you make it through without a scratch, fail and the ship takes some damage depending on your current speed.

Pilot + Damage Bonus - (Hull Size x 2).

1: Make it through without a scratch.

L: Take 5 points per knaut.

H: Take 10 points per knaut.

C: Take 15 points per knaut.

So if a ship with Hull Size 3 and Pilot 50% tries to fly through an asteroid field, it will have a $(50 - 6 = 44)$ a 44% chance of doing so. If it fires off its laser battery doing 8 points of damage, this will increase its chances to 52%.

Fail the check and if your current speed is 3 you take 15 points of damage from a light fail, 30 points from a hard fail, and 45 points from a crash.

Black Holes

Despite the name, black holes look a bit like stars lit up by the combusting gas clouds caught just beyond their event horizons. They come in every size imaginable, ranging from as big as a golf ball to as large as the center of a galaxy. *They are also incredibly dangerous.* Thankfully they are quite rare when compared to the vast expanse of space (of course, isn't everything?)

When using miniatures, small black holes often show up on a map as a bright spot of light inhabiting a single hex. Attacks cannot be made through the hex and anyone attempting to fly through it will be crushed into the singularity. Anyone attempting to fly

through a **hex adjacent** to the black hole should make a **Pilot check +5 per point of AD**. Fail and they get sucked in and destroyed.

Blackholes that are larger than one hex will have a broader event horizon and a greater pull on the surrounding area. Count the radius in hexes that the hole occupies and that is the number of adjacent hexes it will exert its pull into. So a black hole with a 2 hex radius will exert its pull two hexes beyond its border.

[ill]

Beacons

Ships often fly with radio beacons broadcasting their presence to the local area (10 hexes). Military vessels use a coded transmission that is hard to replicate and largely used to tell weapons like Mines and Seeker Missiles to stand down. Any vessel not broadcasting the right signal or **Command Code** will be seen as a potential enemy and attacked.

False Flag Operations. A character skilled with computers may attempt to change their ship's beacon to broadcast an enemy's signature. This is no easy feat with a success rate of **1/4 Intellect + Computer Skill**. It takes at least a minute to change the beacon's signal, as well as the captain's security clearance.

The CM should make this check in private and write it down as succeeding or not. The crew of a ship flying under a false flag will not know if it worked until they engage with the enemy and are not attacked. Changing the beacon back to its original signal is not a problem. No skill check is necessary but it still requires 1 round to do so.

Commandeering a Vessel. When taking over an enemy vessel, the ship's beacon can be quite easily turned off. Changing it to broadcast the command code of your affiliation can also be done if you have the captain's security clearance. This takes 1 minute to do and requires an **Intellect + Computers Skill** check, double hard if the technology is alien to the character doing the programming.

See also: *Mines and Seeker Missiles*.

Boarding Parties

A boarding party is where you grapple a ship, cut a hole in its hull, and send in commandos to take it by force. It's not the easiest thing to do, but when you consider

how much spaceships cost, it is a far more lucrative option compared to blowing a ship to pieces and sifting through the wreckage.

Grappling Gear. Your ship needs either a *Grappling Array* or *Tractor Beam* to grab the other ship. It takes **2d10 rounds** to reel the other ship in close enough to board it. A grappled ship can fire on its grappler while this is going on with a **Hit +20**, so you might want to knock out its weapons first.

Lampreys. Small ships, such as shuttlecraft, can attempt to land on a ship rather than grapple it. This takes a Landing check where failure does the same amount of damage to each ship. There also needs to be space on the ship being boarded to land on. See *Landings* and *Piggy-Backing* for more.

Cutting a Hole. Once attached, someone needs to take a cutting laser and cut a hole in the hull. Cutting lasers are fairly common pieces of equipment that do **1 HP of damage per round**. Once the ship's **Breach Point** is passed you have carved a way in.

