Green Sun: Rise & Fall

1.0 Introduction

Welcome to the **Green Sun: Rise & Fall** Rulebook, this set of rules and the materials that came with it, is enough to get you up and running. More of the details will be revealed with your first turn and again as you continue to play.

Any section of these rules that is written in *grey (and different font)* is just fiction provided to give some flavour to the game, though it may hint at somethings that are yet to come.

2.0 The Game

Green Sun: Rise & Fall is an open-ended play-by-mail game in which the player takes control of a race of creatures, who having just mastered the technology to travel faster than light, are about to set out and explore the stars. This breakthrough, and the exploration it leads to, opens up a new 'golden age' for the race in terms of technological advancement. Whatever the history of your race up until this point, the commitment by your people to explore the stars will see a great blossoming of ideas, leading to ever more opportunities.

Each player submits their orders to the Games Master (GM), who processes these, returning the results back to the player. This process repeats as time allows until the adjustment date, when all game and real-world accounting takes place, before starting the next game cycle (*aka sgyear – see next section*).

Note - Open-ended means that there are no game-set victory conditions, you do not 'win' or 'lose', you just play. The aim being to enjoy the journey, wherever it takes you.

Note - While classed as a 'play-by-mail' game it may be played by paper, or electronic post.

3.0 Turn Cycle

The one turn cycle of the game takes a real fortnight to complete, which is the period between successive adjustment dates. (*There is a monthly option for players who wish to play via paper post*). In game this covers a period of one Standard Galactic Year (sgyear). With the commencement of each sgyear, a player is able to submit orders for their race, these orders are processed by the GM with the results being returned to the player. At the end of the sgyear the GM then adjusts the total expenditure and income for the race, sending out the adjustment to the player so they may begin submitting orders for the next sgyear. As this process takes a real fortnight, a player may submit one set of orders, receive the results, then submit a second set of orders, or even third set, and so on (*especially if they are playing via e-mail*). Multiple turns are processed as and when received, then when the adjustment date is reached, all accounting takes place and the new turn begins. While vessels may receive multiple sets of orders in a sgyear, most other units, such as Research Teams may only be

given one task in a sgyear. All income is totalled at the adjustment date (of which you will have two per real month).

4.0 Orders

During each sgyear your race will have a set number of order slots it may use, the exact number being determined by package you have subscribed to. The following list shows the orders that may be given, along with a brief description of each.

Move	A move order permits one vessel, or more if operating as a fleet, to carry out movement from its current position to another. *See – 7.0 Movement*
Design	This allows a player to submit a design of a vessel to be included in the list of available ship designs. *See – 6.0 Ship Design*
Research	Gives an instruction to one, or more, Research Teams, to advance the tech level of one research area. It may also be used to establish, or hive off, a new research area. *See – 8.0 Research*
Free	Not an order as such, but a series of actions that may be carried out that do not use one of the above limited order types. Examples include, any construction order, the switching on, or off, of an Extraction or Refining Plant.
Special	Throughout the development of your race, often triggered by certain events, an option will present itself and you will be offered a chance to investigate this by the use of a Special Action. Alternatively, these may be used to carry out some specific task not covered by other rules, such as the investigation of some alien derelict, or negotiation with an alien race. These are normally free but may require that one or more of the limited orders be used up.

When a player wishes to use more orders than is within their game package, extra orders may be purchased at a real-world cost. *See – 12.0 Fees.*

5.0 Production

There are two types of production, Extraction (*aka mines*) and Refineries, covering Metals, Petramatter and Exotics. At the start of the game the combined output of the installations you start with is quite low and you may need to rely upon your stockpile for your initial purchases.

Metal covers the whole range of metal and metallic materials that are used in the construction and manufacture process. Metal ores are extracted using an extraction facility (*aka mine*) and is put into your planet's stockpile ready to be refined. Refineries take the ore from the stockpile and refine/transmute it into Metal (M), which is recorded in you inventory. The game does not differentiate between the various metal types, it being assumed that whatever metal is actually needed, has been mined and is in the stockpile. One unit of stockpiled ore has a mass of 1 Kt, should it need moving to another location. One unit of refined Metal however has a mass of 0.1 Kt.

