CompuServe

MegaWars III
The New Empire

Version 3

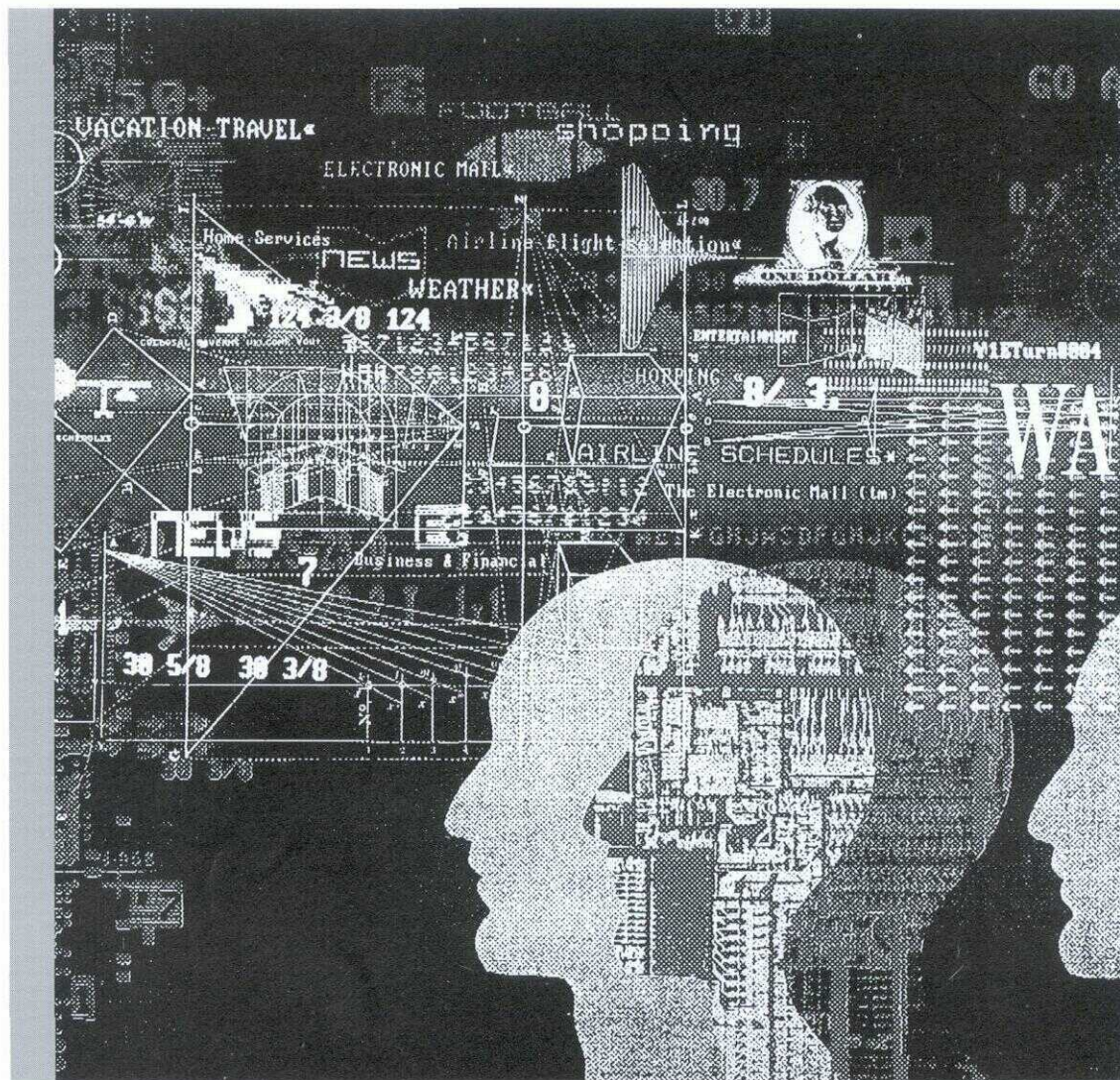Users
Guide

Table of Contents

MegaWars III
User's Guide

Introduction

MegaWars III is a sophisticated multi-user space war game, which simulates the expansion of humanity into unknown reaches of the galaxy and the colonization of planets suitable for human habitation. The game consists of two separate phases, two games in one.

The first is the interactive phase, in which the player has direct control over the ship, and flies about the Galaxy exploring for new planets to colonize and blasting away at the enemies that are often encountered. Except for the strong emphasis on exploration, this phase is similar to many other combat-oriented space games.

The second phase is the economic model, where the player can manipulate the economies and populations of the bases he or she owns. This phase is external to the actual operation of the ship, because of the potential complexity of the actions the player can direct the bases to perform. A straightforward menu-driven scheme guides the player through the intricacies of planetary economics, with just a few basic commands available to manipulate the bases in the interactive phase. The most important interactive commands are to establish a base on an unoccupied planet, and to attack a base owned by another player.

The ultimate goal of the game is to gain wealth and power, and thereby to be crowned Lord Emperor of All the Galaxies. This can be done either by establishing large successful colonies, thereby building a political constituency, or by pillaging the holdings of other players and buying your way into power, or perhaps a combination of the two. Players can organize into teams, pooling their resources to further their political ambitions.[1] The game progresses in four week cycles, culminating in the crowning of the Emperor and his ruling Court.

Politics within the Empire

The political arrangement of the Empire grew out of the shambles left by the Second Kryon War, as a compromise which has perhaps endured beyond its time. After the War, humanity was scattered about the Galaxy, with no central organization. The four main Terran colonies, the Home planets, each coveted the role of the new Imperial capital. The main governing body of the Empire, the Senate, was composed on semi-democratic lines, and no planet could muster enough political support to make itself dominant. After several years of disorder, strife, and near civil war, the Great Compromise was proposed, giving the Imperial throne for a year at a time to whichever landholder could muster the most votes in the Senate.[2] The number of votes a landholder can muster in the Senate is proportional to the populations of all his planets, modified by the standard of living of his subjects (wealthy planets have more effective pull). In addition, military prestige can permit a powerful warrior to pad his vote somewhat (the more people he has *snuffed,* the fewer there are willing to quibble over a few votes). Finally, hard wealth, as always, can buy votes (although it is considered a faux pas to mention this on the floor of the Senate).

---

[1] Along with joining teams, most successful players also join the Multi-Player Games Forum, GO MPGAMES. The MP Games Forum contains lots of detailed information on the game. Changes and clarifications of the game are posted on the board there.

[2] The closest historical parallel to this system of government was the city of Chicago during the third decade of the Twentieth century.

In practice, few nobles have the power to get themselves elected directly. Instead, a system known as the "party" or "team" system has evolved. A group of nobles will band together and pool their votes to get their leader elected. Once in office, all the party members share in the power and glory. The details of forming a team are covered in the **Teams** section.

The Galaxy

The known galaxy spans a region roughly 1000 by 1000 light-years, lying in a plane, containing approximately 2000 star systems known to have planets. Most such systems have from 4 to 12 planets, but for all intents and purposes only the inner 6 planets in any system are worth looking at. Although the locations of the stars are known with great precision, no instrument is sensitive enough to detect whether a planet is habitable from the distance of another star system. Only a visit to the system can provide the detailed survey that reveals indigenous life and rich mineral deposits.

Properties of Planets

Planets have a number of important physical characteristics which affect their usefulness to human beings. Most of these properties can be measured from a ship within the star system. The ship's computer will summarize the data collected by the probes, and present it in tabular form, along with a synthesized habitability index, which represents the computer's judgement as to the suitability of the planet. A rating of 100 is the highest possible, and most earth-like planets have ratings between 90 and 95[3]. The major properties and their effects on the habitability are summarized below.

Physical Characteristics

The position and size of the planet play a major role in determining how the planet evolves over time, and whether or not it develops life. The intensity of the star and the orbital radius combine to determine the amount of radiant energy arriving at the planet, which is the primary determiner of the surface temperature. The mass of the planet and its radius determine the surface gravity. Planets with gravities much above one Terran g are overly stressful on humans, and are difficult and expensive to colonize.

In general, most star systems have a few small rocky planets close to the star, and several massive gas giants farther out. The mass distribution of the planets usually follows a skewed distribution. Few planets tend to form closer than about .25 A.U.[4] to their star, and few planets beyond 15 A.U. are of economic interest.

Planetary Atmospheres

Cold outer planets, and large planets, retain their primitive light atmospheres, and generally have the same basic composition as the star they orbit. Such gas giants have little economic interest, since colonizing them is expensive and risky. The only redeeming feature of a gas giant is that it provides an inexhaustible free source of relatively pure hydrogen for powering starships.

---

[3]The rating of Terra was said to vary between 80 and 100, depending on location, before the Kryon Wars. It is now 43 on a warm day.

[4]Astronomical Unit, defined to be the mean orbital radius of the home planet of the Terrans in 2100 T.S. Note that this planet is now found in a highly elliptical orbit, to which it moved during the second Kryon War. The Kryons are considered to have won the war with that feat of engineering.

Small inner planets are usually depleted in hydrogen, because solar radiation drives off the initial gasses enveloping the planetoid after its coalescence from the primeval gas cloud. Thus, such planets tend to be dense, composed mostly of middle weight elements such as silicon and aluminum, with a metallic core. Extensive vulcanism generally alters the atmosphere dramatically, oxidizing it, and occasionally, starting the planet on the path to life.

Most small planets have atmospheres composed largely of nitrogen and carbon dioxide. Such atmospheres are capable of supporting primitive life, if temperatures are not too extreme. If life is rampant on the planet, the atmosphere usually accumulates a fairly high level of free oxygen. The atmospheric composition can affect the surface temperature, since both carbon dioxide and water vapor contribute to the greenhouse effect, whereby incoming radiation is trapped by the atmosphere, preventing its re-radiation back into space. On the other hand, large quantities of water vapor in the atmosphere can form clouds which reflect significant amounts of the incoming radiation away.
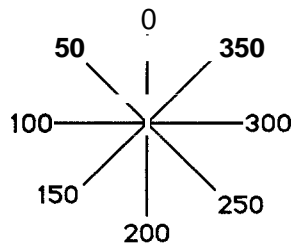
The most significant feature affecting the habitability rating of the planet, barring some property which precludes settlement altogether, is the temperature on the surface. If the mean surface temperature is above the freezing point of water, but below about 40 C, the planet is eminently colonizable, even if the atmosphere is not breathable by humans (which is the usual case). The temperature range, a rough measure of the variability of temperature on the surface, can also prove troublesome if it is too high. Extremes of temperature can produce violent weather, even in a very thin atmosphere.

Atmospheric pressure can rule out a large colony if it is too high, such as on a gas giant, or even on Sol's second planet, where the pressure is roughly 90 atmospheres. Strange atmospheric components, such as traces of chlorine or ammonia, are rare, but if present make development difficult.

Physics

A word or two about time and space is appropriate here. Time runs two hundred times faster in the game than real time, so 3.65 days is two years game time. This means that you shouldn't expect your bases to do very much over a period of a few minutes, but changes can be expected overnight.

Another vital piece of background information is how the computer measures distances. Whenever your ship's computer reports the presence of some object, whether it is an enemy vessel, a nearby star, or a base you are planning on visiting, the relative location of that object will be given by the distance to the object, in whatever units are appropriate, and the relative heading to the object. The relative heading is always measured in gradians. There are 400 gradians to a circle, so a relative course of 200 gradians means directly behind you. The following chart marks out a full circle in gradians, (often simply called *grads*).

Ranges are always denoted by the symbol "R:", followed by the distance, then the units (light years or astronomical units). Relative headings are always denoted by "H:" followed by a number. For example, if the following were displayed on your screen,

-1001 R: 10.1 ltyrH: 102

this would mean that something is located at a range of 10.1 light years, at a relative heading of 102 grads, i.e. almost exactly on your left.

