CELESTIAL EMPIRE

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Contents

List of Tables

List of Figures

1 General Overview

Celestial Empire is a play-by-email game based on Return From Sirius, a play-by-snail-mail game by The Missing Tiger. Using the Unix mail system, the game sends out turn sheets to the players, who then mail all their actions back to the game within a certain number of days.

Celestial Empire is a long term game for 9 players at a time. Each of the players start off by owning one planet, their home world, and five small spaceships. As the game progresses each player will build new ships and claim more planets using these ships. By about the third turn, players should be meeting their neighbors in the galaxy, and here diplomacy takes over, in the form of trade or war. There are a variety of winning conditions determined before the game starts. These include:

- Scoring 30,000 pts or greater.
- Taking $\frac{1}{4}$ of the galaxy (64 planets).
- Owning Earth for a full turn.
- Having an income of 2000.
- Having more than 2500 Earth Credits.

Another sort of winning condition is having the greatest of some commodity (ships, credits, score, income etc.) at the end of a specified number of turns. The number of turns can be either fixed for the whole game, or be dynamically changed by the players as the game progresses.

Planets are the main source of income for players. Planets can have 10 different sorts of mines (types 0–9) and their respective ore types; the more mines the more ore is produced every turn. Some planets will also have industry which enables the player to build various items on that planet from the ore. Planetary Defense Units (PDUs) can be built or unloaded onto a planet to make it more difficult for other players to take it over. Connecting planets together are planetary links, down which ships travel; all planets have at least one and many have up to four. The link operates in both directions, if you can go from planet A to B you can also go from planet B to A.

Ships are the means of expansion for player's empires. Ships consist of various units. There is the main hull and hyperdrive unit, which cannot be destroyed. To build a ship you build one of these. Attached to the hull/hyperdrive unit are other smaller units: fighter, cargo, tractor, and shield units, which can be built on after the ship has been built. Fighter units allow you to attack other ships or planets. Cargo units allow you to carry ores, mines etc. from one planet to another. Tractor units allow you to lock onto another ship and take it with you when your ship jumps down a link. Finally shield units protect the ship from other player's attacks.

Commands are mailed, one per line, to the address listed at the top of the turn sheet, see section 29.1 for an example. Comments can be put in the turn sheet, if the first character is a semi-colon ';' then the line will be ignored, and all characters after a ';' on a command line will also be ignored. Blank lines are also permitted. If everyone gets their turns in early, the game turn will be run early, however if some people get their turns in late, the game will not be delayed for them. If you mail off your commands, and then realize you have made a massive blunder, mail a correct list of commands in (not just the different ones) to the mail address and ask that they be run instead. If you get your commands in in time, they will be fixed.

If you are interested in the workings of Celestial Empire, the source is available by ftp from `yoyo.cc.monash.edu.au` in the `/pub/celemp` directory. The latest version of the documentation is also in this directory.

As well there is a low volume mailing list that discusses various new aspects of the game. To get on the mailing list, mail `listserv@yoyo.cc.monash.edu.au` and put the line "`SUB celemp-list`" in the body of the message.

2 Turn Sequence

1. Research Planet orders[1]

[1]Every 4 turns starting on turn 10.

2. Game length adjustment[2]
3. Naming of ships and planets
4. Gifting
5. Changing Formal Alliances
   (a) Increasing Alliances
   (b) Decreasing Alliances
6. Unloading spaceships
   (a) Unloading Industry
   (b) Unloading Spacemines
   (c) Unloading PDUs
   (d) Unloading Ore
   (e) Unloading Mines
   (f) Global Unloading
7. Loading spaceships
   (a) Loading Industry
   (b) Loading Spacemines
   (c) Loading PDUs
   (d) Loading Ore
   (e) Loading Mines
   (f) Global Loading
8. Selling or buying ore on Earth
   (a) Global Ore Selling
   (b) Selling Ore
   (c) Buying Ore
9. Contracting industry on Earth[3]
   (a) Contracting for Cargo Units
   (b) Contracting for Fighter Units
   (c) Contracting for Tractor Units
   (d) Contracting for Shield Units
10. Deploying and undeploying Spacemines
    (a) Deploying from a Planet
    (b) Deploying from a Ship
    (c) Retrieving from orbit
11. Battle
    (a) PDUs attacking Ships
    (b) PDUs attacking Spacemines
    (c) Ships attacking Ships
    (d) Ships attacking PDUs
    (e) Ships attacking Industry
    (f) Ships attacking Mines
    (g) Ships attacking Ore
    (h) Ships attacking Spacemines
    (i) Earth attacking enemy ships
    (j) Damage Resolution
    (k) Ships engaging tractor beams
12. Tending Ships
    (a) Tending Industry
    (b) Tending Spacemines
    (c) Tending PDUs
    (d) Tending Ore
    (e) Tending Mines
    (f) Global Tending
13. Removing Units from Ships
    (a) Unbuild Cargo units
    (b) Unbuild Fighter units
    (c) Unbuild Tractor units
    (d) Unbuild Shield units
14. Ore Transmutation
15. Building on planets
    (a) Building Industry
    (b) Building Spacemines
    (c) Building PDUs
    (d) Building Mines
    (e) Building Hyperdrives
16. Building on ships
    (a) Building Cargo Units
    (b) Building Fighter Units
    (c) Building Tractor Units
    (d) Building Shield Units
17. Movement[4]
    (a) Jumping 1 link
    (b) Jumping 2 link
    (c) Jumping 3 link
    (d) Jumping 4 link
    (e) Jumping 5 link

[2] Only for games where this is applicable.
[3] These are processed in order from the highest bid to the lowest bid.
[4] If your ship hasn't initiated battle.

18. Scanning
19. Standing Orders entered[5]
20. Spacemine attack resolution (automatic)
21. Mining (automatic)
22. Damage Resolution (automatic)
23. Change of Ownership (automatic)
24. Score adjustment (automatic)

The sequence of execution is important. For example if you tell a planet to build 10 Spacemines, and it only has enough industry to build 8, then any other orders for building, like PDUs will be ignored as all the industry has already been used.

The events that are labeled automatic are automatically performed by the computer and no orders concerning them need by given. All of the actions can be given for the same ship except for battle and movement. If your ship initiates combat it then cannot move by itself, however it can still be towed by another ship with enough tractor beams.

All orders concerning ships (except the initial hyperdrive construction order) begin with an 'S' followed by the number of the ship and then the order. Orders concerning planets should just have the planet number first, no 'P' should be placed in front. There should be no spaces in the order itself, except possibly in a name. Case does not matter when giving orders (except when naming things).

Note that the name of the ship or planet is for the player use only, all instructions to the computer should list the number, NOT the name.

3 Naming

A ship or planet that belongs to you may be named whatever you wish. The only restriction is that the name should be less than 24 characters long, including spaces. *i.e.* up to 23 characters long. The Game Administrator will change any that are deemed unfit. Planets are given an initial name, but these may be changed in the usual manner.

Before the game starts, the players mail the Game Administrator with the name of their empire. These can be up to 9 characters long. If an empire changes hands sometime during the game, if for example a player couldn't continue and gave control to another person, then the Administrator can change the empire's name.

3.1 Naming Ships

Syntax:

S*xxx*=*shipname*	Call ship *xxx shipname*

Examples:

`S123=BLACKGUARD`	Call ship 123 BLACKGUARD

3.2 Naming Planets

Syntax:

xxx=*planetname*	Call planet *xxx planetname*

Examples:

`234=ARAKOS I`	Call planet 234 ARAKOS I

4 Gifts

Diplomacy is very important in Celestial Empire, you cannot survive if everyone hates you, unless of course they are incompetent. To assist in diplomacy, you can bribe players with gifts of ore, mines,

[5] Note the standing orders are executed in the place normal orders of the same type are, next turn.

industry, PDUs, ships or even planets. Money is not able to be gifted directly (Indirect methods include gifting ships full of ore around Earth).

To give ores, mines, industry or PDUs just unload them on the other player's planet. To give ships and planets, use the commands below.

4.1 Gifting Ships

You cannot give away more than two ships in a single turn, otherwise your merchant families will have you assassinated.

Syntax:

S*xxx*G*playername*	Give ship *xxx* to *playername*

Examples:

`S244GMASTER`	Give ship 244 to MASTER

4.2 Gifting Planets

You cannot gift away your home planet, your populace will think you are a traitor and imprison you. Also you cannot give away more than three planets in a single turn, otherwise your populace will think you are trying to destroy their empire.

Syntax:

*xxx*G*playername*	Give planet *xxx* to *playername*

Examples:

`345GWARLORD`	Give planet 345 to WARLORD

5 Formal Alliances

Celestial Empire has a four level alliance system, whereby a player can rate other players as an ally, friend, neutral or enemy. At the beginning of the game all players are considered neutral. Each turn you are allowed to change your ratings, but you cannot go from friendly to enemy or from neutral to ally or vice versa in one turn you must first pass through neutral. *i.e.* you can only change your alliance level with a player one level per turn.

If you declare a player as an ally, they can do almost anything that you can. They can jump through your systems without getting your PDUs firing on them. They can load ore and pdus from your planets and even mines and industry from your home planet. You cannot fire onto an allies planets or ships, except at spacemines. You can build units onto an allies ships. An ally can use your research planets, if you do not use it. If a player wins, all his allies are considered joint winners. Having an allies ship in orbit above your planet will not change ownership if it would otherwise. To sum all this up, only declare a player an ally if you trust him with your empires life, and only if they declare you an ally at the same time.

If you declare a player as a friend, your PDUs treat their ships as they would yours. That is, you cannot order your PDU to fire at his ships and they will not automatically fire at his armed ships as they jump through your planets. This means that he can move his ships rapidly through your empire to help participate in a battle. Your ships will also be unable to fire upon his ships. (It also means that he can quickly reach your home planet to stab you in the back; but then what are friends for?)

Declaring a player neutral returns the PDU to automatic, so that they will attack the fighter units on any armed ships making multiple jumps above your planets.

Declaring a player an enemy retains the automatic defense function, but also allows you to order your PDU to fire at his stationary ships, whether they are armed or not.

Syntax:

+playername	Become more friendly with playername
-playername	Become more hostile with playername

Examples:

`+Assassin`	Become more friendly with Assassin
`-PsiNinja`	Become more hostile with PsiNinja

6 Unloading

The following objects may be carried on ships, in their cargo units, these can be unloaded onto any planet: ore (including fuel), PDUs, industry, mines and spacemines.

6.1 Unloading Mines

Mines are the largest item that can be carried on ships, they each take 20 cargo units to carry. Mines can only be loaded from the player's home planet, but can be unloaded upon any planet. Mines can be unloaded as a different type than what they were loaded as. The only restriction is that to unload a mine onto a planet, there has to be already a mine of that type there. You can even unload them on another players planet. Mine type changing is especially useful on your home planet, where you get a large cargo ship, load up on mines that you have a surplus of and unload them as a type that you are short of, continually adjusting your production to meet your needs.

Syntax:

S*xxx*U*yy*M*z*	Unload *yy* mines of type *z* from ship *xxx*

Examples:

`S276U4M3`	Unload 4 mines of type 3 from ship 276

6.2 Unloading PDUs

Each PDU takes two cargo units to carry. They can be unloaded on any planet, even ones that you do not own, but they defend whatever planet they are unloaded on, even against the player who unloaded them.

Syntax:

S*xxx*U*yy*D	Unload *yy* PDUs from ship *xxx*

Examples:

`S234U3D`	Unload 3 PDUs from ship 234

6.3 Unloading Industry

Each industry takes 10 cargo units to carry. They can be unloaded on any planet. However they can only be loaded from the player's home planet.

Syntax:

S*xxx*U*yy*I	Unload *yy* industry from ship *xxx*

Examples:

`S286U2I`	Unload 2 industry from ship 286

6.4 Unloading Ore

Ore of a specific type can be unloaded onto any planet, irrespective of what ore types there are already present. Each unit of ore takes 1 cargo unit to carry.

