Starship Kit - Volume 6.2
- Environmental -

Ennead Games

Preface

Starship Kit 6.2
Ship Systems
Environmental Systems

Ships need to go, to move through space. Virtually all of them need power as well. Those core parts of almost all space going vessels are covered here.

This is part 6.2 of the Starship Kit, although it can be used as a standalone product if required. This part covers the environmental systems on a starship, like atmosphere and heating.

Future parts will include:
- Captain & Crew
- Special Features
- Cargo, both Legal and Illegal
- Ship Quirks

You do not need to have all the parts in the kit to use them, but it does help and is recommended.

This generator/kit is designed to provide the starting points for your own inspiration. Actual details about each system, such as its design or how it actually works is up to you.

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Class

A broad category, this gives an overall indicator of how strong, powerful and complex the system is. As with weapons, this can vary from group to group, but all other things being equal a Mark V system will be better than a Mark IV but worse than a Mark VI etc.

Not every ship will have all of these systems, but the core systems will exist in some form on almost every ship. The core systems are:

- Computing
- Engines
- Life Support
- Navigation
- Power Generation

The only real exception this is life support for drone or autonomous ships.

The secondary systems include everything else, except weapons, armor and shields, as they have been covered by other parts of the SSK.

Class

Roll a d20. That becomes the tier class of the system you are rolling for. If a 20 is rolled then the system is a Capital-class system and can only be placed on Capital class vessels. Alternately, it is just a Mark XX system, with XX determined by the result of the die roll.

Alternately, if you require a more "realistic" system that keeps the higher class systems to a minimum, use the chart below.

D100	Mark
01	Mark I
02 - 03	Mark II
04 - 06	Mark III
07 - 10	Mark IV
11 - 14	Mark V
15 - 19	Mark VI
21 - 25	Mark VII
26 - 30	Mark VIII
31 – 40	Mark IX
41- 50	Mark X
51 - 60	Mark XI
61 - 70	Mark XII
71 - 75	Mark XIII
76 - 80	Mark XIV
81 - 85	Mark XV
86 - 90	Mark XVI
91 - 94	Mark XVII
95 - 97	Mark XVIII
98 - 99	Mark XIX
00	Mark XX/Capital Class

Quite often, the mark is left off when crew talk about the system, unless there is more than one on the ship and clarification is needed. However, it is useful to know what the tier of a system is as it can have an impact on other systems and the ships size.

Environmental Systems

T he majority of environmental systems on a ship are not needed if the vessel is classed as a drone or is autonomous. Why would an A.I. need a breathable atmosphere or gravity plating?

However, a few systems should be included, such as heating and fire suppression, to deal with unexpected emergencies.

The Mark class of the system reflects not only the size, (with higher marks being smaller and more efficient) but the quality as well.

Some of the systems listed below can be variable or fixed. Variable system allow for various species to work on the same ship and can adjust certain areas of the ship to allow for their own needs, such as gravity or atmosphere. This increases the cost and complexity of the system by 1 class for each species they cater for.

Unlike the weapon or armor, the environmental systems should be chosen and not added randomly. Some of the systems have sub-options that you can roll on for random determination to help make various ships of the same type different.

You could also roll to determine typically how many of a particular system a ship would have, modifying the amount as needed, with larger vessels having more than one, or having a backup in case the primary becomes damaged somehow.

Atmosphere & Gasses

Without an atmosphere, the crew of the ship can't breathe, assuming they need an atmosphere in the first place. Some systems need an atmosphere or gas to maintain proper working order. Certain technologies or invading aliens may react badly to a type of atmosphere, but thrive in others.

Most on board atmosphere do not consist of just one type of atmosphere. Roll on the table below to demine the type of gasses atmosphere your ship has. The first rolled is the primary and major component of the atmosphere, the second is equal or more than likely, smaller amount.

Type of Atmosphere/Gas

D10	
1	Argon
2	Carbon Dioxide
3	Carbon Monoxide
4	Helium
5	Hydrogen
6	Neon
7	Nitrogen
8	Oxygen
9	Sulphur Dioxide
10	Other Gas

If you need an exact percentage, roll a d100 for the primary gas to determine the % it makes up of the on-board atmosphere and reduce the secondary and other gasses by an appropriate amount.