Petramatter (*meaning "material from rocks"*) covers matter, often organic in origin, but not exclusively so, that forms the basis of your planet's *petrochemical industry*. On Earth this is the carbon-based oil and plastics, on other non-carbon worlds, this material will be of an appropriate alternative composition. Petramatter crude is extracted using an extraction facility (*aka drilling rig*) and is put into your planet's stockpile ready to be refined. Refineries take the crude from the stockpile and refine it into Petramatter (P), which is recorded in you inventory. The game does not differentiate between the various petramatter products, it being assumed that what product is actually needed, is within the stockpile. One unit of stockpiled crude has a mass of 1 Kt, should it need moving to another location. One unit of refined Petramatter however has a mass of 0.1 Kt.

Exotics is the range of very rare minerals, each of which possesses some property that may be employed. There are around twelve Exotic materials in the game, going by names such as *Sortrium*, *Bytronia*, *Volkene* and *Cylexion* to name just four. Three Exotics may be found on any one world, sometimes none at all. You will find out which are on your homeworld as part of your start up. Your homesystem will have access to three Exotics, one will form the basis of your sublight technology, one the basis of your FTL technology, the third the basis of your weapon technology (if appropriate). Exotics are extracted and refined in a process that echoes that for metals. One unit of raw Exotic has a mass of 1 Kt, should it need moving to another location. One unit of refined Exotic however has a mass of 0.1 Kt.

Extraction Plant - These are large, industrial complexes that extract the raw minerals from the world they are sited upon which are added to the stockpile. You may have a maximum of 3 Metal Extraction Plants and 3 Petramatter Extraction Plants and 3 Exotic Extraction Plants on your Homeworld. You are limited to a total of 3 Extraction Plants on any other world (*your choice of which*).

Refinery - These are large, industrial complexes that take the raw material from the stockpile and refine them into useable Metals, Petramatter or Exotics. There is no limit to the number of Refineries (*any type*) you may on your Homeworld. You are limited to 1 Refinery on any other world (*your choice of which, this may be expanded with research*).

Where multiple Extraction Plants are sited on a world, the second and third plants operate at a reduced rate, you have the choice as to which plant will be the first, second and third. Multiple Exotic Extraction Plants are similarly affected if they are extracting the same Exotic, but there is no effect if they are all different Exotics. Refineries are not affected by this restriction.

Efficiency of Extraction Plants and Refineries, the size of multiple unit penalties and the restriction on number of units, may be alleviated by the advancement of technology.

6.0 Ship Design

The designing of ships is somewhat akin to building with Lego. Your technology will provide you with various 'Lego bricks' (*e.g., Drives, Scanners et al*) and you are free to assemble them in whichever order suits your needs. The majority of the details you need to know about ship designs will be contained within the information that is provided with each component your technology produces. However, there are a few details you should bear in mind:

FTL Drive - In order for a ship to travel to other stars it may need to be equipped with an FTL drive, though there are restrictions/requirements associated with each system.

Sublight Drive - The sublight drives fitted to a ship will generate a total thrust available to the ship. As part of the design, you will have to allocate thrust, up to the total, to the following functions:

- Speed (*sp*) The thrust allocated (*to speed*), divided by the mass of the ship will gives its speed (*sp*). The speed of a ship will affect the tasks it may carry out. These will be explained as and when the situation arises, one of these is detailed later on. A ship may have a speed of less than 1.00, though will move slowly. However, a ship must have a speed of at least 0.10 in order to physically move.

- Manoeuvrability (*mv*) The thrust allocated (*to manoeuvrability*), divided by the mass of the ship will give its manoeuvrability (*mv*). The manoeuvrability of a ship will affect the combat ability of a vessel, the higher this is, the harder a ship will be to target and/or hit with weapons. A ship may have any manoeuvrability however anything less than 0.10 will have no effect.