The Main Menu

The starting point for operating your starship and managing your interstellar empire is the main menu, which is the first thing your ship's computer will display. The menu will look something like the following:

```
                MegaWars   III
    1.  Instructions
    2 .  Build  or  Repair  Your  Ship
    3 .  Assume  Command  of  Your   Ship
    4.  Planetary  Management
    5 .  Change  Player  Parameters
    6.  Information  Center
    7 .  Team  Management  Center
    8 .  Help!
    9 .  Exit   MegaWars
                Enter  Selection  [1..9]:
```

Many of the later sections will refer to this menu, so that you will know precisely how to access the features in question. When the menu is printed, you may enter a number, to select an option, or one of a number of special commands. To find out what commands you may enter directly from the menu prompt, type **HELP.**

The first menu option will present you with several different ways of obtaining more instructions from the computer. Option five, **Change Player Parameters,** is used to set your handle within the game, your terminal type within the game, and to set the menu displays to *expert* mode, if you so desire. When you build your very first ship, you will be prompted for your terminal type. If you are unsure what this means, or what number you should enter, see the section on **Terminal Information.** Note that terminal type 8 will always work, no matter what brand of computer you have, but your display will not be as neatly formatted as it is when cursor-control is used.

The remainder of the main menu options are the subject of the following sections.

Starship Design

The dockyard menu enables you to design a ship, or to repair a damaged one. In order to do this effectively, you need to understand the basic concepts of starship design. The following excerpts are taken from the *Official Guide to the Design and Construction of HyperspaceCapable Vessels,* published in the year 2483 T.S.[5] by the Imperial Commission on Navigation.

Physical Layout

Starships are constructed out of standardized hull units. Each unit is basically spherical in shape, permitting maximal space-efficiency. To expand the ship, you simply purchase more hull sections, and bolt them on. Then, as you purchase more equipment, it will be fit into the available space. The following table indicates roughly how much space each piece of equipment occupies within a standard hull unit

Volume Occupied by Equipment

Equipment	Size (Hull Units)	
Warp drive	0.25	
Inertial drive	0.116	
Torpedo tube	0.25	
Laser turret	0.25	per 150 Mw power
Shield generator	0.25	per 100 Mw power
Fighter bays	0.5	per bay
Crew's quarters	0.125	per 100 troops
Fuel tanks	0.25	per 3500 units fuel

Fighter bays come in one standard size, capable of supporting twelve fighters. Crew's quarters come in standard hundred-person sections, each section complete with life support and amenities. The standard three-hull ship has space for 10 probes, 25 missiles, and 100 torpedos. If you desire to carry more than that, you will have to use empty hulls to carry them. An empty hull will hold 20 missiles or probes, or 200 torpedos.

Both the maximum warp speed and maximum impulse speed are proportional to the mass of the ship. The heaviest parts of the ship are the hull units themselves, followed by the warp drive, torpedo tubes, and fuel tanks.

Classification

Starships are generally classified by the number of hull units they have. The smallest commercial starship has three hull units, whereas the largest ship ever built had over two hundred hulls! The following table lists the various classifications.

---

[5] Terran Standard dating remains in wide use throughout the Empire, and will be used here.

Classification of Starships

Hulls	Official Name
1	Missile (unmanned)
2	Probe (unmanned)
3	Scout Ship
4,5	Destroyer
6 to 11	Cruiser
12 to 24	Battle Cruiser
25 to 74	Battleship
75 and up	Dreadnaught

Drive Systems

Inertial Drive

All modern starships are equipped with impulse-based engines for use in Einsteinian space, using inertial compensation to achieve near light speed with negligible inertial effects on acceleration. Damaged units may force ships to travel at a small fraction of light speed. Unenhanced impulse drive is not recommended for any vessel for any use other than simple interplanetary shuttles where speed is not important.

Hyperspace Drive

Hyperspace engines permit practical travel between stars on a human time scale. Even at this date the physics of these devices is not completely understood. The properties of hyperspace have been studied for centuries, but still cannot be explained. Velocity through hyperspace is traditionally measured in Warp Factors[6].

Although there is no known limit to the speed a vessel can travel in hyperspace, there is a practical limitation imposed by the temperature at which the engine may operate. The most advanced materials permit the engines to operate at temperatures as high as 3500 degrees C, with catastrophic failure at 4000 C. The highest speed a ship can safely travel is determined by the maximum rate of heat dissipation by the ship's cooling system. The M7 cooling system supplied with most new ships is capable of sustained use at warp factor 8, while the fastest Imperial destroyers are capable of sustained warp factor 14. The risky practice of dumping (ejecting hydrogen to carry heat away) makes higher speeds possible, but only the military makes regular use of this practice. No engine currently on the market can exceed warp factor 14 safely. The largest commercially available engine consumes 1721 Megawatts of power; such an engine can be safely placed only in a Battleship or Dreadnaught.

Entering hyperspace was risky for the early pioneers, and ships are still lost occasionally, usually due to pilot error. From any point in space a probability of leaving normal space can be computed, primarily as a function of the local curvature of space. It is near suicidal to attempt the jump into hyperspace in the neighborhood of a star, and many ships have been lost which jumped too close to massive planets. Failure to make the jump has been likened to hitting a planetoid at 0.1 light speed.

---

[6]Etymologists say this term comes from an ancient myth, some speculate a primitive work of popular fiction. For reasons unknown, the term has persisted in the jargon of engineers to this date.

The Power Plant

Starships are powered by hydrogen fusion reactors. Although this technology dates back nearly to the Stone Age, it is still the most practical for ships which spend long periods of time away from base. Fuel is frequently obtained simply by scooping the atmosphere of a nearby gas giant, and separating the hydrogen from the heavier impurities. Besides providing power in the reactor, the liquefied hydrogen fuel acts as the coolant transferring heat from the reactor and engines to the cooling surfaces.

Hydrogen Ram Scoop

Most ships are equipped with hydrogen scoops which enables them to dip into the atmospheres of likely planets to collect hydrogen. The scoops only work effectively when hydrogen is the primary constituent of the atmosphere, as with a gas giant. Ships without scoops are forced to refuel at planetary bases, so all deep-space explorers have scoops. The failure of the hydrogen scoop was the primary cause of the loss of the first Tau **Ceti** expedition in **2421** T.S.

The Ship's Computer

It is impossible to handle a **starship** without large computers. One of the major tasks of the ship's computer is hyperspace navigation. From hyperspace, it is not possible to detect objects in normal space, so navigation must be done by totally by computer, without reference to external landmarks. Pilots often enter direct course headings and velocities into the controls, but this is rarely done if the actual destination is known at the outset. The usual method is to inform the computer of where you want to be, and let it do the job. The pilot must take over the controls if the ship goes into combat.

Interestingly, it is possible to track other objects in hyperspace by their wakes, at tremendous distances, by observing the **tachyon** flux generated by the ship's fusion reactor. Since star positions are known to great precision from radio telescope observations, the computer can generate a simulated star map indicating the positions of the nearby important stars. Any interesting objects such as other ships passing nearby are also indicated, since formulating the proper reaction to the presence of another ship requires the judgement (or lack thereof) of a human being.

The ship's computer also keeps a record of all planets scanned, so that survey reports can be recalled for later reference. Any system which the ship has entered will automatically be surveyed and recorded. Reports can then be requested on the physical properties of the planets and whether or not indigenous life is present. The presence of colonies by other Imperial licensees cannot be detected, however, until the ship approaches to a relatively close distance.

Lastly, the ship's computer can act as an advisor to the captain, giving recommendations, and making useful calculations to increase the efficiency of the commander. When in doubt, ask for advice. The ship's computer will often require confirmation of risky commands, such as entering hyperspace or exceeding the maximum rated speed of the ship's engines. If you are confident and experienced, you can suppress this confirmation step by selecting *expert mode,* which directs the computer to carry out your command immediately no matter how stupid or dangerous.

Communications

Every ship uses a three-channel hyperspace transmitter. Imperial regulations require all ships to carry two working transmitters at all times; regulations are difficult to enforce, however, over galactic distances. Each transmitter can be tuned to a separate channel, allowing the ship to participate in several conversations at the same time. Hyperspace transmitters are fragile and often fail.

Combat Systems

Electromagnetic Shields

Starships are equipped with electromagnetic shields, primarily to protect against meteoritic impact in normal space, but also to serve as the main defense against hostile fire. There are usually two shield generators, fore and aft, each covering half of the ship.The shields generate fields which serve to transfer energy impacting on the ship to the cooling system, where it can be safely dissipated. The shields can be controlled either separately or together, as required. Should it be necessary to shut an operating shield down, the energy contained in the field can be recovered as electric power and stored,so energy in the shields is not truly expended unless the shields absorb an impact. Shields are rated by the energy which they can absorb in an instantaneous impact, which is governed by the maximum field density generated. The larger the ship, the larger the shield generators can be. The following table gives representative shield generator sizes.

Shield Sizes

Hulls	Maximum Shields (Mw)
3	100
5	170
10	220
20	320
50	620
120	1320

Lasers

All ships carry two laser turrets. The usual method of operation is computer tracking. The fire control officer designates the target or targets to the computer, which then tracks them more accurately than a human could. The lasers are then fired by direct command of the pilot. Lasers are only effective at relatively close range (10 to 20 A.U. depending on the power of the lasers), within which they can be devastating. The maximum lasers that can be mounted in each ship size are given below.

Laser Sizes

Hulls	Maximum Lasers (Mw)
3	150
5	220
10	295
20	440
50	895
120	1945

Torpedos

Since lasers are not usable in hyperspace, the limitless inventiveness of the Terrans has developed the hyperspace torpedo. A torpedo can be fired from any large vessel (the mass of the launch platform affects the accuracy) and travels in a relatively straight line for up to sixty light years. Any ship unfortunate enough to intercept the torpedo (technically a tachyon cluster of immense density) sustains severe damage. Unfortunately, the electromagnetic shields used in normal space as defense against impacts and lasers are ineffective at blocking torpedos; the only effective defense against a torpedo is to avoid being hit.

Torpedos are fired from massive projectors[7] which have to be securely fastened to the frame of the ship. Modern tubes can be made to swivel, and fire in any direction, although many older ships had to be aligned in the direction of the target to aim. The largest vessels mount up to eight of these devices, permitting devastating volleys of fire. By tradition, one or two of the projectors are mounted firing backwards, to foil attack from the rear, although these projectors also swivel.

Missiles

The most expensive and flexible weapon is the guided missile. Missiles mounted with hyperspace engines and inertial compensators can pursue their quarry anywhere and are very difficult to elude. A volley or cluster of missiles is probably the most devastating form of attack in common use.

Fighter Ships

The difficulties of attacking a planet from orbit, through the atmosphere, preclude the use of all the ship's normal weapons, except thermonuclear warheads, which are proscribed by Imperial decree. For this reason, attacks on surface installations are waged by small atmosphere capable fighter craft Once the enemy's air cover is obliterated by the fighters, surface forces, with unimpeded air support, can generally complete the conquest with ease. These craft generally carry two pilots and require in addition eight support personnel on board the main ship. Most vessels carry at least one fighter, for emergency landings, but large warships often carry as many as a thousand.

---

[7]Usually called tubes by spacefarers. The origin of this term is not known.

Starship Construction

To obtain access to the Dockyard facilities, enter **Build or Repair Your Ship** on the main menu (option 2). This puts you in contact with the officials at your chosen dock. Once your license is verified, a standard ship will be issued to you; at either an Imperial dry dock or one of your own bases. When you are just starting out, or if you have suffered a severe financial setback, the standard scout ship may be the best you can afford.

If you already have a ship and you are at a base with a functioning dry dock, the ship design sheet will be displayed. Depending on the size of your computer screen, this sheet may vary in format. For wide screens, a cursor-addressing based, or screen based, mode is used. For narrow screens or terminals without cursor-addressing, a simple menu-driven format will be used. Regardless of the format, the capabilities available are the same. Once you have completed the design of the vessel, leaving the dockyard will return you to the main menu again. From there, you can go onto the bridge of the ship and take control, or check up on the operation of your colonies.