Also roll a second d100. This is a measure of how thick or heavy the atmosphere is, with 01 being virtually absent and 00/100 being practically a solid.

Circuit Breakers

Power surges happen. Even the most protected ship can be hit by an Ion storm or an electrical based weapon and suffer an overload.

D10	Reset method
1 – 4	Manual
5 - 6	Automatic – Instant
7 – 10	Automatic – Delayed

Manual Breakers have to be reset either by hand or the wait until a command signal is given before they work again..

Automatic come in two types, Instant and Delayed. They automatically attempt to reconnect either instantly or after a delay. Than advantage to instant reactivation means a very small and sometimes unnoticeable loss of power across the grid, with the downside being that if whatever caused the power to surge is still occurring, then it will break again. This on-off power fluctuation can cause damage to sensitive equipment and sometimes leaving the power off can be better.

Damage Repair

Space is dangerous. Accidents happen or enemy vessels damage yours. That damage needs to be repaired. But what type of repair system does the ship have?

D10	Repair system
1 – 2	Auto - Slow
3 – 4	Auto - Fast
5 – 7	Manual
8 – 9	Hybrid
10	External

The mark/class level determines how easy and quickly it is to repair the ship with these systems fitted.

Auto repair system, as their name suggests, repair the damage done automatically. Fast repair systems require a lot of power/complexity and generally do not repair the system they are linked to fully, but get it working. Slower auto repairs work better and can fix the damage done fully, but take longer.

Manual covers the crew doing the repairs themselves, sometimes guided by a damage control guidance (DCG) system. The work is done by them. This does save on ship cost, but if your crew doesn't know how to repair the ship, then then are in trouble.

Hybrid systems are a combination of manual use and automatic repairing, with the system repairing as much as possible and the crew overseeing finale repairs and reactivation.

External repair system require the ship to be repaired by an external or other independent body outside the ship, such as a repair yard or another ship or drone designed to fix others.

For essential systems, such as power or life support, a dedicated repair system (with backups) is recommended, but not essential.

Fire

Sometimes called fire suppression system (FSS), this deals with putting out any fires that might occur on the ship. You need to know two things, if the FSS is general or if it is specialised.

D10	
1 – 6	General
7 - 10	Specialised

General treats the whole ship the same, with the same FSS in engineering as you would find in crew quarters.

Specialised FSS covers those areas that need their own systems or can help with various types of fires.

Next you need to know if the FSS is automatic or manual.

D10	Type of FSS
1 – 6	Automatic
7 - 10	Manual

Automatic FSS systems come on automatically, but can be knocked offline, whilst manual FSS system have to activated manually.

D10	Type of FSS
1 – 4	Gas
5	Vacuum
6	Liquid
7 - 9	Solid/Foam
10	Force field

Gas FSS uses a gas to smother the fire, such as Co2 or equivalent that is appropriate for the type of fire.

Vacuum is dangerous but useful and cheap. The FSS opens to space and allows the vacuum of the void the remove any oxygen or burning material the fire is using to keep alight.

Liquid FSS systems use a liquid to put out the fire, such as a sprinkler system.

Solid/Foam uses nozzles to eject a foam/solid substance over the fire, smothering it.

Force fields FSS are the most sophisticated of the FSS's around. Projecting a force field around the fire cutting it off from the material. Higher quality versions of this type of FSS (Mark 10 or above) can supress fires from even starting in the first place, expect in designated areas. These do have one major drawback in that they are prone to breaking very easily and require a lot of power as they need to be on almost all the time.

Gravity

Autonomous drone ships do not need to worry about gravity, unless they have odd or exotic components that require some type of gravity.

For the rest of the ship types, gravity of some kind is a must, especially for long journeys.

D20	Gravity system
1 – 2	None/Propulsion
3 – 5	Rotation
6 – 9	Low
10 – 17	Standard Gravity Plating
18 - 20	Variable

None/Propulsion relies on the thrust of the ship to provide some feeling of weight.
Rotation uses a rotating section of the ship to simulate gravity through
Low gravity is cheap lower powered version of the standard gravity plating
Standard Gravity Plating is as it says. The Baseline of the gravity used is either the home world of the makers or the majority of the crew.