- Take off and Landing (*TOAL*) while a vessel may take off under its own power from the shipyard it was built at, by using its Speed (*providing this exceeds the Gravity of the world*) any further landing and or take off from a world, requires that thrust be allocated to TOAL. Divide the thrust allocated by the ship's mass to give the maximum gravity the ship may land upon and subsequently take off from again.

What is the difference between the three and why should it matter? The purpose behind this choice is to allow you to produce ships with specific roles, while your technology is low and the performance of your engines is low, you will not have the luxury of being able to do all three, and so will need to choose.

Speed (sp). Of the three this would appear the least important, however it is used to determine how quickly a ship is able to react to a situation, especially one that threatens the ship. When in combat it is used in determining which ship is able to get into a firing position first, while it is probably going to be used most by your scout ships when exploring the unknown. Speed is useful for Fighters to get into combat, for Admin ships to carry out regular tasks and most every ship wishing to use Hyperspace.

Manoeuvrability (mv). This is used almost exclusively in determining how hard a ship is to target in combat. Manouvreability is useful for fighters once they are in combat, warships also when in combat and any ship that intends to even the simple missions needs a basic amount of (mv).

Take off and landing (TOAL). Any vessel that intends to take off or land upon a world will need a TOAL system installed, and this includes any vessel that will be using the *land & survey (ls)* move code. There is one special situation, which when a ship having been built upon a world, needs to get into space the first time, in which case there are three methods:

a) By just taking off under its own raw power using its available speed (sp), as long as this is greater than the Gravity of the world it is on. Landing this way is not so easy and should only be attempted where there are landing facilities, such as on a homeworld.

b) By being assisted with solid rocket boosters, or similar. This may only be done when initially departing the shipyard that the vessel was constructed at. This incurs a Metal and Petramatter cost of 1M+1P per Kt of ship, multiplied by (the G of the planet minus the Speed of the ship).

c) By being fitted with a TOAL system that generates a thrust greater than the Gravity of the world it is on. A vessel fitted with a TOAL system may take off and/or land on any world while its TOAL generates an effect greater than the Gravity of that world.

The total thrust allocated across the three functions may not exceed the total provided by the sum of the sublight drives. Once the allocation is made, it may not be changed, though an alternate design with a different distribution may be submitted.

Endurance - Ships are not able to operate away from a base indefinitely. At some point during the vessel's lifetime, it will run out of either fuel, supplies or some other consumable that is critical to the running of the vessel, this quantity is represented by its Endurance. The Endurance of each vessel will be reduced by 1 point at each adjustment date. When a ship exhausts its Endurance, the crew perish, and the vessel stops being controlled by the player. There may be a penalty if too many vessels are lost this way. *See – 11.0 Morale*. Ships belonging to one race may transfer some of their Endurance to other ships belonging to the same race by being at the same location, at a ratio of 1:1. Transfer between ships of differing races may be possible, and depending upon the compatibility of the races, this may be at a penalised rate. While your ship uses the basic Endurance you may consider empty endurance as additional cargo space, even if this then breaks the ship size limits mentioned at the end of this section.

Cargo - Cargo is space within the ship that may be used to transport objects or materials from one location to another. For the purposes of calculating Speed, Manoeuvrability and TOAL requirements, cargo space is always considered as being full. Thus a 1,000 Kt cargo space still has the mass of 1,000 Kt, empty or full. Other vessels may be carried as cargo; however they need to be packed prior to loading, and unpacked afterwards before they may be used. The packing and/or unpacking are processes that can take anywhere between a few sgdays to several sgweeks. Flight-ready vessels may only be transported in Hangars (which will appear via research if not already available to the race).