Screen Mode Dry Dock

A typical dry dock screen in the full screen mode is shown below:

```
                    Dry Dock System  231.b
Hull Used  :    2.99 Max. Warp  :   8.15 Mass       :   36 Ktonnes
                      Ship Design Board
Hulls              :   3.00      Warp Drive       :   100 Mw
Torpedo Tubes      :    3         Impulse Power    :     36 Ktonnes
Laser (fore)       :   150 150 Life Support       :   100
Shields (fore)     :   100 100 Fuel Tanks         :   3500
Fighter Bays       :    12
   Cargo           on board               available
Troops             :   100                    0
Probes             :     1                  764
Missiles           :     0                 2060
Torpedos           :    25                 5000
Fighters           :     1                    6
Cash               :          0                      0
```

Upon entry to dry dock in this mode, the above screen will be displayed, and the cursor will be placed over one of the properties you can modify (some dry docks will be unable to perform some operations). To change the property under the cursor, simply enter the desired new value. If the change is accepted, the field will be reprinted, the cursor repositioned, and the special characteristics at the top of the screen will be reprinted if necessary. To move to the next property on the screen, hit ENTER or RETURN. When you reach the last field, and hit RETURN, the dry dock will wrap around to the first field again.

Menu Mode Dry Dock

The non-cursor-controlled mode of the dry dock is driven by a simple menu. The ship's properties are divided into two groups, one of which will be displayed on the menu at a time. Upon entry to dry dock, the first menu is displayed, similar to the following:

```
Dry Dock System    45.c
Hull Used :    2.99
Max. Warp :    8.15
Mass        :      37 Ktonnes
 1. Hulls                       3
 2. Warp Drive           100 Mw
 3. Torpedo Tubes              3
 4. Impulse Power         36 Kt
 5. Laser (fore)             150
 6. Laser (aft)              150
 7. Life Support             100
 8. Shields (fore)           100
 9. Shields (aft)            100
10. Fuel Tanks              3500
11. Fighter Cap.              12
(E)xit, (P)rint, (A)bort,
C,<field> or <field>,<value>
:
```

If you hit RETURN or ENTER, the second menu will be displayed. Successive RETURN'S will switch back and forth between the two menus.

```
Dry Dock System    45.c
Hull Used :    2.99
Max. Warp :    8.15
Mass        :      37 Ktonnes
   Cargo          on board  available
12. Troops    :       100    14004
13. Probes    :         1    10000
14. Missiles  :         0    10000
15. Torpedos  :        25    10000
16. Fighters  :         1    10000
17. Cash      :    100000          0
(E)xit, (P)rint, (A)bort,
C,<field> or <field>,<value>
:
```

To change the value of one of the ship's properties enter the field number, a comma, and the new value, at the prompt. For example, to add an additional hull to a 3 hull scout ship you would enter

1,4

at the "**:**" prompt. The ship's properties are divided into two menus for display purposes, but you can alter any field at any time. If you are in *expert* mode, the menu of properties will not be displayed automatically upon entry to dry dock, but can be displayed by request.

Dry Dock Commands

In both menu and screen modes, several special commands may be entered at any time. Each of these commands is a single letter, optionally followed by a number. These commands are:

A	Abort, leave the ship unchanged. Return to the main menu or flight.
E	Save the new ship, return to the main menu.
H	Print the Dry Dock instructions.
P	Reprint the screen or current menu.
?	Print the Dry Dock instructions.

In screen mode, several additional commands may be entered. These commands are:

C	Print the cost of the current field.
N<number>	Move the cursor by the specified number of fields, which may be either positive or negative.
$	Go directly to the Cash field, if possible.

In some dry docks, you may not be able to access all of the fields. The capabilities of a dry dock are determined by the size of the ship yards, i.e. the number of workers working in the yards. Imperial yards can generally do anything (although Imperial yards will not permit construction of ships larger than 50 hull units). Private yards may be much more restricted. In addition, the Cash field can only be accessed directly at Imperial bases (where there are offices of the First Bank of the Empire). All private yards operate on the cash-and-carry principle.

There are several automatic repairs, which are generally performed upon entry to dry dock. Any Imperial dry dock, or one of your own with sufficient capabilities, will automatically repair damaged radios, the ram scoop, and damaged torpedo tubes. If the dry dock is large enough to fully accommodate the ship, hull damage will be repaired as well. Shields and lasers will be repaired up to the minimum safe levels, those installed on a new scout. Repairs beyond those levels will have to be bought.

Piloting Your Starship

Once you have completed the design of your ship, it will be built by the shipyard, and you can take control of it. To do so, return to the main menu, and enter **Assume Command of Your Ship,** option 3. The command console of the ship will be displayed on your screen, and you will then be able to communicate orders and directions to the ship's computer. The computer will continuously display various pieces of information which the computer considers significant. To give a command to the computer, when you receive the prompt (">"), simply enter the command, which may be abbreviated to its first three letters, with any parameters that the command requires. Your computer will inform you of the results of the action, or if you make a mistake, what was wrong. All commands except communication have the same basic format.

<command> [parameter1][,parameter2]

Thus,

warp 120,11
warp
warp 120

and

warp ,11

are all syntactically acceptable. Parameters are generally numbers, which consist of an optional sign, and a number with an optional decimal point. For some commands, a parameter may be a letter, or a sequence of letters. Thus

nav c,10

and

nav c

are both valid commands. In addition, the standard notation for a planet, used both for displaying the planet and entering it into the computer is

<system number>.<planet letter>

Thus, 220.C would represent the third planet of star 220.

lib 220.C

is an example of the use of this notation.

Movement

The most basic instruction you can give the computer is to move the ship. There are a variety of ways to do this, depending on where the ship is and whether you want to use manual or automatic control.

At any time the ship will be in one of three states: in orbit of some planet, flying around in normal space in a star system, or flying around in hyperspace. Thus, the navigation commands separate into three groups, depending on the state of the ship.

Planetary Orbit

Ships generally occupy equatorial orbits when they arrive at planets. The planet can be used to block hostile fire and to hide behind. To go directly from one planet to another within the same system, the **navigate** command is used.

navigate <planet letter>

will take the ship out of orbit, and start it flying automatically to the designated planet at the maximum possible speed (usually near light speed). When it reaches the planet, it will automatically enter orbit. To abort the navigation program, simply enter

navigate

or

nav

and the ship will continue on the current heading at the current speed. Entering a manual command to the impulse drive will also take the ship out of orbit.

Normal Space

When in normal space, there are two pertinent commands. The first is **navigate,** which works as described above, and may be given at any time. The second is **impulse,** which is used to manually set the course and velocity of the ship. **Impulse** is most commonly used during combat or when leaving the system, and **navigate** is used when heading to a planet. The **navigate** command is the only way to enter orbit of a planet.

A typical screen (in 64 by 16 cursor mode) is shown below.

```
A       +------------------------+
B       |                        |
C       |                        |
D       |                        |
E       |                        |
F       |                        |
G       | f                      |
H       |             ^          |
I       |    e      dc  ba*      |
J       |                        |
K       |                        |
L       |                       |torpedos: 1 0 0
*   231|                       |lasers   :  200  200
>       |                       |shields  :  150  150
        +-----------------------+>
[   1.7 A.U.]  V= 10  C=300  E= 2950
```

The number on the left side of the screen adjacent to the **"*"** indicates which planetary system your ship is in. All planets are shown in lower case letters and the sun is shown as the **"*"**. The bottom line indicates that your ship is 1.7 A.U. away from the sun with a velocity of 10 percent of light speed, and an absolute course of 300 gradians.

The **impulse** command has two parameters, course, and velocity. Course is measured in **gradians** (400 **gradians** equals 1 complete revolution), and velocity as a percent of light speed. For example,

impulse 100,50

will cause the ship to change its course by 100 gradians, which is a right angle turn to the left, and to travel at 50% of light speed. Note that the ship will not turn instantaneously; it usually takes a few seconds to turn the ship completely around.

imp 200

causes the ship to change course by 200 gradians, in effect a complete reversal of direction, and leave the speed **unaffected.**

impulse ,100

will change the **ship's** speed to full light speed, without changing course. Note that this is equivalent to

imp 0,100

To stop completely, without changing course, simply enter

impulse

If for some reason you wish to navigate along an absolute heading, an **"@"** before the course will direct an absolute heading. For example,

imp @ 100

will direct the ship to fly due north (note that "north" is an arbitrary concept, so this command is rarely needed).

An **impulse** command will cancel any active **navigate** command automatically, so a separate **nav** without parameters is not necessary when taking manual control.

Leaving the star system and entering hyperspace is accomplished with the **navigate** command, or the **warp** command. Any entry of **warp,** or any **navigate** to another star system will automatically begin the **hyperspace-injection** sequence. The ship's computer will compute the probability of a successful injection into hyperspace, and query you **as** to whether these odds are acceptable (if you have the *expert mode* set, you will not be queried, since the computer assumes you know what you are doing). In general, you need to be at least 6 astronomical units from the star before you will find reasonable odds, if you are flying a scout. Heavier ships will have to fly out farther. Also, being near large planets can significantly reduce the odds. If you respond with yes or y, the ship will attempt injection into hyperspace. If this succeeds, the scanner format will change and the computer will state that you are "entering hyperspace".

Hyperspace

Hyperspace is the only means of traveling from one star system to another. Ships in hyperspace are able to travel at virtually unlimited speeds, and are able to communicate with other ships in hyperspace at great distances. The enormous velocities achieved in hyperspace require distance to be measured in light years.

A typical screen (in 64 by 16 cursor mode) of a ship in hyperspace is shown below.

```
A 545 +------------------------+
B 462 |                        |
C 693 |         E              |
D 166 |                        |
E 924 |                        |
F     |         C              |
G     |                        |
H     |            ^           |
I     |            D           |
J     |         B              |
K     |                        |
L     |            A           |torpedos: 1 0 0
*     |                        |lasers   :  200  200
>  177|                        |shields  :  150  150
      +------------------------+>
V=   5.3 C=284 E= 2920 T=1570
```

The scan displayed by the computer while in hyperspace shows the locations of all nearby stars. Stars are indicated on the screen by upper case letters. The column of letters on the left margin of the scanner is used for an index. Next to each letter displayed on the screen will be the identification number of that star. The caret ("^") in the center indicates your position, and the ship is always pointed toward the top of the screen. The number adjacent to the ">" indicates that your ship is on automatic navigation to that star system.

Maneuvering in hyperspace can be accomplished in two ways, exactly analogous to motion in normal space. The **navigate** command is used for automatic flight directly to another star system, and the **warp** command gives manual control of the ship. To navigate to another star, enter

nav <star system number>

Since your computer has recorded the locations of all star systems known to contain planets, you can get to any one of these systems. Another option is to enter the letter that the star is displayed as on your screen. For example

nav a

entered while in hyperspace will direct the ship to head towards the star system represented by an "A" on the screen.

As in normal space,

nav

will cut out the navigation **program,** and leave the ship traveling on manual control.

Maneuvering the ship in **hyperspace** is identical with maneuvering in normal space. All the following commands work the same as their counterpart **impulse commands,** e.g.

    war <course change>,<speed>
    war <course change>
    war ,<speed>
    war
    war @<absolute heading>

There is one difference between hyperspace and normal space. In normal space, velocity is bounded by the speed of light. In hyperspace, velocity is **unbounded,** but there is a definite maximum safe speed beyond which the ship risks damage and possible annihilation. If you attempt to enter a speed beyond your ship's maximum safe speed, your computer will require you to confirm this, to eliminate the possibility of an erroneous command. If you do travel faster than the safe speed, monitor your engine temperature carefully. By the time you get a warning from the computer that you have exceeded the maximum cooling surface temperature of 3500 degrees C, it may be too late to slow down.

In an emergency, there is a desperate expedient that can be used to cool the engines. This involves dumping fuel directly onto the cooling surfaces to carry the heat away. If you find this necessary, the **dump** command is used.

    dump

will dump 10% of your hydrogen.

    dump <units of fuel>

will dump the specified quantity. The computer will not allow you to dump more than half your fuel at one time, as a safety measure.

Combat

Like movement, combat differs depending on where the ship is located. Combat in normal space is generally conducted with energy beams, usually X-ray lasers, whereas in hyperspace energy beams are not only ineffective, they are meaningless. There is a large amount of maneuvering involved in laser combat, since the weapons are very range-dependent. Hyperspace torpedos are relatively insensitive to range, out to their maximum of sixty light years.