Bulwarks. Don't put away your cutting laser just yet! The area beyond the hole will decompress as you cut through the hull. The ship's computer should respond to this by slamming shut the nearest bulwarks to cordon off that area. These are heavy duty doors, not much different from what is on an airlock. You will need to cut through them in the same way you cut through the hull.

While in theory you could attach a robocomkit and try to hack a door open, a ship that knows it is under attack should have no problem locking shut the door and cutting the power to any surrounding terminals.

If you don't have a map of the ship being boarded, expect to encounter **half its hull size** in bulwarks before reaching the command bridge.

Fighting Time! Now your forces can invade the ship. Don't expect the other crew to welcome you with leis. If anyone is left on board, the ship's computer will tell them exactly where you have breached the hull and where you are inside the ship. They will probably be setting up an ambush somewhere near-by.

Celestial Bodies

With a 5 km hex, most celestial bodies will be too huge to appear as anything other than a giant curve on a battle map. The Earth would take up 2,540 hexes. Its Moon takes up 680 hexes.

Technically you can go around a celestial body in any direction, but because our map confines us to a two-dimensional plane the rule is that you cannot fly or shoot through a celestial body. You need to go left or right to get around it.

As far as Light Hawks is concerned there are three things you need to know about a celestial body: its atmosphere, gravity and surface.

Atmosphere. Atmosphere is any body of air surrounding the planet. You need to know how many Megameters separate the surface of the planet from space (Earth has 10) as well as how turbulent it is which will effect spacecraft flying through it. The common levels are: *None, Thin, Medium, Thick, Turbulent, Rough, Brutal, Hurricane*. It also doesn't hurt to know just how hot, cold or breathable this atmosphere is.

Gravity. How much gravitational pull does it have? Earth is 1.0g. Double Earth's gravity is 2.0g. No meaningful gravity is 0.0g.

Surface. Eventually the air of the atmosphere gives out, what kind of surface lies beneath it? Is it rocky, watery, a mix of the two, volcanic?

[might be good to move this to the GM's section and outfit it with some random tables to handle those matters]

Customs

Most planets are set up with a number of security satellites that monitor ship traffic entering and exiting the atmosphere. Most will also have a space station or at least a remote ground base known as a *Customs & Immigration Station* which all visitors are expected to report to as quickly as possible. There the ship and its crew will be inspected, immunized, and quarantined when necessary. If all goes well the captain will be given a travel visa for a set amount of time. This includes a code to be programmed into the ship's beacon that will announce its permission as well as the length of its stay.

Any ship that does not comply and is caught by security satellites entering the atmosphere will be set upon by heavily armed guard ships and escorted to the CIS station to await inspection as well as a hefty fine for not following proper protocols.

Ports-O-Call. Because all of this can pose quite a hassle to those who are simply making deliveries, many of the more populous planets will have a space station or near-by moon-base known as a *Port of Call*. At a port-o-call (as they are more commonly called) a ship can make a delivery or pick up a shipment and only the items will be

inspected. Of course, the ship and its crew will not be allowed to leave the port to visit the planet. For that they need to go through the CIS just like everyone else.

Smugglers. While this sounds like a fairly airtight system of border management, it is good to remember that planets are very big places and not nearly as closely watched as they could be. A fast smuggler might be able to shoot past the security satellites, land on the planet's surface, make a delivery, take off and escape into hyperspace before anyone takes notice. Or they might be blown to smithereens which is the risk all smugglers take.

Damage Scale

Where characters in the *Free Frontiers* deal with Damage Points or DP, ships and equipment in *Light Hawks* deal with Heavy Points or HP. We don't often convert between the two but it can be done:

1 HP = 10 DP.

Try to use a laser pistol to damage a spacecraft and it needs to do at least 10 points of damage to destroy 1 hp. Hitting it with 9 points of damage or less does nothing. Likewise, hit a character with 3 points of damage from a ship's Laser Gun and it will do 30 points of damage. **Piercing** is the default damage type for ship weapons.