Scanners - These are the physical aspects of a vessel's data gathering ability, including aerials, antenna, arrays, and other external structures that gather data (*in addition to the in-built systems*), which is handed on to the Sensor Suite to be converted into information. *See – Bridge (below)*. Scanners have mass and occupy space aboard a vessel but only need to be fitted to vessels that wish to explore, or those that wish to fight. *See – 7.0 Movement*. A vessel may only take advantage of one version of the Sensor software but may install multiple Scanners if desired.

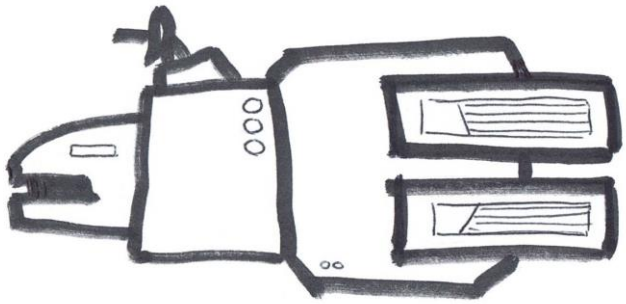
Bridge - The region of the ship that is used to control it, where the ship's Captain spends most of their time, probably just sitting in a chair! A bridge has no mass and no cost to install, its purpose is to be the site of any software that is installed in the vessel, especially the additional Sensor software. If a vessel has a bridge (and such is installed automatically) it is assumed to have Basic Scanner (5 points) and Basic Sensor (5 points) software installed. This means every manned ship will generate 25 Sensor Points, not enough to yield any useful

information, but enough to avoid flying into objects. The bridge is also the centre of communications between the vessel and any other friendly unit. Communications between a vessel and its homesystem is not instantaneous, however the delay is inconsequential as far as the game is concerned. The only detail that is important is that such communication may not happen while the vessel is travelling faster than light.

The whole design process is not without limits, the most important being the size of your ship building facilities. At the start of the game, you are limited to a vessel size not exceeding 150 Kt. This means the maximum size would be a 150 Kt ship, which may consist of 100 Kt of Hull components (*Drives, etc.*) and 50 Kt of Cargo space, but may be less. As your General Technology advances, options will be offered to expand these size limits. Suffice to say, a great deal will be learned in the process of your first ship successfully travelling faster than light.

A 'typical' beginner ship, the ***FT-5/50***

System	Mass	Notes
Jump	1 @ 25 = 25	Max 10 jump
Sublight	3 @ 10 = 30	Thrust 3 x 50 = 150
Endurance	5 @ 5 = 25	Endurance = 5
Scanner	1 @ 10 = 10	+5 Scan
Bridge	0	+5 Scan, +5 Sensor
Sensor	0	+5 Sensor
Cargo	1 @ 40 = 40	40Kt cargo
Total	**130 Kt**	



Thrust (sp)	(20/130)	= 0.15 sp
Thrust (mv)		= 0.0 mv
TOAL	(130/130)	= 1.0 G limit

The FT-5/50 is a basic ship, using technology available at the start of the game, while it could be designed, built and put into service it is not recommended this design is copied too closely.

The FT-5/50 has a basic Jump drive, which has a maximum of 10 uses before it will need to be serviced. It has three sublight engines giving a total thrust of 150. As it

will not be going into combat, it has a (mv) of zero. A minimal 20 thrust is put into speed moving it forwards at just 0.15 (sp), while the majority of the thrust, 130 has been allocated to TOAL, meaning it may take off or land upon a world with a G not exceeding 1.0. It has a basic Endurance of 5. It has a simple Scanner and Sensor arrangement that still gives it 100 Sensor points and a Cargo capacity of 40 Kt. The vessel is limited in its operation by the low endurance but could be used as a very early scout ship, or to move materials between two worlds.