Shields

The **shields** command can be used to manually set the shields.

    shi <forward>,<aft>

will set the power of the forward and aft shields. If you are hit, the shields will be reduced in power for a few seconds. They should recover automatically, unless they are damaged. This command is used primarily for recovering the energy in the shields in an emergency. If you buy new shields in dry dock, you may also need to use a **shields** command to activate them to their new energy.

Fighting in Hyperspace

The ship is equipped with up to eight torpedo tubes. To charge a tube in preparation for firing, you enter the **load** command.

loa <tube number>

will charge the specified tube. This is generally indicated by a " 1" on the display for that tube. Note that charging a tube will consume about thirty units of fuel, **and** will heat the cooling surfaces by twenty or thirty degrees C; you may need to dump some fuel during an intense fire fight to cool the ship back to safe operating levels. Tubes can not be unloaded except by firing.

A loaded tube can be fired with the **torpedo** command.

tor <tube number>

will fire the loaded tube. All the tubes fire straight forward, except for the last, which fires straight backwards. In ships with more than six tubes, the last two fire backwards. Since the torpedos are normally fired in the direction the ship is pointed, the **warp** command can be used to turn the ship to the appropriate heading.

The tubes can also be swiveled and fired in any direction, with the following command.

tor <tube number>,<course>

The torpedo will travel along the relative course specified. For example,

tor 1,100

will fire tube 1 along a course 100 gradians to the left of the ship's heading.

Hyperspace missiles can also be used against other ships in hyperspace. To fire a cluster of two (or one if you do not have two) missiles, enter

mis <ship number>[,<extra fuel>]

Missiles will change course as necessary to pursue their target, so the ship's heading is not significant in firing a missile. A missile has very efficient hyperspace motors, and will track a target for a long time. A missile with no extra fuel travels at warp 14 and does about one fourth as much damage as a torpedo. A cluster of two would double the damage to about half as much as a torpedo.

If you load extra fuel into the missiles they will fly more slowly but will do more damage on impact. The following table illustrates how the missile's speed and damage varies.

Missile Energy	Attack Value	Warp Factor
0	0.25	14
150	0.75	12
600	1.25	10
2400	2.25	8
9600	4.25	6
38400	8.25	5

The amount of energy specified is the total amount that will be loaded into the pair of missiles, each missile getting half. The Attack Value is specified in multiples of torpedos.

Fighting in Normal Space

Most ships are mounted with two turrets, one fore and one aft, each firing a very large X-ray laser. Each turret has about a 230 gradian field of fire, so targets to the side of the ship can be fired upon by both turrets simultaneously. The turrets are guided by computer. To aim a turret, enter the **lock** command.

loc <ship number>

will lock both turrets onto the specified ship.

loc <ship number 1>,<ship number 2>

will target the fore turret on ship 1, and the aft turret on ship 2. The ship's computer will inform you when either or both turrets actually have the target in sight. If you have a VT100-type terminal or emulator, the lasers will flash when ready. Other cursor-addressing terminals will display an asterisk ("*") in front of the laser that can be fired. Non-cursor addressing modes will print a message when a laser acquires or loses its target. If the expert mode is set, this printed message will be of the form

L#R

or

L#O

where "#" will be either 1 or 2, for fore or aft turret. "L1R" means the fore turret is ready, and "L2O" means the aft turret has lost sight of its target.

The lasers are fired with the **fire** command.

fire

will fire both turrets at their locked targets.

fir 1

will fire the forward turret, and

fir 2

will fire the aft turret.

Lasers will consume one tenth their rated power in hydrogen when fired. You may need to duck into a planet and recharge in the midst of a heavy fire fight, so keep a careful watch on the fuel supply. If your ship has less than three times the fuel needed to fire, the weapons computer will reduce the power of the lasers. Also, the amount of damage a laser can do falls off rapidly with increasing distance. The longest range that the typical laser will do full damage is about five A.U. Beyond that range, the damage falls off with the inverse of the distance, since the beam spread reduces the ability to penetrate the shields. For this reason, combat in normal space is usually a cat-and-mouse game, with each ship trying to maneuver in close and get a shot off with both turrets, without getting blasted itself. The **impulse** command is used to maneuver the ship.

All lasers have a built-in, undefeatable locking system installed by Imperial technicians, preventing their use in the four major Imperial systems. This action was taken by the Empire after several famous (or perhaps infamous) slaughters of scout ships were perpetrated by bands of marauding pirates, within sight of an Imperial Naval base. Whatever foul deeds may take place elsewhere in the Galaxy, the Empire will have no more within sight of the scandal-mongering *Vid* crews of the Home planets.

Fighting Planets

There are two stages in subduing a hostile base from a ship in orbit. First, you have to get command of the air by destroying all the enemy fighters and surface laser emplacements. This is done with the **attack** command. Each fighter you dispatch carries a crew of two, and you must have an additional eight mercenaries on board the ship as support personnel. To destroy all the enemy defenses you will need a commanding numerical lead, since the defender has a considerable advantage.

The basic scenario of an attack goes as follows. First, the surface laser guns fire on the attacking fighters, since they have the greatest range. Any surviving attackers then simultaneously take on the defending fighters that rise up to meet the threat, and attempt to destroy the surface guns. The defenders will usually hold back some fighters and guns, rather than squander them all in one battle. Surface guns take an average of one minute real time to recharge after firing, although some may recharge faster. This means that a rapid series of attacks may succeed in saturating the guns, permitting the attackers to bombard them without loss. If there are no defenders to meet the attack, the attacking fighters then usually bomb the ship yards on the surface, to reduce the chance that damaged guns and fighters will be repaired.

Once you gain control of the air, the time has come to land surface troops and mop up the opposition. Without air support, the defender will only resist if he has a considerable chance of success. The **occupy** command will direct troops to the surface. You will need to have a fighter available for each ten troops sent down, to provide transport. The results of the battle will be duly reported, and, if successful, the troops will remain on the surface. The fighters return to the ship. The landing troops generally attack forces roughly their own size. Since the transporting fighters usually lend air support, the attackers often have an advantage in the fight, since they can pick the point of attack.

Communications

The tune command will activate a communications channel and specify the frequency the channel will operate on, e.g.

tune <channel>,<frequency>

The channel identifier, <channel>, may be any one of the 3 channels, a, b, or c. Frequencies available range from 1 to 999 (1 Mhz to 999 Mhz), in the hyperspace FM band. To send a message over a channel, enter

<channel letter>/<message>

For example,

`a/Help!! I'm` under attack!

You can have all three channels operating simultaneously.

You can transmit on channel A at any time, by appending your message after a slash. For example

`tor 1,120/Eat` hot `tachyons,` gravy sucking pig!

or something similar.

You can block reception from one or two other players, whose comments you particularly don't want to hear, with the **squelch** command.

squ 8302

will prevent 8302's transmissions from printing on your screen, and

squ 8302,9007

will block both 8302 and 9007. Squelch with no parameters will reenable general reception.

The **send** command is used to privately send a single number to another ship. Usually this is used to tell another ship which radio channel to tune to. For example, the following might be used to request ship 8302 to tune to channel 700 for a private conversation.

sen **8302,700**

The **who** command will query the Imperial Registry by hyperspace radio for the identity of an unknown vessel.

who <ship **number>**

will tell you who the ship is registered to, and how many kills have been recorded by that ship. This command is recommended before going into battle, to prevent tragic mistakes (gnats rarely defeat elephants). It also helps to establish the ownership of bases you may encounter.

Status

The **status** command presents a brief readout on the condition of the ship.

sta

For example, a typical scout ship:

```
Location  ( 553.5  749.1)
Ship Id  :     8302
Troops   :      100
Torpedos :       25
Missiles :       20
Fighters :        1
Cash     :      302
Probes   :        1
Radio a/b/c:      1    302     1
torpedos: 0 0 0
lasers   :  150  150
shields  :  100  100
```

The most crucial number displayed here may be your hull damage. If you have taken severe damage in combat, this command will tell you how severely your hull is damaged. When the hull damage exceeds one hundred percent, the ship disintegrates, with unfortunate consequences. Hull damage is repaired by entering a suitable dry dock (all Imperial bases, for example, unless your ship is unusually large). If no hull damage is displayed, as above, you have no significant damage.

Scanners

The automatic scanner that updates the view around the ship has an adjustable range. In hyperspace, the scanner can display out as far as thirty light years. In normal space, the range is one hundred A.U. The **range** command will adjust this.

range <scanner range>

When entering a star system, the range is automatically set to the distance to the star. Upon injection into hyperspace, the scanner is set to twenty light years.

The **picture** command is used to control the frequency of the scanner's reports. On cursor-controlled terminals, the scanner is updated every turn. On terminals in a non cursor-controlled mode, or in *expert mode,* the scanner is only run on request.

picture

will request a scan.

picture <frequency>

will set the scan frequency. For example,

pic 2

will cause a scan to be printed every other round.

Entering a negative frequency will put the scanner into combat mode. In this mode, other ships will be displayed on the screen, but not stars or planets. The maximum range of this mode is sixty light years.

pic -1

will cause the scanner to update every **round,** with ships only.

pic 0

will turn the scanner off completely. This is often done to reduce the load on the **ship's computer.**

map
will print a map of the known galaxy, with your ship and the four main Imperial planets. A sample map:

```
A    88
B   672
C   229
D   930                    ^D
E         C
F
G
H
■
J
K         A            B
L
*
```

The four main Imperial bases are displayed as stars A through D. Your ship is the ＾.

map **<star number>**

will in addition display the requested star.

The **search** command prints a list of the ships nearby.

search **<range>**

lists all the ships out to the given range. The default range is 50 light years, the maximum is 300 light years. The computer will display at most eight ships with this command.

If your terminal suffers damage,

redraw

will erase the screen and draw up a fresh image.

The **scan** command is used to obtain a list of nearby stars.

scan

will list all stars within 20 light years. For example,

```
Star   46 R:    0 H: -230
Star  647 R:   11 H: -134
Star  910 R:   14 H: -114
Star 1272 R:   18 H:   -9
Star 1481 R:   18 H: -210
```

```
Star   930 R:    19 H:     4
Star  1685 R:    17 H:    57
```

       scan <star number>

will give the distance to that star. This is useful for checking up on the progress of a navigate command.

Obtaining Help

There are several important commands you can enter to get the computer to give you assistance.

       help

will give a short explanation of the most essential commands.

       help <command>

will explain the specified command in further detail.

       info

will give a list of the command abbreviations.

       info <page number>

will print the specified page (1 to 4) of a brief description of the game. You should try all these commands, since the ship's computer can give you a lot of timely, useful information.

In addition, you can ask the computer directly for advice.

       advise

will print what the computer thinks you should do. The computer is not always reasonable (that's why there is a pilot), but it can give you a good indication of what to do. Never do what it says without thinking first; it may tell you to attack an Imperial base, for instance, which is not a very good idea. You might want to, but probably not. The machine is a little blood-thirsty.

Miscellaneous Commands

The **combat** command is used to switch the display mode between the full cursor-addressing mode and the higher speed non-cursor-addressing mode.

       com

will place the ship in non-cursor-controlled mode (much faster in combat), or put it back into the normal mode. If you have the *expert* mode set, this is the default mode, and you will have to enter com to get cursor-addressing. Note that using *expert* mode is better than selecting non-cursor-control, if your communications software supports cursor control, but you do not want to use it. *Expert* mode gives you the high speed condensed output needed for intense combat, yet retains the cursor-controlled dry dock and Planetary Management menus.

The **end** command will **save** your ship and remove it from use.

    end

You must be in orbit of a planet to do this. When you return, you will be in orbit of the same planet. If you are in combat, you may be prevented from ending for a certain time after being hit, as an inducement to courage. This restriction also applies to the **dry** dock command.

You can enter dry dock at any system directly from orbit, using the dry command. This command bypasses the main menu.

    dry

If you use this command, the dry dock commands **abort** and **exit** will return you to flight again, rather than to the menu.

    dry save

will place you in dry dock, and attempt to save all radio messages that you receive while in dry dock. When you return to flight, the saved messages will be printed. The amount of storage devoted to the messages is limited, however, so some messages may be lost if you stay in the dry dock for a long time.

