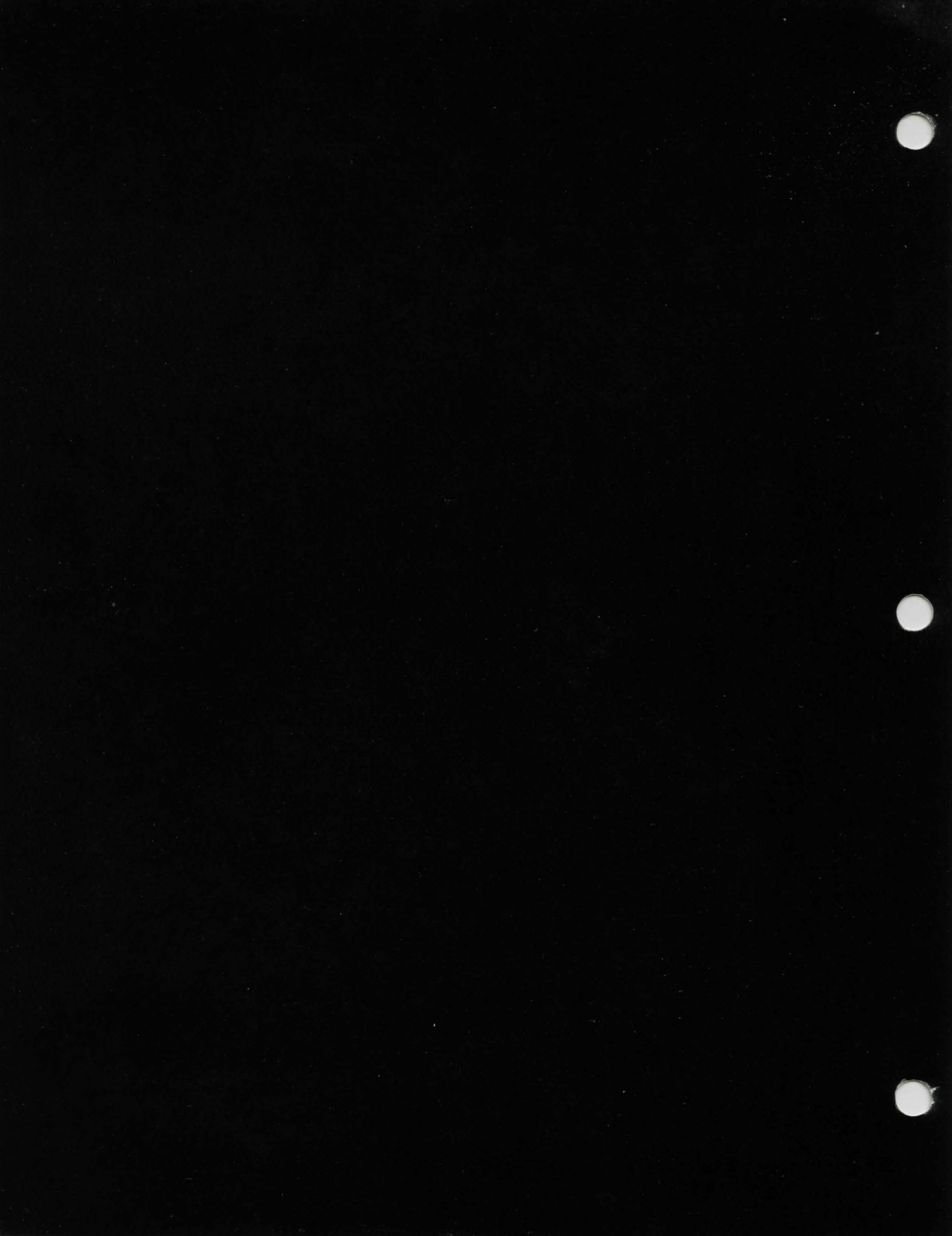


OMNITRENDS

UNIVERSE



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This program is dedicated to those who
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**OMNITREND
SOFTWARE**

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INTRODUCTION

HISTORY

During the latter part of the First Stellar Expansion, it became evident that the resources from planets in a sphere some 40 light-years across could not support the ever-expanding colonization effort.

Hyperdrive had opened an era of fast, economical travel between the stars. Before its invention, interstellar journeys consumed hundreds of years. With its use, light-years can be crossed in a matter of days. However, the hyperdrive is not without its limitations. One of them is the enormous expenditure of energy required to enter hyperspace. The second is the so-called, "Mass Limit," which, stated simply, prevents an excessively large ship from entering hyperspace. These two factors effectively set a limit to the distance a single ship can travel without refueling. Convoys were attempted but the uncertainty involved in reentering normal space scatters the ships too far apart to be effective. Fuel depots were and still are limited to a few advanced colonies and dependence upon finding a world to mine fuel from often proves disastrous. Experts were predicting an end to the expansion.

A research ship traveling far outside the habitable zone of Tau Ceti discovered a huge artifact 31 billion kilometers from the star and over 27 degrees off the plane of the ecliptic. Entire scientific communities came to study the alien object. Eventually, records were recovered and mankind saw the faces of an alien race perhaps millions of years dead. It took little study to learn the purpose of the great machines: a hyperspace booster. The booster had the capability to propel a spacecraft not by tens but by thousands of light-years. Since the booster itself did not enter hyperspace, ships of sizes up to the mass limit could travel great distances with minimal engine power.

Years of research continued. Scientists were unable to determine why the aliens had abandoned the booster or where they had come from. The booster contained a map of millions of stars but few of them had received any special designation.

Finally, the control system was deciphered and test-flights were made. They proved the machine to be fully functional and the technicians' knowledge of the aiming system adequate enough to allow regular use. The Second Stellar Expansion had begun.

You are in a cluster of stars known as, "The Local Group." You are unable to communicate with Earth because travel using the booster is strictly one-way. Packages from Earth arrive every 25 days, when examples of their latest developments in technology. They reenter somewhere in orbit around Axia, your home planet and the mother planet to the Local Group. The technical level of the Local Group is behind Earth's; the packages are vital. Progress has been swift since the first colonists arrived, but it will take more than 200 years to achieve a technical level equivalent to that of Earth's. Some starsystems in the Local Group have not progressed as rapidly as Axia because of cultural and environmental differences. Yours is a planet specially noted by the aliens for some strange purpose. There is evidence that you are not the first to colonize it.

All is not well now in the Local Group. There is evidence of slave trade, atrocities, oppressive governments, and piracy on some of the less-developed planets. But far worse is the disturbing news that, for the past 80 days, not a single package has arrived from Earth. The last few communications had not mentioned any trouble and the scientists had reported that at last they were able to duplicate some of the parts within the booster. Rumors about what has happened to Earth are rampant. Some say the Earth has been destroyed by war. Some think that Earth may have been hit by whatever destroyed the race that created the hyperspace booster. Others have theories about the booster exploding or the aliens returning to take their machine back. Whatever the case may be, the Local Group is on the verge of panic.

Only 15 days ago, the Axian Central Educational Institute announced that it had evidence proving that there is a second booster somewhere in the Local Group. You and your colleagues have decided to search for the missing booster. You won't receive a free ship, so in the midsts of your searching, you're going to have to earn a living.

Be the first to find the missing hyperspace booster and your fortune is made. Fail, and a civilization encompassing a volume of several thousand light-years may fall. The need for a hero has never been greater.

GAME STRUCTURE

Universe is distributed on several disks. The rest of the package consists of the manual, quick reference cards, and the registration card.

As a registered owner of Omnitrend's Universe, you are entitled to 2 hours per month of free time on the Universe bulletin board. Information on how to access the system can be found in Appendix J.

If, after having enjoyed proper operation of your game, a problem occurs with one of the original disks, you may secure a replacement disk as follows:

Mail the defective disk along with \$10 to Omnitrend Software. Be sure to include your serial number. You will receive a new disk within 10 days.

GETTING
STARTED

GETTING STARTED

GETTING
STARTED

HOW TO USE THE MANUAL

The size and complexity of Omnitrend's Universe can be quite imposing at first glance. However, it is not necessary to know many of the details of this game in order to play. Much of this manual covers equipment which you may not ever use on your spacecraft or equipment which you won't be able to purchase for quite some time.

This section of the manual deals with the material we feel necessary to know before playing the game. The following outline will help you to assimilate this knowledge as soon as possible and get on with the game.

Recommended Reading (In the listed order)

1. How to Operate Your Starship
2. Navigation and Orbits
3. Operation of the On-Board Computer
4. Commerce in the Local Group
5. Using Menus
6. Sound Effects and Their Meanings
7. Version Specifics
8. Sample Game

After you have read these sections, flip to the Construction section of this manual, which deals with financing and building your spacecraft, and begin reading. This will lead you right into playing Omnitrend's Universe.

Note:

If you have any problems with the terms used in your reading, check the glossary (Appendix I) for details.

The manual sections Flight and Starport will explain how to run specific parts of the program. Each chapter, such as Report Status, is broken into three sections: purpose, operation, and implementation. Purpose tells when and why you would want to use a particular system or part of the program. Operation details what your actions represent in "real life"; i.e., the Report Status screen represents a small display on the bridge. Implementation shows how the program is actually used, which keys to press, et cetera.

Use the appendices to find a particular piece of information (What's Kiskismok's radius, anyhow?).

VERSION SPECIFICS

The following information details specific information for several computers. Please read the section that pertains to your computer.

ATARI HOME COMPUTER

System Requirements

This version requires an Atari 800, 1200XL, or 800XL computer with at least 48K and 1 or 2 drives.

Your Universe game is distributed on four disks entitled Construction, Starport, Flight 1, and Flight 2. Three of these disks, Construction, Starport, and Flight 1, are bootable. During play, a fifth disk is created entitled Player Disk.

Making Player Backup Disks

After creating your player disk and placing the parts aboard your ship, you may create backup copies of your player disk by selecting the save game option on the flight menu. This section contains a backup utility. You may also use any other disk copy program (except the copy facility in the Atari DOS).

Note:

On some non-Atari disk drives, formatting your player disk can take up to 10 minutes.

Two Drive Use

Using Universe on a dual drive system is very similar to using it on a single drive system except that disk swapping is virtually eliminated.

Using the Construction Disk

Boot the Construction Disk and begin playing. The option to use two drives is available after you purchase a spacecraft. Insert the Player Disk into Drive 2 and leave the Construction Disk in Drive 1. Now press "OPTION." When the computer asks you to insert a different disk, (ex. Please Insert the Starport Disk) use Drive 1. The Player Disk should always remain in Drive 2.

Using the Flight Disks

Insert the Flight 1 Disk into Drive 1 and the Flight 2 Disk into Drive 2. When the "Insert Player Disk and Hit Return" display appears, place the Player Disk into Drive 1. Next, you must hold down the START key and then press RETURN. Do not release the START key until the computer beeps.

Whenever the computer asks you to insert Flight 1 or Flight 2, use Drive 2. The Player Disk should always remain in Drive 1 when you are using the Flight Disks.

Using the Starport Disk

Boot the Starport Disk. When the "Insert Player Disk and Press Return" display appears, place the Player Disk into Drive 1 and the Starport Disk into Drive 2. Next, you must hold down the START key and then press RETURN. Do not release the START key until the Customs display appears. Both disks will remain in their respective drives during the use of Starport.

APPLE II HOME COMPUTER

System Requirements

The Apple version of Universe will run on any Apple II, Apple II+, Apple IIe, Apple IIc, or any Apple compatible system with at least 48K memory, DOS 3.3 and one disk drive.

Your Apple version of Universe is contained on four disks. These are labeled CONSTRUCTION, FLIGHT, FLIGHT 1 and STARPORT. To start playing Universe, boot the CONSTRUCTION disk. Once play has begun, you may boot the FLIGHT disk to resume play where you left off.

Throughout this manual, you will see references to three function keys. These are Start, Option, and Select. For the Apple version, you will use the keys <Q>, <W>, and <E> respectively. For instance, if the manual says to press start to return to the previous menu, then you would press the <Q> key. Also, due to the nature of the Apple II keyboard, the up and down arrow keys are not available for use. When these two keys are referenced, you may use the <I> and <M> keys. If the four arrow keys are available, you may simply use them.

VERSION SPECIFICS

One and Two Drive Use

Omnitrend's Universe may be played with one or two disk drives. It is recommended that two drives be used.

For one drive use, select the one drive option when you boot up either the FLIGHT or STARPORT disks. You will then be prompted to insert the correct disks at the proper time. The problem with one drive use is that there are frequent changes from the game disks to the player disk.

For two drive use, select the two drive option upon booting either game disk. You will then be asked to place the player disk in Drive 2 and the game disk in Drive 1. After this point, relatively little disk switching will have to be done.

Making Player Backup Disks

After creating your player disk and placing the parts aboard your ship, you may create backup copies of your player disk. We suggest that you use the COPYA program included on your DOS 3.3 disk, however any disk copy program should work.

Wherever the manual refers to "booting" a particular disk, you may simply run the appropriate file. Program and data files must reside on the same disk, and this disk must be set to the MS-DOS "default drive."

Players with two disk drives will want to use drive A for the Starport and Flight disks, and drive B for a disk containing player files. One drive players will follow the same system, however drive B is an "imaginary" drive in their systems. This means that one drive players will be prompted to swap the player and Starport or Flight disks. In both single and dual drive situations, players will precede their player file name with "B:". Players with hard disks may copy all files onto a partition, however either the Starport or Flight disk must reside in the floppy drive. Universe does not support 8" disk drives or drive mapping on the Zenith Z-100.

MS-DOS 2.X OPERATING SYSTEM

System Requirements

This version requires one of the following systems: IBM-PC, IBM-PCjr, IBM-XT, IBM-AT, or IBM compatible with at least 192K of memory, color graphics, MS-DOS (or PC-DOS) 2.0 or higher, and at least one drive.

Zenith Z-100 series computer with at least 192K of memory, color graphics chips (64K type required), MS-DOS 2.0 or higher, and at least one drive.

Your Universe game is distributed on two disks entitled Starport and Flight. The Starport disk contains the programs CONSTRUC and STARPORT. The Flight disk contains the FLIGHT program. Both disks also contain several data files used by the game. These disks are copy protected, so you will not be able to make backup copies. If you should have a problem with one of the disks, contact Omnitrend Software for an immediate replacement.