Decompression

Decompression is what happens when a part of a spaceship is suddenly opened to space. Any heat and air in the area will be sucked out of it, often carrying with it anything which is not nailed down. Characters caught in a decompressed area without a spacesuit will take 1d10m per round until dead.

Decompression = 1d10m per round.

This comes from a combination of factors (freezing cold, depressurization, solar radiation, etc) and does not include the problem of not having any air to breath. Which means a character will still take damage once per round even if they have access to an oxygen tank. Most of the time this will kill a character long before they get around to the problem of holding their breath in space.

Force Fields. Having an Energy Field up will protect against **half** of the damage caused by cold and radiation. An Inertia Field will help protect against the other **half** of the damage caused by depressurization. On the whole, it's probably best just to wear a space suit while out in space.

Equipment

Spaceships, especially the large ones, tend to carry far more stuff on board than anyone realizes - *Wrenches, Screws, Ladders, Rolls of Duct Tape, Blow Torches, Lava Lamps, Etc* - the way we handle this is with one component called **Equipment**. Its HP count tells us how many heaps of stuff you have on board. Every time it takes a point of damage you lose a heap of stuff.

When a character needs something, such as a roll of duct tape, they should make a Luck check. The success of this tells us how long it took to find it.

Check: Luck

3: You know exactly where it is!

2: 1d10 rounds to find it.

1: 1d10 minutes to find it.

L: 1d10 minutes to find the wrong thing, like a flat head when you needed a phillips head.

F: 1d10 minutes spent simply not finding the thing.

C: 1 hour to find a note reminding you to pick one up the next time you hit a store.

Fail the check and you get to try again providing you have more heaps of equipment to search through. So if you have three heaps of equipment you get three chances to find what you are looking for.

This check should be made hard or easy depending on just common the item is. It should not be used for anything truly rare, large or expensive, like a spare Laser Cannon.

Fortresses

Buildings should be treated like spaceships that landed and never took off again. In fact, *many are just that*. Their engines have been stripped down to generators, earth has built up around their edges and they are now a permanent structure.

Combat-wise this makes them sitting ducks. However, by not having to deal with the rigors of space travel they have more room to work with, which means fortresses will often be found bristling with weapons and protected by force fields.

Atmosphere. Masking screens and particle weapons will not work unless the fortress is on a planetoid with no atmosphere. Otherwise the atmosphere itself will provide a decent amount of protection against attacks from space.

Atmosphere	To Hit
None	-0
Thin	-0
Medium	-5
Thick	-10
Turbulent	-20
Rough	-30
Brutal	-40
Hurricane	-50

Flying into an atmosphere to make an attack should be treated like a **Landing/Take-Off** but with a **+20** bonus because you are not trying to touch the ground (see *Space Travel*). The check should be made once upon entering the atmosphere and again on leaving it.

Collapse. Just like a ship, a building should have a number of Hull Points. Once they gone the building collapses. The destruction is not as total as it is in space but for most fortifications and its inhabitants that is game over.

Cities. Cities are well aware of the threat from above. Even the most civilized ones (*often the most civilized ones*) will be incredibly well armed and have a shield generator the size of a skyscraper creating a protective dome over the entire place, one attached to power plants inside the city which supply it with near limitless energy. Typically there will also be armed satellites and cruisers orbiting overhead.

While the buildings inside a city are largely defenseless, the city is not. Word of advice - *do not attack a city* – not without a very large armada as well as someone sabotaging the place from the inside.

Gravity Sickness

Exceedingly few organic creatures have evolved to live in a weightless environment. All seem to have spent millions of years living a primitive existence on a planet with a steady gravitational pull. Some weightlessness can be fun, but too much of it will make you sick.

Every alien race comes with a **Base Gravity** which is the number of g-forces they evolved to live with back home. A planet like Earth has a 1.0g. **Constant Gravity** is the average amount of g-force they have been living under for the last seven days.