Stardate 2304.21 - The first flight of FT-5/50 01 "Ranger". Orders have been given and the crew readied the *Ranger* for take-off, the first ship in the fleet to be equipped with the new Jump Drive, one that our scientists confidently inform us will allow the vessel to jump to the destination recently named Chandos. With the last of the manifest stowed aboard and the external hatches sealed in anticipation of the rigours ahead, the captain awaits confirmation from the engine room that everything is ready to go. Engines are brought up to speed and a low hum fills the whole of the starship, which builds to a low roar as the thrust peaks and with the release of the moorings the *Ranger* lifts off the launch pad and rises gracefully, albeit with a lot of ground wash. Less than a kilometre away, sitting on its own pad is the sister ship Lancer, its launch date still a few months off. Equipped with launch and landing drives the *Ranger* is spared the roller-coaster ride into low orbit that the previous generation of exploratory vessels had to endure. Ascent through the atmosphere is sedate and rather long, needing some 45 minutes to pass through the mesosphere and into the exosphere. It took a further six hours to travel out beyond the four planetary diameters required before the Jump Drive could be spun up. The subtle bump as the *Rangerengaged* its Jump Drive was exactly as had been predicted in the dozens of simulations the crew had trained through, though this time they heard the ship creak more than once under the great strain the journey put upon its hull. Flight time to Chandos was estimated at a little over three weeks, one that the military crew may cope with, but civilians, future colonists, would need to travel in hib-units, passing the journey in deep hypo-sleep. The flight was event free, the approach to Chandos much anticipated as the countdown clocks aboard the *Ranger* ticked ever closer to zero. There was great joy at the arrival at their destination, but this was tempered by

the need to carry out scans of the area, even from the arrival point in the translight orbit, there was a certain degree of information that could be gathered. The scanning equipment was deployed, much of the inter-thermal array having been far too delicate to survive the journey through jump space unprotected. Planetary information, assuming there were planets present, would need to await a system scan in the next day or two, hopefully revealing something that may answer one of the oldest questions, are we alone? An answer however came unexpectedly early, as with a flashing of lights and the wail of sirens, the proximity alarm was triggered…

7.0 Movement

There are two types of movement available for vessels, sublight and FTL, though there is more than one way of achieving the latter. Movement, of either type, is controlled by the use of a movement code indicating the destination of the vessel involved along with the orbital position it is to take up, along with its contact posture (*see at end of this section*).

[tl] - trans light - The order [tl] is given to a vessel, along with the name of the destination star. The [tl] position is somewhat removed from the gravity of the central star, and a scan from this position yields only basic information unless advanced Sensor/Scanners are used.

[ss] - system scan - The vessel moves to a position closer to the central star where it can see more of the system in more detail.

[os] - orbital scan - The vessel takes up a position in one of the numbered orbits within the star system, ideally one that contains a planet, or some other feature and there carries out a scan of that planet or feature. In the Sensor Points table, in the split cell section for [os], the upper row of figures indicates the Sensor Points required to gain information for the whole system, the lower row of figures just for the planet being orbited (*see below*).

[ls] - land (and) survey - The vessel attempts to land on a planet, directly, or via the use of a small utility craft, if available. Prior to the development of advanced Sensor/Scanners, the planting of boots, tentacles, or whatever passes for feet in your race, on solid ground, is the only way to discover the resources a world may have.

The Sensor Points table (below) shows the number of Sensor Points required by a vessel, using a given movement code, to learn specific information. For example, a vessel with the move order of [ss] will require 100 Sensor Point to know the nature of the central star the FTL destinations from that star (if the vessel has a functioning FTL drive) and the number of Planets in the system. It would need 500 Sensor Points to know the exact orbits of those worlds, 1000 Sensor Points to know the size of each world, 3000 Sensor Points to know the atmosphere type & pressure, and 5000 Sensor Points to identify the Metal resources, 10000 for the Petramatter and 20000 to identify the Exotic content. A vessel generates Sensor Points as follows:

Total Scanner Points of all scanners fitted x Sensor Points from software installed

If the number generated is equal to or greater than the number shown in the table, then that information is known to that vessel. Success at one particular level of information includes everything else of a lesser value.

Sensor Points required by move order.