VERSION SPECIFICS**Multiple Drive Systems**

You begin playing Universe by booting the MS-DOS (or PC-DOS) operating system. Once you get the system prompt, place the Starport disk into drive A. You will also need to place a formatted disk in drive B. Run the CONSTRUC program by typing "CONSTRUC" and pressing return. Follow the Construction section of the manual for information on how to construct your ship. Near the end of the construction phase, the computer will ask you for a file name for your player file. Type in any name, no more than 8 letters, all upper case, preceded by "B:". For example, if you wanted to call your player "sample", you would enter "B:SAMPLE". The computer will then store the file on drive B.

Remove the Starport disk from drive A and insert the Flight disk. Type "FLIGHT" and press the return key. The computer will ask for the name of your player file. As in the previous example, you would type "B:SAMPLE". At this point, the flight menu will appear on the screen. Use the option key (F3) to advance the arrow to "Docking Control". Now, press the select key (F2) to enter the drydock. Refer to the Docking Control section of the Flight chapter for information on how to place parts and purchase supplies.

Single Drive Systems

You begin playing Universe by preparing a formatted disk to store your player file. Boot the MS-DOS (or PC-DOS) operating system. Once you get the system prompt, place the Starport disk into drive A. Run the CONSTRUC program by typing "CONSTRUC" and pressing return. Follow the Construction section of the manual for information on how to construct your ship. Near the end of the construction phase, the computer will ask you for a file name for your ship. Type in any name, no more than 8 letters, all upper case, preceded by "B:". For example, if you wanted to call your player "sample", you would enter "B:SAMPLE". You will be asked to place disk B into the drive. Insert the disk you prepared earlier and press return. The computer will then store your ship on drive B.

Run the Flight program by typing "FLIGHT" and pressing the return key. The computer will ask you to place disk A in the drive. Remove your player disk and insert the Flight disk. The computer will ask for the name of your player file. As in the previous example, you would type "B:SAMPLE". Once again, you will be instructed to swap disks. After reading your player file, the computer will ask for disk A. Replace the Flight disk into the drive. This may happen several times during the game. Be sure to perform the same procedure each time. At this point, the flight menu will appear on the screen. Use the option key (F3) to advance the arrow to "Docking Control". Now, press the select key (F2) to enter the drydock. Refer to the Docking Control section of the Flight chapter for information on how to place parts and purchase supplies.

Hard Disk Systems

Even though the Universe disks are copy protected, you may still play Universe on your hard disk. Copy all the files from both disks onto your hard disk. During play, you must have either the Flight or Starport disks in the floppy drive. Follow the procedure for dual drive use. You will not need to change disks in the floppy drive, however. In addition, your player file may be stored on the hard disk. Simply substitute "B:" for whatever drive letter your hard disk has been assigned.

The function keys are mapped as follows:

- F1 = Start
- F2 = Select
- F3 = Option

For instance, whenever you see a reference to the start key, you must use the F1 function key.

There are no sound effects on the Zenith Z-100 series computer.

SAMPLE GAME

This is a sample game that you can play in order to learn more about Omnitrend's Universe. We suggest that after following this game, you restart a new game, selecting ships and items as you desire. The sample game is by no means the best or only way to play. It is provided only to get you started.

Although overwhelming at first glance, UNIVERSE is designed to give you many long hours of enjoyment. This documentation will give the beginner a step by step start up guide, from acquiring a loan for your ship to trading merchandise in another star system. Although your results may vary, it is a sound guide to get you there and back again.

Beginning the Game

If you are running the MS-DOS 2.X version, you should first prepare a blank, formatted disk to be used for your ship's data. To play the sample game, you must first run CONSTRUCTION. Turn to the Version Specifics section and follow the instructions for running CONSTRUCTION for your computer. You will see the game logo and some messages scrolling. Next, the music will start. After the music, you will see the copyright notice and the version number of the game. Next, you will be ushered to the office of the Axia bank and confront a loan officer who will coerce you into a loan. The only thing you need to do here is to select the number of years in which you want to pay the loan off. Start high . . . say 10 years. After the red tape is out of the way, you will end up at the shipyards and will be requested to select a ship design.

Select the cheapest design with the most hull space (every penny counts at this point!). Here's how: Hit the select key. The screen will clear and you will be asked for the design number with a "WELL?" prompt. Type a "3" and hit return to lock your selection in place. Finally, your ship's data will have to be stored on a disk. On the Apple // and Atari versions, you will create a player disk. You must have a blank disk to do this. Follow the instructions on the screen, and when you finish you will have a player disk. The MS-DOS 2.X version stores the ship's data in a file. You will be asked to enter a name for your player, such as "B:SAMOYA". Remember to precede your player name by the drive your player disk is in (the version specific section told you which drive the player file will be stored on). Don't put a suffix on it! UNIVERSE does that for you. After creating your player disk, you must run FLIGHT.

Building Your Ship

Atari players must now boot the FLIGHT 1 disk. Apple // players must boot the FLIGHT disk. MS-DOS 2.X players should run the FLIGHT program (follow the instructions in Version Specifics to do this). MS-DOS 2.X players will be asked to enter the name you entered at the end of the CONSTRUC program above. Apple // and Atari players will need to swap a few disks. Just follow the instructions on the screen. The screen display the MAIN FLIGHT menu giving you several choices. The one we're interested in now is the DOCKING CONTROL section. Using the option key, move the pointer down the list of options until it's pointing at DOCKING CONTROL and select it by pressing the select key.

The screen will blank out and show you the docking maneuver. When you have safely arrived, you will be at the Drydock and have a different menu of three options. The first, most important option is PLACE PARTS. There is where you build your ship from the items in your Ship Loan Package. Use option to move the pointer to PLACE PARTS and hit select to select that option. The next screen will show you your ship's skeleton and a guided tour of each of the sections will be displayed. The ship you have purchased has six sections, each capable of holding a pre-determined number of hulls.

SAMPLE GAME

To place the hulls on the skeleton of your ship, first type the section number, then the number of hulls to place in the section and hit return (place all 31 hulls in section 4). Do this until all the hulls have been placed. When all the hulls are in place, hit start to store them there. Now you will be shown all the Parts and asked to place them in the various hulled-in sections of the ship.

Placing Parts on your Ship

You will see that each part has a size. This size is the number of hulls it takes to store that part. Therefore, a part with a size of 5 wouldn't fit in a ship section that only has 3 hulls in place. The set of parts you have been given with the loan will take 31 hull spaces.

To place parts, first enter the Section Number to place the part in and then lock the part in place by hitting select. Continue in this manner until all the parts have been placed on the ship (the last part is the Skandis Mass Storage Unit). After placing the last part, it will remain on the screen as though it didn't "take". This is UNIVERSE's way of telling you it's the last part. Lock your selections in place by hitting start. You will be returned to the Drydock Menu at this point. Look at the bottom of the screen. You should see "UNDISTRIBUTED PARTS: 0" and "UNDISTRIBUTED HULLS: 0" (Apple // and MS-DOS 2.X only). If you don't see zeroes after each of these items, you haven't placed one of your hulls or parts! Select PLACE PARTS again and the computer will show you what hasn't been placed on your ship.

There are three parts in your Merchant Loan Package that are highly inefficient energy-wise. These are the ION SUBLIGHT DRIVE, the MANX ORBITAL SCANNER and the QUENTRIX SHUTTLE. After they've been placed on your ship, you'll want to sell them. To do this, use the option key to move the pointer to PARTS REMOVAL and select it with the select key.

Inside PARTS REMOVAL, you'll see the names of all the items on your ship. Use the select key to move the pointer to item #1 (ION SUBLIGHT DRIVE) and hit the space bar to change its status (bottom of the screen) from "MAINTAIN" to "SELL". Sometimes you'll get credits for the items, sometimes not. This depends on the part's sophistication. Do the same thing for items #7 and #27 (MANX ORBITAL SCANNER AND QUENTRIX SHUTTLE). When you've changed the status of all three items from MAINTAIN to SELL, hit the start key to return to the Drydock Menu. Now use the option key to move the pointer to PURCHASE ITEMS and select it with the select key.

In the Purchase Items Menu, you'll see 8 boxes with different categories of items for sale. The pointer is sitting at the PARTS section. Hit the select key to select this section. You have to buy the three parts you just sold (in PARTS REMOVAL) to replace them. The Sublight Drive you want is SYSTEM #1 and PART #5. So type a "1" in the System Section and hit return, then type a "5" in the Part # Section and hit return again. The computer will automatically fill in a quantity and compute the price. When the price has been displayed, hit the select key to select this item. (NOTE: To abort a purchase, hit the option key.)

Next, purchase System #7, Part #28 and hit select to select it. Finally, purchase System #28, Part #72 and hit select to select it. Hit return to exit the PARTS section and hit option to move the pointer down to the ORE 4 section. Hit select to select this section and purchase 20,000 (you don't need the comma) units of Ore 4. There will be a small handling charge on all Ore 4 purchases. When the price for the ore is displayed, hit the select key to select the purchase, then hit return to exit the ORE 4 section. Move the pointer down to the PROGRAMS section and hit select. You need to purchase two computer programs that didn't come with your Merchant Loan Package. All computer programs cost the same thing. The only thing you need to enter is the program number, so purchase Program #6 (Shuttle Control) and select it with the select key, and purchase Program #9 (Market), select it with the select key, then hit return to exit the PROGRAMS section.

SAMPLE GAME

Every ship needs a crew, so move the pointer to the CREW section and select it. Your ship has accommodations for 40 crew members, but you don't need that many to operate it. Purchase 15 crew members (they're paid union scale and are a bit expensive!), hit select to select the purchase, then hit return to exit the CREW section. Finally, we need to feed them, so move the pointer to the PROVISIONS section, select it and purchase 2000 Provisions. Hit select to select the purchase, hit return to exit the PROVISIONS section and start to exit the PURCHASE PARTS menu.

Look at the bottom of the screen, you should see "UNDISTRIBUTED HULLS: 0" and "UNDISTRIBUTED PARTS: 3" (Apple // and MS-DOS 2.X only). That's right! You just purchased three new parts, so you have to place them on your ship before you leave. The rest of your purchases will be handled by the Drydock Workers. Move the pointer to PLACE PARTS and select it with the select key. You will see the items you just purchased one at a time appear on the screen. Place them as above (type in the Section Number and hit select to place them). When the last part has been placed, hit the start key to exit PLACE PARTS and return to the Drydock Menu. Make sure you see "UNDISTRIBUTED PARTS: 0" (you guessed it, Apple // and MS-DOS 2.X only) at the bottom of the screen before continuing! Now hit start to return to the MAIN FLIGHT menu.

Setting up your Ship's Computer Operations

Move the pointer down the screen with the option key until it points to PROGRAM CONTROL and select it with select. In Program Control, you'll see three columns titled "PRIORITY", "STATUS" and "LOADING". Move from column to column with the option key. Move to column #2 (STATUS). Use the UP and DOWN arrows (I and M on the Apple][+) to get to the Program Names. When the pointer is at the sixth (Shuttle Control) program, hit select to change its status to RUN, hit option to move to the LOADING column and hit select to change it to AUTO. Move the pointer down to the seventh (Sublight Navigation), and change its Status to RUN and its Loading to AUTO. Finally, move the pointer to the ninth program

(Market) and change its Status to RUN and its Loading to AUTO. Now hit the start key to exit PROGRAM CONTROL and move the pointer to SAVE GAME. Select it (select) to save the game at this point. As you'll soon see, getting started takes the longest time in UNIVERSE. So if anything awful happens to you, you'll want to avoid repeating these steps!

Make a backup of your player! Apple // players can use COPYA to copy the player disk. Atari players can use the built in copy program (in the save game section) to copy the player disk. MS-DOS 2.X owners can use the COPY command to copy the player file. Your player file has an extension of ".DF0". We suggest you name your backup player file with an extension of ".SV1".

Now, on with the game!

Changing the Planetary Orbit and Launching your Shuttle

Run FLIGHT again (do it the same way you did earlier). When the MAIN FLIGHT menu appears, select Drive Systems from the menu. Now select the Sublight Drive option and press option to move to the Planetary Scale option. Now press select to start the scan. The computer will scan the planet and give you a map of the polar view of the planet. In order to land on a planet, you have to get into as close an orbit as possible so the shuttle doesn't run out of fuel and crash (remember Lunar Lander?). The closest you can orbit any of the planets in UNIVERSE is 1.05 times the planet's radius. Axia has a radius of 6300 km, thus 1.05×6300 is 6615.

SAMPLE GAME

When the Planetary Scan is through, the cursor will appear next to the "R:" (radius or rho). Type in 6615 and hit return. Enter zeroes (0) for the next three values (E, TE and T). You will receive the message "MANUAL ENTRY". Now hit select to calculate the transfer's energy/ore requirements and hit select again to perform the transfer. When you see the Solar Scale again, hit the start key to return to the Drive Systems menu and start again to return to the MAIN FLIGHT menu. Move the pointer to Trade Systems and select it, then select the Launch Orbiters option.

Although this screen looks confusing, it's really very simple. Hit select to load energy into the Shuttle and put in "30" and hit return. This fuels the orbiter to 30% of its total capacity. Next hit the option key to move to the "Crew" section and hit select to load your crew. Hitting more option's would allow you to load Ore on the shuttle (for Miners) or Passengers (if you had any). But since you're just starting out, you've done all you can. So hit start to launch the shuttle. (NOTE: If, after launching the shuttle, you decide you want to abort the shuttle's descent and have it return to the ship, type the shuttle's number to start ascending.)

You'll now get a countdown. After the launch, you'll see at the bottom of the screen the Altitude ("A:") start decreasing until you reach the planet's surface ("A: ARRIVED"). Also, as you're descending, you will see your energy usage, and any damage your shuttle has taken during descent. After arrival, you will be told you have arrived and should proceed directly to Customs.