Syntax:

S*xxx*U*yy*R*z*	Unload *yy* of ore type *z* from ship *xxx*

Examples:

`S132U42R2`	Unload 42 of ore type 2 from ship 132

6.5 Unloading Spacemines

Spacemines take up one cargo unit each. They can be unloaded on any planet, including those belonging to other players. However when unloaded they go to the planetary stockpile, they are not deployed around the planet. See Section 9 for details on deploying spacemines from ships.

Syntax:

S*xxx*U*yy*S	Unload *yy* spacemines from ship *xxx*

Examples:

`S322U23S`	Unload 23 spacemines from ship 322

6.6 Global Unloading

There is a global unload command to facilitate unloading of large amounts of ore onto a single planet. This command unloads ALL ore except type 0 onto the planet below. If you want to unload ore type 0 you will have to give a specific order to do so. If you want to unload all except ore type 4 for example, you can do a global unload, and then load the ore 4 back onto the ship (as long as you own the planet), as loading occurs after unloading.

Syntax:

S*xxx*U	Unload all ore except fuel (ore 0) from ship *xxx*

Examples:

`S309U`	Unload all ore except type 0 from ship 309

7 Loading

Loading can occur only if the player owns the planet. The ship on which you are loading the item must be large enough to carry it. Table 1 shows the size each item takes up in a cargo hold.

Loading occurs after unloading, so cargo can be transferred between ships if the player owns the planet they are on at the start of the turn.

Item	Number of cargo units needed
1 unit of ore or fuel	1
1 spacemine	1
1 PDU	2
1 industry	10
1 mine	20

Table 1: Number of cargo units to carry items

7.1 Loading Mines

Mines can only be loaded from the players home planet. They take up 20 cargo units each. They can be loaded as any type that is present and unloaded as any type (as long as that type exists on the planet being unloaded onto).

Syntax:

S*xxx*L*yy*M*z*	Load *yy* mines of type *z* onto ship *xxx*

Examples:

`S306L10M4`	Load 10 mine type 4's onto ship 306

7.2 Loading PDUs

Each PDU takes up two cargo units. They can be loaded from any planet that is owned by the player. More PDUs cannot be loaded from the players home planet than have been built since the start of the game. *i.e.* You can't remove PDUs that were there at the start of the game. The population insist on retaining their level of protection. If the PDUs are reduced, due to enemy attacks, to below the initial level (100 PDUs) they will have to built to the initial level again before you can load any.

Syntax:

S*xxx*L*yy*D	Load *yy* PDUs onto ship *xxx*

Examples:

`S243L34D`	Load 34 PDUs onto ship 243

7.3 Loading Industry

You can only load industry from your home planet, and like PDUs you cannot load industry that was there at the start of the game. The planetary population insist on retaining their standard of living. Like PDUs if the number of industry is reduced below the initial amount (60 industry) they will have to be built above that level before they can get loaded again. Each industry takes 10 cargo units to carry.

Syntax:

S*xxx*L*yy*I	Load *yy* industry onto ship *xxx*

Examples:

`S345L3I`	Load 3 industry onto ship 345

7.4 Loading Ore

Ore is perhaps the most common thing to carry, usually bringing ore from the mines of your outer planets into your inner planets for processing. Each ore takes up one cargo unit. They can be loaded from any planet that the player owns. See Section 8 for details on loading ore from Earth.

Syntax:

S*xxx*L*yy*R*z*	Load *yy* of ore type *z* onto ship *xxx*

Examples:

`S123L120R2`	Load 120 of ore type 2 onto ship 123

7.5 Loading Spacemines

Spacemines can be loaded only from the planetary stockpile, to load spacemines from active duty, they must be undeployed using the Retrieve command, detailed in Section 9 on spacemines. Each spacemine takes 1 cargo unit to carry.

Syntax:

S*xxx*L*yy*S	Load *yy* spacemines onto ship *xxx*

Examples:

`S234L34S`	Load 34 spacemines onto ship 234

7.6 Global Loading

This is like the global unload command. It loads all the ore it can beginning with type 1 and working its way up to type 9. If the ship runs out of cargo units the loading will stop. Note that fuel, type 0 ore, is not loaded with this command and must be loaded separately. Global loading occurs after all other loading.

An option to global loading is to specify which ore types have priority in the loading. After all the ores specified in the priority list have been loaded the other ore types are loaded as before. PDUs and spacemines may also be loaded with this option. To use this option, include after the normal global load command the ore numbers that you wish to give priority to in the order you wish them to be loaded in parenthesis '(' and ')'. Specify 'D' or 'P' for PDUs and 'S' for spacemines.

Syntax:

S*xxx*L	Load ore, starting from type 1 to type 9 onto ship *xxx*
S*xxx*L(*spec*)	Load ore, in the order specified by *spec* and then from type 1 to type 9 onto ship *xxx*

Examples:

`S276L`	Load ore from 1 to 9 onto ship 276
`S276L(78D)`	Load all ore 7, then all ore 8, then PDUs and then load ore from 1 to 9 onto ship 276

8 Trading and Earth Contracting

Earth is the center of the Celestial Empire galaxy, and is four jumps away by the shortest route from every players home planet. Earth is different from the other planets in that it is neutral, but players may still make use of its resources in various ways. Any player that successfully takes over Earth and holds it for a turn wins the game. However be warned Earth takes an active interest in its defense. In order to encourage trade, Earth will remove 10% of spacemines orbiting it every turn during the planetary building phase. There are a variety of options available to a player while his or her ships orbit Earth:

- Use of Earth Industry.
- Purchase of needed types of ore.
- Selling of a surplus of ore for credits.

Note that no player may fire while on Earth, or at ships on Earth, until turn 15 when this restriction is lifted; the order will be ignored until that turn. Ships destroyed while over Earth, *i.e.* stripped of all units except the base hyperdrive unit, become neutral, but can be towed using tractor beams to a friendly planet for refitting. Units cannot be built onto an empty ship over Earth, because when that ship is over Earth, it is owned by Earth.

8.1 Earth Contracting

A ship may use the industry on Earth by offering to pay for it. The highest bidder that turn then uses as much industry as they want to, but the required ore must be in the ship's cargo holds to succeed, although it can be bought from Earth in the same turn. The ore must be in the ship being built on, not any other ship. This is the opposite to normal planet operations where the ore must be on the planet not the ship. If the bid is not successful then nothing will be built, but no credits will be lost. There is a minimum bid for Earth industry depending on the type of unit begin built. This is shown at the top of the turn sheet. Any bid below the specified amount will be ignored. The bid is on a per industry basis, not a lump sum.

Only fighter, cargo, tractor and shield units may be built on Earth, as these are built onto the ship, not on the planet, everything else built would be owned by Earth, so such orders are not valid. Although you can contract for Earth industry there is still a limit on how much industry you can use, that being the number of industries that Earth actually has. If there is a high demand for Earth industry then more industries will be automatically built to cope with the demand over time. To pay for the use of Earth industry, you use Earth Credits, which are obtained by selling ore to Earth. If you do not have any of these, your score will be deducted instead at a rate specified at the top of the turn sheet. For example if the multiplier rate is 3 it takes 3 points of score to equal one earth credit.

If Earth has been damaged, it reserves some of its industry and ore for its defense, so even though there might be 50 industry left on Earth, it might not have all 50 available for players to use.

Syntax:

S*xxx*B*yy*C*oz*	Bid *zz* credits/industry used in the building of *yy* cargo units onto ship *xxx*.
S*xxx*B*yy*F*zz*	Same as above except for fighter units not cargo units.
S*xxx*B*yy*T*zz*	Same as above except for tractor units not cargo units.

S*xxx*B*yy*S*zz*	Same as above except for shield units not cargo units.

Examples:

`S178B43F45`	Bid 45/industry to build 43 fighter units on ship 178
`S179B23C10`	Bid 10/industry to build 23 cargo units on ship 179

8.2 Buying Ore

If your empire is short of a certain type of ore that is needed, then you can purchase ore from Earth at a price per unit that is stated at the top of the turn sheet. This ore is loaded directly into the cargo units of the ship that does the purchasing. Note that you can buy ore from the Earth market and build units onto the ship using Earth industry in the same turn, this is a very fast method of building up the size of cargo ships, with the number of cargo units almost doubling every turn, other units are not nearly as efficiently built using the resources of Earth. There are limits to the amount of ore that can be bought from Earth, this is shown in the turn sheet in the Earth details section under `Amount`. However if there is a demand for a certain type of ore, more mines of that type will be be automatically built over time. Again the unit of currency in the trade is the Earth credit.

The ship must be over Earth to make use of this facility. If Earth has been under attack, and has less than a certain number of PDUs there could be a limited amount of some ores, as Earth reserves various ore types for its defense.

Syntax:

S*xxx*P*yy*R*z*	Purchase *yy* units of ore type *z* and load them onto ship *xxx*

Examples:

`S123P12R1`	Buy and load 12 units of ore 1 onto ship 123

8.3 Selling Ore

If you have a surplus of a certain type of ore or you need Earth credits then you can sell the surplus ore to the Earth market. The ship, which needs to be over Earth to sell ore must have the ore in its cargo hold to sell it to Earth. The price is $\frac{2}{3}$ that of the selling price listed on the turn sheet. There are a number of different behaviours to selling ore to Earth.

- Earth will buy all ore that is sold to it. This will be indicated on the turnsheet near the ore prices by "Unlimited Selling".
- There are limits on the amount you can sell to Earth. Earth will not buy more ore than it thinks it needs. Currently Earth thinks it needs about 100 of each type of ore. So if Earth has 30 of ore type 0, it will not buy more than 70 of that type of ore. This will be indicated on the turnsheet near the ore prices by "Limited Selling".

This is the only way a player can get Earth credits.

There is also a global sell command which sells all ore that a ship has except ore type 0.

Syntax:

S*xxx*X*yy*R*z*	Sell *yy* units of ore type *z* from ship *xxx*
S*xxx*X	Sell all ore except 0 from ship *xxx*

Examples:

`S123X23R2`	Sell 23 units of ore type 2 from ship 123
`S123X`	Sell all ore from ship 123

9 Spacemines

Spacemines are semi-intelligent orbiting boxes of explosives that home in on any ship that enters the system. However they are only semi-intelligent and attack all ships, whether friendly or not. Spacemines are less effective than PDUs, but are easier to build, and can also be used in ways that PDUs can't be.

Spacemines exist in two modes: inactive or active. In their inactive stage they are stored on the planet, and are harmless, and safe from external attack. Active, they are orbiting the planet, homing in on any ships that are present in the system. Spacemines automatically hit any ship that enters the system that they are in, doing half as much damage as PDUs do, *i.e.* two spacemines are needed to destroy one ship unit. They do not attack ships that are already in the system, or have just been built in the system. Spacemine attacks can destroy cargo units, unlike PDU attacks. 10% of all spacemines will be destroyed in any attack that they perform (losses are rounded up). The spacemines suffer losses immediately when they attack. Spacemine attacks are resolved after all movement, so a spacemine attack will not prevent a ship from completing its jump. They attacks ships in order of jumping, so length 1 jumps will be affected before and jump 2 attacks and so forth.

Spacemines can be loaded and unloaded directly from a planetary store, and transported to other systems where they are needed. They can also be deployed (put into active mode) from both ships and planets. When a planet changes ownership, the planetary stockpile is unaffected, and the new owner will inherit all of the spacemines there. Note that you do not need to own a planet to deploy spacemines from a ship into its system (see section 30 on Strategy and Tactics). However spacemines can only be undeployed or retrieved (put into inactive mode) by spaceships that have tractor beams and cargo units enough to store the spacemines. It takes one tractor unit to retrieve each spacemine, and also one cargo unit to store the mine in.

Spacemines can be deployed on Earth before the attack restriction is lifted on turn 15, however every turn that there are spacemines above Earth, 10% of them will be destroyed during the planetary building phase.