Variable allows for the gravity to be changed, both across the ship and in certain areas.

Heating

Space is cold. Extremely cold- roughly 2.7 Kelvin (-270.45 Celsius, -454.81 Fahrenheit). Even drone ships need something to stop their fragile inner components from freezing. But how is this managed?

D20	Heating system
1 - 10	A.C.
11 - 14	Convection Panels
15 – 16	Heated Gas
17 - 18	Thermal Materials
19	Organic system
20	Exotic Heating Methods

A.C. also known as air conditioning. Can be used to blow hot or cold air around the ship.

Convection Panels are sometimes called radiators.

Heated Gas is similar to A.C but instead a gas that retains heat is left to permeate the ship and uses the natural heat produced by the vessels itself to warm the inside.

Thermal Materials are materials within the ship that naturally, or when supplied with power, generate or absorb heat. They tend to be very slow, but don't require much energy.

Organic heating systems are based of organic technology. They use the same type of heating and cooling methods an organic or living being would use to heat or cool. Some variants are similar to other methods, but simply use organic technology. Expensive and complex to develop and install, but has the advantage of being self-repairing and resistant to EMP damage.

Exotic Heating Methods covers anything else either too complicated for mortal minds to understand or an experimental system not seen on any other ship,

Humidity

Humidity is the amount of water vapour in the air. 30 to 60 percent relative humidity is considered the optimal range for humans.

Low humidity makes the air feel dry and high can make the air feel muggy and uncomfortable. Certain types of technology require a certain humidity to work properly, which may be uncomfortable for the crew.

If you need to determine base line humidity level for your star ship use this dice roll:

20 + 4d10

Next you need to know is this level fixed or variable.

D20	Humidity system
1 - 15	Fixed
16 – 20	Variable

Fixed means that the humidity is set. This could be anything from humidity regulators to simply nothing being installed and letting the ship settle at a humidity level across the vessel.

Variable allows for changing humidity, but increases the size, cost and complexity of the system.

Is the humidity the same across the ship? For each area roll on the chart below and add or subtract the appropriate dice rolls to the base humidity level.

D20	Humidity level
1 - 12	Standard
13 – 14	Higher (1d10)
15 – 16	Higher (2d10)
17 – 18	Lower (1d10)
19 – 20	Lower (2d10)

Inertia Negation

Inertia is the resistance of any physical object to any change in its state of motion, including changes to its speed and direction. On any ship that accelerates fast enough, some kind of system is required to prevent to the organic components of the ship, also known as the crew, from being turned into flat meaty pancakes.

Some drone ships have internal IN to protect delicate internal mechanisms from the forces of suddenly acceleration

D100	Inertia Negation
01 – 20	None
21 – 30	Liquid/Gel Protection
31 – 50	Force Fields
51 - 90	Inertia Manipulation
91 – 00	Unknown

None means the ship has no working IN system to speak of. They have to accelerate very carefully and slow. Sudden jumps to FTL are impossible without killing the crew.

Liquid/gel Protection requires the crew to be in an acceleration pod or chamber that cushions their fragile bodies against the high forces the experience. Easy to make and install, the main problem is stopping the ship at the required destination without a crew.

Force Fields use a type of force projector to balance the acceleration. Crew are awake and have some mobility. Downside is it requires a lot of energy and the crew cannot move that much whilst this system is active.

Inertia Manipulation counters the force completely and allows for full crew movement. The most expensive to use and install and not always effective in combat.

Unknown covers anything else or systems that simply work, even if the user do not know how.

Lighting

The vast majority of species require light to see what they are doing.

The type of lights and their typical location can be found by using the tables below if needed.

D100	Typical location
01 – 40	Ceiling
41 – 60	Flour
61 - 00	Wall

D100	Type/Style of light
01 – 10	Fluorescent
11 – 50	LED equivalent
51 – 60	Halogen
61 – 70	Standard/Filament
71 - 80	Xenon
81 – 90	Sodium
91 - 10	Other

Emergency Lighting

When the main lighting goes down, there is often an emergency lighting system that starts up, in a slightly different colour, to help the crew. These systems are not designed to last long, but to provide a back-up whilst the crew fix the main system or the auto-repair gets to work.