You will now need to run STARPORT. Apple // and Atari players can boot the STARPORT disk. MS-DOS 2.X players need to run the STARPORT program (on the STARPORT disk) by removing the FLIGHT disk and inserting the STARPORT disk (ignore this if you have a hard disk). As with the FLIGHT program, you will need to swap a few disks (Atari and Apple //) or enter your player file name (MS-DOS 2.X). Now, you will see the Customs Clearance screen, showing your customs violations (for trying to smuggle contraband onto the planet), the amount of the penalties for these illegal activities and how many credits you have to spend in the various Startport areas. Hit return to get the MAIN STARPORT menu.

First things first, let's go get some passengers! Move the pointer to the Traveler's Terminus section and select it. Type an "L" to load passengers. You'll be asked which orbiter to load them on (you can have up to five shuttles on a planet at any one time!) and how many passengers you want to load. Your shuttle can only hold 5 passengers at a time so ask for 5. When you've loaded your shuttle with passengers, hit the ESC key to exit the terminal. Now move the pointer to the Buyer's Board section and select it.

Buying Merchandise and Loading it on your Shuttle

Here's where the fun starts. A confusing array of products, prices and cargo sizes is constantly changing. The idea is to select items you can afford and to make sure you don't buy more than your shuttle can carry! The shuttle you have can carry a load up to 150 cargo units in size, so watch your cargo units (at the bottom of the screen)! Be careful not to buy something too large to fit on your shuttle. If you do, you will not be able to place that item on your shuttle and will have to leave it with the Portmaster.

SAMPLE GAME

Purchasing items takes a quick eye. The items are given numbers from 0 (top line item) to 9 (bottom line item). When you see an item you want to purchase, quickly (!) press its corresponding item number. You don't need to hit return or any of the function keys to buy it . . . its number alone will do. As you purchase items, your total credits will decrease and the cargo size will increase. Watch these items carefully. Save at least 3500 credits for emergency Ore purchases. Try to buy at least one or two "big-ticket" items (say from 8,000 to 10,000 credits each). These will bring you nice profits!

When you have purchased all you want and are sure it will all fit on your shuttle, press the ESC key. The flow of items for sale will cease . . . DO NOT PRESS ESCAPE AGAIN!!! You will find yourself at the Portmaster's, who will load your cargo on your shuttle. Use the UP and DOWN arrow keys to move the pointer up and down your list of items. Press the letter "L" to load the items onto your shuttle. Do this until the list is blank. DO NOT EXIT THE PORTMASTER'S UNTIL YOU HAVE LOADED ALL YOUR PURCHASES! If you do, you'll lose both the item AND the credits you paid for them.

When everything's been loaded, press the ESC key to leave the Portmaster. You're now ready to depart the Starport. Move the pointer to and select "Departures". Type an "L" to launch the shuttle. (You're automatically boarded.) The countdown commences and you're launched! As with descending, you will see your energy usage, altitude (increasing this time) and damage points your shuttle has taken. After docking with your ship, you will be told to run the FLIGHT program.

What the Heck Did I Buy?

Run FLIGHT again. At the MAIN FLIGHT menu, move the pointer to the Trade Systems option, select it, then select the Cargo Manifest option. The Market program (which is running) will give us a breakdown of our cargo.

Use the option key to move the pointer up and down the list of items. The top of the screen displays the Type of Item (in four characters) and its Sophistication (SOPH) Level for the item the pointer is positioned at. The Type is important information later on in the game after you've gotten enough fuel and money to go to other stars in the Local Group. But for now, only the price, name and sophistication level is important. When you've completed your Cargo Manifest, hit start twice to exit the Trade Systems menu and move the pointer to Program Control and select it. In program control change the status of programs #6 and #9 to HALT and change the status of program #8 (Hyperdrive) to RUN and Loading to AUTO. Hit start to return to the MAIN FLIGHT menu. Now to fly away!

Hyperdrive and Getting There

Move the pointer to Drive Systems and select it, then select Sublight Drive (to leave orbit). Use option for the Planetary Scale and select to start the scan. When the scan is completed and the cursor is sitting next to the "R:", type in 25,000 and hit return. Then enter zeroes for the other three factors. It is important that you get away from the planet before entering Hyper-space. If you're too close to the planet, you could severely damage your ship. You must be AT LEAST 20,000 km from the planet! Now hit select twice to execute the transfer.

When you are back at the Solar Scale screen, hit start to return to the Drive Systems Menu, then move the pointer to Hyperdrive and select it . . . Here we go!

On the screen will be displayed all the Star Systems in the Local Group. Your current location is the Hope Star System (see the "YES" in the VISITED column?) Use the DOWN arrow to move the pointer down the screen to the Prisa Star System and select it (select key) for viewing. You will see it is several light years away and requires 10,000 units of energy/light year to reach. Now select (select key) again to commence the hyperdrive countdown. When the pointer reaches "COMMIT", your ship will enter hyperspace. After a few seconds, you will be returned to the list of Star Systems. Hit start to return to the Drive Systems Menu.

You have now reached the Prisa starsystem . . . our planetary destination is Zeath.

SAMPLE GAME**Sub-Light Navigation on a Solar Scale**

Since we don't know where we are in this Star System, select (select key) the solar scale to locate and navigate to Zeath. The first body identified is us. Hit option to identify the other blips on the screen. When you find Zeath, hit select to calculate the transfer requirements, then hit select again to execute the transfer. Once at Zeath, you'll still have the Solar Scale on your screen, so hit the option key to get the Planetary Scale and select to start the scan.

When the cursor is sitting at the "R:", hit return (for manual entry) and hit option until you see the Drydock. When you've located the Drydock, hit select to calculate the transfer and select again to execute it. Once there, hit start twice to return to the MAIN FLIGHT menu and move the pointer to and select Docking Control. After you've docked at the Drydock, select PURCHASE ITEMS and buy as much Ore 4 as you can (at least 3,000 units!). After the purchase, hit return to leave ORE 4's section and start twice to leave the Purchase Items and Drydock Menus.

Move the pointer to and select Drive Systems again to get in closer to the planet's surface. Select the Sub-light Drive option and hit option to get to the Planetary Scale. Hit select to start the scan. As you see from the Planet Guide on page B.3 (in the Appendices), Zeath is 6,000 km in radius. Multiplying $1.05 \times 6,000$ tells us the closest we can get to the planet is 6,300 km. So after the planetary scan is through and the cursor is sitting next to the "R:", type in 6300 and hit return. Then enter zeroes for the other factors. Hit select to calculate the transfer then select again to execute the transfer. Once back to the Solar Scale, hit start twice to return to the MAIN FLIGHT menu.

Move the pointer to and select Program Control. Change the status of the Hyperspace (program #8) program to HALT, and change the status of the Shuttle (program #6) program to RUN. Hit start to exit Program Control and move the pointer to and select the Trade Systems section. Select Launch Orbiters and follow the same steps to load energy and crew onto the shuttle. This time, you'll only load 25% energy (since you don't have as far to go). You also have passengers! Not all of your passengers may have survived the trip, though, so load as many as are left.

Finally, hit start to begin the countdown and descent. Once there, remove the FLIGHT diskette and insert and run STARPORT.

Unloading Passengers and Selling Your Cargo

Welcome to Zeath! Now to unload your passengers. Move the pointer to and select Traveler's Terminus and note how much Zeath is offering for immigrants. Hit ESC and re-enter the Terminus several times until you see their top dollar. When you see a high price, take it by typing "U" (unload). You will be asked which Orbiter to unload and how many passengers to unload. Enter this information and hit ESC to exit.

Now to dump, uh, sell your cargo. Move the pointer to and select the Seller's Board option. What you can do now is place an item up onto the board and wait until someone buys it. The trick here is to set the price to some amount so that you make a fair amount of profit and still be able to sell the product. The first thing you have to do is to add items onto the board. You do this by typing "A". This will add a product to your sellers board. You can do this until you either have ten products on the board or you don't have any left on your shuttle. Next you must price each of the items you wish to sell. You do this by typing "P" and then the product number that you wish to price. The cursor will appear where the old price was and you simply type in your new selling price. Once again, the trick to making a hefty profit is to price your items in such a way that you make a profit and can still sell the product. Most of the buyers are pretty smart and they won't buy a product if they think the price is too high. Once you have priced all of your items, start the bidding by typing "S". The items will then be put up for sale and you will be informed if any of your products sell. If you notice that some of the products are not selling, type "H" to stop the bidding and change the price on those products. Resume the bidding and repeat this until you have sold all of your products. Once you have finished selling, make sure the bidding has stopped by pressing "H" and then hit ESC to exit to the main starport menu.

SAMPLE GAME

Another way to make some money is to go the Contract House. Select this item on the main Starport menu. First your manifest will be checked for any completed or outdated contracts. Then you will be shown a list of products that are currently in demand at this Starport. Select one and it will be put on your contracts list. When you are in a buyer's board on some Starport, you must remember to specifically look for the products you have contracts for.

If in the future you get a contracted product, return to the contract house on the planet that contracted you and your account will be credited for the correct amount. You can check any contracts you might have in the miscellaneous section of the Report Status section on the main flight menu on board your ship.

Now it is time to stock up on Ore 4. Ore 4 is the most valuable resource in Universe (it is your ship's fuel), so be sure you have plenty. Enter the money exchange and exchange some of your credits for Ore 4. Be sure to leave enough credits left to buy products with when you get back to Axia.

Now, having sold your items and disembarked your passengers, it's time to leave. Zeath, being a less sophisticated planet than Axia, has nothing to offer them. So select Departures and launch your shuttle. Upon arrival, you will again need to run FLIGHT.

Getting Back to Axia

At the MAIN FLIGHT menu, move the pointer to and select Program Control and change the status of Shuttle to HALT and change the status of Hyperdrive to RUN. Press start to return to the MAIN FLIGHT menu and select Drive Systems and Sublight Drive. Now use option to select the Planetary Scale and select to start the Planetary Scan. At the end of the scan, type in 25,000 and hit return. Then, enter zeroes for the other three factors. This is to get us away from the planet so that we can use the hyperdrive. Now, hit select twice to execute the transfer. When you are back at the Solar Scale Screen, hit start to return to the Drive Systems Menu.

Now, select Hyperdrive. When the Star System list is displayed, use the DOWN arrow to move the pointer to the Hope Star System and select it (use the select key). After the Local Group scan, hit select again to enter Hyperspace.

When you have reached Hope, hit start to return to the Drive Systems Menu and select Sublight Drive on a Solar Scale. Hit select to begin the Solar Scan, and option's until you've located Axia. When you have found Axia, hit select twice to calculate and execute the transfer to the planet.

At this point you should have enough funds to purchase more expensive (and, thus, more profitable) items and to pick up more passengers to return to Zeath with. About five more trips like the one detailed above should make you rich enough to buy more shuttles (bigger shuttles hold more passengers!) or to change your trade from "merchant/bus driver" to Mining (most lucrative of all the trades!) or (heavens!) Piracy!

Your options are limitless in UNIVERSE. It is up to you to decide how you want to make your money and how best to find the Hyperspace Booster. It's easy to forget that this goal is what UNIVERSE is really all about with all the activity going on. But that's the quest . . . find it and you'll be rich for life! Fail, and a miserable existence awaits you and the Local Group . . . and don't forget that banker waiting for her money back on Axia!

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PLAYING
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HOW TO OPERATE YOUR STARSHIP

This section of the manual deals with the operation of the various systems (pieces of equipment) aboard your ship.

HYPERDRIVE

Theory of Operation:

The hyperdrive is a propulsion system that allows travel at faster-than-light speeds by pushing the spacecraft into an alternate dimension-set called hyperspace. Once in hyperspace, the spacecraft is no longer subject to the rules which govern motion in normal space. Due to the chaotic nature of hyperspace, the aiming system used in reentry is only accurate enough to return the user to a particular star, not a particular planet.

Application:

The hyperdrive is used to travel between starsystems. It is not accurate enough to use for interplanetary travel. Hyperdrive motors are equipped with the special feature, overload. Overloading the hyperdrive will destroy any other ships within a 50,000 meter radius. It should only be used for emergencies, since it severely damages your hyperdrive.

Warnings:

Never attempt to operate the hyperdrive with an orbital radius of less than 20,000 kilometers or damage may result.

Never attempt to make trips of less than 1 light-year; i.e., 0 light-years, as damage may result.

SUB-LIGHT DRIVE

Theory of Operation

The sub-light drive comes in several different forms. Some depend on ejecting matter at very high velocities while others use controlled gravity to drive the ship forward in space. Due to the speed of light being an absolute limit on anything traveling in normal space, a trip between even the closest of starsystems would take years using a sub-light drive.

Applications:

The sub-light drive is used for travel between planets in the same starsystem and maneuvering between objects in orbit about a planet.

BRIDGE

Theory of Operation:

The bridge is the section of the ship where the captain resides.

Application:

The bridge is not actually featured in the game except that it is assumed the captain is in it while giving commands.

Warning:

The ship is destroyed and the game ends if bridge damage goes below 1 damage point.

ACCUMULATORS

Theory of Operation:

The accumulators are the intermediate storage area between power generation and consumption. They are nothing more than high-efficiency large-capacity batteries. Converters can only provide a slow, steady current while some applications, such as using the hyperdrive, require brief bursts of enormous power. The accumulators can provide this capability by storing power over a period of time and releasing it instantly.

Application:

Power flow through the accumulators is automatic.

CONVERTER

Theory of Operation:

The converter transforms Ore IV (a radioactive isotope of hydrogen) into electrical energy.

Application:

The converter operates automatically any time the power level in the accumulators is less than the power required for a particular job. When the converter is running, it produces a low "whirring" sound. If there is not enough Ore IV for the amount of power required, the computer will beep rapidly and fail to complete its current job. The converter will automatically deplete your Ore IV supply.

Warning:

The ship is destroyed and the game ends if converter damage goes below 1 damage point.

HOW TO OPERATE YOUR STARSHIP

DOCKING ADAPTER

Theory of Operation:

Attached to the exterior of the ship, the docking adapter seals around the outside of another ship's airlock. This allows transfer of goods and personnel to be conducted without the need of breathing equipment.

Applications:

The adapter is used to transfer boarding troops into a target ship and transfer captured goods back to the attacking ship. It is automatically used when you are boarding another spacecraft in the **Weapons** section.

INERTIAL COMPENSATOR

Theory of Operation

The inertial compensator creates a localized internal gravity field in the spacecraft.