Syntax:

S*xxx*D*yy*	Ship *xxx* deploy *yy* spacemines
*xxx*D*yy*	Planet *xxx* deploy *yy* spacemines
S*xxx*R*yy*	Ship *xxx* retrieve *yy* spacemines

Examples:

`S123D34`	Ship 123 deploy 34 spacemines
`234D2`	Planet 234 deploy 2 spacemines
`S123R23`	Ship 123 retrieve 23 spacemines

10 Battle

All battle is simultaneous. A ship may attack spacemines, mines, industry, PDUs or other ships. The ships may attack multiple targets in the same system in the same turn, but may only use each fighter unit once per turn. If the number of fighter units is not specified in an attack command, all fighter units are assumed to be used.

Some targets, like mines, take multiple shots to destroy; if not enough shots are received per attack then no damage is done. For example, it takes 10 shots to destroy a mine. If the mine took 9 shots in a turn from a single ship it would not be affected. If another ship came and did another 9 shots to it, it would still not be destroyed. Fractional damage amounts are not kept from turn to turn. Normal maintenance repairs the damage inflicted during the turn. If your ship initiates combat, it cannot then jump on its own, however it can still be engaged by tractor units from another ship.

10.1 Shot Calculation

To calculate the damage your ship will do:

1. Calculate the mass of the ship[6].

$$Mass = 1 + (ecu) + 1.5 * (fcu) + (tu)/2 + (su)/2 + (fu)/10.$$

[6] Where ecu is the number of empty cargo units, fcu is the number of full cargo units, fu is the number of fighter units, tu is the number of tractor units, and su is the number of shield units.

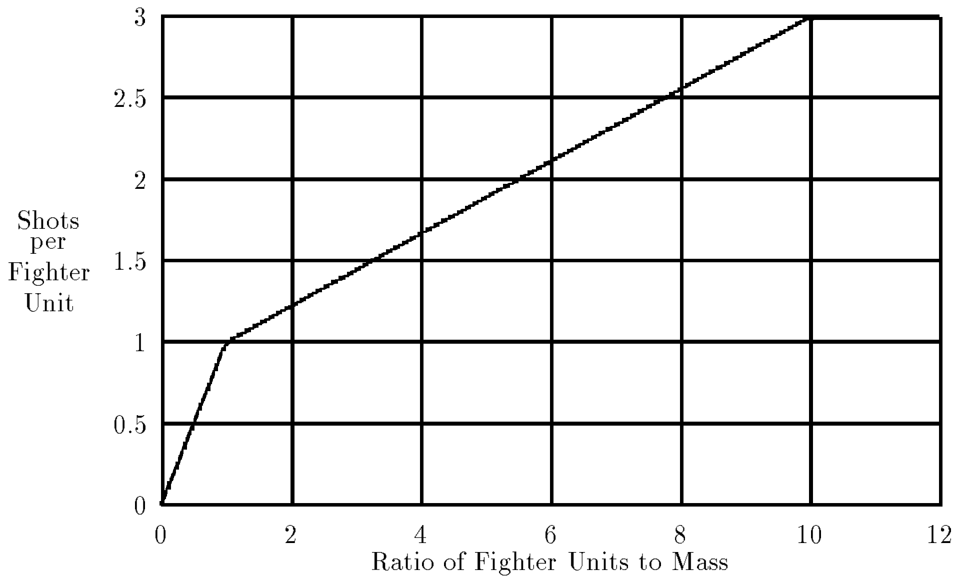

Figure 1: Graph of shots/fighter unit vs mass ratio

For example a ship has 102 fighter units, 20 cargo units, 10 of which are full, 10 tractor units, and 20 shield units[7]. Its mass is:

$$1 + 10 + 1.5 * 10 + 10/2 + 20/2 + 102/10 = 51.2$$

2. Calculate the ratio between the number of fighter units used in the attack and the mass of the ship. In the above example $Ratio = \frac{102}{51.2} \approx 2.0$
3. Cross reference this number to get shots per fighter unit from Figure 1. In this example it is around 1.25 [8].
4. Calculate the number of shots fired by the ship. Multiply the number of shots fired per fighter unit by the number of fighter units and round down to a whole number. So our example ship will have $1.25 \times 102 = 127.5$ rounded down to 127 shots.

10.2 Ship Design

The number of shots that a combat ship can apply depends on many factors. The mass is one of the most important factors. Shield units are useful but they mass a fair bit. Also try and reduce the number of cargo units that the ship will have, it needs a few if it is to be mobile. Tractor units are not very useful for battle-ships as they mass too much in the large numbers that you need them in, it is better to have a dedicated battleship and a cargo vessel that has lots of tractor units. One of the skills in Celestial Empire is the ability to design ships that are useful in a wide range of areas, and have little or no weakness.

For a cargo ship mass does not matter, they are going to mass heaps and have very low shot ratios if you bother putting fighter units on them. However shield units are very useful for cargo vessels, as the mass does not matter, and it allows a heavily laden cargo ship to get past enemy raiders.

There are five types of targets:

[7] This is a very powerful and expensive ship, a Super Battleship.

[8] For those of you who want the precise details the vertices of the graph are at (0,0), (1,1), (10,3) and (16,3).

10.3 Ships

Ships are unpredictable targets. You know the type of ship, but you never know exactly how big the target ship is. For details on this see the section 22 on ship types. The targeted ship does not lose the ability to move unless the attack has destroyed sufficient cargo units to make it impossible to carry the required fuel. Each shield unit will absorb a number of shots depending on the proportion of units that are shields, as shown in Figure 2[9]. If there are any excess, each shot will destroy a shield unit until there are none, and then destroy fighter units until there are none. If there are still any shots left the tractor units start to be destroyed and finally cargo units are removed, all for one shot/unit. The hyperdrive/hull unit cannot be destroyed. If the ship, after being attacked, does not have sufficient cargo units to hold all its cargo, the excess is unloaded onto the planet, starting with mines[10], industry, PDUs, spacemines, then ore from type 9 down to type 0. However spacemines released in this way do not end up on the planet like everything else, they end up orbiting the planet, *i.e.* they are deployed.

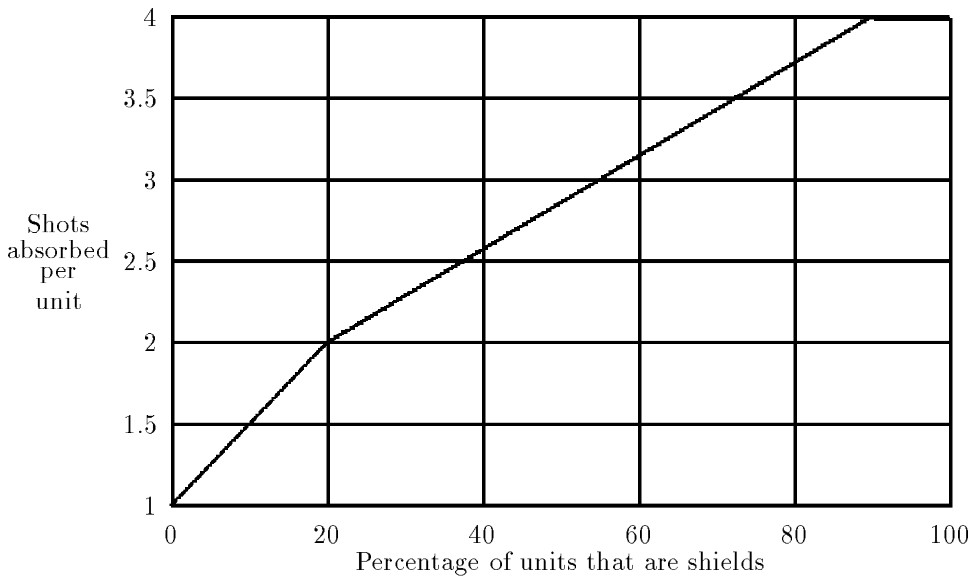

Figure 2: Graph of shots absorbed per shield unit

You cannot attack a ship that is owned by a player you consider FRIENDLY. However that does not stop them attacking you if you are NEUTRAL or HOSTILE in their eyes. Also your ship cannot attack itself, but can attack other ships owned by you, for whatever nefarious reasons you may wish to do this.

When you attack a ship you will get a report in your command history of how much damage that ship had done to it that turn, and how much of it you did. Likewise if your ship is damaged, you will be told how much damage it took, and what effect it had.

Syntax:

S*xxx*AS*yyy*	Ship *xxx* attack ship *yyy* with all fighter units
S*xxx*A*zz*S*yyy*	Ship *xxx* attack ship *yyy* with *zz* fighter units

Examples:

`S231AS321`	Ship 231 attack ship 321
`S231A34S321`	Ship 231 attack ship 321 with 32 fighter units.

10.4 Planetary Defense Units

The PDUs on a planet must be removed before ownership can change, unless it is gifted away by the owner. This is the normal reason for attacking them. PDUs can be ordered to attack ships only if the

[9] Vertices are $(0,1)$,$(20,2)$, and $(90,4)$.

[10] These mines will be randomly distributed amongst the mines that exist on the planet below. If there are no mines on that planet, then these mines will be destroyed

owner of those ships is considered hostile in the formal alliance table.

When a ship that does not belong to the player or to one of their formal allies, jumps *through* a planet that has PDUs defending it, the PDUs will automatically fire upon that ship. A ship that finishes its turn on the planet will not be fired upon automatically.

When attacked, PDUs will fire at each attacking ship. Each PDU will destroy units as for ship to ship combat. The number of shots each PDU generates is a function of how many PDUs there are on that planet, as shown in Figure 3. This occurs simultaneously, so the ship will attack with its full strength at the same time that the PDUs attack at their full strength. However at the end of the turn both will be damaged. Each three shots from a ship will destroy one PDU.

When you attack PDUs you will be told in your command history how many you destroyed. The player whose planet they were around will also be told how many you destroyed.

Syntax:

S*xxx*AD	Ship *xxx* attack PDUs
S*xxx*A*zz*D	Ship *xxx* attack PDUs with *zz* fighter units

Examples:

`S309AD`	Ship 309 attack PDUs
`S309A2D`	Ship 309 attack PDUs with 2 fighter units

10.5 Mines

To attack a mine the firing ship must specify the mine type. It takes 10 shots to destroy 1 mine. The PDUs on the planet will react as if they had been attacked and will attack the ship at the same time that it attacks the mine. If there are some shots left after all the mines of the specified type are destroyed, stored ore of that type will be destroyed at one unit/shot.

When you attack mines you will be told in your command history how many you destroyed, as well as how much ore. The player whose planet they were around will also be told how many you destroyed.

Syntax:

S*xxx*AMy	Ship *xxx* attack mine type *y*
S*xxx*A*zz*My	Ship *xxx* attack mine type *y* with *zz* fighter units

Examples:

`S165AM0`	Ship 165 attack mine type 0
`S165A10M0`	Ship 165 attack mine type 0 with 10 fighter units

10.6 Ore

To attack ore the firing ship must specify the ore type. The PDUs on the planet will react as if they had been attacked and will attack the ship at the same time that it attacks the ore. If there are some shots left after all the ore of the specified type have been destroyed, the shots are wasted. It takes one shot to destroy one unit of ore.

Syntax:

S*xxx*ARy	Ship *xxx* attack ore type *y*
S*xxx*A*zz*Ry	Ship *xxx* attack ore type *y* with *zz* fighter units

Examples:

`S165AM0`	Ship 165 attack ore type 0
`S165A10M0`	Ship 165 attack ore type 0 with 10 fighter units

10.7 Industry

The same rules apply for industry as for mines, except of course there's no need to specify type, and all excess shots are wasted.

Syntax:

S*xxx*AI	Ship *xxx* attack industry
S*xxx*A*zz*I	Ship *xxx* attack industry with *zz* fighter units

Examples:

`S164AI`	Ship 164 attack industry
`S164A20I`	Ship 164 attack industry with 20 fighter units

10.8 Spacemines

Ships with fighter units can attack spacemines that are active around a planet. Spacemines that are stockpiled cannot be attacked by ships, or by any other means. One spacemine is destroyed per shot. You will be told how many you destroyed, as will the owner of the planet.