Base/Constant	0.0	0.5	1.0	1.5	2.0	2.5	3.0
0.0	0	1	2	3	4	5	6

0.5	1	0	1	2	3	4	5
1.0	2	1	0	1	2	3	4
1.5	3	2	1	0	1	2	3
2.0	4	3	2	1	0	1	2
2.5	5	4	3	2	1	0	1
3.0	6	5	4	3	2	1	0

When base gravity equals constant gravity everything is fine. Otherwise, once a week, too heavy an environment will steal that number of **Health** points from the ability score of your character. Too light an environment steals those points from your **Muscle** score instead. If either score reaches zero you die.

Too Heavy = Lose Health

Too Light = Lose Muscle.

If your gravity figures do not match the table, use whatever row/column pair comes closest. A 1.6 or 1.7 should use 1.5 while a 1.8 or 1.9 should use 2.0.

Note that most of the gravity plating used on ships is adjustable. Characters can compensate for a difference of up to 1 point of gravity by simply adjusting the gravity dial in their sleeping quarters. They won't be as happy as they would be under normal conditions but at least it will keep the space sickness at bay.

Long-Distance Engine Travel

Because sometimes you take the long way home. Traveling long distances by engine power is not impossible, but it is rarely done in the age of hyperspace travel. Even inside a solar system it is an agonizingly slow way to go. Between the stars it is tantamount to a death wish.

Thanks to the fact that once you speed up in space you will keep that speed until you slow down again, long distance travel can be done even by the smallest of ships. The big question is – how long will it take?

The distances between planets is measured in **Teras**, each is equal to 1,000,000 kilometers. Engine speed is measured in knauts, each of which does 6,000 kilometers per hour. To find the time it takes in hours, multiply the number of Teras by 1000, multiply your speed by 6 and divide the distance by the speed.

$$\text{Hours} = (\text{Teras} \times 1000) / (\text{Speed} \times 6)$$

It is 78 teras from Earth to Mars. Burn the fuel to go 20 knauts and the trip will take $(78 \times 1000 = 78000, \text{ and } 20 \times 6 = 120, \text{ so } 78000 / 120 =) 650$ hours, or approximately 27 days.

Mines & Seeker Missiles

Mines litter space with relatively small magnetic bombs. They will read the beacon signatures of passing ships and cling to those not broadcasting the right signal. Exploding mines do **3d10** damage to the ships hull with no hit roll necessary.

Most mines will announce themselves with a message saying essentially – *do not enter* – others can be quite hard to detect. An astrogator needs to be at their post and actively scanning for them. A successful **Sense + Astrogation** check will detect a mine field before entering it.

When using miniatures, a counter should be placed in a hex where mines have been dropped. Any vessel entering that hex which is not broadcasting the right beacon signal will be attacked by them. Once the mines go off, remove the counter from the board.

Seeker Missiles. A seeker missile is essentially an assault rocket left floating in space that has been programmed to launch itself at any passing ship which is not broadcasting the right signal. Most have a 70% chance to hit and do 6d10 when they do.

By being a small solitary thing they are harder to detect than mines and require a **Hard Sense + Astrogation** check. Once detected they may be fired on and destroyed. When the missile activates it will be immediately detected and the attacked ship will have one chance to destroy it with countermeasures.

When using miniatures, place a seeker missile counter in the hex the missile was been dropped in. It will attack anyone broadcasting the wrong signature within 6 hexes of that spot. Remove the counter after the rocket fires.

See also: *Beacons*.

Mothballs

A spacecraft will burn **1 fuel unit per day** by simply sitting in space, running life support and all necessary electronics. Mothballing a ship shuts down life support to only those decks that absolutely need it and keeps the rest just a few degrees above freezing to keep the pipes from bursting. A ship in mothballs can only support the ship's minimum crew, as determined by its hull size. In doing so it burns **1 fuel unit per month**.