Application:

A sub-light drive will produce sufficient acceleration to squash the crew inside a spacecraft. The inertial compensator protects the crew from the effects of acceleration by creating an artificial internal gravity field that protects the crew from acceleration.

Note:

If you do not have an inertial compensator, your maximum acceleration will be limited to 3 gravities.

ORBITAL SCANNER

Theory of Operation:

The orbital scanner is a sophisticated radar that can detect objects spacecraft-size and larger on a planetary scale, and planet-size bodies on a solar scale. It cannot generate a picture or discern particular features of an object, it can only tell if something is there.

Application:

The scanner is used to find drydocks, high resolution scanning targets, attacking spacecraft, planets orbiting about a star, and the spacecraft's position in space.

Important:

The user must be within range of a scanning beacon to produce an orbital scan. The scanning beacon is a satellite located at an orbital radius equal to five times the radius of the planet.

RESOURCE SCANNER

Theory of Operation:

The resource scanner is used to scan planetary surfaces for traces of Ores I-IV and indicate optimum mining sites.

Application:

The resource scanner is automatically switched on when the user begins mining procedures. The scanner finds mining sites and displays ore concentration, natural hostility, and population sophistication data on each one. This enables you to select the site with the best danger to payoff ratio.

HIGH DEFINITION SCANNER

Theory of Operation

The high definition scanner uses a large part of the electromagnetic spectrum in order to produce a highly detailed picture of an object and an account of the spacecraft's most probable configuration.

Application:

The high definition scanner can be used to determine whether a particular target presents a threat. It can also be used to find choice targets to board and plunder.

HOW TO OPERATE YOUR STARSHIP

MISSILE RACK

Theory of Operation:

A term referring to the system of racks, conveyors, and lifts used to bring the missile from its storage area into firing position.

Application:

The storage of missiles occurs automatically as they are purchased.

Warning:

If the missile rack is destroyed, all your ship's missiles will be lost.

MISSILE LAUNCHER

Theory of Operation:

The missile launcher launches the missile and provides primary course guidance.

Application:

Operation of the missile launcher occurs automatically as firing is requested.

LASER

Theory of Operation:

The lasers used as weaponry are the flexible-aperture micropulse type. They emit intense beams of coherent light to blind or puncture enemy targets.

Application:

The laser can be used for defense or offense against targets in orbit. Note that the laser cannot be aimed at ground targets (it diffuses and becomes ineffective) or at drydocks (programmed inhibition).

SHIELD GENERATOR

Theory of Operation:

The shield generator contains a very fast scanner that checks space around the ship for incoming fire. Within 10 millionths of a second after the scanner detects an incoming object or energy beam, the shield generator shoots a pulse of intense gravity. The gravity either destroys the object, as in the case of a missile, or it distorts and diffuses it, as in the case of laser beam.

Application:

Functioning of the shield generator is automatic and occurs whenever you are fired upon. The shield may only be able to stop a fraction of the incoming fire.

ELECTRONIC COUNTERMEASURE

Theory of Operation

Electronic warfare dates back to the late Twentieth Century (Common Era) and the basic elements are still the same. Electronic countermeasure, or ECM, is the process of jamming your opponent's tracking radar and missile guidance systems. This dramatically reduces the odds of an incoming missile hitting your ship.

Application:

The ECM will automatically jam missiles as they come in.

HOW TO OPERATE YOUR STARSHIP

ASSAULT CAPSULES

Theory of Operation

Assault capsules are electro-gravitationally driven space shuttles used to land troops on the surface. They are heavily armored and contain two or more Voigt-Effect cannons.

Application:

The assault capsule is used to clear a hostile area prior to deployment of ore processors.

CREW ARMOR

Theory of Operation:

Crew armor is used to protect the crew from injury and supply additional speed and payload capacity during boardings or ground assaults.

Application:

The computer will automatically ask you for armor when it is needed. You may have only one unit of armor per crew member.

ORE PROCESSOR

Theory of Operation:

An ore processor is a giant mining platform that can land on the surface of habitable and airless worlds. It has no defense capability and its mining lies must be relatively flat and hard.

Application:

Ore processors are used to mine ore at mining sites which were found by using the resource scanner. They can process raw rock at varying rates of efficiency.

CARGO HOLD

Theory of Operation:

The cargo hold stores up to eighty (80) items of varying size in an atmosphere controlled environment.

Application:

Cargo is automatically stored in the cargo hold.

Warning:

If the cargo hold is destroyed, all the cargo inside is lost.

CRYOGENIC VAULT

Theory of Operation:

The cryogenic vault is a low-temperature (98 degrees K) storage area for passengers and prisoners. Putting non-essential personnel into suspended animation greatly reduces operating costs and accommodations size. A person entering the vault is pumped full of cryo-protectant and his body temperature is reduced to that of liquid nitrogen. The thawing process is rapid and a certain percentage of revivals fail.

Application:

The cryogenic vault can be used most profitably to carry emigrants to other worlds. Many planets need hard-working immigrants. Underpopulated worlds encourage immigration with kickbacks to transport captains such as yourself. Passengers are placed into the cryogenic vault automatically after returning from a Starport or completing a ship-to-ship boarding in Weapons.

Note:

To find the loading status of the cryogenic vault, check the miscellaneous section of Report Status and look under the heading of "passengers."

HOW TO OPERATE YOUR STARSHIP

ORBITAL SHUTTLE

Theory of Operation

The orbital shuttle is an electro-gravitic transport used for starport-to-ship operations.

Application:

The orbital shuttle is used to carry cargo, migrants, and ore to and from starports.

Warning:

Orbital shuttles have extremely limited range, usually less than 1500 kilometers. It is necessary to maneuver your spacecraft in an extremely low orbit to facilitate their use.

AUTODOCTOR

Theory of Operation:

The autodoctor is a complex medical computer/robot able to diagnose and treat a myriad of illnesses and injuries.

Application:

The autodoctor is used to heal boarding casualties only. It will operate automatically whenever you are running the **Boarding** section of **Weapons**.

ORE STORAGE

Theory of Operation:

Ore storage is the series of compartments where ore is stored on your ship.

Application:

Ore is automatically placed and removed in the section of the ship.

CREW QUARTERS

Theory of Operation:

The crew quarters are the section of the ship which contain the sleeping, food preparation, recreation, and sanitary facilities for the crew.

Application:

Crew usage of these facilities is automatic.

RESCUE PODS

Theory of Operation:

Rescue pods are a collection of 50 to 200 small plastic spheres, each with a 2 hour air supply.

Application:

Rescue pods are used for mass personnel transfer without the need for a docking adapter.

COMPUTER

Theory of Operation:

A machine which processes data using predefined instructions which are provided by the programs kept in mass storage.

Application:

The computer is used to control many of the systems on the ship. A particular program is required for a particular system.

Warning:

The ship is destroyed and the game ends if computer damage goes below 1 damage point.

NAVIGATION AND ORBITS

The area of space containing the Local Group is divided into a cubic volume of space 200 light years on a side. Appendix A contains a list of stars and their coordinates within this cube. Note that the home star of the Local Group, Hope, lies at the center of the cube.

Navigation from star to star is accomplished using hyperspace. The X, Y, and Z coordinates of your destination are fed to the hyperspace navigation program and the rest is handled by the computer. A hyperspace jump, regardless of the distance, takes 6.8 days.

Navigation within a solar system is accomplished using sub-light engines. In order to move from planet to planet, you need to feed the sub-light navigation program the current coordinates of the planet. Since planets move, their locations cannot be presented in a table. Rather, the current coordinates of a destination planet can be obtained from the solar scan in the sub-light drive section. The coordinates for a planet are given in spherical coordinates, with one slight modification. Here is a diagram illustrating solar coordinates:

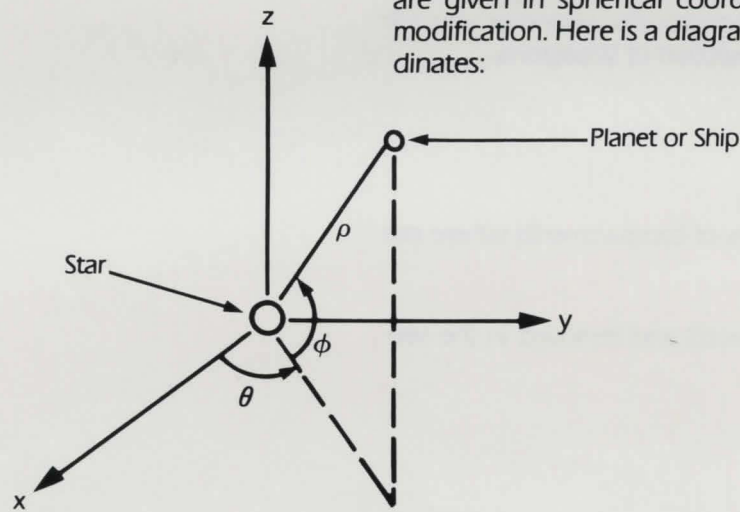


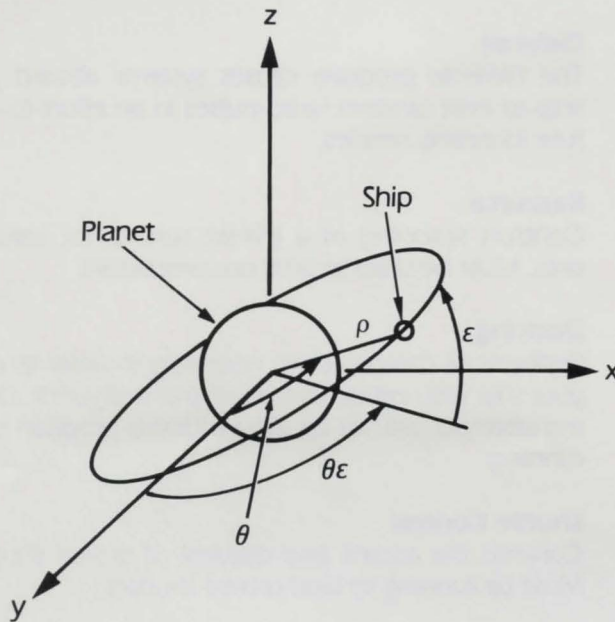
FIGURE 1: SOLAR COORDINATES

Where ρ = distance from the star (rho)
 θ = angle in the plane of the ecliptic (theta)
 ϕ = angle from the plane of the ecliptic (phi)

When arriving at a planet, you are placed into a standard orbit which is to be defined as an orbit with a radius four times the radius of the planet. All other coordinates for the orbit are zero.

NAVIGATION AND ORBITS

Changing planetary orbits are also accomplished using sub-light engines. For planetary orbits, it is necessary to feed the sublight navigation program the coordinates for the new orbit. Planetary orbits are defined as follows:



Where ρ = distance from the center of the planet (rho)
 θ = angle in the orbit (theta)
 ϵ = inclination of the orbit (epsilon)
 $\theta\epsilon$ = angle in the plane of the ecliptic where the inclinations of the orbit is maximum (theta-epsilon)

FIGURE 2: PLANETARY ORBITS

Note that ρ (rho) is equal to the radius of the orbit. Keep in mind that this value is measured from the center of the planet and not the surface. This means that if you are orbiting a planet that has a radius of 7000 kilometers, the minimum orbit you can establish is 7350. The 350 kilometers above the 7000 is to allow for atmosphere. This amount will vary from planet to planet and can be calculated by the formula:

$$\text{minimum orbit} = \text{planet radius} \times 1.05$$

OPERATION OF THE ON-BOARD COMPUTER

The computer system aboard your ship consists of a computer processor and a mass storage unit. These units work together to perform all computer activities aboard your ship. The mass storage unit stores the programs, while the computer processor executes them.

There are ten computer programs that you may purchase to run on your computer. Two of these programs, sub-light navigation and hyperspace navigation, are absolutely essential to operate your ship. The following is a description of each of the ten programs:

Weapon

Controls the loading and aiming of missiles and lasers.

Autofire

This program is not currently implemented.

Amphibious Assault

This program controls the descent and deployment of assault capsules. It must be running for assault capsule use.

Defense

The Defense program causes systems aboard your ship to emit random radio-pulses in an effort to confuse incoming missiles.

Resource

Controls scanning of a planet surface for valuable ores. Must be used to land ore processors.

Docking

Performs all computations necessary in order to dock your ship with either another ship or a drydock. Docking attempts will not be allowed if this program is not running.

Shuttle Control

Controls the ascent and descent of orbital shuttles. Must be running to land orbital shuttles.

Sub-c Navigation

Performs all computations necessary in order to execute a sub-light maneuver. In addition, this program actually controls the ship attitude and engine thrust to make the maneuver totally automatic. If this program is not running, no sublight maneuvers will be permitted.

Hyperspace Navigation

Performs all computations necessary in order to execute a hyperspace jump. If this program is not running, no hyperspace travel will be permitted.

Market

Analyzes the cargo aboard your ship to determine the category (ie. food, narc, arti) of each piece. If this program is not running, you will not be able to determine the category of each piece of cargo.

OPERATION OF THE ON-BOARD COMPUTER

Each of these programs has a characteristic called timeshare. This is the amount of time-space the program occupies in the computer processor and mass storage. Appendix D contains a list of programs and their timeshare values. For instance, the resource program takes up two timeshare units. From Appendix C, under processors, you can see that the Alkis 2 processor can hold up to 12 timeshare units. This means that the Resource program consumes 2/12 of the processor space. Also from Appendix C, under Mass Storage, you can see that the Skandis unit can store up to twenty-five timeshare units. Thus the resource program consumes 2/25 of the storage space. It is important to note however, that processor space is only used when a program is running. Storage space on the other hand is used regardless of the run state of the program.

A program in mass storage has three characteristics: status, load state, and priority. All three of these characteristics can be viewed or changed by you at any time in the Program Control section.

The status of a program may either be "run" or "halt". If the status is read or set to "run", the program is in operation and uses up processor space. A "halt" condition suspends execution and frees up processor space. The status condition does not affect storage space.

The load state of a program may either be "auto" or "manual". If a program is set to manual, the status of that program can only be changed by you. A program in auto state can have its status changed by the computer itself. For instance, if the hyperspace navigation program were in a halt status with auto load, the computer could begin executing that program if needed. If you attempt to plot a hyperspace jump, the computer will run the program automatically without your having to change the status manually.