Syntax:

S*xxx*ASM	Ship *xxx* attack space mines
S*xxx*A*zz*SM	Ship *xxx* attack space mines with *zz* fighter units

Examples:

`S123ASM`	Ship 123 attack space mines
`S123A6SM`	Ship 123 attack space mines with 6 fighter units

10.9 Planetary Attacks vs Ships

If you have listed another player as Hostile on the formal alliances, your PDUs can, if you so direct, fire at his ship, when it has stopped over the planet. This attack form will not work if the player who owns the ship is not listed as Hostile. The more PDUs are in the attack the more shots they do per PDU. For the exact amount see Figure 3[11]. See above for details on the power of a single shot.

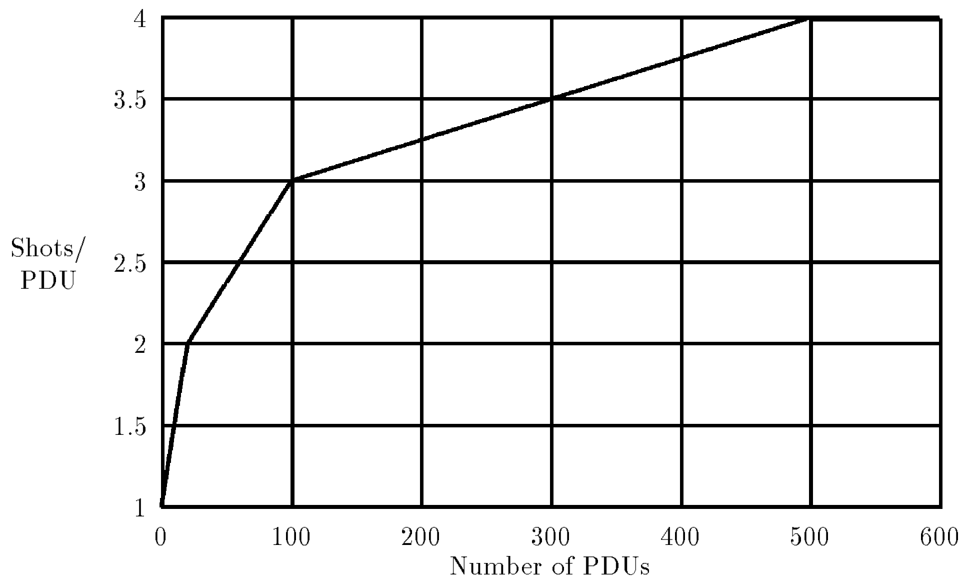

Figure 3: Shots per PDU

When you attack a ship you will get a report in your command history of how much damage that ship had done to it that turn, and how much of it you did. Likewise if your ship is damaged, you will be told how much damage it took, and what effect it had.

[11] The vertices on this graph are (0,1),(20,2),(100,3),(500,4).

Syntax:

*xxx*AS*yyy*	Planet *xxx* attack ship *yyy*
*xxx*A*zz*S*yyy*	Planet *xxx* attack ship *yyy* with *zz* PDUs

Examples:

`123AS234`	Planet 123 attack ship 234
`123A120S234`	Planet 123 attack ship 234 with 120 PDUs

10.10 Planetary Attacks vs Spacemines

If some other player, or even yourself has deployed spacemines around your planet, and you want to get rid of them before your ship jumps into the system, you can get your PDUs to fire upon the spacemines, destroying one spacemine for every PDU. You will be told in your command history how many were destroyed.

Syntax:

*xxx*ASM	Planet *xxx* attack spacemines
*xxx*A*zz*SM	Planet *xxx* attack spacemines with *zz* PDUs

Examples:

`123ASM`	Planet 123 attack spacemines
`123A20SM`	Planet 123 attack spacemines with 20 PDUs

10.11 Earth attacking Enemy Ships

Once a player has fired upon Earth that player is listed as hostile by NEUTRAL. That player will, from then on, be attacked by any neutral planet that has PDUs that have not been fired yet. This is after all normal attacks.

Note that this happens even if you do not put a turn in, so if you attack Earth be careful.

11 Ship Tending

Sometimes you need to move cargo from one ship to another without first unloading it on the planet below, usually when you do not own the planet below. To do this you give a tend command, telling one ship to transfer cargo into another ships cargo hold. Naturally you can only do this to your own ships, or those of your allies. At the moment if two ships try to tend to each other with the same type of unit (ore, mines, industry, etc.) it is undefined which will occur first, so if you have no free space on your ships your order could fail due to lack of space.

Syntax:

S*xxx*T*yy*S*zzz*R*w*	Ship *xxx* transfer *yy* of ore type *w* onto ship *zzz*
S*xxx*T*yy*S*zzz*I	Ship *xxx* tend *yy* industry onto ship *zzz*
S*xxx*T*yy*S*zzz*M	Ship *xxx* transfer *yy* mines onto ship *zzz*
S*xxx*T*yy*S*zzz*D	Ship *xxx* tend *yy* PDUs onto ship *zzz*
S*xxx*T*yy*S*zzz*S	Ship *xxx* tend *yy* spacemines onto ship *zzz*
S*xxx*TS*zzz*	Ship *xxx* transfer all ore from 1 to 9 onto ship *zzz*

Examples:

`S276T4S123R5`	Load 4 ore type 5 onto ship 123 from ship 276
`S123T1S276I`	Tend 1 industry from ship 123 to ship 276
`S134T9S200M`	Tend 9 mines from ship 134 to ship 200
`S145T120S206D`	Transfer 120 PDUs from ship 145 to ship 206
`S100T59S270S`	Tend 59 spacemines from ship 100 to ship 270
`S103TS104`	Ship 103 transfer all ore from types 1 to 9 to ship 104

12 Unbuilding

The owner of a ship can remove units from a ship to change the profile of the ship, and also to recover the ore used in their construction. It takes the same amount of industry to destroy units as it does to create them in the first place, however not all the ore is recovered, half of the ore is lost in the process, rounded down. The order syntax is shown below, 'Z' was chosen basically because all the other nice letters had been taken. Just think of 'Z' for zap.

Only ship units can be unbuilt. Mines, industry, spacemines, PDUs and hyperdrives cannot be unbuilt.

Item	Amount recovered	Types recovered	Industry Needed
cargo unit	$\frac{1}{2}$	1	1
fighter unit	$\frac{1}{2}$	2,3	2
tractor unit	1	7	2
shield unit	$\frac{1}{2}$	5,6	2

Table 2: Unbuilding requirements

Syntax:

S*xxx*Z*yy*C	Ship *xxx* unbuild *yy* cargo units
S*xxx*Z*yy*F	Ship *xxx* unbuild *yy* fighter units
S*xxx*Z*yy*T	Ship *xxx* unbuild *yy* tractor units
S*xxx*Z*yy*S	Ship *xxx* unbuild *yy* shield units

Examples:

`S123Z30C`	Ship 123 unbuild 30 cargo units
`S234Z5F`	Ship 234 unbuild 5 fighter units
`S309Z9T`	Ship 309 unbuild 9 tractor units
`S276Z25S`	Ship 276 unbuild 25 shield units

13 Building

The owner of a planet may order the planet to build items if the planet has enough industry and ore. The ore is consumed, the industry is not, however an 'industry' can only be used once per turn. Table 3 contains all the relevant information for building.

For example if a planet had 60 industry it could be ordered to build 1 hyperdrive with 8 cargo units, 1 industry and 2 PDUs, if it had the required ore[12].

If you try to build using more than you have of industry or ore, the amount you will build will be reduced to the amount that can be produced. For example, if you tell a planet to build 20 mine 3s and it only has ore for 5 mines, then only 5 mines will be produced. With hyperdrives, only whole units will be built, so if you ask for 3 hyperdrives, each with 10 fighter units, and you have enough ore for only 25 fighter units, but enough for the three actual hyperdrives themselves, then only two hyperdrives will be built, both with 10 fighter units on them. A hyperdrive with only 5 units will NOT be produced.

13.1 Planetary Building

You can build industry, mines, PDUs, spacemines and hyperdrives on planets. You do not need to have a ship on the planet to do any of this building, just the ore and the industry. You can build mines on a planet even if there are not any mines of that type there at the moment.

Note that spacemines use any sort of ore, the type being specified in the order to build.

Syntax:

*xxx*B*yy*D	Planet *xxx* build *yy* PDUs

[12] This build order would need 8 units of type 1 ore, 12 type 4, 10 each of types 5, 6 and 7, and 5 each of types 8 and 9 on the planet doing the building.

Item	Amount of each type	Types needed	Number of Industry
cargo unit	1	1	1
fighter unit	1	2,3	2
tractor unit	2	7	2
shield unit	1	5,6	2
PDU	1	4	1
industry	5	8,9	10
mine	5	8,9	10
spacemine	1	any	1
hyperdrive (new ship)	10	4,5,6,7	40

Table 3: Manufacturing Needs

*xxx*B*yy*M*z*	Planet *xxx* build *yy* mines of type *z*
*xxx*B*yy*I	Planet *xxx* build *yy* industry
*xxx*B*yy*S*z*	Planet *xxx* build *yy* spacemines using type *z* ore
*xxx*B*yy*Hff/cc/tt/ss	Planet *xxx* build *yy* hyperdrives with ff fighter units, cc cargo units, tt tractor units and ss shield units each.

Examples:

`345B50D`	Planet 345 build 50 PDUs
`235B5M8`	Planet 235 build 5 mines of type 8
`103B10I`	Planet 103 build 10 industry
`100B50S0`	Planet 100 build 50 spacemines using type 0 ore
`327B1H0/5/0/7`	Planet 327 build 1 hyperdrive with 0 fighter units, 5 cargo units, 0 tractor units and 7 shield units each.

13.2 Shipboard Building

Shipboard units: fighter, cargo, tractor and shield units must be built directly onto ships — they cannot be stockpiled on a planet, and cannot be built onto another player's ships. The orders to build these units begin with an 'S' and the ship number that they are being built on. The ore required has to be on the planet, not in the ship's cargo hold. The exception to this is contracting units on Earth, see section 8.1 for details.

Syntax:

S*xxx*B*yy*C	Ship *xxx* build *yy* cargo units
S*xxx*B*yy*F	Ship *xxx* build *yy* fighter units
S*xxx*B*yy*T	Ship *xxx* build *yy* tractor units
S*xxx*B*yy*S	Ship *xxx* build *yy* shield units

Examples:

`S123B30C`	Ship 123 build 30 cargo units
`S234B5F`	Ship 234 build 5 fighter units
`S309B9T`	Ship 309 build 9 tractor units
`S276B25S`	Ship 276 build 25 shield units

14 Movement

If a ship has enough fuel (type 0 ore) it can jump from planet to planet if the order can be written, *i.e.* if you know the correct planet numbers. There are two ways to find out the planet number — visit the planet, or ask another player (or a research planet). Trading in information is common. A ship can jump as many as 5 planets in one turn by listing the intermediate planets and the final planet. The fuel requirements are listed in Table 4. Note that fuel must be carried by the cargo units of the ship.

If another ship that has successfully engaged yours with tractor beams, you will follow it through the jumps, but at no expenditure of fuel, even if you wish to jump elsewhere. Your ship cannot jump if it initiated battle, either against another ship or a planet.

The fuel used in long jumps (greater than 1) is dependent on the efficiency of the drive. The initial efficiency is 0. The only way to increase the efficiency of a drive unit is using a research planet order. The ship must be on the planet during the research turn. See section 20 on research planets for more details. The amount of fuel used for the length of jump and the efficiency of the drive is given in Table 4. Note that the maximum effective efficiency is 4, but the drives efficiency can exceed 4. When a ship is stripped of all its units, to become a hull, its drive efficiency remains what it was. This is because the hull/hyperdrive unit is indestructible, and not affected by the attack.

Effective efficiency is modified by the size of the ship. For every 200 units the ship has, apart from the first 200, the effective efficiency goes down by 1. A ship can have an effective efficiency of -1 and still move, however it will be expensive in fuel costs. If the effective efficiency goes below -1 the ship will not be able to move. For example if a ship has an efficiency of 1, and has 100 units, its effective efficiency will still be 1; if the same ship had 210 units, its effective efficiency would be 0.