Out of Mothballs. Bringing a ship back out of mothballs requires at least **3 hours per hull size** of work by its crew. Bringing a hull size 3 Adventure Scout out of mothballs requires 9 hours of standard maintenance. Skipping this step, just starting up the ship and taking it out, will add **1d12 hours** to its maintenance clock.

Piggy-Backing

Small vessels with landing gear can magnetically attach themselves to larger ships and ride them piggy-back. The maximum number of hull sizes that can do this depends on the hull size of the larger craft.

Hull Size	Piggy Back Limit
1 to 3	0
4 to 6	1
7 to 9	2
10 to 12	3
13 to 15	4
16 to 18	5
19 or 20	6

So a ship with Hull Size 4 can carry a single Hull Size 1 ship, such as a shuttlecraft. A Hull Size 12 vessel can carry 3 hull sizes worth of a smaller craft, such as three shuttles or one adventure scout.

The force fields and masking screens of the larger vehicle will surround the smaller ones but the smaller ones cannot use force fields or masking screens to surround the larger vehicle. Active inertia fields will stop the piggy-backing from happening.

Add the hull sizes of the piggy-backing vehicles together and **divide by 3**. For each point the larger vessel will lose AD 1 and TR 1 due to the extra mass it now needs to contend with. If either drops to zero the ship will be unable to move.

Piracy

Piracy is a strange affair. Once a ship gets moving it will be going too fast for a pirate ship to pull up alongside it and make demands. Jump to hyperspace and you are gone. There is no way to track a ship once it has slipped into the void. Of course, these same factors are what make piracy and other criminal endeavors such a big problem out on the frontier. If you can make it into space, you are not far from an easy escape.

Buccaneers. Most piracy is of the buccaneer style. A ship in orbit is spotted from a planet's surface. A small craft is taken up, hoping to find it staffed by a skeleton crew. They cut into its hull and remove everything that isn't nailed down. Computers and weapon keys are a favorite target of these space rats, seeing as their high price and small size makes them easy to ransom back to the captain of the ship.

Conniving Bastards! Otherwise, most piracy happens on the surface of a planet or in a space station rather than out in space. Pirates trick spacers into a sticky situation where there is no easy escape, and then they start making demands. Compromised crew members return to their ship to sabotage it. Accidents immobilize the ship somewhere out beyond planetary space. A distress signal goes up and the pirates arrive to lend a hand.

Pirate ships are often indistinguishable from ordinary trading ships. They rarely announce their affiliation other than to connect to with other pirates. Pirate bases are often hidden deep inside asteroid belts that make them risky to approach. Those who do not send out the right signal from their beacon will be fired upon without warning.

Star Law does what it can to keep the pirate menace under control, but space is a big place and they cannot be everywhere at once.

Ram Damage

There is an old spacer adage that ships are as fragile as soap bubbles and should be treated as such. This is not true, but it feels true, especially when you consider all that will be lost when that bubble pops. Even dire enemies know better than to ram another vehicle in space, but sometimes passion takes control and a ship with nothing left to lose will try to kamikaze another vehicle.

Both pilots should make a **Pilot** check. If the strength of the ramming ship is greater than the strength of the ship being rammed it happens. Otherwise, the ship being rammed managed to scoot out of the way.

Ram Attempt = Pilot vs Pilot

Ram Factor. Each vessel should find the amount of hull point damage they have left and multiply it by their current speed. This is called their *Ram Factor*. Both vehicles take the lesser amount in ram damage.

If ship A has 45 hull points and has taken 20 points of damage? It has 25 hp left. At speed 3 its ram factor is (3×25) 75 points of damage.

If ship B has 80 hull points and has taken 10 points of damage that is 70 hp left. At speed 2 its ram factor is (2×70) 140 points of damage.

Ship A has the smaller ram factor so both ships take 75 points of damage from the impact. Usually this results in the utter destruction of the smaller ship.