	Star	**Dest'**	**Planets & Orbits**	**Size**	**Atmos'**	**Materials**	
[tl]	100	100	500	1000	3000	5K/10K/20K	
[ss]	100	100	100	500	1000	3K/5K/10K	
[os]	100	100	100	100	500	1K/3K/6K	System
				100	100	500/1K/2K	Planet
[ls]	-	-	-	100	100	100/200/400	Planet

Note - The three figures in the Materials column are the number of Sensor Points required to identify the Metal/Petramatter/Exotic content of the planet concerned. If the target of the scan is an asteroid belt (or Kuiper region), then only 10% of the stated figure (never less than 100) is required instead (in this instance K = 1000).

Sensor Points are also used in identifying the details of alien vessels that may be encountered. While the actual presence of an alien vessel is always revealed, as long as it is not deliberately concealed, the level of detail that may be obtained by scanning is shown in the table that follows. The column headed 'Separation' is the distance between the scanning ship and its target, measured in difference of orbits. A separation of '0' means that the two ships are in the same orbit, while 'Adjacent' implies anything less than a kilometre but is meant to be something nearer a hundred metres or less. If the physical distance should get to zero, for example by boarding, then the level of detail available rises accordingly.

You may scan friendly or allied vessels though they will be aware that this has happened.

Sensor Points required by separation.

Separation	**Symbol**	**Mass**	**Make up**	**Components**	**Known Components**	**Full Details**
Adjacent	100	100	100	200	500	1K
0	100	100	200	500	1K	3K
1	100	200	500	1K	3K	5K
2	200	500	1K	3K	5K	10K
3	500	1K	3K	5K	10K	20K

4	1K	3K	5K	10K	20K	40K

Note – for this table the following definitions apply (in this instance K = 1000):

- *Symbol includes identifying the owning race, if known.*
- *Mass is the approximate mass of the target.*
- *Make up will reveal how much of the target is hull, and how much is empty/full cargo space.*
- *Components will reveal how much of the target is engine, weapons.*
- *Known components will identify the number and type of any component that your race has already researched.*
- *Full details will give you a copy of the design (but may include some components marked as 'function unknown'*

In addition to what has been said previously, Sensor Points play a role in combat, in essence the more points that can be generated, the greater the chance to weapons being able to aim at their target.

In addition to the destination part of each movement order, there is an additional contact posture code, indicating what the response of your ship will be, upon encountering anything else.

[b] - block - Your vessel will attempt to intercept whatever (vessel) it encounters and prevent it from carrying out any further action. The success of this will depend upon the relative Speed and Manoeuvrability of the two sides. Issuing this order will move your vessel to the same location (orbit) as the target vessel and may require the other portion of your move order be overridden.

[c] - contact - Your ship will attempt to contact the other vessel in a friendly manner while carrying out is move order as written.

[f] - flee - Your ship will move to whatever position is furthest away from the other vessel, exactly where will depend on the other vessel's move order though [tl] is the more likely.

[i] - ignore - Your vessel will ignore the presence of any other vessel and go about its business. This is the default setting.

[sos] - shoot on sight - Your vessel will initiate combat with whatever it has detected and press the combat to its conclusion.

Conditional orders are acceptable, such as *'Continue on [i] but change to [c] if someone uses [c] on me.*' Just be aware that if conditional orders from both sides conflict or result in some sort of logic feedback loop may just resolve it by roll of die!

Additional posture codes may arise through activity and/or research.

8.0 Research

At the start of the game your race will have a comparatively limited understanding of its technology, though this may be improved by allocating work to your Research Teams. A Research Team is a collection of individuals working at one location, or a number of groups spread out across your planet, all working on a particular idea, or something between the two.

Initially your race will have access to six Research Teams *(plus any it acquires as part of the Racial Set Up*), though under the right conditions this may be improved. During the sgyear you use a Research Order to allocate one or more Research Teams to a particular technology area (*see below*), the result will be to raise the understanding in that area by +1, per Research Team allocated. You may allocate more than one Research Team to a technology, up to a number not exceeding your Research Tech level (*initially 1*). Improvements in technology have been set at specific tech levels, do not expect a new technology with each level of improvement.