If you specify a multiple jump and the ship can only jump part of the way, for example if you got one of the intermediary planet numbers wrong, the ship will jump as far as it is able along the route specified, but will use fuel as if it had completed the jump. If the jump cannot be started, *i.e.* you got the first planet wrong, no fuel will be lost.

		Drive Efficiency					
		-1	0	1	2	3	4+
	1	2	1	1	1	1	1
J	2	8	4	2	2	2	2
U	3	18	9	6	3	3	3
M	4	32	16	12	8	4	4
P	5	50	25	20	15	10	5

Table 4: Fuel requirements for jumping

As you jump through a system in a multiple jump, if the planets you jump through are not owned by you and have PDUs on them, then the PDUs will fire on your ship in the normal manner as if you attacked them, but you cannot fire back. If a player has *you* listed as friendly in the formal alliance table then the PDUs will not fire in this manner. However if they have you listed as neutral or hostile they will fire at you.

If a planet has spacemines they will attack your ship independent of which player you are, even if you own the planet you will be attacked. If you go on a multiple jump, spacemines on any of the intervening planets will also attack your ship. The attacks by the spacemines are resolved at the end of the turn. See section 9 for details.

Syntax:

S*xxx*[J*yyy*]J*zzz* — Ship *xxx* to jump to planet *zzz* via *yyy*

Examples:

Note that there can be up to 4 *yyy* planets. So a jump 5 order could look like:

`S123J120J240J320J101J322`

Ship 123 jump to 120 to 240 to 320 to 101 and to 322

Or be as simple as:

`S123J120` — Ship 123 jump to 120.

15 Ore Transmutation

If you desperately need ore of a specific type and you have an excess of industry you can transmute one sort of an ore into another sort. This is expensive in industry, but if you need the ore, or have industry surplus to your needs it can be worth while.

It takes 10 industry to transmute 1 unit of ore from one type to another.

Syntax:

*xxx*X*yy*R*z*R*w*	Planet *xxx* transmute *yy* ore type *z* into type *w*

Examples:

`145X4R5R6`	Transmute 4 ore 5 into ore 6 on planet 145

16 Planet Scans

Your home planet is able to obtain information on one planet per turn, each research planet is also able to provide one scan per turn. The information you get is exactly what you would receive if you had a ship on the planet. When a planet is scanned, by either you or someone else, everyone who has an interest in that planet (*i.e.* owns it, has a ship above it, or is scanning it) will see that it is being scanned by having the following line appear above the planet in the turn sheet:

```
******* PLANET SCANNED THIS TURN *******
```

Syntax:

SCAN*xxx*	Scan planet number *xxx*

Examples:

`SCAN123`	Scan planet 123

17 Standing Orders

A standing order can be given to each planet and ship that the player owns. This order will be treated like a standard player order, but will be executed every turn, even if the player does not put in a turn sheet for that turn. Only orders that directly concern the planet or ship in question can be given (*i.e.* No changing alliances or scanning using standing orders is allowed). The standing orders will be included in the players COMMAND HISTORY along with all the commands that the player gave that turn.

Standing orders will not be executed the turn they are set but the next turn, and every turn thereafter until they are turned off. The syntax for setting a standing order is the same as doing a normal order except precede the commands with an 'O'. To clear a standing order just put an 'X' in front of the ship or planet name. The order will not be cleared until the turn after the order is given. *i.e.* When the clear order is given the standing order will still be executed that turn.

Note that no syntax checking of the order is done until the command is executed in the following turns, so if you get the order wrong you will get an error message every turn until you change the standing order.

The standing orders will be executed before they are cleared in the same turn, due to them being placed after they are executed. *i.e.* If you have a planets standing order to building industry, and then set it to build PDUs, it will still build industry on the turn you tell it to change its standing order.

Standing orders are cleared when ownership changes.

Syntax:

OS*xxxorder*	Set the standing order of ship *xxx* to *order*
O*xxxorder*	Set the standing order of planet *xxx* to *order*
XS*xxx*	Clear standing order for ship *xxx*
X*xxx*	Clear the standing order for planet *xxx*

Examples:

`OS123AI`	Set a standing order for ship 123 to attack industry every turn
`O234B3D`	Set the standing order for planet 234 to build 3 PDUs every turn
`XS123`	Clear ship 123's standing order
`X234`	Clear the standing order for planet 234

18 Change of Ownership

Ownership of a planet is determined automatically at the end of the turn, there is no need to do it formally.

Spacemines do not affect ownership in any way, planets that have spacemines deployed will change their ownership by the normal methods specified below.

18.1 Planet Ownership

Ownership of planet cannot change while there are PDUs on it (unless gifted away). If there are no PDU, the ownership:

- is unchanged if there are no ships on the planet, or
- changes to the player who owns the ship if there is only one ship there as long as it is not an **empty hull**,
- is unchanged if more than one player has a ship there.

Before any player has visited a planet, it is neutral, and for the purposes of this section the planet can be considered to belong to another player called NEUTRAL. If two players land on a previously unclaimed planet in the same turn, it continues to be neutral until there is only one player's ship there and there are no PDU on the planet. If a player drops PDU on a neutral planet it becomes an armed neutral planet. Also, it is possible to gift a planet to NEUTRAL.

When a player takes over a planet a message will appear in the command history: "`Planet 102 liberated from PsiNinja`". The player who lost the planet will get "`Planet 102 defeated by Space Attack`". You are not told who took your planet, you have to that yourself with scans or moving a ship over that planet.

To summarize, a planet will only change ownership if you are the only player with ships over a planet that is not defended by PDUs. Empty hulls do not count as ships for this purposes. Gifting is the only other way to change ownership of a planet.

Most of the planets owned by NEUTRAL are unarmed, less then 5% have PDUs on them at the start of the game. Earth is always defended, and will rebuild its defences if it is attacked.

18.2 Ship Ownership

Ownership of ships which have not been gifted is:

- unchanged if any units remain on the hull.
- changed to the player who owns the planet the ship is on if the ship is just a hull.

Ownership of a ship with any units on it is not changeable except by gifting. A hull (*i.e.* a ship with no units) belongs to the owner of the planet it is orbiting around. Hulls will not affect the ownership of the planet however. When a ship changes ownership the person who now owns it gets the message "`Ship S103 has been boarded by your space marines`" while the original owner gets "`Ship S103 lost to space pirates`".

19 Mining

Most planets have some mines of several different types. Each mine of each type will produce 1 unit of ore per turn. This is automatic and requires no orders from the player. Neutral planets will not produce ore — a planet must be owned by a player before its mines will produce. The exception to this rule is Earth, which produces all the time. Spacemines do not produce anything, except casualties.

20 Research Planets

About 10% of all planets are Research Planets. These have various effects on the game. The player who owns them receives additional credits as shown in section 24. Also on turn 10 and every 4 turns thereafter, each research planet will allow its owner to choose one of the benefits listed below. Also they allow more planet scans, which are described in section 16. Finally, after every research turn a list of the owners and nearby planets will appear on the turn sheet sent to the players. This list contains all research planets that were owned at the end of the research planet turn, irrespective of whether they were used that turn or not. Available benefits:

- Creation of a permanent link between two planets, both of which are owned by the player giving the order, and neither of them having four connecting planets already
- Building of four cargo units with four units of fuel already loaded onto a ship at the research planet.
- Creation of an industry on the research planet.
- Creation of a mine, regardless of the existence of mines of that type on the research planet.
- Creation of 10 PDUs on the research planet, or 5 on another planet.
- Transmutation of ore. This can be done in fairly large quantities. 100 units of ore on the research planet, and about 25 for not on the research planet. Only a single ore type can be done per research planet.
- Transmutation of mines. Two mines on the research planet can be converted to mines of a different type. One mine off the research planet can be converted.
- Changing of mines to industry or vice versa. If the mines and industry are on the research planet, 3 mines can be converted to 2 industry, or 3 industry can be converted to 2 mines. Off the research planet, 2 mines can be converted to 1 industry, or 2 industry can be converted to one mine. Note that this cannot be used to reduce your home planets industry below its initial level.
- Random positioning of one of your ships. Note that random means getting the dice out, you have no control over where your ship will end up. Your ship does not have to start on the research planet.
- Specific positioning of a ship onto an either neutral or planet owned by you. It does not have to be on a research planet, but it cannot be on another players planet. This takes TWO research planets in the same turn.
- Loading one unit of fuel onto another player's ship.
- About 50% increase in the number of units of any type on a ship on the research planet, or about 20% increase for one off the research planet. If an industry is sacrificed on the research planet, at the start of a research planet turn, then an extra 10% increase per industry in either of these figures, to a maximum of 100%. Note that the industry can be on a ship above the research planet as well as on the planet. There will be a minimum growth of 5 units unless specified. There is also a maximum rate of increase, no ships units can more than double in a single turn, no matter how many research planets you use. Research planets can only increase the number of units upto 250. Any units beyond this will be ignored.
- Decrease in the number on units on one of your ships. The rate of decrease is double that of unit increase. *i.e.* 100% decrease for a ship on the research planet, 40% for a ship off the research planet. If you want a lesser number destroyed remember to write it clearly on your turn sheet.
- Transferring units from one ship to another; 30 units if both ships are over the research planet, or 20 if only one is over the research planet, or 10 if neither ship are over the research planet.
- Details of another player's ships — you are told the number of each type, *not* the specific unit numbers, locations, cargo etc.
- Details on ownership of planets, *i.e.* Who owns how many planets.

- Destruction of a link. The player must own both planets involved, must have a battleship on each planet and must have at least two industries on one of the planets. the two industries will be destroyed in the process of destroying the link.
- Increase the drive efficiency of a ship that is on the research planet at the start of the research turn.
- Moving a ship around (by teleport) without using fuel. The range that it can move is 4 if the ship is on a research planet, 2 if it is not. This cannot move a ship over or through space not controlled by you. Please give the path that you want the ship to take. Note that the ship cannot end up on a planet that you do not own. Also no planets that you pass through can have either deployed spacemines or non-aligned ships on them. You can still start your ship at an enemy controlled planet however.
- Converting one sort of unit to another on a single ship. This can be done in unlimited amounts. The ratio of units changed will be different depending on what units you are changing from and to. For example 3 shield units will be converted to 2 fighter units, or if the ship is not on the research planet then 3 shield units get converted to 1 fighter unit. For cargo to fighters the ratio is 4 to 1, cargo to shields 3 to 1.
- Transporting two industry or mines from a research planet to a ship. Or transporting one industry or mine from another planet to a ship. In either case the ship must be orbiting the planet where the mines or industry are.
- As requested by a player. The following restraints must apply:
  - The request must be physically realistic, and be possible to implement in the game.
  - It must not be too powerful, anything more powerful than a 50% increase in fighter units will probably not be allowed.
  - It cannot create new game elements. The effects must be instantaneous.

When giving research planet orders please be clear. Note that these orders are carried out before any others so ships must be on the research planet at the end of the previous turn if they wish to use some of the ship based options on the research planet turn. If you want a special request, mail it in early so that I can discuss it with you, otherwise just mail me your requests with your normal commands. Be sure to say which planet is doing which request.

The actual syntax of these orders is open as they are human read, not machine read. Place the research orders at or near the top of the turn sheet in a comment. For example:

```
;RP103 Increase efficiency of S100
```

21 Diplomacy

To communicate with other players there are various sorts of message facilities available. These messages should be included in the turn sheet just like any other command.

There are three sorts of message:

Global Messages The message gets sent to all players in the game.

Personal Messages This message gets sent to just one player.

Alliance Messages This message will be sent to people who are of the same alliance status to you. So you can send messages to all people who are your allies, friends, enemies etc.

Each message must be only one line long. If you want to send a message longer than one line send multiple messages, the order will be preserved. Having a terminator at the end of the line is optional but recommended.

Syntax:

{ *broadcast message* [}]	Send *message* to every player.
&*playername personal message* [&]	Send *personal message* to *playername*.
(*allnce allnce msg* [)]	Send *allnce msg* to all players who you have at *allnce* status.

Examples:

`{Death to Grok the infidel.}`	Send "`Death to Grok the infidel.`" to every player.
`&Winter Leave #306 now or face war.&`	Send "`Leave #306 now or face war`" to Winter.
`(ALLY We must strike at P304 now)`	Send "`We must strike at P304 now`" to all allies.