The First Bank of the Empire maintains an account for each noble. You can display your balance at any time by entering

    bank

When in orbit of an Imperial base, you can transfer cash from your ship to your bank account, or vice versa.

    bank <amount>

will deposit that amount into your account (where it is safe from enemy hands).

    bank -<amount>

will withdraw cash from the bank, so that you can spend it elsewhere. When docked at an Imperial base, the Cash field of the dry dock will perform these functions, as well.

The **transfer** command can be used to give money to another ship. For example,

    tra <ship number>,<amount>

will give <amount> to the specified ship. You must be in the same system, or within 60 light years of the other ship. You cannot transfer negative amounts (vacuuming out other people's holds is not allowed).

Planetary Exploration

There are two commands used to query the computer on the survey results for a planetary system. The first, **library,** requests physical data on the planet.

From planetary orbit,

library

gives the readout on the planet being orbited. This report gives the size and orbit of the planet, its atmospheric pressure and temperature, the **habitability** index, and the availability of metals on the surface. For example, a typical Imperial planet:

```
System   930.  Planet b.
Mass:      1.205 Orbit:      1.185
Grav:      0.964 Radius:     1.097
Press:     0.951 Day:        31.718
Temperature  :     19.2 to    24.2
Length of year:   471.15  days
Metals          :     63.40
Habitability    :     99.38
```

Mass, orbital radius, gravitational strength, planetary radius, and atmospheric pressures are given as ratios to Terran standard. The length of the day is given in hours. The temperature range on the surface is given in degrees C. The length of the year will be either Terran standard days or years, whichever is most convenient. Metal ore concentrations are rated on a scale of 0 to 100, as is habitability.

A typical planet colonized by a less successful noble would look like the following:

```
System    46.  Planet b.
Mass:      0.044 Orbit:      0.676
Grav:      0.254 Radius:     0.406
Press:     0.000 Day:        37.991
Temperature  :   206.5 to   232.5
Length of year:   203.15  days
Metals          :     64.72
Habitability    :     28.70
```

Note the rather high surface temperature and lack of an atmosphere (0.000 pressure), resulting in the low habitability rating of 28.7.

environment

gives a reading on the atmospheric composition and life forms. Again, an Imperial planet:

```
System  930.  Planet b
 Environmental Analysis
Nitrogen        :   83.927
Oxygen          :   16.073
Noble Gases     :    0.842
Life forms: Earth-like
Wet, mild climate
Forest predominant.
```

The concentrations of atmospheric components are given, along with a report on the presence of indigenous life forms.

Outside of planetary orbit,

lib

produces a table of the planets and their properties. All values are ratios based on Terra (e.g. mass of 2 means the planet is twice as massive as Terra was). For example, the Imperial system:

```
System  930.   Intensity  1.570
No.    Mass    Orbit  Temp. Press.
 a       0     0.55   297     0.0
 b       1     1.18    24     1.0
 c     236     2.58   -70  6668.6
 d      13     5.62  -138  4519.2
 e      10     8.24  -162  3731.2
 f       9    16.16  -193  2664.9
```

The stellar intensity is given as a ratio to Sol's.

> lib <planet letter>

or

> env <planet letter>

will give the detailed listings for the indicated planet

At any time, any planet previously known can be called up, with

> lib <system number>.<planet letter>

or

> env <system number>.<planet letter>

Likewise,

> lib <system number>

will give the table describing all the planets in the system.

Colonies

Once a planet suitable for settlement is found, usually with a habitability above 70, the usual course of events is to establish the planet as one of your own private holdings, and request

the opening of the planet to immigration. As colonists arrive and homes and factories are built, the colony grows from a mere outpost to a (hopefully) thriving independent society. As the land holder, Imperial law permits you to levy a tax on the settlers of your planet, and to require them to provide you with certain materiel for your ship upon demand. In addition, unless you are so harsh a master as to provoke a successful revolution, your political pull in the Imperial Senate will increase as the colony flourishes. The name of the game in Imperial politics is to get as many colonies under your control as possible, either by your own effort or stealing them from other land owners.

Establishing a New Colony

Establishing a new colony is quite simple. A single command to the ship's computer will direct it to register the planet with the Empire, and set up the initial colonization. From planetary orbit,

establish

will set the planet up to receive 5000 colonists in the initial ship load. A loan will be taken out in the name of the newly designated planetary government, to pay for importing housing and factories to provide jobs for the first colonists. This loan has no time limit, and interest is charged at an annual rate Of 5 percent. Most colonies succeed in paying off the initial loan in 20 years or so.

est <planet name>

will establish the colony and register your chosen name for the planet in the Imperial registry.

The initial economy of the colony when the first ship load arrives will be primarily growth-oriented, but diversified. The population is divided between basic industries, mining, construction of new housing, military production, and service jobs. Agriculture is demand driven, with no exports. This economy is generally stable and does not need immediate intervention on your part to pay off its loan in good time. If you wish to drive the base harder, or force it to militarize the economy further, you will have to take the reins yourself. Planets with large ore concentrations will have metal refining capacities installed that are substantially larger than required for the initial colony; this allows rapid growth of a mining-based economy.

Imperial regulations limit any individual landholder to six planets, so you must be selective.

Abandon can be used to release a base that you no longer wish to control. You must be in orbit of that planet to issue the command. **Abandon** will give the base its political freedom.

Examining a Colony

From planetary orbit, a colony can be examined carefully, and some information can be gathered even about a hostile base. The command to do this is **survey.**

survey

The survey command determines the owner of the base, and the approximate number of colonists there. If the base is yours, a brief summary of the military position of the base is given. A sample printout of one of your own bases is given below.

```
System    46.  Planet b.
Owner: 8302
Habitability    =    28.70
Colonists       =     5676
Surface Guns    =       10
 Dry dock is open.
Mercenaries     =       65
Fighters        =    16.50
Torpedos        =   100.90
Missiles        =    20.99
Probes          =     2.12
```

survey <system number>.<planet>

will print the survey report for any of your own bases. This enables you to check up on the base while in flight.

base

will display a list of all the bases under your control, and the range to them in light years.

Manipulating a Colony From Orbit

If you own the colony, there are several commands which you can use to manipulate the defenses of the planet directly. The **troops** command will take mercenaries up from the surface to the ship, e.g.

tro <number of mercenaries>

The reverse of this command, which sends mercenaries down, is the same, with a negative number of mercenaries.

tro -<number of mercenaries>

The **fighter** command will land fighters from the ship, or bring them up from the surface.

fighter <number of fighters>

brings fighters up to the ship.

fighter -<number of fighters>

sends them down.

The **tax** command is used to collect taxes. The tax rate is set by an option in one of the menus, and taxes are set aside at the specified rate in a special account in the colony. You can collect these taxes and take them away with you by entering

tax <amount>

from orbit. If you do not specify an amount, all of the taxes waiting on the planet will be taken aboard your ship.

The pay command is used to pay off a planet's loan with cash on board the **ship.**

pay <amount>

will apply the cash on board directly to the loan. If you do not specify an **amount,** all the cash aboard your ship will be used, if needed, to pay the loan.

All the non-military manipulations of the colonial economy are performed through the planetary management menus, which are accessible from the main menu.

Probes

Although you can explore the galaxy using your ship, the process can be greatly accelerated by the use of automated probes. To fire a probe to a system, you must be in **hyperspace.**

probe <star number>

will send a probe to that system. In addition,

probe <letter>

will send a probe to the system represented by that letter on your scanner (similar to the **navigate** command). The probe will fly into the system, and notify you when it gets there. Once it has notified you, you can examine the system with the **library and environment** commands. The probe will then fly back to the ship, **Probes** generally travel at warp 12 in hyperspace. If you enter a system before the probe returns, it will follow you, and chase you in normal space.

pro

will recall the probe immediately. Keep in mind that probes are too small to carry shields, and are therefore very vulnerable to attack.

Planetary Management

As the reigning noble, the colonies you have established are nominally under your control, to do with as you please. Planetary economies are complex, however, and some care is needed. Any aspiring land holder should familiarize himself or herself with the basics of economics, so that too much havoc will not be wreaked on the unsuspecting citizens. The menus listed below are accessed through the **Planetary Management** entry on the main menu (item 4).

<pre>
                    Planetary Management

        1. List Owned Planets
        2. Modify Planetary Operations
        3. Modify Labor Assignments
        4. Modify Commodities Stockpiles
        5. Display Economic Report
        6. Print Planetary Report
        7. Help!
        8. Return to Prior Menu
            Enter Selection [1..8]:
</pre>

The first menu entry will print a list of the colonies you currently control, just as the base command in flight mode. **Display Economic Report** and **Print Planetary Report** are used to obtain detailed information about the operation of the economy. The two menu options display the same information, in slightly different formats. **Display Economic Report** is for examining the data on-line, the report will be formatted for the width of your terminal, and the program will pause after each screen full. **Print Planetary Report** is designed for printing the report on your printer, either via a capture buffer or transparent printing. The report is 64 columns wide, and does not stop between pages. In addition, this command will optionally let you print all of your bases at once, or one at a time. If you are not in *expert* mode, the report will also print the physical data on each colony you specify, similar to the **lib** and env commands in flight. *Expert* mode suppresses this additional printout.

Menu options two, three, and four are used to adjust the parameters of your planetary economy. These menus are explained in more detail in the following sections. First, it is appropriate to discuss the initial base set up, and the contents of the Economic Report.

Establishing the Colony

Colonies are established on-line, using the **establish** command. Colonies are set up for 5000 colonists, which entails a loan of around 35000 credits for planets with habitability greater than 70. Planets worse than 70 cost a great deal more. Also, high metal planets will have higher loans, as large initial refineries will be established to enable a rapid growth of a mining-based economy.

The initial setup as unloaded from the boat is sufficient to place the colony on a firm footing, and begin export of a small quantity of consumer goods (Mostly knick-knacks at first. The Home planets have an insatiable appetite for junk marked Made in Outer Bango Bango.)

Settling gas giants is never recommended, since such colonies are very expensive to maintain, and prove unpopular with the inhabitants. Planets with habitabilities as low as 19 can be successfully colonized, but growth rates will be much slower than for colonies with habitabilities above 80.

Defending the Colony

There are three elements to the planetary defense, surface guns, fighters, and troops. Surface guns fire on attacking fighters and orbiting ships, fighters intercept other attacking fighters, and troops defend on the ground. In addition to the infantry, each surface gun is manned by five mercenaries, and each fighter has two mercenaries on board, and an eight man ground crew. You will need to have sufficient troops available to operate the guns and fighters, or they will be useless. Note that if a fighter is shot down, its 2 crew members will be killed, and that if a surface gun is destroyed, up to 5 mercenaries may be lost.

Not only must you have the materiel to defend the planet, but the planetary economy must be healthy enough to continue to produce arms under war time conditions. Many large, well defended planets only fall when the underlying economy collapses under the strain of maintaining and repairing the defenses, i.e. when the planetary government runs out of money.

Planetary Industries

All colonies except the very smallest have basically industrial economies. There are seven industries you will be concerned with, which you will need to control in order to make the planet produce the goods and services you desire. A brief discussion of these industries will be helpful before an in-depth analysis of how the planetary economy operates can be undertaken.

Housing and the Environment

The nastier the planet, the more important it is to have adequate shelter for the colonists. Troops are tougher, and don't really care (at least they aren't allowed to complain). The initial boatload will set up adequate housing for the starting population. The Environment, or Construction, industry is used to build new housing for additional colonists, whether they immigrate from one of the Imperial planets or are born in the colony.

The important figure for monitoring the living conditions of the colony is the Effective Habitability, which is found on the Economic Report. Effective Habitability is defined as the ratio of population (with troops counting half) to available housing. The initial base will be established with an Effective Habitability of 80, and it normally will be maintained at a level above 75 if adequate resources are devoted to construction. As the population grows, more housing will have to be built, or the effective habitability of the colony will fall, from overcrowding and inadequate facilities. Usually, 10 to 20 percent of the work force is allocated to construction of new houses, but a colony that is rapidly gaining people will have to devote more to provide for the immigrants. The number of housing units available in the colony is also printed in the Economic Report. If there are more houses than people, Effective Habitability will be 100. In this case, you will be able to safely increase immigration.