The following areas are available at the start of play, other research areas may be suggested by players, and if appropriate, established via a Special Action.

Colonial Support - Initially your race will only be able to live on worlds that match very closely to your homeworld environmental condition. It is possible to inhabit less favourable worlds, but at a cost to your race's reproduction rate, which in severe cases may even be negative. With research it will be possible to develop equipment that will allow your race to inhabit less favourable worlds with a lesser penalty.

Endurance - One of the serious limits on travel to the stars is the restriction caused by the requirement of a vessel's endurance. While ships may be resupplied to extend their time in space, a little research into endurance will yield ever more efficient systems that may prolong the time a vessel is able to stay out unsupported.

FTL - Research into your FTL drive will bring better versions, either by reducing its mass, extending the range or area of effect. Research will be into the type of FTL drive you began with, while research into alternative systems may only begin once your race has hard evidence of such an alternative system.

Production - Research into your production systems will see improvements in extraction and refining processes, allowing more efficient systems to be installed, or to reduce some of the restrictions/penalties the existing systems operate under.

Research - The research into ways of improving the way your race undertakes research and how this can be improved through efficiencies. It should be obvious that, at least for the first few sgyears, this should be a priority. Advancing your Research Tech level will increase the number of Research Teams you may allocate to a given technology each year.

Sensor/Scanners - Initially two research areas (*Scanners = physical equipment and Sensors = software*) combined, the result being to increase your ship's ability to produce an ever-greater number of Sensor Points. Specialisation into one of the fields will be offered, as will other choices (*for example, military and civilian versions*).

Sublight - Research into your sublight drives will bring better versions, either by reducing its mass, extending the range or area of effect. It is expected that one or more options will be presented during the progress of this field (*for example, military and civilian versions*)

Weapon Defence - This is a research area to cover all aspects of defensive technology. While the mainstream will be the development of Armour and its gradual shift towards actual Shields, there will be ample opportunities to investigate specialised, bespoke or even esoteric technologies.

Weapon, Primary - Research into your Primary weapon will produce ever more efficient versions of it, along with opportunities for complimentary projects. Any advancement in your Primary technology will produce a 50% increase in your Secondary weapon.

Weapon, Secondary - While your Secondary weapon is advanced automatically when your Primary weapon is advanced, it is possible to advance it specifically. Such an advance has no effect on the Primary weapon. If the tech level of the Secondary weapon is ever taken above that of the Primary weapon, then the names are reversed, such that your highest weapon technology is always your Primary.

General Tech - This is a 'catch-all' technology area and represents work being done that either feeds into another area, or the incidental things that flow out of other work. General Technology is important in several ways:

a) Each time you submit Research Orders, you MUST include an advancement of at least +1 technology level in General Tech. If you do not, then the other research will not be undertaken in that set of orders.
b) Certain other technologies may require a particular level in General Technology be achieved before any further advancement may be made, of which you will be informed.
c) Increasing General Technology will bring about advances of its own, such as breakthroughs in Cargo technology.

At certain points in the advancement of a given technology a choice will be presented to the player, asking them in which direction they wish the subsequent work to follow. Some of these choices may open up new areas of work, or hive off an aspect of existing work, while others may close off other future projects.

It is important that the player understands that the equipment their technology provides at the start of the game is (deliberately) inefficient but be assured that improvements will occur, which unfortunately may make some of your initial designs obsolete very quickly. However, a word of warning, just sitting and waiting is not the best option, as some significant breakthroughs will only be triggered when a certain activity is undertaken. Without giving too much away, one of these will be when your race first improves its General Technology, another when it first uses its FTL drive to travel to another star...