Inertia Fields. If either ship has an Inertia field, its protection should be rolled and **half** of it will reduce the amount of damage taken.

So in the example above, if ship A has an Inertia 4 field active you would roll 4d10 and subtract it from the 75 points of damage the ship is destined to take. This will not change the amount of damage that will be taken by the other ship.

Used Spacecraft

Need a quick lift but don't have the cash? All over the galaxy slightly used and abused spacecraft eagerly await the chance to blast back out into the great beyond. Just don't mind the laser burns around the airlock.

Searching. Not all ships are available everywhere. The larger a ship is the harder it will be to find. For each week spent looking make a **Luck Save** minus the hull size of the ship times -5. Something small like a shuttle craft with a hull size 1 is a fairly easy find at -5. A used battleship with hull size 20 is a bit harder to come by at -100.

Check: Luck Save - 5 per hull size

S: You found one!

H: Try again next week.

F: Try again on some other planet.

C: We have one but it may be demonically possessed and/or belonging to a vengeful warlord who will do anything to get it back.

Discount. Used spacecraft often come with a discount directly related to the amount of time on its maintenance clock. Every hour is a 1% discount on the price. So if there are 30 hours on the clock you get it for 30% off.

1 MC = 1% Discount.

This goes up to 50%, after that Used Ship Dealers are legally not allowed to sell a ship in such poor condition as anything but spare parts.

Construction Centers. These are some of the best places to go looking for used spacecraft. However, it is good to remember that many are in the business of building ships and far more interested in selling brand new ones than used ones.

Level 1 Centers. You get a +30 when searching here and may find any hull size ship from 1 to 20. However the best discount you can get is 10%.

Level 2 Centers. These provide a +20 search bonus but are limited to hull sizes 1 to 15. Their discount rate tops out at 20%.

Level 3 Centers. These provide a +10 search bonus. The hull sizes are limited 1 to 9 and the discount rate goes up to 30%.

Level 4 Centers. No search bonus and the hull sizes are limited to 1 to 4. The discount rate tops out at 40% but they may be willing to go higher, possibly selling the ship as scrap providing you don't do something stupid like taking her up without giving the ship an overhaul first.

NOTES

+Space Bikes - basically fusion powered motorcycles characters ride for short distances through space, such as between orbiting ships and space stations.

Dedication

This game is dedicated to my dad who flew Crusaders for the Navy, sailed boats with his family, and never passed on the chance to go fly model rockets with his son and his friends. He never got the chance to go into space, but I'm sure he was in love with it. He took pictures of our television set broadcasting the moon landing back in 1969, and helped his teenage son put up a full wall mural of Earthrise in his bedroom.

Love ya Pop Pop!

Distances

Here is a table of the diameters of celestial bodies and how many hexes they would take up on the map.

1 Tau = 150 megameters, 150,000 meters

Celestial Body	KM
Sun	1,391,016
Jupiter	138,820
Saturn	116,460
Uranus	50,724
Neptune	49,244
Earth	12,742
Venus	12,104
Mars	6,779
Mercury	4,879
Moon	3,475
Pluto	2,377
Makemake	1,430
Ceres	946

Death Star 120

Earth to Moon 384,400

What you use depends a lot on the kind of battles you want to wage and how big a map you intend to use. A part of me really wants to use New Hawks. You would have to chuck the matter of orbiting and planets sitting by themselves. Instead planets would take up big sides of maps. But you could have more fun with asteroids and dwarf planets. In many ways it makes more sense with spaceships dog fighting inside a 100 km hex.

To put it into Star Wars terms, Death Star I is supposed to have a diameter of 120 km. Death Star II has a diameter of 160 km. Trying to do a death star battle might be quite crowded with anything more than NH hexes.

I also like the idea of the entire game using 6 second turns no matter what the field of battle may be. Sorry Niles but I just like the more cinematic scale better.

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