If the effective habitability falls below 70, the life support system for the colony may fail from overloading. The first symptom of this will be the failure of the agricultural systems (except for hydroponics), and a probable loss of population. If you notice that you have a large number of people vainly toiling in hydroponics, and you have people starving, the first thing to check is your effective habitability. Note that the colony will normally not permit immigration to drive the Effective Habitability below 75. Intrinsic population growth, on the other hand, has no such restraints.

Feeding the Hungry

The first priority of the colony is always food, since food importation is always too little, too late. Food is generally grown in the native soil wherever possible, although usually often air and temperature control must be provided for the crops. The effectiveness of agriculture is governed by the Effective Habitability of the base (see previous section). In severe cases Hydroponics must be used to grow food artificially. Hydroponics is required whenever the Effective Habitability falls below 70. Should this happen, and Hydroponics capacity is insufficient to meet planetary food demands, top priority will be given to building more Hydroponics capacity; some starvation will take place in the interim.

Most colonies are allowed to regulate their own agriculture, since it is difficult to judge the demands of the colony from many light-years away. When regulating its own food supply, no one will starve in the colony unless a major catastrophe takes place, such as an invasion destroying enough of the available housing to drop the Effective Habitability below 70. See the **Modify Labor Assignments** menu for how to manipulate Agriculture.

If you desire to export food (or perhaps to starve the populace to show your displeasure with their performance), you can set the percentage of the population toiling in the fields yourself. This is very risky, since misjudging can be costly. Before changing the numbers, carefully examine the available information and see how many workers are allocated to agriculture on *automatic* mode.

Mining and Refining Metals

The mining and refining industries take metal ores from the ground and refine them into pure metals. Since metals are the basis of the Imperial economy, this is literally making money. Mining is a low-capital endeavor, and everyone assigned to mining grabs a pick and shovel and goes to work. Refining is fully automated. The refining capacity is a measure of how many miners' output can be refined on-planet by the equipment; no laborers are assigned to refining. Excess ore which cannot be refined on-planet may be exported, albeit at a considerably lower price than its full metal content

Basic Industries

The Basic Industries sector of the economy is concerned with expanding the capital resources of the colony, i.e. building new factories. The effort of the basic industries is divided among the various industries on the basis of which industries have the most unemployment, although some effort will in general be devoted to every industry, just to keep ahead of demand. Adding new capital requires money as well as labor, so a colony with a cash shortage will have difficulty expanding its industries. Understanding how Basic Industries deals with unemployment in an industry is essential to proper planetary management, and the section below on Advanced Planetary Management is largely on how to manage Basic Industries.

Beating Plowshares into Guns

Many militarily-inclined landowners produce their own weapons and ammunition on their colonies. This is more economical than buying equipment from the Empire, and often much safer than venturing into the vicinity of an Imperial yard when an enemy is lying in wait for you. An arms industry will produce three commodities of importance to the interstellar warrior, namely torpedos, missiles, and probes. Excess materiel can be exported, for a healthy profit.

Building a Shipyard

A shipyard is the most sophisticated, expensive endeavor a colony can be directed to undertake. Shipyards are relatively slow to construct and require huge amounts of metals. Once built, however, a shipyard is the most valuable possession one can have. With a large shipyard, one need never visit an Imperial base at all; in fact with a large enough shipyard you can build things the Empire would never dare sell to you.

The major occupation of a shipyard is the construction of fighter ships. These can either be accumulated on-planet, or exported for profit. Building fighters requires a large work force, and a good supply of metals. Since fighters are the basis for both the attack and defense of planets, an aggressive warrior will need a plentiful supply.

The shipyard may also be directed to produce ground-mounted laser turrets for planetary defense. A turret requires roughly the same amount of materiel and labor as a fighter.

In addition to fighter craft and ground defenses, the shipyard can build or repair your starship. Not only are simple repairs performed cheaper and more conveniently than in an Imperial yard, enhancements to the ship are more easily obtained in your own yard. The level of work the docks can do is proportional to the number of workers working there. The following table gives the size of the ship that can be fully repaired in ship yards of a given size.

Ship Yard Workers	Hulls
360	3
640	4
920	5
1200	6
1760	8
3360	10
4960	12
7360	15
15360	25
23360	35
35360	50
47360	65
55960	77
75360	100
115360	200

The Service Sector

The Service Sector of the economy comprises those jobs that are concerned with the support and maintenance of the populace, and the production of consumer goods. These jobs are essential, and form the basis for a happy colony. In addition, consumer goods are one of the most profitable, and easiest, exports. The service sector is very flexible, and can be more easily expanded than any other sector requiring capital investment. Never neglect this sector of the economy, even though you can't easily fly away with its products in your ship.

Planetary Reports

The following report, printed with the **Print Economic** Report option of the **Planetary Management** menu, shows a good example of a typical planet. This economy is running very

close to the settings established when the base was created. As the different properties of the economy are discussed, you might find it helpful to refer back to this report periodically. It is about three years old (game time), and has grown by about 14 percent.

```
         Planetary Report for Excalibur      ( 46.b)
              Date: May 10, 3075

      Industrial Capacity              Employment Report
   Hydroponics             0      Hydroponics    :          0
                                  Farmers        :        186
   Ore Refining         1958      Mining         :        985
   Basic Industry        491      Basic Industry :        491
   Armaments             491      Armaments      :        165
   Ship Yards            491      Ship Yards     :        491
   Service Sector       1473      Service Sector :       1473
                                  Construction   :       1313
                                  Bureaucrats    :        568
   Unemployment    :    0.09%     Unemployed     :          5

     Stockpiles of Material            General Information
                                  Housing Units  :       4408
   Consumer Goods :         0     Colonists      :       5676
   Food           :         0     Mercenaries    :         65
   Metals         :      1096     Habitability   :      77.22
   Metal Ores     :         0     Loan Remaining :      20746
   Torpedos       :       100     Land Tax Rate  :      0.00%
   Missiles       :        20     Tax Collected  :          0
   Probes         :         2     Conscription   :      5.00%
   Fighter Ships  :        16     Radio Channel  :          0
   Surface Guns   :        10     Std. of Living :     116.10

        Desired Stocks                Employment Rates
                                        Assigned/Actual
   Torpedos       :       100     Mining          17.3/  17.3
   Missiles       :        20     Basic Industry   8.7/   8.6
   Probes         :         2     Armaments        2.9/   2.9
   Fighter Ships  :       100     Ship Yards       8.7/   8.6
   Surface Guns   :        10     Service Sector  26.0/  26.0
   Troops         :       100     Construction    23.1/  23.1
   Immigration    :      2000     Agriculture     AUTO    3.3
   Food           :         0     Government      10.0/  10.0
                                  Unemployed              0.1
```

The first page of the report gives the raw data on each of the industries in the economy. The industrial capacities are the number of people who can work in those industries, the number of jobs available. For example, there are 491 jobs available in Basic Industries, and there are 491 people working there, as shown by the Employment column to the right.

The second page of the report gives the quantities of commodities on the planet, and a table of general information about the economy. Important figures to note here are the number of colonists, loan remaining, and tax collected.

The third page of the report shows the commodities stockpiles you have set using the menu options, and the breakdown of the population by industry, in percent of population. This

employment report is the primary tool in determining how well the planetary economy is responding to your directives.

Manipulating Commodity Stockpiles

The **Modify Commodities Stockpiles** menu is used to adjust the desired stockpiles of the various manufactured goods. These stockpiles are summarized on the Economic Report, although several can be examined from flight mode also, with the **survey** command.

```
Planetary Commodities for    46.b
        Item        On Hand    Stock
1 O r e                   0        0
2 Consumer Goods          0        0
3 Agriculture            0         0
4 Fighter Ships          17      100
5 Probes                  2        2
6 Missiles               20       20
7 Torpedos              100      100
8 Surface Guns           10       10
Enter <Item>,<New Value>
or  (P)rint or  (E)xit
```

The menu shows two columns of numbers, the quantities of each commodity currently on the planet, and the minimum level of stockpiles the planet should keep around. You can change the stockpile levels freely. The actual current quantity is displayed for your reference.

The fundamental purpose of each of the various industries in the economy is to produce a particular variety of goods. Once the goods are produced, they can be used in a variety of ways. Some are consumed on planet. Services "goods" are not only consumer goods such as toasters and private flyers, but also units of service work. The economy consumes a certain amount of these internally. Likewise, fighters produced by the ship yards may be used by the colony to defend against an enemy attack.

Some goods can be used directly by you, for example munitions produced by the arms factories, or fighters produced by the shipyards. The stockpile level, the minimum amount to be held on planet, tells the planetary government how much of these goods they should keep around for your personal use. Stockpiling everything produced by the colony will rapidly deplete the economy of hard cash, and cause a business depression. Exports are vital to the economies of all but the smallest outposts, so you shouldn't squeeze too hard.

For example, if a stockpile of 10 is set for fighters, then 10 fighters will be held on planet, and any produced beyond 10 will be exported. Note that this applies to troops also, so if you fail to set the desired level of mercenaries properly your troops will be sold on the open market. The on line commands for dropping troops increments the stockpile number, but conscription does not.

Those goods produced beyond the stockpile level will be exported. There are a few things to note about the interplanetary export trade. First, the prices you will receive for goods exported in bulk from your planets will often be lower than you might obtain by other means. For example, any ore mined that your refineries cannot refine into metal will be stockpiled. If more ore accumulates than the established ore stockpile level, the excess ore will be sold to a visiting cargo ship. The price obtained for the ore will be lower than if you had refined the ore yourself then exported the metal (which is, after all, money itself). Thus it might be in the colony's best interest to have a very high stockpile setting, hold all the surplus ore until the refining capacity has caught

up with the demand, and refine all the ore at a later time. If, on the other hand, you have better things to do with the economy than build up refineries, you might elect to export all the ore, and take whatever price you can get. After all, the capital investment required to expand your refineries will reduce the planet's capacity to crank out the fighters and torpedos you need to wage war on your enemies.

Note that the Ore Stockpile is handled a bit differently from other commodity stockpiles: the refinery will refine all the ore available, regardless of the stockpile setting, up to its full capacity. The setting is used to regulate the sale of ore off-planet, but does not represent a desired minimum stockpile of ore. This is to facilitate the kind of manipulation described above.

The surface guns stockpile is used to tell the colony's military high command how many guns should be kept in active service. Producing these guns takes the highest priority of the ship yards, only after the guns have been built will the yards produce fighters, for your use and for export. Together with the surface gun stockpile setting, the fighter setting and the mercenary setting on the Planetary Operations menu, determine the level of planetary defenses the colony will have.

Manipulating Labor Assignments

Primary control of the economy is exerted through the Modify Labor Assignments menu. Using this menu, you specify the percentage of laborers to work in each of the major industries. An typical menu follows.

```
        Labor Assignment  for    46.b
1  Service  Sector             27.00
2  Mining                      18.00
3  Agriculture             Automatic
4  Basic  Industry              9.00
5  Construction                18.00
6  Armaments                    9.00
7  Military  Shipyards          9.00
8  Bureaucrats  (fixed)        10.00
Total  (  <= 100.00)          100.00
 (A)bort,  (E)xit,  (P)rint
 (N)ormalize or <item>,<value>
```

To change the number of workers in a given industry, change the percentage specified for that industry. You will not be able to leave the menu, and make the changes effective, unless the total is less than or equal to 100. The Normalize command is used to adjust the current values so that they sum up to 100.

You specify zero (0) agriculture if you desire automatic regulation of agriculture. In this case, the employment report will show "AUTO=" in the Assigned Employment Rate for agriculture, with the number in the Actual Employment Rate column being the percentage of the population assigned by the automatic regulation. Agriculture is initially set on automatic, which means the farm workers are allotted as needed before any other planning is done.

You cannot change the number of bureaucrats with this menu, the number is displayed for your information only. The percentage of workers devoted to government service is dependent on the tax rate you have specified. The higher the taxes, the more government workers required to collect and manage the money. A colony with no land tax will have 10 percent bureaucrats to control the economy and pass necessary laws. If you set a land tax of 20 percent, the size of the

government will increase to about 20 percent of the population; the planetary economy will suffer accordingly.