22 Ship Types

Another player's ships will not appear on your printout in the same detail as your own ships. The only information you will be given is the type of ship that it is, as well as its number, name and who the owner is. Ships are divided into classes according to the number of fighter and cargo units they have. Shield and tractor units have no effect. Table 5 lists all ship types.

Ship Type	F-units	C-units	Ratio (fighter:cargo units)
Empty Ship	0	0	na
Small Cargo		1–10	less than 0.5
Medium Cargo		11–30	"
Large Cargo		31–75	"
Super Cargo		76–150	"
Mega Cargo		151–250	"
Ultra Cargo		251+	"
Small Ship	1–10		between 0.5 and 2, inclusively
Medium Ship	11–30		"
Large Ship	31–75		"
Super Ship	76–150		"
Mega Ship	151–250		"
Ultra Ship	251+		"
Small Battle	1–10		more than 2 and less than 9
Medium Battle	11–30		"
Large Battle	31–75		"
Super Battle	76–150		"
Mega Battle	151–250		"
Ultra Battle	251+		"
Small Deathstar	1–10		9 or more
Medium Deathstar	11–30		"
Large Deathstar	31–75		"
Super Deathstar	76–150		"
Mega Deathstar	151–250		"
Ultra Deathstar	251+		"

Table 5: Ship Types

23 Tractor Beams

Tractor beams may be used to capture and tow ships. If the tractors are successfully attached, the target ship will accompany the towing ship when it moves, for no extra cost in fuel. They can also be used in the retrieval of spacemines from active duty.

To determine if tractor beams will engage successfully the following rules must be followed.

- The engaging ship must have equal or greater tractor units than the target ship has mass, using the same formula as in the battle section.
- A ship which is engaged by one ship cannot engage another, *i.e.* no daisy chaining.
- If two ships engage the same target, the ship with the most tractor units wins.

A ship can only attach its tractor beams to one ship. The target ship is then prevented from moving, or tractor beaming another ship. The tractor beams disengage at the end of the turn.

Syntax:

S*xxx*ES*yyy*	Ship *xxx* engage ship *yyy* with tractor beams.

Examples:

`S123ES234`	Ship 123 attempt to engage ship 234 with tractor beams

Tractor beams can only be used to engage ships or retrieve spacemines, not both. When retrieving spacemines, the tractor beams automatically succeed in locking on. It takes one tractor beam for every spacemine, as well as the cargo unit to hold the spacemine. See the section on spacemines for more details.

24 Score

Score is one of the ways to win the game. The score you have and that all the other players have is listed at the top of the turn sheet as shown in section 29.1. Table 6 lists the returns from various items.

Item	Return (Credits/turn)
mine	1
industry	5
planet	20
1 research planet	1 (in addition to everything else)
2 research planets	16
3 research planets	81
4+ research planets	256

Table 6: Income gained

For example a planet has 12 mines and 3 industry on it. Its income would be

$$20 + 12 + 3 \times 5 = 47$$

The bonus for the research planets is on an empire basis, so a planet being a research planet does not increase its own income, just that of the empire that it belongs to.

25 Further Improvements

The game administrator is open to discussion for any improvements that you might have thought of. They will be implemented, if everyone approves, as soon as possible in the current game, and in all subsequent games.

Current improvements on the drawing board include:

- Space patrol vessels wandering through the galaxy slowly, who attack any one who attacks Earth, but otherwise do little.
- Having the chance to hit ships in combat vary with the size of the ship.
- Automatic retaliation if a ship does not have an attack order and is itself attacked.

- A system where players can trade with one another, rather than just Earth.
- Change the way players buy ore at Earth to a bidding system like contracting where the current price is the minimum bid.

26 Adjusting Game Length

There are three different lengths to the game

- The game is over when one of the winning conditions is met. The player or players who meet the winning conditions are the winners, as are their allies.
- The game is over after a number of turns specified at the start of the game. The player with the most of a certain resource at the end of the game, such as score or credits is the winner, as are their allies.
- The game is over after a number of turns specified by the players themselves. This number can change from turn to turn. When this number of turns is completed the player with the most of a certain resource, such as score or credits is the winner, as are their allies.

In the last case each player can issue a turn command to adjust the length of the game. The program will take each players desired turn length and produce a compromise between them, which will be displayed with the players current desired turn at the top of the turn sheet. This means that a player who has got a good score or whatever, and knows that noone has a better score, will put the turn low, so as to try and win sooner, while someone with a low score will put the turn high to give them time to build up their score. There are minimum and maximum limits to the desired ending turn, at the moment these are 10 and 100 respectively.

Syntax:

TURN *xx*	Finish the game on turn *xx*.

Examples:

`TURN30`	Finish the game on turn 30.

27 Changes to last version

The following changes have been made to the game and/or documentation since version 1.43.

- Introduced transmutation of ore
- Ship numbers are allocated at random at the start instead of sequentially
- Introduction of ship unbuilding
- Priority list to global loading introduced.
- Alliance Messages introduced.
- Earth now removes spacemines from itself.

The following changes have been made to the game and/or documentation since version 1.44.

- Shields are scaled according to the percentage of the ship that are shields.
- Fighters now have mass, shields now weigh half as much.
- PDUs get more shots each the more there are of them.
- Further restrictions and clarifications for research planet orders.
- PDUs no longer fire on empty hulls.

- Changed the documentation to use inline gnuplot commands.

The following changes have been made to the game and/or documentation since version 1.45.

- Internal change in code, changing NEUTRAL to plr0 rather than plr9.
- Income and Earth credits are now winning conditions.
- Planets are given an name on galaxy creation.
- There are now two modes to selling ore on Earth. Unlimited, where all ore can be sold at once, or Limited, where Earth will only buy a limited amount of ore.
- In certain games the players can change the game length themselves each turn.
- The ship types have been changed around and rationalized.

28 Example move

The following is a sample move mailed to the game.

```
% mail celemp1@sola.fcit.monash.edu.au
Subject: PsiNinjas Turn

; RP 123 increase f-units on s123 by 20%
; RP 190 create industry on planet

; Naming
S123=BLACKGUARD
234=ARAKOS

; Give some stuff to MASTER or he will attack me
S244GMASTER
345GMASTER

S123P12R1
S276U4M3
S234U3D
S286U2I
S309AD
123A120S234
S132U42R2
S322U23S
S306L10M
S243L34D

; Get S123 to research planet in time for combat.
S123J120J240J320J101J322
S123L120R2
S234L34S
100B50S0
SCAN123
SCAN223
OS123AI
{Death to Grok the infidel.}
&Winter Leave #306 now or face war.&
S123ES234
+Assassin
```

Note that the order is not important. When sending turns in please put your empire name in the subject line, it makes it much easier for me.

29 Turn Sheet Example

There may be some small discrepancies between the example turn sheet shown here and the one that the game sends out. This is due to constant improvements in the turn sheet format and the details of the game. If you find a major discrepancy please mail the author.

29.1 Header

This section contains the basic information about the game, like turn number, date that the turn sheet has to be mailed back, where they must be mailed to. The scores of the players are read across so player 2s score is 1660. Winning conditions are listed here, make sure that you know what you are aiming for when you play the game. "`Earth`" means that you need to take earth for a turn to win, the others should be fairly self explanatory. If one of the conditions such as "`score`" does not appear in the list it means that it is not part of the winning conditions. The minimum bid accepted by Earth for each of the different unit types is also listed. Bids below these amounts will not be accepted. Also listed is the number of scans that you have this turn.

```
                         CELESTIAL EMPIRE 1.42
                                  by
                             Zer Dwagon

        *********   PsiNinja   player number=1     *********
        score=1559       turn number=3        Game number=1
        date due= before 12 Aug     player scores   1559   1660   1667
        your income=539                             1655   1506   1644
        Earth Credits=2344 Credits:Score=2          1585   1661   1682

        Winning Conditions: Earth Score=30000 Planets=64
           Mail commands to Zer Dwagon dwagon@wyrm.cc.ascii.edu
        Minimum bids: Cargo=1 Fighter=3 Shield=2 Tractor=2
        You have 3 scans this turn
```

The following section should not be here for this turn, but shows what is produced at the start of every research planet turn.

```
Remember to give research orders this turn
You have 2 research planets
They are  219 227
```

29.2 Ship Type Summary

This summary occurs every second turn. It shows how many ships of what type exist in the galaxy at that time.

```
SUMMARY OF SHIP TYPES
Empty Ship      1               Small Cargo     0
Medium Cargo    11              Large Cargo     32
Super Cargo     2               Mega Cargo      0
Ultra Cargo     0               Small Ship      1
Medium Ship     0               Large Ship      0
Super Ship      0               Mini Battle     0
Small Battle    2               Medium Battle   7
Large Battle    1               Super Battle    0
Dreadnought     0               Death Star      0
Mega DthStar    0               Ultra DthStar   0
```

29.3 Ship Summary

This is a summary of all the player's ships. It shows all the details of the ships. What units they have, their name, where they are, and what cargo they have loaded. The number in brackets after the number of cargo units is the number of empty cargo units. The number in brackets after the number of shield units is the number of shots that the ship will absorb before taking damage. The number in brackets after the efficiency is the effective efficiency.

```
SUMMARY OF SHIPS
S100 f=1  c=10( 6) t=0  s=0(0) eff=0(0) shots=0   Death
          Planet 239 Small Cargo
          R0 4.
S101 f=1  c=10( 6) t=0  s=0(0) eff=0(0) shots=0   Destruction
          Planet 126 Small Cargo
          R0 4.
S102 f=1  c=10( 6) t=0  s=0(0) eff=0(0) shots=0   Devastation
          Planet 127 Small Cargo
          R0 4.
S103 f=1  c=10( 6) t=0  s=0(0) eff=0(0) shots=0   Disintegration
          Planet 193 Small Cargo
          R0 4.
S104 f=0  c=40(16) t=0  s=0(0) eff=2(2) shots=0   Decimation
          Planet 119 Large Cargo
          R0 4.R1 10.I 1.
```

29.4 Planet summary

This is a summary of all the player's planets. It shows the amount of ore stored on each planet and its production, as well as the number of PDUs and industry there. The first number in each column is the production(*i.e.* the number of mines of that type) of the ore on that planet. After the slash is the amount of ore stored on the planet. For example in the following sample output planet 104 has 2 mine types 3, and 6 ores stored on the planet. With the ore type 6 on planet 107 there is no production of that mine type, just some ore. The amount of ore, industry and PDUs on ships is also shown, as is the total amounts for the players empire at the bottom. This total includes the amount on all the players planets and ships.

```
SUMMARY OF PLANETS.
planet   0     1     2     3     4     5     6     7     8     9     PDU  IND
------  ---   ---   ---   ---   ---   ---   ---   ---   ---   ---   ---  ---
104      /     /     /    2/6    /     /     /     /     /     /     -    -
107      /     /     /    1/3    /     /    /5     /     /     /     -    -
113      /     /    2/2    /     /     /     /     /    3/7   1/2    -    -
123     4/53  3/9   3/39  3/25  2/11  1/18  1/18  /15   5/6   5/6   120  60
126      /     /     /    2/2   1/3    /    1/3    /     /     /     -    -
127      /     /     /     /    1/1    /     /    5/5    /     /     -    -
152     2/7    /     /     /     /     /     /     /     /     /     -    -
250      /     /     /    1/3    /     /     /     /     /     /     -    -
290      /     /     /     /    3/3    /     /    2/6    /     /     -    -
Ships:  /20   /10    /     /     /     /     /     /     /     /     0    1
------  ---   ---   ---   ---   ---   ---   ---   ---   ---   ---   ---  ---
Total:   6/    3/    5/    9/    7/    1/    2/    7/    8/    6/   120  61
         80    19    41    39    18    18    26    26    13    8

total number of planets owned = 9
```

29.5 Ally Status

This shows the status of the player with respect to other players in the game. If you are neutral to a player and they are neutral to you, they will not show up in this table.

```
ALLY STATUS
Empire Name          You are     They are
Grok                  : ALLY      : FRIENDLY
Master                : HOSTILE   : HOSTILE
```