9.0 Population

Depending upon any modifiers purchased during the racial generation at each adjustment your population will grow at a predetermined rate. The growth being the difference between births and deaths each sgyear, which unless there are any detrimental circumstances, should always be positive. Each world will have a maximum population it may support, if the number of people living on that world exceeds this limit, then there will be some sort of *Malthusian Disaster* which will reduce the population. These events may be deferred in either of two ways, a) research ways to increase the population limit of a world, or b) exporting

people to a colony. *See – 10.0 Colonies*. The occurrence of Malthusian Disasters may have a detrimental effect upon morale. *See – 11.0 Morale*.

10.0 Colonies

A colony is any location where your people are sent to live, that is not on the homeworld. Any location that has the same environmental conditions as your homeworld will give your people the best chance of surviving. A location that has less than favourable conditions will impact on the reproduction rate, which if too severe may result in a negative growth that is more people will die each sgyear than are being born. Improving the tech level of Colonial Support will produce hard technology that will permit your people to live at increasingly less-favourable locations.

11.0 Morale *Optional*

The Morale score attributed to your race is a representation of how well the people feel things are going. If things are felt to be good, your people will be more productive, if things are not so good, then they will be less productive. Morale affects the production at Extractors, Refineries and the rate of Research.

Morale is expressed as a percentage, where 100% is the normal position, a score greater than 100% indicates satisfaction, a score of 99% or lower represents dissatisfaction. It is applied as a modifier to Extraction and Refining of all resources, such that a Morale of 105% will see these plants operate at 105%, while the converses, with Morale at 99% will see plants operate at 99%.

In the case of Research, Morale will determine if the Research Teams work more efficiently or not. For each whole 10 points of Morale your score is above 100, your researchers work as if there was an extra Research Team for the next sgyear. Thus a Morale of 125 will mean that for the following year, you will have 2 bonus Research Teams to call upon.

Morale may be gained with:

- Milestones e.g., first journey to another star.
- Discoveries e.g., first alien contact.
- Beneficial events.

Morale may be lost with:

- Death of people e.g., Malthusian Disaster.
- Loss of a ship e.g., destroyed by aliens.
- Detrimental events.
- Time erodes positive morale.

Morale is optional, it is not an essential part of the game but does provide an extra bit of flavour for those players who wish to engage with it. As part of your racial generation, you will have the option to play with Morale or not. This choice is not permanent, you will have the option to change your mind once at any time later in the game.

12.0 Fees

The cost to play Green Sun: Rise & Fall are as follows:

Basic £5.00 — This included a set number of Move orders, Design orders, Research Orders and Special actions for your starting homeworld. Your first colony is included in this fee. Your game credit is amended at Adjustment.

Colony £1.50 — The setting up of a second or subsequent colony is charged at £1.50 per colony at Adjustment. Each Colony will get you an additional number of orders slots.

Extras — You may purchase extra Order slots for your current turn, these are charged at the following price for each order so purchased:

Move	£0.50
Design	£0.10
Research	£0.25
Special Action	£0.50
Postage	Whatever the price is to post a turn to you.

All payment shall be by PayPal, to the account xott@sark.net please include your player number in any payment that I know which account to credit, though an e-mail just to let me know would not go amiss.

An account that runs into negative credit will not be processed unless by prior arrangement.

13.0 Discord & Website

A Discord channel has been set up as a forum for discussions, for players, either to ask questions of the GM, each other, or just generally chat about the game. Please ask for a link to gain access to this channel.

There is a simple website up and running at www.ae84.co.uk which features some material related to Green Sun (past and present).

14.0 Acknowledgements

Green Sun: Rise & Fall owes much to the game **Green Sun**, played (by this author) from 1989 to the last few months of 1999, and run by **Nic Best**, of **Sevenstar Games** (not to be confused with 7 Star Games).

The original FT-50 Ranger was built in 8911.13 and launched that same year. The Ranger explored space until year 9103 when the drive fuel was spent though was refitted in early 9109 to carry out black hole research only to be decommissioned on 9109.18 and returned to the homesystem to be housed in the Museum of Spaceflight.

FT-50 Lancer, built 8911.13 was destroyed in the Krell System in 9201.16