To direct the construction of a new industry, or to expand an existing one, you assign more people to work there. Under ideal conditions, those people would immediately begin to work in the new industry, turning out the desired products. In reality, however, the factories usually do not yet exist, when you make the labor assignment. This creates what is known as structural unemployment within the economy. Jobs are available, but they are the wrong jobs for the available workers. To rectify this problem, the Basic Industries will begin rapid construction of the required factories, thus relieving the unemployment.

During the interval when the factories have not been completed yet, but the workers have been assigned, some dislocation exists in the economy. Sometimes this results in true unemployment, and sometimes the workers are reassigned to another industry. The industries are ordered in the following sequence for purposes of labor reassignment

> Shipyards
> Arms Manufacturing
> Basic Industry
> Services

Unemployed workers will be reassigned to an industry lower on the list, but not higher. For example, if you have assigned 10 percent of your workers to the ship yards, but the yards are only completed enough to employ 2 percent, the other 8 percent would be idle. If unused industrial capacity is available in basic **industry,** for example, those workers would actually be working in basic industry until the jobs open up in the ship yards. Thus, they will not be unemployed, and will remain productive. The secret to keeping the economy moving while expanding your industries is to work up the list, not down. If workers were waiting for jobs in services, and jobs were available in the meantime in basic industries, the workers would not be transferred (they lack the proper training). They would just be sitting around collecting welfare payments and eating up food. This is highly undesirable.

Manipulating Planetary Operations

The Planetary Operations Menu is used to set a variety of parameters affecting day to day operations of the colony. A sample menu follows.

```
    Modify Planetary Operations
1   Conscription Rate      5.00
2   Mercenary Force          100
3   Immigration Rate        2000
4   Land Use Tax            0.00
5   Radio Channel              0
6   Group Access               0
7   Planet Name      Excalibur
8   Trade Surplus %         0.00
(E)xit, (P)rint, (A)bort or
<item>,<number or planet name>
```

The various sections following explain these parameters in some detail.

Conscription and Volunteerism

The conscription rate is a percentage of the population expected to sign up for military service each year. If no stockpile of mercenaries has been set up, these recruits are shipped off planet for cash. In many depressed economies, the major source of foreign exchange is this people-export. You should be careful not to draft too many people, and sell off the whole planet.

Conscription does not take place at exactly the rate you establish; in effect you are setting the target recruitment rate. Several factors can effect the actual rate of growth of the armed forces. Most importantly, no military organization can do more than triple its size in a year (it's highly doubtful whether it will maintain any military effectiveness if it does anywhere near that). If you set a high conscription level, it may take some time before the rate of growth of the military reaches that level. It may be beneficial to hire mercenaries at the Imperial planets and fly them in yourself, to form cadres for your new army to form around.

When there is high unemployment, many workers will voluntarily enter military service, hoping to escape the miserable conditions in the civilian economy. Usually they will be sold off-planet, and help to improve the economy directly. Alternatively, they may serve to keep their former associates loyal to your regime.

A high conscription rate will disturb the civilian population and cause unrest. This will drag the standard of living down somewhat. On the other hand, the high level of conscription will assure that any unrest that does occur won't last long.

Immigration

The immigration figure set by the Planetary Operations menu sets the desired number of immigrants to the colony per year. The actual number of immigrants will never be larger than this, but some problems on-planet may reduce it considerably. First, a housing shortage will prevent people from coming in, since they will not immigrate until they have a place to live. Secondly, a high unemployment rate will scare them off; few people will voluntarily emigrate to a known hell-hole. Population growth is obtained primarily through immigration. The best that can be expected through natural increase is about 6 percent a year.

Taxes: Your Share of the Booty

As the landowner and titular head of government, you are entitled to a land-use tax, levied on each person in the economy on an annual basis. This tax is set as fraction of a man-year of labor. If you demand more than about 20 percent of the laborer's time, he will probably become angry, especially since many laborers at the low end of the scale only produce about 0.4 man-years of labor equivalent.

The tax is set aside as hard cash, and you can collect it with your ship at any time. Of course, if someone else captures the planet, he may collect your tax for you. Civil unrest may also diminish your tax receipts. Short-lived revolutionary governments almost always manage to spend or otherwise appropriate whatever possessions of the "bloodsucking fascist landowners" they can get their hands on. By the time the riot is over, no one remembers where the money went.

Radio Channel

The Radio Channel entry is used to establish the channel which the base uses to broadcast distress messages. If set to zero, the base will suffer in silence.

Group Access

Group Access determines who can use your dry dock. If set to zero, only you can use your base. If set to your team number (see the Team section for further details), your team mates may also use the base, on the same basis you do. Of course, regardless of the group access, you may still use your own bases at the usual low low prices.

Trade Surplus Percent

The Trade Surplus Percent determines how much materiel the base will keep on hand for the purpose of selling to other players via dry dock. For example, suppose you have a stockpile setting of 10 missiles. This means the colony will keep 10 missiles on hand, and sell any more produced to the Imperial cargo ship. You have access to these 10 missiles, as the owner of the base. Suppose you then set the Group Access to the id of your team leader, to help the team out. There will rarely be any missiles for sale to other players, since the 10 missiles held back are for your use only. To direct the base to keep an additional stock for trade, you should set the Trade Surplus to some value greater than 0 (and less than 300%). If you set the Trade Surplus to 200%, the base would keep 30 missiles on hand, the 10 in the stockpile, and 200% of 10, or 20, for trade. All excess above the 30 will be sold to the Imperial cargo ship.

Advanced Planetary Management

This section explains in depth the operation of the planetary economy. You will be able to successfully manage your economy with the information in the previous sections, but to become Emperor, your planets will need to be run very well indeed.

The trade sector of the economy is the force that drives all the rest; it produces the money the other sectors spend. It is a rare colony that subsists only on its mining, and doesn't make heavy use of trade. The following table lists the approximate production costs and prices payed by the Imperial cargo ship for the main commodities produced by a colony.

Item	Production Cost	Sale Price	Imperial Price
Torpedos	0.5	4.0	15.0
Probes	5.0	25.0	75.0
Missiles	2.0	10.0	45.0
Fighters	100.0	120.0	150.0
Surface Guns	100.0	----	----
Consumer Goods	—	20.0	----

To produce a fighter, for example, the ship yards will use 100 units of metal. If that fighter is then sold, the colony will receive 120 units of metal in payment, thus making a profit of 20 units. Note that the Imperial price for a new fighter is 150 units, so the Imperial arms merchants will make a considerable profit as well when the fighter is sold at the Imperial base.

Consumer goods are sold for 20 units each, yet have no cost associated with them. The raw materials cost of consumer goods and services are very small compared to the total value of the goods. Services is therefore the easiest way to generate a lot of cash. As will be seen, new service capacity can be built up very quickly and cheaply.

Aside from exports, the other way a colony can generate cash is by mining. Mining works as follows:

A miner will produce 0.4 times the metal value of the planet in a year. The refinery will refine 40 units of ore per year per refining unit installed, producing 40 units of metal. Thus, on a 50 metal planet, a Mining job with adequate refining capacity will produce 20 units of metal per year, the same as a Service sector job. On high metal planets, Mining may be more advantageous than Service sector. Of course, the standard of living is lower for miners.

As mentioned above, the ore stockpile setting does not affect refining. All available ore will be refined, any left over will be sold up to the stockpile value.

There are a large number of ways a colony can spend the money it earns with exports and mining. The Imperial bankers will generally manage to take their cut first, collecting their loan payments and interest promptly even in the middle of a major invasion. Social welfare usually comes second; most colonies will pay their unemployed a subsistence wage of 0.1 units a year. Government workers, who manage the economy and thus control to a large extent where money is spent, rarely miss their paychecks, usually totaling 2.5 units per year.

Each of the capital industries will spend money at a fixed rate per worker. This rate contains not only the wages of the workers and the overhead of maintaining the factories, but the maximum materials costs that can be expended by that industry in a year. In other words, the cost per job figure specifies how much each industry can produce in a year, once the cost per unit of production is taken into account. The cost per job per year of each industry is:

Cost Per Job Per Year

Industry	Cost
Environment	1.2
Basic Industries	10.0
Arms	2.0
Shipyards	5.2

Note that Services, Mining, and Agriculture are considered to have no cost per year; their costs are included in their output. If the colony has less money available than the industries could spend running at full capacity, then the available money will be divided among the industries on the basic of equal employment in each industry. For example, if you have 1000 people in Basic Industries, and 1000 in shipyards, shipyards will get 34% of the money and Basic Industries will get 66%.

The costs of running the different industries will vary widely. In general, the output of an industry will be the amount of money spent by the industry divided by the unit cost of whatever the industry is producing. For example, 1000 people in Environment would spend 1200 units a year to build 1000 houses (on a 100 hab planet), whereas 1000 workers in Shipyards would spend 5200 units to build 52 fighters.

The unit cost of new housing is a rather complex function of the habitability of the planet and the population of the colony. Unit cost starts at about 1.2 units per house on an uncrowded 100 habitability planet. When the population reaches 100,000, the housing cost will start to rise, reaching about 2 at 1 million, and 2.5 at 20 million people. The cost also increases dramatically with lower planetary habitability, as the following table shows.

Base Cost of Housing

Habitability	Base Cost
100	1.2
90	1.4
80	1.7
70	1.9
60	2.2
50	2.4
40	2.6
30	2.9
20	3.1

The Armaments, or Arms, industry has three different products. The industry will produce only one of those three products, probes, missiles, or torpedos, during any given budgetary period. You can control what the industry produces by setting the stockpile levels. If the base has fewer probes than the stockpile, the factory will produce probes. Otherwise, if it has fewer missiles than the stockpile, it will produce missiles. Lastly, if it has plenty of missiles and probes, it will produce torpedos.

Shipyards spend their money building surface guns, or fighters if there are enough surface guns. The cost for both items is 100 units each. Note that ship repairs in the dry dock do not cost the colony anything, except for the value of the goods you carry away. Money you or a customer spend for services in the dry dock goes back into the economy.

Basic Industries build new industrial capacity by determining the relative need of each industry for expansion. Initially, each industry is weighted by the employment levels set in the Labor Allocation menu. If there is no unemployment, then new industrial capacity will be built in precisely those proportions, maintaining a stable economy. If there is unemployment in a given sector, because the industrial capacity is lower than the labor level you have set, then the weighting for that industry will be increased by an amount proportional to the degree of unemployment. Thus, over time the industry with the shortfall will build up faster than the others, and the unemployment will disappear.

If there is a shortfall of refining capacity, i.e. if ore is accumulating in the stockpile, then the weighting for refineries will be increased. Likewise, if there is starvation in the populace, then the weighting for hydroponics, which is normally zero, will be set to a high level, to build up hydroponics quickly.

Once the weightings have been determined, the available money is apportioned out according to those weights, and then each share is spent on building new jobs for that industry. The following table shows the amount of money Basic Industries will have to spend to create a new job in each industry.

Cost to Build a New Job

Industry		Cost
Basic	Industries	6.000
Arms		11.000
Shipyards		100.000
Refining		1.125
Service		1.125
Hydroponics		7.000

Note that the weights are computed from the true employment levels in each industry, so if there is unemployment, the workers who *trickle down* from other industries will affect the weights. The exception to this is if you have set the labor allocation of an industry to zero. In that case, no new capacity will be built for that industry.

The Standard of Living Index

The standard of living index measures how well the people are living. The primary determiner of standard of living is the wages earned by the workers. These wages are usually determined on an industry-wide basis, so the more workers employed in a high wage industry, the happier the economy is.

The industry that yields the highest standard of living is Services. The more people working in Services, the more satisfied the workers. Not only are more people earning high wages, but there are more goods for them to consume. Shipyard and arms workers have the next highest wages. On the other hand, unemployed workers have a very low standard of living. Mercenaries also have a low standard of living, so keeping a large standing army will drag the value of the real estate down.

One hundred to one hundred fifty is a high standard of living, seventy is common. Anything below fifty is deplorable, and the populace may opt for a change of government. If a large percentage of the population is unemployed, and there is insufficient hard cash to make the meager welfare payments traditionally doled out, rioting may result, even if the rest of the population is content. If you don't keep enough troops on-planet to handle the mobs, your control over the planet may be lost.