The priority value of a program is only meaningful if the program is set on auto load. Priority values range from zero to nine, with nine having the highest priority. If the computer encounters the need to run a program which is set to auto load, it will first check if there is enough free space in the processor. If there is, it will simply go ahead and execute the program. If not enough free space exists, the computer will attempt to halt another auto load program. The only auto load programs the computer will halt are programs with the same or lower priority than the one it is trying to run. If the computer cannot free up enough space, it will abort the attempt.

COMMERCE IN THE LOCAL GROUP

In the Local Group, the basic currency is the credit (☾). The credit is fixed by the Interworld Trade Commission as being equivalent in value to one unit of Ore IV. This frees the interstellar trader from the problems of barter and exchange difficulties usually found between currencies. Since Ore IV is a common substance but tedious to refine, it provides a stable monetary base.

One of your primary goals, as an interstellar merchant, is to earn money. The four major sources of revenue available to you are: mining, trade in products, passenger transport, and piracy.

MINING

Mining is a fairly straightforward way of earning or actually producing money. It requires at least one ore processor, a resource scanner, a resource program for your computer, and many crewman. In addition, depending how intent you are in your pursuit of ore, you may need a few assault capsules and their various operating paraphernalia.

Once the ore has been mined and refined, you bring it to a starport money exchange where it is converted into credits.

The disadvantages of mining are numerous. The success of a trip out to a mining world depends on how rich the deposits of ore are. The process of mining the ore is very dangerous and tedious. The worst disadvantage for the beginning merchant is the enormous start-up cost. The equipment required for a reasonably profitable mining expedition comes to well over 50,000 credits.

TRADING

The object of trading is to buy an item on a world where it is commonplace and relatively inexpensive and bring it to a world with a slightly lower sophistication and run the price up 250%. Multiply that by the 80 products you can carry at a time and you can see the amount of profit involved in a successful trip.

A Starport will offer products only within the range of numbers that have the same tens digit as the port's sophistication. Example, if Grotto's starport has a sophistication of 76, it will offer products that range in sophistication from 70 to 79 (notice these all start with the same tens digit: 7).

COMMERCE IN THE LOCAL GROUP

The value of a product is based on its sophistication and its base price (a value you will never know exactly). If the product has a base price of 7000 and a sophistication of 73, on Grotto it would sell for approximately 6500 credits. Contrawise, if a product has a base price of 7000 and a sophistication of 79, it would sell for about 7500.

Other merchants at a starport will buy products that are up to 9 sophistication points greater than the starport's sophistication. For example, if you place a product for sale on the Seller's Board that has a sophistication of 85, merchants at the Grotto starport will buy it.

The best method of trading is to buy products with a sophistication slightly less than the sophistication of the starport you are at. For example, merchants on Grotto are trying to get rid of a product with a sophistication of 73, because on Grotto it's not current technology. You buy that product for a reduced price and bring it to the Stowe starport (sophistication = 67) where it's suddenly the latest thing! Plan on making a 250% profit.

You must take into account a planet's culture as well as its sophistication. On Rouvchorra (culture = 4, Formation of Aristocratic States), for example, many product types are illegal and will be confiscated if you try to bring them down to the starport. Consult Appendix G to make sure none of the types of products you bring down to a planet are illegal.

PASSENGER TRANSPORT

Some planets in the Local Group have a surplus of people. Other planets are rapidly expanding and need all the manpower they can get. The object of passenger transport is to take people from a planet in the former category and take them to a planet in the latter.

Planets offering emigrants will actually pay you to take people away. Planets that need people will pay you for immigrants. The problem is that many cultures do not accept transportees and all of them want people who are at least 1 and no more than 10 sophistication points greater than that of the planet.

Transport captains can expect over 1000 credits per passenger on a well-planned run.

PIRACY

In orbit above many of the planets, complete anarchy is the rule. Properly armed, you can profit from this situation. To capture another spacecraft, however, is a long and dangerous process. You must carefully analyze your target and be able to outmaneuver it into a forced docking. Your troops must be stronger and better equipped than your target's to successfully capture it. Once captured, though, the ship's entire crew are your prisoners, all their credits and ore are yours, and all their cargo. But only if you live.

USING MENUS

The Flight and Starport disks are "menu driven". This means that all sections are accessed by selecting the section from a menu (or list) of sections on the screen. When a menu is displayed on the screen, you will see a pointer that points to one of the sections on the menu. This pointer may be moved from section to section by pressing the option key. To run a section, you must first use the option key to move the pointer to that section. Pressing the select key will then run the section. To exit a menu and return to the previous menu (if any), press the start key. This procedure is used for all menus in the game.

SOUND EFFECTS AND THEIR MEANINGS

There are several sound effects that are used throughout Universe. These are detailed as follows:

Ship Under Attack:

If your ship is hit by an enemy weapon, you will hear a sound that resembles an explosion. When this sound occurs, one of the parts aboard your ship may take some damage or be destroyed. Upon hearing this noise, you should either transfer to a different orbit (in an attempt to escape the attacker) or fire back.

Ore Converters in Use:

Whenever the ore converters run, you will hear a whirring sound. This sound will last from a few seconds to as long as a minute, depending on how much ore is being converted. A few short beeps will occur if you run out of ore during the conversion process.

ANSWERS TO COMMON QUESTIONS

Drive Systems

- Q: When I rendezvous with another ship using manual entry, I can't dock with it.
- A: That's because you really haven't rendezvoused with the ship. Manual entry will move you to a specific point in space. Ships orbiting a planet are constantly in motion, so when you arrive at the coordinates you entered, the other ship has already moved away. Let the computer calculate the correct orbit for you if you wish to make a rendezvous.
- Q: When I'm going to move into a minimum radius orbit (orbit radius = 105% of planet radius), what should I enter for the other three coordinates (E, TE, T - Epsilon, Theta Epsilon, and Theta)?
- A: Just enter zeroes for all three and everything will work properly.
- Q: Sometimes I can't make a hyperjump even when it is within the hyperdrive's range and I have enough Ore IV to make the energy required.
- A: That's because you do not have enough accumulators to hold the energy required for the hyperjump. To calculate your total accumulator capacity, multiply the number of installed accumulators modules by the EU capacity for one module. This number must be greater than the energy required for the hyperjump.

Docking Control

- Q: When I try to purchase Ore IV, crew, missiles, or computer programs at a drydock, the computer won't let me.
- A: All of these items need to be held within another system. For example, the missile rack must be installed for you to purchase missiles, because missiles are placed within the missile rack.
- Q: When I'm placing parts on my ship, after a while the select key will stop moving me forward through the parts list.
- A: This means that you have all your parts on the ship and you may use the start key to exit the section.

High Def Scanner

- Q: I haven't received any radiocomm messages yet.
- A: They don't start until after the year 105.

Trade Systems

- Q: In the Launch Orbiters Section, what does the ENERGY display mean?
- A: The ENERGY display indicates the amount of energy remaining in the accumulators. This is not your total reserve of energy. As systems are used, they activate the converter if there isn't enough energy in the accumulators. Whenever the converter is run, it always produces a slight surplus of energy, so if the ENERGY display reads 3000, that's the surplus.

General

- Q: Can I change my ship?
- A: Not in this game.
- Q: What is the relationship between Ore IV and energy?
- A: Your Ore IV supply represents your unused energy supply. To calculate how much energy is available, multiply your Ore IV level (found under "Miscellaneous" in Report Status) by your converter EU/Ore IV rating (which can be found on page C.5). It is a good idea to purchase the most efficient converter you can afford. Remember, one unit of Ore IV equals one credit, so the more efficient converters are giving you more EU's per credit.
- Q: How should I search for the Hyperspace Booster?
- A: Wait for the radiocomm messages.
- Q: When I make copies of the game disks they don't work.
- A: Omnitrend's Universe is copy protected. However, if the game fails to operate, contact us and we will arrange a quick replacement or repair.

CONSTRUCTION

CONSTRUCTION

CONSTRUCTION

MORTGAGE

PURPOSE:

Here is where the game begins. In order to purchase a ship and supplies, you need money. Since stealing is out of the question (morals are assumed here), you must take out a loan. The Central Bank of Axia, so you hear, is the easiest to borrow from. In fact, they don't even do a credit check!

OPERATION

The bank, being located at the commercial center of the Local Group, sees a lot of your type looking to buy a ship. Thus, they have devised a loan called the "Merchant's Loan Package". The total value of this package is 300,000 credits and includes the following:

Part#	Sys#	System Name	Type	Quantity	Cost
0	0	hyperdrive	Quantum Div	1	(☛) 35,000
4	1	sub-light drive	Ion	1	20,000
11	2	bridge	Xorconn	1	3,500
14	3	accumulators	Alkis Group	8	8,000
17	4	converter	Fuel cell	1	10,000
88	36	processor	AE3504	1	10,000
93	37	mass storage	Skandis	1	5,000
27	7	orbital scanner	Manx	1	10,000
49	13	shield generator	Koto Co	1	8,000
68	26	cryogenic vault	Ageless Ind	1	7,000
71	27	orbital shuttle	Quentrix	1	10,000
79	33	ore storage	Baynus	1	2,000
82	34	crew quarters	Kraakobinir	1	2,000
n/a	n/a	fuel	Ore IV	15,000	15,000
n/a	n/a	hulls	Standard	31	77,500

Total Cost (if purchased separately) (☛) 223,000
 Package Cost (☛) 173,000

The part number and system number of the items in the package are given so that you may use appendix C to look up the specifics on the parts listed.

You must, of course, eventually pay back the loan. The payback period is flexible, however. You may choose any period between five and sixteen years.

MORTGAGE**IMPLEMENTATION:**

Payment of the loan is done entirely at the end of the period. The bank officer will tell you what year the loan is due based on your decision. If, for instance, the officer informs you that the loan is due in 112, you must pay the loan between 112.00 and 112.99. Since you are paying interest on the loan, the longer the payback period you select, the more credits you will eventually have to pay. The bank officer will give you the current interest rate and the amount that will be due at the end of the loan period.

To pay back the loan, you must visit the Axia drydock within the due year. The customs agent will guide you over to a bank official and give you the opportunity to pay the loan.

You will also be required to give your name and the name of your ship to the bank officer. This is recorded on your loan agreement in the event that the bank needs to locate you. You should enter your last name only.

The goods will be sent to the Axia drydock where you can later place them on your ship. When you have finished obtaining your loan, you will be ushered over to the drylock to select a ship design.

BUYING A SHIP

PURPOSE:

Once you have secured a loan from the bank, it is time to purchase a ship. You may use part of the 127,000 credits remaining from your "Merchant's Loan Package" to pay for the ship.

IMPLEMENTATION:

You find yourself in the drydocks of Axia, talking with Zefrep, the sales manager. He will lead you over to a terminal from which you can view the current selection of ten ships. It is important to remember that these ships are merely framework, and that you must fill it with hulls and parts from the Merchant's Loan Package in order to make it operational.

A menu of ship names will appear on the screen. To obtain information on one of the designs, type the number corresponding to the name and then press the return key. The terminal will go blank for a few seconds while it accesses the proper information, then display the first of several screens of information on the ships. The top half of the screen will give you an angled view of the ship. The bottom half will relate the specifications of the ship. The specifications are defined as follows:

- Designation** ... The model name for the design
- Company** The company who constructed the ship
- Year** The year construction was completed
- Price** Current cost of purchase
- Length** Overall length of the ship in meters
- Beam** Overall width of the ship in meters
- Draught** Overall height of the ship in meters
- Mass** Mass of the ship in millions of kilograms
- Max. Hulls** The maximum number of hulls the ship can hold
- Visibility** The overall visibility of the ship (this is a number between 0 and 99; the higher the number, the more visible the ship is to other ships.)
- Integrity** The overall structural integrity of the ship (this is a number between 0 and 99, the higher the number, the more structurally sound the ship is.)

When you are finished reviewing the data, press the return key and the computer will access the next screen of information. The last screen of data is a ship overview.

When you are finished reviewing the data, hit the return key and you will find yourself back at the selection menu. You may now select another design to review.

You can obtain additional information on the ships from Appendix H. This will list the size and visibilities for each section on the ship. Ships are divided into a maximum of eight different sections. Each section is capable of holding a particular number of hulls. Hulls are the main measure of a parts size. The larger sections will be able to hold more hulls, therefore more parts. Sections also have a visibility factor. This is a measure of how visible the individual section is to another ship. This is a value between one and ten inclusive. The higher the value, the more visible the section is. The more visible sections have the greatest chance of being hit by enemy fire. A good strategy is therefore to place vital parts in the sections with the lower visibility factors.

Once you are finished reviewing ship designs, you may purchase a ship by pressing the select key when at the selection menu. Zefrep will then ask you which ship you want to purchase. To do this, press the number corresponding to the ship you want, then press the return key. The cost of the ship will automatically be deducted from the credits you have. The ship will be moved from the storage area to the drydock area so that you will later be able to place your hulls and parts aboard your ship.

CREATING THE PLAYER'S DISK

PURPOSE:

This section will create the player's disk for the game. This is the disk that is used throughout the game to keep track of all the data on your ship. (See version specifics section for more information on this process.)

IMPLEMENTATION:

While Zefrep is moving your ship into the drydock area, he will ask that you assist the computer in creating the player disk. You will be asked to remove the construction disk from the disk drive, then press the return key.

You will need a blank disk to use as the player disk. The computer will ask you to place this disk in the disk drive and press the return key to begin formatting. The format procedure will take almost a minute. If the format is successful, the computer will ask you to replace the construction disk. The format may fail if the disk proves to be defective. In this case, the computer will allow you to place a different disk in the drive and try again.

When you get a successful format and have replaced the construction disk, the computer will then begin the process of moving data onto the player disk. Simply follow the instructions the computer gives for inserting disks. Several disk insertions will need to be made during this process. Above all, be patient! Universe is a complex game that requires over three-quarters of the space on the player disk for data.

Zefrep will inform you when the process is complete. At this point, your ship, parts, and hulls are in position and you are ready to boot the computer with the flight disk.