29.6 Earth Listing

This section shows the prices of ore on Earth, and which ships are on Earth. It also lists the nearby planets, making it easier to find Earth. If you scan the right planet you can get to Earth by turn 2 at the earliest. This is the area that various details of Earth are printed, such as Earth Amnesty and the type of selling permitted.

```
 119  ******** EARTH ********
Earth amnesty in effect. No shots allowed.
Limited Selling.
NEARBY PLANETS 294 109 160
                   EARTH   Trading Prices
type         0    1    2    3    4    5    6    7    8    9
price       10   16    6    6   15    6    5    3   12   14
amount      89   76   99   98   71  100   95   90   81   74
- - - - - - - - - - - - - - - - - - - - - - -
S104 PsiNinja : f=0  c=40(36) t=0  s=0(0)   eff=0(0) shots=0 Decimation
               Large Cargo    Standing Order:None
            R0 4
S109 Grok     : Alienoid                 : Large Cargo

--------------------------------------------------
```

29.7 Planet List

This is the main body of the turn sheet. It lists all the information about every planet that the player has an interest in. Ships that are orbiting the planet are listed as well. You can get this information even if you do not own the planet in question. The number in brackets after the number of PDUs is the number of shots that all the PDUs fired together will generate.

```
                   *******  PLANET SCANNED THIS TURN *******
101 NEUTRAL  :
Nearby Planets   247  332  307      Industry= 0      PDU= 4(4)    Income= 21
Spacemines: Stored= 0     Deployed= 0
       Mine Type             2
       Amount stored         2
       Production            1
--------------------------------------------------
```

Above is a neutral planet that was scanned this turn.

```
104 PsiNinja :Abduco
Nearby Planets   123  290  337  127  Industry= 0      PDU= 0(0)     Income= 22
Spacemines: Stored= 0     Deployed= 0
       Mine Type             3
       Amount stored         6
       Production            2

--------------------------------------------------

119 NEUTRAL  :**** EARTH ****
Nearby Planets   294  109  160      Industry= 60     PDU= 200(650) Income= 320
```

```
Spacemines: Stored= 0     Deployed= 0
       Mine Type
       Amount stored
       Production

S104 PsiNinja : f=0  c=40(36) t=0  s=0(0) eff=0(0)
           Large Cargo
           Decimation     R0 4
S109 Grok     : Alienoid                : Large Cargo
--------------------------------------------------
```

Above is the long listing of Earth; also shown is a ship that belongs to another player. Note that with the other ship very little detail is shown. The only information available is the ship number, the owner, the name of the ship, and the type of the ship.

```
123 PsiNinja :Affirmare
Nearby Planets   250  175  104  152  Industry= 60     PDU= 120(366) Income= 347
Spacemines: Stored= 0     Deployed= 10
       Mine Type             0    1    2    3    4    5    6    7    8    9
       Amount stored         53   9    39   25   11   18   18   15   6    6
       Production            4    3    3    3    2    1    1    0    5    5
--------------------------------------------------
```

Above is the player's home planet. It has been built up a bit from the original layout.

```
126 PsiNinja :
Nearby Planets   300  175  221      Industry= 0      PDU= 0(0)  Income= 24
Spacemines: Stored= 0     Deployed= 0
       Mine Type             3    4    6
       Amount stored         2    3    3
       Production            2    1    1


S101 PsiNinja : f=1  c=10(6) t=0  s=0(0)   eff=0(0) shots=0  Destruction
            Medium Cargo
            R0 4
--------------------------------------------------

250 PsiNinja :Abicio
Nearby Planets   265  239  123  229  Industry= 0      PDU= 0(0)  Income= 21
Spacemines: Stored= 0     Deployed= 0
       Mine Type             3
       Amount stored         3
       Production            1

--------------------------------------------------
```

Above are some more of PsiNinja's planets. Note that in this section quite a few of the planets have been removed for brevity.

29.8 Messages

This section comes at the end of the turn sheet, and contains messages from other players.

```
GENERAL MESSAGES
PsiNinja: PsiNinja desires allies. Please mail psininja@host.va
Master:Anyone with information about PsiNinjas empire please send to me

PERSONAL MESSAGES
From Grok: You use Earth Ind this turn, I will use it next turn
```

These are messages from other players. General messages go to all players, while personal messages are just to a specific player. See Section 21 on Diplomacy for more details on how to send messages.

29.9 Command History

This is a list of all the actions that the computer processes by you, in the order they were processed[13]. The order on the left is the order desired and the one on the right is the actual order carried out. If for some reason the command cannot be executed, say because the planet you tried to jump to did not exist, you will have the reason printed after the desired order. If a command could only be partially carried out, like an attempt to build 20 industries, when there was only enough ore to build 3, then the actual order will be `123B3I`. In these limited cases the limiting factor will be shown between the two orders. In the example below, this was industry. Scans will only appear once in the desire list.

The results of attacks, changes in ownership, and other details will also be printed here. For attacks both the attacker and the attackee get details on the damage done.

Abbreviations include:

I	Industry
R1	Ore Type 1
$	Credits
C	Cargo units
F	Fighter units
SM	Spacemines
PDU	PDUs
POP	Population standards. See Section 7
EL	Earth limit on ore selling reached
M	Mines

```
COMMAND HISTORY
113=Aeternus          113=Aeternus
265=Affabilis         265=Affabilis
290=Affero            290=Affero
123=Affirmare         123=Affirmare
107=Aetas             107=Aetas
S104U1M3              S104U1M3
S104L10R0             S104L10R0
123B1M3               123B1M3
123B1M8               123B1M8
123B1M9               123B1M9
S104B60C      I       S104B10C
S100J250J239          S100J250J239
S101J175J126          S101J175J126
S102J104J127          S102J104J127
S103J152J193          S103J152J193
S104J175J140J294J119 S104J175J140J294J119
SCAN101
```

30 Strategy and Tactics

This section is only to give hints on what can be done in Celestial Empire. It is not the definitive list of what can be done; indeed the list will grow as people play the game and their successful strategies are enshrined in this section for future generations of players to marvel over (Credit will naturally be given to those players who first performed the given strategy or tactic). If you want to keep your strategies secret just drop me a message and I will remove them from the list.

[13] Messages will not appear in this list.

30.1 Planet Scans

Piggy in the Middle — Granny Smith Use your scans to trace a path to a neighbor's homeworld. Then you scan outwards in another direction from that homeworld. Once you establish the player's neighbors in that region give them the route to your enemies homeworld and offer a joint or triple attack.

Scans for Sale — Granny Smith You are operating a self contained empire of three rings width readying yourself for that lunge to Earth. Industry is humming along, supplies are regular, ship production constant and smooth. So what do you need scans for? Probably nothing. So why not sell them to players who are desperate for information.

Magic Eye — Granny Smith A combination of "Piggy in the Middle" and "Scans for Sale". Once a homeworld is found, you place your scan there every turn. Such a "magic eye" will provide reams of information. Numbers of ships, what is being built, industries/fighter units, obvious scarce resources etc.

30.2 Planetary Defense Units

Speed Trap — Zarg To stop an enemy from jumping straight to your home world, and then blasting away all your industry before you can recall your battle ships to defend your capital, place buffer zones of PDUs on the planets surrounding your homeworld, ideally about 20 PDUs on the first three layers surrounding your homeworld. Then if your enemy comes in at full speed to attack your home planets, he will have lost 60 Fighter units off every ship that participated in the attack, almost certainly stopping the attack cold. If on the other hand he comes in slowly, single jumping it, not only can you fire on his ships as the come through with your PDUs, it also gives you time to either recall your battleships or even build new ones.

30.3 Battleships

Security Blanket — Missing Tiger If other players know that you have a superbattle cruising around your inner planets they will be a bit more cautious in attacking, just like the superpowers build nuclear warheads. However the construction of a SuperBattle is expensive and can take over 20% of your empires industrial capacity. It is cheaper, though less threatening to build several smaller ships, say medium battles.

Piracy — Missing Tiger Sit on a trade route used by another player and wait for a large cargo ship to stop there on its way back to a home planet all loaded up with goodies. Attack it. Severely maim it. Most of the cargo drops to the planet, as the ship is unable to carry it due to lack of cargo units. If you own the planet, the cargo is yours.

Ambush — Missing Tiger An extension of piracy. If the battle ship is big enough in relation to its target, you will destroy it totally when you attack. Then if you own the planet the ship is yours. However you will need to transport some type-1 ore and some industry to make use of the ship, or you can use tractor beams.

Hunting — Missing Tiger This is a high risk operation as you are usually much nearer the other player's home planet than you are to your own. Send your super or large battle ship accompanied by a large cargo ship carrying industry, PDUs and ore types 0, 1, 2 and 3 into another player's area until you find a ship. Attack the ship with your superbattle and the planet with your cargo ship. Next turn, drop the cargo including industry, and build fighter and cargo units on your new ship. Now, since you cannot reload the industry you just dropped, you can choose between destroying it to stop your enemy using it or attempt to hold the planet.

30.4 Spacemines

Dwagons Devastator — Zer Dwagon Have a large cargo ship full of spacemines lay spacemines on the route from his home planet to his producing planets, the nearer to the home planet the better, and dump the whole lot of them on a few planets. If you can dump them all on your enemies home planet you are laughing, as his ships take major destruction every time they jump to his home planet.

Vux's Vulture — Bruno Wolff Get to Earth early, dump a large stack of spacemines there and wait. Another ship will come screaming in, and get destroyed by the spacemines. With the tractor units on your original ship, load all the spacemines, then engage the hull and jump out of there with a new ship. An alternative is to leave the spacemines there, and remember to have enough shields on your ship when you jump back to Earth, there might even be a few hulls waiting for you.

30.5 Earth

Monopoly Player — Greg James Get a super cargo ship to Earth with at least 100 cargo units. Buy all of the cheapest commodity. Sell it all next turn and corner another one. Repeat until bored.

This will allow you to amass huge amounts of Earth credits, basically allowing you to use Earth's industry and mines as a second home. The ideal situation is one ship at Earth playing broker, another becoming very large off the fruits of the first, and a third shipping ore back to your home planet in massive quantities.

Note: due to the spectacular success of this method the first time it was tried, game changes have been implemented that will hopefully make this difficult/impossible in future. The main change has been the introduction of Earth credits, and the credit/score ratio.

31 Winners

These are the empire names of the people who have won previous games.

Game 2 Duration: 24 turns, Ended Apr 14 1992, Winner: Ishmolin
Ishmolin won by getting 30,000pts

Game 3 Duration: 23 turns, Ended Apr 9 1992, Winner: Zethrin
Zethrin won by getting 30,000pts
At the end of the game, only Wumpsters had withdrawn, however a number of players had stopped sending in turns. Benden when he decided to leave the game gave all his planets to Zethrin, which helped him win. This lead to the introduction of gift limitation, so you cannot give all your planets away in a single turn, and you cannot give your home planet away ever.

Game 4 Duration: 25 turns, Ended Apr 23 1992, Winner: ISH
ISH won by getting 30,000+ pts
Here is what ISH recalls of the game, and the way he played it.

> I began the game when I had more spare time than now, and spent a lot of time on diplomacy. I made friends with neighbors and patched up a quarrel with Klicknex after they took over the Iron-Gang spot. I gave the Klicknex the benefit of my vast (a few turns) CE experience. Later, when they decided to play only a token role in the game, they gave me several planets and ships out of gratitude. That was basically the key to the game.
>
> Since the worlds around my home were fairly rich, I didn't bother sending any ships to Earth: I would need the points later, and in the time it would take to get a ship to Earth and back, it could make two round trips to a nearer planet. I didn't realize until late in the game that I could build R7, R8, and R9 mines on my home planet. I did a lot of exploring, and held the lead in points for several turns before the Klicknex gifts. I tried to build a new ship every other turn, and I believe I had more ships than any other player even before the Klicknex gifts. Some were kept small, to shuttle PDUs to outer worlds or claim more planets. Wherever possible, I put an industry on a planet with R4 mines and steadily built PDUs.
>
> When Bude and Antigone tried to take some of my planets at the end, I just kept claiming new ones. I sent a cargo ship to each threatened world to postpone its fall. I kept

my only super battle at home to protect the home world or jump to Earth to postpone its fall. As it turns out, I doubt that anyone realized how difficult it is to take Earth. $\ddot\smile$

So basically the game was won by friendly diplomacy.