Information Center

The **Information Center** area of the menu is used to operate a number of special features related to communications, both with other ships and with your bases.

```
              Information Center
    1.  List Ships in Flight
    2.  Read Messages
    3.  Hyperspace Radio
    4.  Display Team Roster
    5.  Display Team Scores
    6.  Display Top Player Scores
    7.  Display Your Score
    8.  Help!
    9.  Return to Prior Menu
          Enter Selection [1..9]:
```

The first menu entry, **List Ships in Flight,** will print a list of all the ships currently in space. This enables you to check out the field before launching your ship.

The second menu entry, **Read Messages,** will display the telegrams you have received from your bases while you were not logged in. Various team functions are also performed via these telegrams. If you see the message "You have messages waiting" when you first enter the main menu, you should come to this menu entry to see what awaits you.

The next entry provides a way to communicate with other ships without risking life and limb in space. From this entry, you can talk to any ship in flight, or anyone also in this area. The format of the commands is identical to the radio-related commands in flight.

Display Team Roster and **Display Team Scores** are used to print the members of a given team, and the scores of the various teams, i.e. the number of votes they muster in the Imperial Senate. **Display Top Player Scores** shows the votes that each noble controls. These scoreboards are generally updated every morning to show the previous night's activities.

The individual score is composed of three terms, the value of your ship, the value of your planets, and your record as a warrior. The ship's value is the sum of the square root of the cash on the ship, 1.5 times the troops on the ship, and 500 times the number of hulls. The value of a planet is computed as 0.1 times the number of the colonists times the standard of living, the square root of the cash on the planet, 0.15 times the number of troops times the standard of living, minus 1.5 times the debt. The value of a planet is never allowed to be less than zero. Your combat record is summarized by 250 times the number of kills you have, plus the number of *brownie points* you have earned. Brownie points are earned by putting damage on enemy ships, the larger the ship the more points. Killing a battle cruiser or battle ship will gain you about 2500 brownie points. Note that you get **no** brownie points for killing a scout ship!

When the *scout protection* law is in effect, you will not be credited for any killing of a scout by any ship larger than a scout. This scout protection law is controlled by the Imperial Navy, and is almost always in effect; if the law will be temporarily out of force, the Imperial Navy will make an announcement to that effect. The Empire generally frowns very severely on the killing of helpless scouts.

Team score is computed as the sum of the scores of all the members of the team, divided by 1650 (the value of a basic scout.) The leader of the team with the highest score at the end of the

four-week war is crowned Emperor of the Galaxy. The leader of the second highest team becomes Viceroy of the Empire. If the third place team is close to the second place team, their political power enables their leader to join the Court as Counselor of the Empire.

The individual with the highest score at the end of the four weeks is titled the President of the Imperial Senate. The next nineteen highest individuals are titled the Second Lord of the Empire through Twentieth Lord of the Empire. All of these people, plus the two or three top team leaders mentioned above, have their names placed in the Multi-Player Game SIG.

At the end of the four-week period, after final scores have been posted and awards announced, the galaxy is cleared, and the war starts over with a clean slate. This enables the formation of new teams, new alliances, and perhaps new vendettas.

Team Management

The Team Management menu is where teams are handled. This menu is shown below.

```
          Team Management Center
    1.  List  Team  Scores
    2.  List  Team  Roster
    3.  Invite  New  Team  Member
    4.  Request  To  Join  a  Team
    5.  Expel  a  Team  Member
    6.  Withdraw  From  a  Team
    7.  Change  Team  Name
    8.  Send  EasyPlex  to  Your  Team
    9.  Help!
    10.Return  to  Prior  Menu
          Enter  Selection  [1..10]:
```

The first entry lists all the teams and their scores. This is a duplicate of the **List Team Scores** entry of the **Information Center** menu.

The List Team Roster entry is used to display a list of the members of any team. A team is always identified by the **ship id** of the team leader. The ship id is a four-digit number uniquely identifying each noble. Your ship number is first printed when you create your ship, and can be displayed while in flight with the **status** command. To list the members of the team, enter the ship id of the team leader when **List Team Roster** requests it.

Request To Join a Team is used to send a telegram to the leader of a team, informing him/her of your desire to join that team. Again, you will need to know the ship id of the team leader.

Team leaders can invite new members to their team with the **Invite New Team Member.** This sends a telegram to the prospect, giving your team number. The prospect will be prompted for whether he/she accepts the invitation. If it is accepted, the person is added to the team, and an acknowledgement telegram is send back. If declined, a telegram stating that is sent back.

To create a new team, invite your first member. The team will automatically be formed. You will probably want to select **Change Team Name** right away, to set the team's name.

The Expel a Team Member option is used by a team leader to get rid of an unwanted team member. If the offending player is not currently in the game, the expulsion will take place the next time he enters the game, or the next morning when the day's scores are compiled. If he is on the game, the expulsion can take place when he or she reads the expulsion telegram.

The Withdraw from a Team option is used by a member to leave the team.

Send EasyPlex to Team enables a team member to compose and mail a message via CompuServe EasyPlex℠ to all the members of the team. Any EasyPlex surcharges will apply.

The only direct effect being on a team has, besides team vote in the Imperial Senate, is that team membership can enable you to use your fellow team members' bases, and you can open your own bases to your fellows, if you wish. This is done from the **Modify Planetary Operations**

menu, by setting the **group id** to the number of the team you wish to permit to use the base. A group id of zero indicates that only you may use the base.

Shooting at your team members, or even trying to blast your leader, is common behavior on some teams. Only the military might of the team leader and the team's *esprit de corps* can deal with this situation. Note that the Empire does not try to regulate the conduct of team members in any way. That's what anarchy is all about.

Terminal and Terminal-Emulator Support

Most users of on-line services use personal computers with communications software to emulate computer terminals. Every make of computer has a different collection of communications programs, and many different terminals are emulated. MegaWars III has the capability to use a wide variety of different formats, but to use them you must first decide how to tell MegaWars III what you have.

Most communications programs emulate some well known computer terminal. The three most common are the DEC VT100 (also known as ANSI), DEC VT52, and Lear-Siegler ADM 3a. Some public domain communications software does not emulate any specific type of terminal, but provides what is commonly known as a Glass TTY (a reference to the old-style TTY, or teletype). It is highly recommended that you obtain a communications program that can emulate one of the terminals listed below, so that you can take advantage of the feature known as cursor-addressing.

The term "cursor addressing" refers to the ability of a communications program to move the cursor about on the screen under the control of the host computer, to rapidly draw up neat charts and tables. MegaWars III makes heavy use of this capability if it can, in flight mode and in the menus. If cursor addressing is unavailable with your communications software, you must select terminal type 8. In this case, output during flight will scroll down your screen, and the various game menus will prompt you for commands. Some players prefer this type of output during combat.

The most common and efficient form of cursor control used is DEC VT52 emulation. The CompuServe Vidtex™ terminal package uses the VT52 protocol. MegaWars III will support three different screen sizes with VT52 emulation. Terminal type 1 is formatted for 64 by 16 character screens, such as older Radio Shack models. Terminal type 2 is 40 by 24 characters, which covers most home computers used with television sets or low cost monitors, such as Commodore 64/128, Atari 400/800 and descendants, Apple II series, etc. Terminal type 3 is 32 by 16 characters, for the Radio Shack Color Computer. Use of cursor control is minimal in mode 3, because of the small screen size.

Most newer and more powerful personal computers have larger screen sizes than the older designs. Terminal type 5 provides for a full size 80 by 24 screen, such as an IBM PC, Macintosh, or an actual VT52 would have. All of the remaining modes expect at least a 64 character width, so if you have a screen size narrower than 64, and cannot obtain a program that will handle VT52 emulation, you should use terminal type 8.

Terminal type 4 is for an ADM 3a emulator. This is a bare bones cursor controlled terminal, and you should use this one only as a last resort. The ADM 3a does not have a crucial feature that MegaWars III needs to make efficient use of the screen. The ADM 5 does have this feature, and will work well with MegaWars III, using mode 11.

The VT100 and ANSI modes are the most sophisticated that MegaWars III currently supports. If you have an actual VT100 terminal or compatible, or a very complete terminal program, use terminal type 7. This will take advantage of the scrolling regions, line drawing characters, and character attributes available on these very sophisticated terminals. If you try type 7 and get mangled output, try type 10, which is for ANSI terminals. This is a subset of the full VT100 mode, and will avoid the less common features. Note that VT100/ANSI cursor control is rather inefficient, and a good VT52 program is really preferable to using ANSI mode 10. Programs for MS-DOS machines that use the ANSI.SYS driver, such as a simple communications program written in BASIC, should work with mode 10.

      The Zenith Z19/Heath H19 and Teleray 1061 are supported for historical reasons. If you happen to have one of these, you are in luck.

      If you just can't get anything to work, do not despair. Set your terminal type to 8, which will ALWAYS work, then send a cry of distress to us via FEEDBACK.

All commands can be abbreviated to 3 letters. **<xxx>** denotes information you supply. Anything in brackets may be omitted.

<channel letter>/<message>...............................broadcast a message.
ABANDON..abandon the base being orbited.
ADVISE..give advise (suggested commands).
ATTACK [<number of fighters>].............................attack a base from orbit.
BANK [<change in bank account>]..........................deposit, withdraw, or show balance.
BASE..list your bases.
COMBAT..enter or leave the *combat* terminal mode.
DESTRUCT..commit suicide.
DRYDOCK [SAVE]...enter dry dock.
DUMP [<quantity of fuel>]......................................jettison fuel to cool the engines.
END..leave flight mode, when orbiting a planet.
ENVIRONMENT <star number>.<planet letter>.........report on a planet.
ENVIRONMENT [<planet letter>]............................examine the current planet, or the one specified.
ENVIRONMENT [<star number>]............................display current star system, or the one specified.
ESTABLISH [<base name>].....................................establish a new base.
FIGHTER <change in fighters>................................transfer fighters between ship and a base.
FIRE [<laser number, 1 or 2>]................................fire lasers.
HELP [<command>]..give instructions.
IMPULSE [[<relative heading>][,<% of light speed>]].impulse drive
INFO [<page number>]..print a list of commands, or a short intro.
LIBRARY <star number>.<planet letter>...................report on a planet.
LIBRARY [<planet letter>]......................................examine the current planet or the one specified.
LIBRARY [<star number>].......................................display current star system or the one specified.
LOAD <tube number>...load a torpedo tube.
LOCK [<target 1>[,<target 2>]]................................lock lasers on target
MAP [<star number>]...display a map of the known Galaxy.
MISSILE [<ship number>[,cluster size>]]..................fire missiles at a ship.
NAVIGATE [<planet letter>].....................................navigate (normal space).
NAVIGATE [[<star number>][,<warp speed>]]...........navigate (hyperspace).
OCCUPY [<number of troops>]...............................land troops on a base.
PAY <amount>...pay off the a colony's loan with cash.
PICTURE [<frequency>]..set frequency of picture update, or print a picture.
PROBE [<star number>]...fire a probe to a system, or recall the probe.
RANGE [<scanner range>]......................................set scanner range.
REDRAW..reprint the screen.
SCAN [<star number>]...find range and heading to star, or all nearby stars.
SCOOP...scoop a gas giant for fuel.
SEARCH [<range>]..search hyperspace for other ships.
SEND <ship number>,<value>................................send an integer message to another ship.
SHIELD [<forward shield>[,<aft shield>]].................. set energy in shields.
SQUELCH [<id 1>[,<id 2>]]...................................... block radio messages from turkeys.
STATUS..print the ship's status.
SURVEY [<star number>.<planet letter>]................survey a base.
TAX...collect taxes from a base.
TORPEDO <tube number>[,<relative heading>].......fire a torpedo.
TRANSFER <ship number>,<amount>....................transfer metal to another ship.
TROOPS <change in troops>..................................transfer troops between ship and base.
TUNE <channel letter>,<frequency>.......................tune the two hyperspace radios.
WARP [[<relative heading>][,<warp speed>]]...........warp drive (hyperspace).
WHO <ship number>..identify a ship.

CompuServe