Duration of emergency light

D20	Duration
1 – 5	Short – 1d6 x 10 minuets
6 – 15	Average 1d6 hours
16 - 20	Long – 3d6 hours

Colour of emergency lights

D20	EL colour
1 – 10	Red
11 – 15	Orange/Yellow
16 – 18	Same as normal
19 - 20	Other colour

Waste Disposal

Almost every powered ship makes waste of some kind form their engines and other components. There is two main types of waste, By-products and Organic.

By-products

By-products are the waste materials from internal reactions within the ship. It might be from the engines, or from other system on board.

Organic Waste

This covers the waste from the crew, or in other more morbid circumstances, the crew themselves if they pass away.

How is it dealt with?

D20	Waste disposal
1 – 5	Stored
6 – 10	Ejected
11 – 15	Recycled/Altered
16 - 20	Incinerated/Destroyed

Stored materials are kept on the ship until they can be unloaded at a designated point later. Very cheap, but takes about the same, if not more, amount of room when compared to original material.

Ejected waste is simply ejected into deep space as needed. The simplest and cheapest method, but can cause environmental and traffic problems.

Recycled/Altered covers the material being re-used or recycled in some way. Roll 4d10 and ad 50 to the result to determine how effective this system is as a %. So 90% would mean 90% of the materials can be re-used somehow.

Incinerated/Destroyed covers the waste being utterly destroyed in some way. Expensive and takes a lot of energy, which could make more waste.

Water & Other Liquid Storage

Liquids are used for many purposes on a starship. Drinking, cooling, powering turbines to name but a few possible uses. This needs to be stored somewhere until needed.

Liquid storage takes up a lot of room. It also needs to be keeping at a certain temperature, which depends on the liquid in question. Water for example if it gets too cold turns into ice. Certain fuels if they get too hot can explode or ignite.

If you need to determine what type of liquid is stored in a tank, roll on table below.

D100	Type of liquid stored
01 – 20	Water – Regular/Treated
21 – 30	Water – Contaminated/Waste
31 – 35	Coolant
36 – 40	Anti-freeze
40 – 60	Fuel – Simple (petrol etc.)
61 - 80	Fuel - Advanced (for FTL systems, weapons etc.)
81 – 90	Other Liquid Waste – See below
91 – 00	Other Liquid

Waste covers a multitude of various liquids. This can be waste from the crew, other systems, or transported waste from another location. It is advised to keep the various waste products separate from each other and have on system for each type of waste liquid being transported, as having the water supply for the crew mixed with the water supply is not a good idea.

Coming Soon

Keep an eye out for these upcoming products from Ennead Games (in no particular order)

Starship Kit 6.3 – Medical Systems

The continuing Starship Kit Series covers the medical systems your crew may need, from first aid stations to quarantine measures and more.

Empire Builder
Country Name & Title Generator

The first in the Empire Builder series covers generating randomly the name and title of your country or kingdom.

Background & Details Kit
Super Heroes

The Background and Details Kit returns – This time covering Super Heroes, their origins, powers and more

Prison Kit

Sometimes you need a place to hold those dastardly villains. A multi-part kit series that will cover the prison, security and the inmates, their crimes and those who guard them

Spell Generator

For those times you need to create a spell but just can't decide what it does.

Also Available

Other products from Ennead Games

Background & Details Kits
Fantasy + Scifi

Need some background details for your characters? You can't decide how many children they have or what their hair style is?

Well worry no longer. The BADK is for you. Currently available in two versions, one themed for fantasy characters and the other for sci-fi characters, the BADK will give you enough options and suggestions to get the creative juices flowing for a long time,

Technobabble Generator
(Standard, Extended and Steampunk)

Technobabble is a staple of any sci-fi game or story. It helps with emersion and makes impressive sounding technology.

3 versions of the technobabble generator are available

- Standard – Basic technobabble generator
- Extended – Takes the Standard version and adds more options and solutions for your technological problem
- Steampunk – Technology goes steampunk with this version that adds wonderful devices and the names of those who invented them