After booting the flight disk, you must proceed **DIRECTLY** to docking control (this is a section on the docking control menu). This section will allow you to place the parts included in the loan onto your ship. After placing the parts, you must select purchase items (also on the docking control menu). Here, you will need to hire at least 10 crew members (you may wish to hire at least 15 if you plan to use orbital shuttles) and to purchase enough provisions to last them until you return to a drydock.

This procedure must be followed in the given order. If you fail to do so, you may find yourself sitting in your ship with no parts or crew. This will end the game rather abruptly.

FLIGHT

FLIGHT

FLIGHT

DRIVE SYSTEMS

PURPOSE:

This section will allow you to use the sub-light and hyperspace drives to move from star to star, planet to planet, or change your planetary orbit. This section requires that the sub-light navigation program be running to use the sub-light engines, or the hyperspace navigation program be running to use the hyperspace engines.

IMPLEMENTATION:

After selecting drive systems from the flight menu, the computer will display the drive systems sub-menu. Select the sub-light drive for planet to planet or orbital transfers, or the hyperdrive for star to star transfers.

HYPERDRIVE

The computer will display a list of star names, their coordinates, and a visit flag which displays "Y" if you have visited there before, or "N" otherwise. Use the up and down arrow keys to select the starsystem you wish to visit. Note that you do not need to use the shift key when using the arrow keys. Near the top of the screen is an area for entering coordinates manually. This is used if the distance to your destination is too great for your drive and you must make several jumps. You may enter coordinates here by moving the starsystem pointer up to the manual entry line (use the up arrow key.)

After positioning the starsystem pointer, you may then jump to or obtain data on that system. At the far right hand side of the screen you will see a "visited" indicator that is set to "Y" if you have been to that system before, or an "N" if you have not. If the indicator is set to "Y", you may obtain data on the planets orbiting that star by pressing the option key. The planetary data will include the planet name, the sophistication levels of the drydock and starport (including of course whether or not the planet has a starport or drydock), and the type of planet. You may return to the starsystem list by pushing the start key.

You may select a star as your destination by pressing the select key. If the starsystem pointer is on the manual entry line, it will first be necessary to enter the proper coordinates. To do this, press the option key and a small cursor will appear after the "X:". Enter the X, Y, and Z coordinates, pressing return after each. Then you may press the selection key to select those coordinates as your destination.

You will now see the Local Group map as the hyperspace navigation program plots the appropriate coordinates. The source coordinates will be displayed on the left, while the destination is displayed on the right. The distance between the two locations is given at the center of the map, measured in light-years. The amount of energy needed for the jump is displayed at the bottom of the map.

To make the jump, push the select key. To abort the jump, push the option key and you will return to the starsystem list. If the computer beeps when you push the select key, the hyperspace navigation program has rejected the jump due to insufficient energy or an illegal jump distance.

Once the hyperspace navigation program has accepted a valid jump, the computer will begin calculating, fueling, and sequencing for the jump. Don't be alarmed if you see strange patterns of light on the screen. This is simply sensory distortion due to the hyperspace effect. Providing you obeyed the orbital radius minimum for a hyperspace jump, you will find yourself at the destination. If you were too low in the orbit (less than 20,000 kilometers), you will find that you did not move. You may also have damaged your hyperdrive.

To return to the drive system menu, you must first have the starsystem list displayed on the screen. Pushing the start key from this point will return you to the drive system menu.

DRIVE SYSTEMS**Sub-light**

At the bottom of the screen is the status area. Here is where the computer displays the current scale, coordinates, selected object, and status. Upon entering sub-light drive, you will be in the select scale mode. Use the option key to toggle between solar and planetary scales. The select key will activate that scale. The start key will return you to the drive systems sub-menu.

Solar Scale

If you select the solar scale, the computer will begin by doing a solar scan. This scan will look for all planets and stars for your current location. The star, if present, will be displayed at the center of the display area. Planets will appear as dots, and your ship will appear as a dot with a box around it. The computer will switch to the destination select mode.

To select your destination, use the option key. One of the dots will begin to blink, indicating the current object. Information on this object can be seen at the bottom of the screen. These objects are always planets, with the exception of the one object which is your ship. The data on the object includes the object name and its coordinates, displayed as rho, phi, and theta respectively. All angles are displayed in degrees. Pressing the option key again will select the next object. Continue pressing the option key again until the destination planet you want is displayed. At this point, press the select key to select the current object as your destination, or the start key to return to the select scale mode.

After selecting your destination, the sublight navigation program will make the appropriate computations. At the bottom of the screen you will see the following information:

Time Time in minutes needed for the transfer
Ore The amount of Ore IV needed
Energy The amount of energy needed

Push the select key to begin the transfer, or the start key to abort. If the computer beeps after pressing the select key, the sub-light navigation program has rejected the transfer. This is due to either insufficient energy, ore, or the number of gravities of thrust needed for the maneuver is too great. During the transfer, time will be speeded up to approximately 500 game minutes per 1 second of real time. After the transfer, you will return to the select scale mode.

DRIVE SYSTEMS

Planetary Scale

If you select the planetary scale, the computer will begin by doing an orbital scan, then a planetary scan. A polar view of the planet will appear at the center of the display. If your ship is within the range of the orbital beacon for the type of orbital scanner you have, one or more dots will appear, indicating objects in orbit. The computer will switch to the destination select mode and a cursor will appear in the "rho" coordinate. You are now in the destination select mode, and the computer is waiting for you to enter the coordinates of your destination.

The coordinates are as follows: rho, epsilon, theta-epsilon, and theta. To enter the coordinates, simply type in the numbers, entering all angles in degrees. A radius or angle that is too small or large will be rejected. The minimum radius will be 5% greater than the radius of the planet. For example, the minimum orbital radius around Axia would be 6615 kilometers. The maximum radius will be around ten times the radius of the planet. You may hit return for the radius without entering a number if you do not wish to manually enter coordinates. If you have entered coordinates, you may press the select key to select those as your destination. Otherwise, you may press option to display the coordinates of the objects in orbit. You may select an object as a destination by pressing select when the object's data is at the bottom of the screen. Due to the physics of planetary orbits and the limitations of sub-light engines, you will not be able to select a destination whose orbital radius is within 500 kilometers of your ship's orbital radius.

Objects other than an orbital drydock or your ship appear with the description "HRS#". This is a hi-resolution scanner contact number. It is usually another spacecraft in orbit. In order to determine the nature of a HRS#, you must run the hi-resolution scanner section and enter the appropriate contact number. In order to do this, the contact must be within range of the scanner, so you may wish to first transfer to the contact's location.

In order for your orbital scanner to pick up other objects in orbit, you must be within range of the orbital scanning beacon. The beacon is a ring of satellites surrounding the planet at an orbital radius equal to five times the radius of the planet. To be within range, the difference between your orbital radius and that of the beacon must be less than the maximum range of your orbital scanner.

After selecting a destination, the sublight navigation program will compute the course and resources needed. The following data will be displayed:

Time Time in minutes to complete the transfer
Ore Amount of Ore IV needed
Energy Amount of energy needed

If you now press the option key, a "V" will appear at the end of the status line indicating that the transfer will be "visual". This means that you will be able to watch the maneuver on the screen. This will be interesting to watch since the transfer uses real formulas, however it will take considerably longer than a "non-visual" transfer. To select a non-visual transfer, press the option key again. This will turn off the "V" on the screen. At this point, you may press select to begin the transfer, or start to abort the transfer. After the transfer, you will return to the select scale mode.

WEAPON SYSTEMS

PURPOSE:

The Weapon System is used for defense and offense, depending on how you use your weapons.

OPERATION:

The Weapon Systems aboard your ship are very complicated. There are loaders and launching units, tracking sensors, and a vast array of support equipment.

IMPLEMENTATION:

The Weapon Systems screen is comprised of 6 parts. They are, from top to bottom: the tactical view window and the tactical display, the strategical view window and the strategical display, the damage control display, and the text area. The tactical displays provide you with information on the ship you are attacking. The strategical displays have data on your relative position in orbit and your defense systems, and the damage control will give information on damaged sections during battle.

If the Weapon Systems say, "high definition scan required," you must use your high definition scanner before you can use the weapons. If the message, "weapon program not running," you may have to raise the program priority in **Program Control** before running this section. Now you may enter a command.

If you are still in the Weapon Systems section at this point, the text area will go blank. This means that the computer is waiting for a command. The possible commands are:

Select Target

Press <T> to begin this section. The computer will then ask you for a target. Use the "HRS #," and set the magnification the same way you did in **High Definition Scanners**. The computer will then display a picture of your target in the tactical display window (upper left-hand corner). Next, the computer will ask "Visual damage?" If you press <Y> at this point, the computer will flash sections of your ship on the damage control display if they are hit. The disadvantage of this option is that it is rather slow. Type any other key to avoid this option. The computer will confirm your selection of visual damage by putting a small "F" in the bottom of the strategical data area. Your target is now selected.

Important:

You must select a target before firing a weapon.

Fire Laser

To begin the laser firing sequence, press <L>. The computer will then ask for a lock-on confirmation. Press <C> to confirm. The laser will charge and then fire.

Fire Missiles

To select missile firing, press <M>. The computer will then list all your current missile loading status. Choose a missile type by pressing its corresponding number key (0-9). The computer will then ask you for the salvo size. This is the number of missiles to fire at once. Type in a number up to the maximum and press return. The computer will then ask for a lock-on confirmation and a firing confirmation. Press <C> both times, if you wish to fire. The computer will then display details on your salvo's fate.

Emergency Systems (Overload and Rescue Pods)

To use the emergency systems, press E. The computer will then display a menu in the text area. To overload your hyperdrive, press <O> or to launch rescue pods, press <R>.

WEAPON SYSTEMS

Docking and Boarding

To forcibly dock and board another ship, press <D>. The ship must be within 1000 kilometers and you must have engines of equal or greater strength (unless the target's engines were destroyed by you previously). Next, the computer will ask for the number of boarders to send over. This number should not exceed the total number of armor suits you own. Now the computer will erase your ship from the damage control screen and draw the target's ship. The computer will display your current forces and the target's current forces. If your men are winning the battle, successive sections of the target ship will turn red, signifying that you have captured it. If things are not going well, press <R> to retreat. If you are able to control the entire ship, then you have captured it. The computer will then transfer the booty onto your ship. (Booty is the reason why you did this, right?).

Autodoctor and Docking Adapter

Both of these systems are used automatically in Weapon Systems. The autodoctor will repair a percentage of the battle casualties, if you have one. The docking adapter allows you to dock with other ships, when you are attempting to board them.

Exiting Weapon Systems

Press start to exit.

DOCKING CONTROL

PURPOSE:

The dock system allows you to dock your ship with a drydock, then disembark and trade in parts, crew, provisions, hulls, armor, Ore IV, programs, and weapons. You may also remove parts from your ship in order to sell them or to move them to another section. Parts moved from section to section are also repaired.

OPERATION:

Once you have performed an orbital transfer to a drydock, your ship will be in position to dock. Docking with a drydock maneuvers your ship into a berth and connects the airlocks. There are three sections to the drydock: **Parts Removal**, **Purchase Items**, and **Place Parts**.

Parts Removal

This area of the drydock is for removing parts from your ship. There is a charge for part removal, based on the size and value of the part to be removed. You may also sell parts in this area. The drydock personnel will determine how much the part is worth (not always to your satisfaction). Removal charges include re-installation and repair costs, so that you may later place the part in another section of your ship free of charge.

Purchase Items

This is the main trading area of the drydock. This area is where you purchase parts and other items for your ship. All products purchased here are new and have their full complement of damage points. The price of hulls and parts includes the installation charge for placing the product aboard your ship.

Place Parts

This is the area of the drydock that all hulls and parts are sent to upon purchase in the main trading area. Drydock personnel will place hulls and parts aboard your ship free of charge (the cost of placement was included in the purchase price or the removal cost.)

IMPLEMENTATION:

At the bottom of the drydock menu screen is a value which indicates the number of parts you have in the holding area. These are the parts you have either purchased or removed from your ship. Upon entering the drydock, this value will always be zero. As you move from section to section in the drydock this value may change. You should never leave the drydock menu unless this value is zero. If you do, the parts in the holding area will be lost. The exception to this rule occurs when you have purchased more parts than your ship can hold, and you cannot place them on your ship.

DOCKING CONTROL

Parts Removal

The parts removal screen will display all 38 ship systems and the make (company name) of the part you currently own. A blank space will appear after the system number for systems you do not have installed. Below the systems list the computer will display the amount of credits you have. Below the credits is the status line. The system pointer is the small arrow which points to a system number. When you first enter this section, the system pointer points to system zero. To move the pointer ahead one system, press the select key. To move the pointer back one system, use the option key. If you move the pointer backward from system zero, it will point to system thirty-seven. If you move the pointer ahead from system thirty-seven, it will point to system zero. The pointer selects which part's status will be displayed on the status line at the bottom of the screen.

To change the status of a part, move the system pointer to the part's system number. The status line at the bottom of the screen will show the current selection for the part. There are three possible selections: Maintain, Sell, and Remove.

If a part has the selection "maintain," the part will not be removed from your ship. Note that this is the normal selection for all the parts when entering this section. You may change the selection for a part by pressing the space bar. Successive taps on the space bar will "roll" you through all three selections.

If you change a part's selection to "sell", the net worth value at the bottom of the screen will display the amount the drydock is willing to give you for the part. If you change a part's selection to "remove", the net worth value will display the charges for removing the part, repairing all damage, and re-installing the part in another section of the ship. Note that if you remove a part from your ship, you may not sell that part until after you re-install it aboard your ship. If the sophistication of the drydock is less than that of the part you are removing, the drydock will be unable to repair the part. In this case, the removal charge will not include repair costs.

Once you have set the selection status for each part you wish to change, you may return to the dock menu by pressing the start key. No removal or sales of parts will take effect until you press this key.

DOCKING CONTROL

Purchase Items

The Purchase Items screen is divided into eight trading sections. The section pointer points to the section you wish to trade in. This is a small arrow just to the left of the section name. The amount of credits you own is displayed at the top of the screen.