Game 5 Duration: 23 Turns, Ended Apr 11 1992, Winner: Feline

Imperium Feline Rex in Celestial Empire 5

When I started with celemp5 I didn't have any strategies in mind, just play and find see where my empire will end up. So I expanded freely and happily, I reacted on some e-mail addresses posted and let the Empires know where I could be reached. My best contact was Alpha, we were fairly close to each other but didn't have things to trade yet. So we decided to stay in touch until one of us needed help. Not much later I made contact with Meloria both by links and e-mail. We made traded planet- and player-info.

Around turn10 I found out, I had made some mistakes. The most important thing in the beginning is to build mines of type 8 and 9, until at least 5 each exist on your home planet. And drop on any planet you own at least 1 PDU, so you see who entered your hemisphere.

Another mistake was building 20 cargo on each ship I owned, in the early phases it came in handy but when I needed an Battleship, it didn't have much firepower.

Lucky for me my ally Meloria had to leave the game and because we had been trustful allies he gifted every single planet and Ship to me. So I had 40+ planets and 13 ships to my disposal. They came in useful because the Empire Kaspar became more annoying every turn. He took 3 planets from me and I took 3 planets from him. But I could build any ship I wanted so after some maneuvering I had a planet near his homeplanet and an empty hull became mine.

But this happened in the last turn, I reached the 30K points and became winner of this game of Celestial Empire.

Niels Koerse
Slin de Morque Lord High Commander
Imperium Feline Rex
Miaaow!

Game 6 Duration: 28 turns, Ended: 17th May 1992, Winner; Warlus.

Vendetta gets an honourable mention for almost taking Earth. In one turn he destroyed all of Earths PDUs, and other players ships that were on Earth. There are now 13 hulks orbiting Earth. And as a parting gesture, dropped 200 spacemines to prevent any other ships arriving. Unfortunately the effort drained his empire dry, and he was on the slow road to recovery when the game ended.

In the last turn, BlueAdepts home planet was turned to slag, along with about half a dozen ships, by Tragins new toy, the Ultra Death Star. At the end of the game almost a third of the ships in the galaxy were hulks.

Game 7 Duration:22 turns, Ended: Feb 3 1992, Winners: Vux & Kartheige

This was the first turbo game with 3 updates a week but unfortunately was hampered by bugs. Retchian and Skynet dropped out early on in the game.

Vux won by getting 30,000pts by using speculating on Earth, forcing the introduction of Earth credits by getting more than 8,000pts in a single turn.

Kartheige won by getting over 64 planets, 88 in total, a large number of which were given to him at the last moment by ZPZX when it was obvious Vux was about to win.

Game 8 Duration:29 turns, Ended: Jun 19 1992, Winner: Kartheige

Kartheige won by getting 65 planets. Honourable second goes to ISH who got 63 planets on the last turn. The winning condition was 64 planets. This game saw the start of the new ship class, the Death Star. At the end of the game there were two Ultra Death Stars in the galaxy.

Game 9 Duration: 29 turns, Ended Jun 19 1992, Winner Darmak

Darmak won by taking over Earth, after reducing it to slag with his Ultra Death Star.

Game 10 Duration: 41 turns, Ended Feb 5 1993, Winner BlueAdept and ally Winter
Game 10 was finally over after a massive drawn out battle over Earth that lasted about half the game. At the end of the battle 14 ships lay hulks on Earth, and another 7 over the other trouble spot in the galaxy, Greybeards home planet, where Winter and Myrtha/Algoria/Greybeard slugged it out.

Game 12 Duration: 27 turns, Ended Mar 12 1993, Winner Endarian and allied Godoraith and Meines.
Won by taking Earth.

Game 13 Duration: 32 turns, Ended May 19 1993, Winner Salish and ally Hogarth
Won by taking Earth.

Game 14 Duration: 20 turns, Ended Nov 28 1992, Winner VAXXUS and ally Guht
Won by taking Earth. Here is what they had to say about the game:

> Game 14 was won by a strong alliance formed early, and kept secret, between Guht and VAXXUS. The key to its success was two-fold. First, we both sent ships to Earth early and built up ships with every bit of score we could muster. Second, VAXXUS played to consumate diplomat, while continuing to build massive warships; and Guht developed a reputation as a madman, harassing the other players with a few ships, while giving some ships and planets to VAXXUS. VAXXUS then descended to Earth and preceded to lay waste, while Guht diverted attention.

Game 15 Duration: 16 turns, Ended Sep 16 1993, Winner OuToLunch
Won by getting over 1500 income.

> This was the first game with income as a winning condition, and the income level required was set a bit too low, so the empires were only beginning to collide when the game finished. The key to my being first to reach the required income level was that all resources must be as fully utilised as possible. Ships which don't move are wasted, unless they are achieving some purpose by not moving. Industry which doesn't build things is wasted. Large stockpiles of ore without sufficient industry to process them are wasted. This overriding philosophy is particularly important around turn 6, when the initial stockpiles of ore on a home planet start to dwindle away.
> Brief Hint:
> High resource utilisation $\Rightarrow$ high efficiency.
>
> Emperor OuToLunch

32 Hints on Play

Here are some hints given by players who have won their games:
Zethrin's Hints (Howard Bampton) Winner of Game 3.

1. Don't think that you have to go to, or even find Earth. I didn't put in an appearance there until turn 20. Of course, if your next door neighbors start dropping in, some strategically placed mines might be of use. . . .
2. Building industry seems to not be very useful (at least in the first 10–15 turns), instead I should have concentrated on building more mines. Type 0 & 1 ore was in particularly short supply. Once you start running low on fuel, you are in serious trouble —
no fuel = little ship movement $\Rightarrow$ little new resources to build with $\Rightarrow$ wasted industry & no new sources of fuel.
3. Initially, I would recommend building as much cargo capacity as possible. I would concentrate on bringing back type 1, 8 & 9 ores. Type 8 & 9 can be used to build more type 1, 8 & 9 mines.
4. When exploring, try to send along PDUs in the cargo hold. As you acquire a planet, drop a PDU on it. This keeps other players from accidentally capturing your planets.

5. Scanning: I used my scans to get a list of as many systems as possible. In a long game, or one that is more violent than this one was, even knowing a single link to a system is useful. A couple of times, I would scan a system that was near (2 jumps) one of my systems and one of my opponents.

6. Probably the most important: try to plan 2 turns ahead. Don't just send ships out to pick up ore. Send them out to get enough ore of some type so that you can build something. If you don't do this, you may end up with part of your industry being idle each turn.

7. Don't bother to build warships until you need them. If you really need one, just convert a Medium Cargo. Don't forget to put shields on things, especially that new warship.

8. Look for the pattern that was used to set up the galaxy. In game 3, there were a number of research planets equidistant between 2 players.

Ishmolins's Hints (Rich Staats) Winner of Game 2.

1. Ishmolin Icon: "Do unto others as you would have them do unto you, and be the type of player that people do not feel bad to let win."

2. Ishmolin Icon: "React to any betrayal with overwhelming aggression."

3. Ishmolin Icon: When fighting above a planet you own, you can use a cargo ship. Cargo units are easier to replace than fighter units if destroyed, and you can pack the hull with PDUs which you drop on the planet prior to battle.

4. Produce a mixture of PDUs and Industry early on. Use lightly armed ships to do scouting, and drop off a PDU on each planet you find.

5. Talk to any race you discover — what's the worst thing that could happen.

33 Quick Reference

This is a summary of all the commands and tables present in the rest of the rules. For details see the sections involved.

Naming:

	Sxxx=*shipname*
	yyy=*planetname*

Gifting:

	SxxxG*playername*
	xxxG*playername*

Unloading:

mine	SxxxUyyMz
pdu	SxxxUyyD
industry	SxxxUyyI
ore	SxxxUyyRz
spacemine	SxxxUyyS
global	SxxxU

Loading:

mine	SxxxLyyMz
pdu	SxxxLyyD
industry	SxxxLyyI
ore	SxxxLyyRz
spacemine	SxxxLyyS
global	SxxxL
priority global	SxxxL(*spec*)

Earth Contracting:

	SxxxByyCzz
	SxxxByyFzz
	SxxxByyTzz
	SxxxByySzz

Buying Ore (Earth):

	SxxxPyyRz

Selling Ore:

	SxxxXyyRz
	SxxxX

Planet Attack:

ship	xxxASyyy
	xxxAzzSyyy
spacemines	xxxASM
	xxxAzzSM

Ship Attack:

ship	SxxxASyyy
	SxxxAzzSyyy
pdu	SxxxAD
	SxxxAzzD
mine	SxxxAMy
	SxxxAzzMy
industry	SxxxAI
	SxxxAzzI
spacemines	SxxxASM
	SxxxAzzSM

Tending:

mine	SxxxTyySzzzM
pdu	SxxxTyySzzzD
industry	SxxxTyySzzzI
ore	SxxxTyySzzzRw
spacemine	SxxxTyySzzzS
global	SxxxT

Unbuilding:

cargo units	SxxxZyyC
fighter units	SxxxZyyF
tractor units	SxxxZyyT
shield units	SxxxZyyS

Build:

pdu	xxxByyD
mine	xxxByyMz
industry	xxxByyI
spacemines	xxxByySz
ship	xxxByyH*ff*/*cc*/*tt*/*ss*
cargo units	SxxxByyC
fighter units	SxxxByyF
tractor units	SxxxByyT
shield units	SxxxByyS

Jumping:

	SxxxJyyy[Jyyy[Jyyy[Jyyy[Jyyy]]]]

Transmutation:

	xxxXyyRzRw

Scans:

	SCANxxx

Messages:

broadcast msg	{Hello all you players}
private msg	&playername personal message&

Tractors:

	SxxxESyyy

Alliances:

ally	+*playername*
hostilize	-*playername*

Spacemines:

ship deploy	SxxxDyy
planet deploy	xxxDyy
retrieve	SxxxRyy

Item	Nmbr of cargo units needed
1 unit of ore or fuel	1
1 spacemine	1
1 PDU	2
1 industry	10
1 mine	20

Item	Amnt	Types	Ind
cargo unt	1	1	1
fighter unt	1	2,3	2
tractor unt	2	7	2
shield unt	1	5,6	2
PDU	1	4	1
industry	5	8,9	10
mine	5	8,9	10
spacemine	1	any	1
hyperdrive	10	4,5,6,7	40

Drive Efficiency

		0	1	2	3	4
	1	1	1	1	1	1
J	2	4	2	2	2	2
U	3	9	6	3	3	3
M	4	16	12	8	4	4
P	5	25	20	15	10	5

Item	Return (Cr/turn)
mine	1
industry	5
planet	20
1 rsrch plnt	+1
2 rsrch plnts	+16
3 rsrch plnts	+81
4+ rsrch plnts	+256

Ship Type	F-units	C-units	Ratio (fighter:cargo units)
Empty Ship	0	0	na
Small Cargo		1–10	less than 0.5
Medium Cargo		11–30	”
Large Cargo		31–75	”
Super Cargo		76–150	”
Mega Cargo		151–250	”
Ultra Cargo		251+	”
Small Ship	1–10		between 0.5 and 2, inclusively
Medium Ship	11–30		”
Large Ship	31–75		”
Super Ship	76–150		”
Mega Ship	151–250		”
Ultra Ship	251+		”
Small Battle	1–10		more than 2 and less than 9
Medium Battle	11–30		”
Large Battle	31–75		”
Super Battle	76–150		”
Mega Battle	151–250		”
Ultra Battle	251+		”
Small Deathstar	1–10		9 or more
Medium Deathstar	11–30		”
Large Deathstar	31–75		”
Super Deathstar	76–150		”
Mega Deathstar	151–250		”
Ultra Deathstar	251+		”