You may move the section pointer to the next section by pressing the option key. Once you have positioned the pointer at the section you want, press the select key to activate trading. A cursor will appear to indicate that you are currently trading in that section. Here is a detailed description of the trading in each section:

Parts: To purchase a part, you must first enter the system number of the part. Press return after entering this number. Next you must enter the part number. Both the system and the part number can be obtained from appendix C. If you select a system for which you already have a part, or you select a part which has a sophistication greater than the drydock's, the computer will delete your entry. When purchasing missile racks or accumulators, you must also specify the quantity. The computer will compute and display the cost. To purchase the part, hit the select key. To abort the purchase, hit the option key. To exit the parts section, press the return key in response to the system number.

Ore IV: You may purchase ore IV by entering the amount of ore you want. The computer will compute the cost (there is a small handling fee.) To purchase the ore, hit the select key. To abort, hit the option key. To exit the ore IV section, hit return in response to the ore IV quantity.

Hulls: To purchase hulls, enter the quantity of hulls you want. If you enter a value that is greater than the amount of free space on your ship, the computer will reject it. Once you have entered a valid quantity, the computer will compute the cost. Hulls cost 2,500 credits each. To purchase the hulls, hit the select key. To abort the purchase, hit the option key. To exit the section, hit return in response to the hull quantity.

Programs: You may purchase programs by entering the number of the program you want. The computer will not allow you to purchase a program you already have, or to purchase a program that will exceed the free space in your mass storage unit. Programs cost 1,500 credits each. To purchase the program, hit the select key. To abort the purchase, hit the option key. To exit the section, press return in response to the program number.

Weapons: Weapons are purchased by entering the number of the weapon you wish to purchase. Following the weapon number, you will need to enter the quantity of that weapon you want. You will not be allowed to purchase weapons whose missile size units exceeds that of your missile rack. The computer will calculate the cost and display it on the screen. To purchase the weapons, hit the select key. To abort the purchase, hit the option key. To exit the section, press the return key in response to the weapon number.

DOCKING CONTROL

Crew: You may hire crew for your ship by entering the quantity of crew you wish to hire. You will not be allowed to exceed the current crew capability of your ship. The computer will display the cost for hiring. To hire the crew, hit the select key. To abort the transaction, hit the option key. You may exit the section by pressing the return key in response to the crew quantity.

Provisions: To purchase provisions for your crew, simply enter the quantity of provisions you desire. You will not be able to purchase more than 100 provisions per crew accomodation. This means that if you own a Kraakobinir crew quarters (which can accomodate 40 crew) the maximum amount of provisions you can carry is 100 x 40 or 4000 provisions. The computer will calculate the cost of the provisions (1 man-day of provisions costs 3 credits.) To purchase the provisions, hit the select key. To abort the purchase, hit the option key. You may exit the section by pressing return in response to the provision quantity.

Armor: To purchase armor for your crew, enter the number of the armor type you want. You will then need to enter the quantity of that type of armor you wish to purchase. You may not own more than one suit of armor per crew member, thus the limit on total armor quantity is your current complement of crew. The computer will calculate and display the cost of the armor. To make the purchase, hit the select key. To abort the purchase, hit the option key. You may exit the section by pressing return in response to the armor number.

To exit the Purchase Items section, hit the start key. You may only exit when you are not in an active trading section.

DOCKING CONTROL

Place Parts

In this area, you will select the section number of the ship that parts and hulls will be placed. The top half of the screen is a three-dimensional view of your ship. If you have hulls in the holding area, proceed to "hull placement", otherwise proceed to "parts placement".

Hull Placement: The bottom half of the screen will display the hull placement data. Here you will see a list of the sections of the ship. Immediately following the section number is the size of the section. This is the maximum number of hull units that can be contained in the section. Following that value you will see the current number of hulls that are in the section. Near the bottom of the screen you will see the quantity of hulls that are in the holding area.

The computer will begin by flashing each section while the arrow in the bottom half of the screen points to the section number being flashed. This will help to familiarize you with the sections and how they are numbered. Once the computer has run through each section, you will be ready to distribute the hulls.

Hulls are placed on the ship by first entering the section number you wish to place hulls in. The section you have selected will be highlighted on the top half of the screen. The computer will then request the quantity of hulls you want to add to that section. You will not be able to add a quantity of hulls that exceeds the maximum number of hulls that the target section can contain. The amount you have distributed to that

section will then appear on the section list following the current number of hulls value. You may "undo" a distribution by entering a negative number in response to the quantity to add to the section. Note that you will not be able to enter a negative number that is greater than the quantity of hulls you have distributed, even though there may be more hulls in the section placed during a previous drydock visit. This is due to the fact that hulls, once placed, cannot be removed from the framework of the ship. When you distribute hulls, they are not actually placed on the ship until you are finished. Once all the hulls have been distributed, hit the start key to exit.

Parts Placement: The bottom half of the screen will display a list of sections. Following the section number, you will see the total number of hulls currently attached to the section. Following that, you will see the number of hulls currently being used in that section. To compute the number of free hulls in a section, subtract the total number of hulls used from the number of hulls in the section. Near the bottom of the screen, you will see the system name, type, and size of a part in the holding area.

To place a part in a section of the ship, enter the section number you wish to place the part in. The size of the part will appear in the "item" column of the section number you selected. You may then move on to the next part in the holding area by hitting the select key. When you reach the last part in the holding area, pressing the select key will have no effect. You may move back to a previous part by hitting the option key. The computer will display the size of the part in the "item" column for the section you placed the part into. You may change the location of the part by entering a new section number. If you wish to move a part back to the holding area (remove it from the section you have selected to place it in), enter zero for the section number. Once you have finished placing the parts, you may exit the area by pressing the start key.

HI-DEF SCANNERS

PURPOSE:

The High Definition Scanner will create a detailed picture of an enemy vessel as well as providing data on its fighting capability and most possible configuration. It has the additional capability to receive radiocomm messages, which are relayed by the orbital scanning beacons above any planet.

OPERATION:

The High Definition Scanner is a combination of thermographic and radar devices. The computer processes the data from many different types of scanners and creates a highly-detailed composite picture. The scan also gives clues as to the target ship's configuration (pirate, transport, etc.).

IMPLEMENTATION:

The computer will ask you for a target to scan (if any). The target number is based on the "HRS #" numbers which appear on the Planetary Scan in Sub-light Drive. The notation stands for High Resolution Sighting Number.

For example, if you rendezvous with HRS #1 (in Sub-light Drive), to obtain a picture of that ship, select scanning target 1.

Next, if the target ship you have selected is within range, the computer will ask you for a viewer magnification. This will determine the size of the picture. The value may range from a minimum of 20% to the maximum magnification of your hi-def scanner. To change the value, press up arrow to increase it by 10% or down arrow to decrease it by 10%. Press return when you are finished. If you are fairly close to the target, as you are after a rendezvous, do not set the magnification too high or only a few of the ship's lines will appear.

At the bottom, the computer will display some data on the currently targeted ship. All of the information is very accurate except for the crew size (it is difficult to determine).

To continue, press start. The computer will ask you if you want to scan another ship. Press <Y> to do so again or <N> to return to the main menu.

Note:

If you are using the high definition scan prior to an attack, you must make a new scan every time you move your ship.

Radiocomm Messages

Your high definition scanner also operates as a long-range radiocomm message receiver. Whenever a new incoming message is detected, the computer will display it for you automatically. You may only receive these messages when using your high definition scanner.

MINING SYSTEMS

PURPOSE:

Mining Systems can provide you with a ready source of income and an inexhaustable supply of fuel. Although the initial cost of mining is expensive, finding a planet rich in ore can make mining the most profitable of the professions available to you.

OPERATION:

The Ore Processors greatly resemble giant off-shore oil rigs. They have electrogravitic engines, a large crew capacity, on-board refining systems, and large payload areas. They can only be operated on relatively flat and hard surfaces, thereby limiting the number of landing sites on most planets. During their descent to the surface, you will have to decide, based on readings from their radar, whether or not they will land. This can sometimes be fatal, in terms of lives and equipment, if your decisions are bad.

The Assault Capsules are giant armored assault carriers, armed with two or more Voigt-effect cannons. Use them to control an area prior to mining. These have the same landing limitations as ore processors.

IMPLEMENTATION:

First, Mining Systems will display a menu. The choices are Ore Processors and Assault Capsules. Select Ore Processors.

Ore Processors

The computer will scan the surface of the planet below (if possible). The planet must not be a gaseous type. You must be within the resource scanner's range, have the program running, and have sufficient power to run the scanner. The computer will then present you with a series of possible mining sites.

Use option to move between the mining sites and use select to choose one. If the sophistication of the site is above 39, the computer refers you to assault capsules and exits the back to the mining systems menu.

Next, the computer will display all available ore processors and their loading states. Press the corresponding number (1-5) to change the state of an orbiter. Example, orbiter 2 is unloaded. Press <2> and it changes to loaded, if there is enough energy and crew to man it. Press <L> to launch or <ESC> to return to the Mining Systems menu.

If you have launched, the computer will display a three-dimensional grid. On the grid, the computer will place one triangle for every lander. Then it will draw a line starting from the center of each triangle toward the top of the screen. This is your altitude indicator. It will slowly shrink (move toward the center of the triangle) as your ore processor descends. At the bottom of the screen is the ore processor status line. Each ore processor's display will be in its corresponding spot. For example, processor 5's status area is on the far right. It contains information on ship's energy (percent), current damage level, and direction of travel.

As captain, your main concern at this point is to ensure that the ore processors all land on safe sites. To gather information for your decision, you must get surface reports. To get a report from a processor, press the letter directly underneath its corresponding number key (Q=1, W=2, E=3, R=4, T=5). For example, press <Q> if you have an ore processor #1. The computer will print something like "PRCSR #1 Ancient Seabed." In this case, it is a safe landing site. On the others, you are going to have to use your own judgment as to whether or not it is safe to land.

MINING SYSTEMS

Note that each ore processor will land on a different site. Reports from a single ore processor may vary. This occurs when the processor's downward scanner gets a false reading. The frequency of false readings is directly proportional to the hostility of the landing site. Therefore, you must take several readings from each ore processor and make decide whether or not each one is going to land.

Mining Ore

Once you have landed all your processors that are going to land, the computer will switch you to the mining screen.

The ore concentrations are the concentrations for the current site, not the planet. Each ore processor that is on the ground gets a mining status area. The area shows current ore holdings (the green line is the maximum mark for each type). All are percentages. The "E" stands for current energy percentage. When it is down to the minimum needed to return, the ore processor will automatically take-off (with all the others). The mining indicators show which ore is currently being mined. A "5" denotes the ore processor is standing idle (using no energy). The ore processor displays are the same as the descent type except that these also list the efficiency of the processor in recovering ore.

To tell a particular processor what ore to mine, press <C> until the indicator shows the single number near the status area of the proper ore processor. Press the corresponding key for each ore (1-4) and <5> to make the processor stand idle. When you wish to have the processors return to the main ship, press <L> and they will all leave at once.

Assault Capsules

Now the computer will display all the available assault capsules. They are loaded the same way the ore processors are. Press the corresponding number key to fill an assault capsule (1-5). Press <L> to launch or <ESC> to exit.

If you have pressed <L>, the computer will draw the descent grid, and place on it all the planet's ground forces (hollow orange squares). Now it is your turn to decide where your assault capsules will ground. In the center of one of the grid squares is a dot. That dot is your positioning cursor. To move it using the four arrow keys. You do not need to hold the shift or control keys when moving it. When you have found a suitable landing site (it must be empty), press select. This will place your first assault capsule in the grid square. Your assault capsule will be represented by a hollow square of a different color.

After you have placed all your assault capsules, the computer will start to fill in empty grid squares, adjacent to the enemy units in red. Then it will fill in empty squares adjacent to yours. These filled in squares represent "zones of control." The zones give a rough approximation of the tide of the battle. During the course of the battle, these zones may change hands frequently. Each zone is controlled by only one base unit (a hollow square) and the same holds true for yours. As a zone is hit, the attack factor of its controlling unit is reduced. When a unit is totally destroyed, its zones are cleared off the board too.

The attack factor ("AF") of each assault capsule is indicative of its strength. When a capsule's attack factor is zero, it is destroyed and removed. It is a good idea to recall a capsule near 0 by pressing its corresponding number key. It will leave the battle field and return to the ship. All of its abandoned zones will disappear.

If you successfully wipe out all the ground forces, you will be returned to the ship. The site where you fought is now clear for ore processors.

TRADE SYSTEMS

PURPOSE:

This section allows you to view the items you currently have in the cargo hold, and to launch your orbital shuttles down to a starport. You will also be able to move products to and from your cargo hold and orbiters.

OPERATION:

Cargo Manifest

The cargo manifest is a list of the products in your cargo hold. This list includes the size, name, and price paid for each item in the hold. If your computer has the market program, you may also obtain information on the type and sophistication of each item.

Launch Orbiters

Orbiters are the only method of transportation to a starport. Orbiters may be launched when in a fairly low orbit around a planet with a starport. Just how low an orbit depends on the gravity of the planet, the amount of energy your orbiters can hold, the amount of energy you fill the orbiter with. Obviously, the greater the orbital radius, the farther away you are from the starport and the greater the amount of energy you need. Planets with a high gravity will force you to use more energy.

Control of the descent of orbital shuttles is accomplished in this section. You will need to fuel and load your orbiters with crew, passengers, and ore. When this process has been completed for each orbiter that is to be launched, you will be allowed to board an orbiter and the countdown will begin. All orbiters will be launched simultaneously. From your orbiter you may control all others via radio communications.

IMPLEMENTATION:

Cargo Manifest

After selecting the cargo manifest selection from the trade systems menu, the computer will display the list of products. At the top of the screen you will see the amount of free space in each of your orbiters and the cargo hold. These values appear below the numerals and the word "HOLD" respectively. Note

that numerals will not appear on the screen for orbiter you do not have.

Directly below the free cargo space you will see the market program status line. This line displays information on the status and readout of the market program. The status for the program will be displayed as one of the three following values:

NAProgram is not available (not in mass storage)
HALTProgram is in a halt state
RUNProgram is running

The readout of the program is the type and sophistication of the product pointed to by the row pointer (the row pointer is the small arrow just to the right of the manifest number.) The readout will be active only when the market program is running.

The row pointer may be moved up and down the display by using the up and down arrow keys. Note that it is not necessary to use the shift key when using the arrow keys. You may also scroll the manifest up and down by using the option and select keys respectively. By using these four keys, you may access any product in the manifest.

To move a product from one place to another, you must first move the row pointer to the product you wish to move. Then, press one of the number keys from "1" to "5" to move the product to orbiters one through five respectively, or press "0" to move the product to the cargo hold in your ship. The computer will give you a warning signal if you try to move the product to a place where there is insufficient space. To exit the cargo manifest, press the start key.

Launch Orbiters

Before using this section, you should first make sure you are orbiting a planet that has a starport. Since orbiters can only land at starports, you will lose all orbiters that reach the surface of a planet and cannot locate a starport. Since you will be in one of these shuttles, this will end your career, your life, and the game.

TRADE SYSTEMS

The orbiter control screen is divided into five columns, one for each orbiter aboard the ship (five is the maximum number of orbiters, you will not necessarily have all five at a given time.) The current amount of energy in the accumulators will be displayed at the top of the screen. The rows on the screen are defined as follows:

Energy	.....	Percent of full energy capacity (100% is a full load of energy)
Crew	.....	Status of crew "unloaded" or "loaded" (there are 5 crew members per orbiter)
Ore	.....	Quantity of Ore types I through IV loaded on the orbiter
Pasngr	.....	Number of passengers on the orbiter
Status	.....	Current status (this will be explained later)
A	.....	Altitude of the orbiter in kilometers
D	.....	Number of damage points for the orbiter

Before launching the orbiters, you must load them with energy, crew, passengers, and ore. The screen will begin with the row "energy" for orbiter one highlighted. Press select, and a cursor will appear under the row name. Now you must enter the percent capacity of energy you wish to fill the orbiter with.

After entering the energy, hit the option key to move on to the next row for orbiter one. The row "crew" will now be highlighted. The select key will toggle the status of the crew between "load" and "unload". You must have crew loaded on the orbiter before launching. The status will not toggle if you do not have enough crew on the ship. Since you must leave at least ten crew aboard your ship, you must have at least fifteen crew members on the ship for this value to toggle.

The next four rows are for ore types I through IV. Use the option key to move through these rows. If you wish to load a quantity of ore aboard the orbiter, hit the option key until the proper ore type appears highlighted. Now hit the select key and a cursor will appear on the appropriate row. Enter the quantity of that type of ore you wish to load.

After moving through the four ore types by using the option key, the "pasngr" row will be highlighted. If you wish to load passengers into the orbiter, hit the select key. A cursor will then appear under the row name. Enter the number of passengers you wish to load.

If you have more than one orbiter, hitting the option key again will highlight the "energy" row for the next orbiter you have. If you only have one orbiter, the "energy" row will again light up for that orbiter.

Once you have finished preparing the orbiters, you may begin the countdown to launch by pressing the start key. You will then board whichever orbiter has a row name highlighted (you should move the highlight onto the column for the orbiter you want to be on prior to hitting the start key.) If you wish to abort the launch BEFORE PRESSING THE START KEY, you may do so by pressing the <ESC> key.

Once the orbiters have launched, you will see the altitude indicator for each orbiter begin to decrease. During the descent, you will be in radio contact with the other orbiters. Depending on the atmospheric conditions, you will periodically lose contact with other orbiters. During this period of loss, you will be unable to obtain altitude and damage status from the orbiter.

If you feel that you wish to abort the descent for an orbiter (due to excessive damage or lack of sufficient fuel) you may do so by pressing the numeric key corresponding to the orbiter number. If you have temporarily lost contact with the orbiter, you will be unable to abort the orbiter until contact is reestablished. An aborted orbiter will reverse direction and ascend to your ship. If you abort the orbiter you are in without aborting the others, they will be lost.

Once you have arrived at the starport, you will be able to boot up the starport disk and proceed to customs.

REPORT STATUS

PURPOSE:

Report Status allows you to examine a system's current damage level, energy usage, visibility, and its special functions. It also allows you to check coordinates and supplies.

OPERATION:

Report Status represents a small display close to the command area on the bridge.

IMPLEMENTATION:

The Report Status screen will list all of your currently operating systems along with the miscellaneous category and the exit marker. The small arrow on the outer left column can be pointed at any of the functional systems by pressing the option key. To display the status of a particular system, move the arrow until it is to the left of the name and press select. The computer will display the status of that system. Press start to return to the list of systems.

The miscellaneous category area will display the ship's current coordinates. Press start to continue. Next, it will display your supply status. Press start again. Finally, it will list your current contractual obligations. Press start to exit.

When the computer displays the status of one of the systems (as opposed to the miscellaneous category), it will display information on the three "functions." "Functions" are the values for the special features of each system. For example, in the Parts List (Appendix C), a hyperdrive has only one special piece of descriptive data, its range in light-years. Range in light-years, therefore, would be function 1. The other functions would be nulls. On the parts list, all functions will be listed following the visibility factor and preceding the sophistication factor of each part. Number them from left to right, starting with 1.

To exit this section, move the arrow to the "*** EXIT **" area and press select.

PROGRAM CONTROL

PURPOSE:

The program control section allows you to view and change the priority, status, and load state of your computer programs.

IMPLEMENTATION:

The screen will display all computer programs you currently have in mass storage. In addition, at the bottom of the screen, the type of computer processor and the free computer space are displayed.

The up and down arrows on the keyboard will move the row pointer to select the program number to change. Note that it is not necessary to hold the shift key down when moving the pointer. The option key will move the column pointer to select the value to change. Using the up, down, and option key will allow you to select any of the three values you may change for any program you currently have.

To change the value pointed to by the row and column pointers, use the select key. In the case of status and load state, the select key will toggle between halt/run and auto/manual respectively. Note that the select key will not select a program to run if there is not enough timeshare space in the computer. In the case of priority, the select key will increase the priority of the program by one. If you push select when the priority is at its maximum of nine, the value will change to zero.

To return to the flight menu, press the start key.

SAVE GAME**PURPOSE:**

Save Game will save the current game on the player disk so that you may restart the game from the same position at a later date.

OPERATION:

Select the save game selection from the flight disk menu. The computer will automatically save all necessary data onto the disk. To restart a saved game, boot the flight disk and proceed as normal.

You may find it desirable to make a copy of the player's disk. If you at a future point in the game decide you wish to return to that position. This can come in handy if some catastrophic event occurs (such as death).

STARPORT

STARPORT

STARPORT

CUSTOMS

PURPOSE:

Customs is the section of Starport where the planet's customs officers search for any illegal import items within the cargo you have brought down to the surface. It is automatically executed upon booting and may not be avoided.

OPERATION:

The execution of Customs is automatic. The computer will make a chirping sound while it is searching through the cargo aboard the landers you have brought down to the surface. If any illegal items are found, the computer will destroy them and dock your credit holdings the appropriate amount for the fine.

Important:

If you do not have enough credits for the fine, the computer will randomly destroy additional legal items as a penalty.

THE BUYER'S BOARD AND PORTMASTER

BUYER'S BOARD

PURPOSE:

The Buyer's Board allows the user to purchase a variety of products at the current market rates.

OPERATION:

The Buyer's Board represents a small terminal on the end of a pedestal in a giant room where they are so numerous as to be a forest. People are all about in the room, screaming and yelling to buy or that they've found a bargain.

IMPLEMENTATION:

Each line of products is broken up into four sections: the product number, its name (ITEM column), price (in credits), and cargo size (CSIZE column). To select a product, press the key that matches its product number (0-9). The elapsed time display is in the minutes/seconds format.

Your stay at the Buyer's Board will end if you press <ESC> or purchase your tenth product. If you have purchased anything before exiting, you will be transferred to Portmaster.

PORTMASTER

PURPOSE:

Portmaster allows you to pay for the products you have just purchased and store them on your orbiter(s). Portmaster will only execute if something has been purchased on the Buyer's Board.

OPERATION:

You insert your temporary ID card into a lander access terminal and a transport hauls you and your crew down to the cargo pick-up. From there it takes you to your lander(s) to load the cargo on-board.

IMPLEMENTATION:

At the top of the Portmaster screen is an area listing the load status for all the orbiters on the ground. Next to the one of the orbiter's identification numbers will be a black dot. This indicates the current active orbiter. Cargo, loaded by pressing <L>, goes into the active orbiter. To change the active orbiter, press <C> and then the number of your new active orbiter. The computer will not allow you to choose an orbiter which is not currently on the ground and will not alter the active orbiter number. Use the up arrow and down arrow keys to select the product to be loaded into the active orbiter. Press <L> to load the selected product into the active orbiter.

Warning:

If you exit Portmaster without having placed all the purchased products on one or more orbiters, the unplaced products will be lost.

THE SELLER'S BOARD

PURPOSE:

The Seller's Board is the other end of a starport's PES (Planetary Exchange System). It allows you to place your own items up for sale on the network.

OPERATION:

The Seller's Board represents a small terminal on the end of a pedestal in a giant room where they are so numerous as to be a forest.

IMPLEMENTATION:

The Seller's Board is broken into three regions. In the top region is the numbered products list. This is where your products that are currently on sale are displayed. It is broken up into the number, item (description), and the asking price columns. The middle region has displays for elapsed time and your current cash holdings. The bottom region is a menu of the available functions.

To add items to the list, press <A>. The computer will choose the next product which is not currently being displayed and place it on the first free line of the product list. If there are not any products left to add to the list, the "ITEM ADDITION" display is erased and the computer is ready for another command. The computer will take products from all the landers which are loaded and at the starport. If you keep cycling through the products, you will eventually come upon products which were previously displayed. The shorter the total number of products brought down to the starport, the faster they will all be cycled.

To remove an item from the list, press <R>. The computer will ask you for the number of the item to be removed. Press any number from 0 to 9 and the corresponding product will be erased. Note that the product is merely removed from the list, not your possession.

To price an item, press <P>. The computer will then ask you for the number of the item to be priced. Press the corresponding number key. The computer will then erase the selected item's price and place a cursor at the beginning of column. You will now be able to enter a new asking price. Press the return key when you are finished.

To begin the sales, press <S>. The computer will make a high chirping sound. If your items for sale have been priced equitably, the other buyers will select them and the computer will remove them from your list and credit you with their sale.

To halt sales, press <H>. The computer will stop allowing other buyers to bid on your items.

To exit this section, press <ESC>. The Starport authorities will charge 1 credit for every minute of stay on the Seller's Board.

Pricing Items

If you are trying to sell a product whose sophistication is one greater than (but not more than 9 greater than) the starport's sophistication, you can charge almost 250% of the price you paid for it.

If the product is of the same sophistication as the starport, you can expect sales up to 150% of what you paid for it.

Selling a product of a sophistication lower than the starport will yield no more than 100% of what you paid for it. Obviously, this is not a recommended practice.

THE MONEY EXCHANGE

PURPOSE:

The Money Exchange is a place where you can exchange between ore and credits or transfer ore between orbiters.

OPERATION:

At the side of the starport nearest your landers are the terminals for exchange. Here miners turn their ores into credits and transport captains turn their credits into Ore IV.

IMPLEMENTATION

The Money Exchange screen is broken up into four sections. The topmost section lists the surcharges for exchanging ore and transferring it between your orbiters. In the second section, information on an orbiter exchanging ore or two orbiters transferring ore is displayed along with your current credit holdings. The third section is for any entry of any additional information a function may need. The bottommost section lists the some of the commands available.

Exchanging Ore and Credits

To exchange ore or credits, press <E>. The computer will then ask you which orbiter will be doing the exchange. Enter a number between 1 and 5. If the orbiter you selected is at the starport, the computer will then display the ore loading for the orbiter. Next, you will be asked whether to exchange ore-to-credits/credits-to-ore (1) or ore-to-ore (2).

If you have selected (1), the computer will then ask whether you wish to exchange credits-to-ore (C) or ore-to-credits (O). If you select credits-to-ore, the computer will need the number of credits to be exchanged and the type of ore desired. If you select ore-to-credits, the computer will ask you which type of ore and how many units to be exchanged. Both credits-to-ore and ore-to-credits will store your ore and credits in their appropriate places, minus the exchange surcharge.

If you have selected (2), the computer will then ask which ore you wish to exchange. Enter a number between 1 and 4. Next, the computer will ask you which ore you want. Enter a number between 1 and 4. Next, the computer will ask for the number of units to be transferred. Enter the amount. The computer will exchange your ore minus the surcharge for exchanges.

Transferring Ore Between Orbiters

The computer will need to know from which orbiter you are transferring the ore. Enter a number between 1 and 5. If the orbiter you have selected is valid, the computer will then display the ore loading for the orbiter. Now the computer will ask for the receiving orbiter. Enter a number between 1 and 5. Next, enter the number of units to be transferred. The computer will transfer the ore minus the transfer surcharge. The computer will not transfer the ore if the receiving ship does not have a large enough ore storage capacity.

Important:

When exchanging a less expensive ore for a more expensive one, make sure you have at least enough of the lower cost ore to make one unit of the higher priced ore. For example, if you exchange 970 units of Ore IV for Ore I, the computer will credit you with 0 units Ore I and subtract the 970 units from your Ore IV holdings.

Exchange Rates

At the first meeting of the ITC (Interworld Trade Commission), the relative values of all the ores were set and the credit was established as a universal currency in the Local Group. The following is a table of the exchange rates. Note that these exchange rates are subject to starport surcharges, etc.

Ore Exchange Rates

FROM	TO			
	Ore I	Ore II	Ore III	Ore IV
Ore I	1	10	100	1000
Ore II	.1	1	10	100
Ore III	.01	.1	1	10
Ore IV	.001	.01	.1	1

1 Credit = 1 Ore IV = .1 Ore III = .01 Ore II = .001 Ore I

Note: All values are in units of ore.

THE CONTRACT HOUSE

PURPOSE:

The Contract House represents a planet's Business Cooperative. Companies belonging to the Cooperative place orders for off-planet products and supplies (usually of slightly higher sophistication). The Contract House generally offers higher profits on products brought to them.

OPERATION

The Contract House is a large, well-furnished office on the far side of the starport.

IMPLEMENTATION

The Contract House screen is broken up into three sections. At the top is the current contract bonus. This is the amount of money you will make above the your cost of the item. In the center of the screen is the available contracts list. Each item in the list has a contract number, description, and due date. The last section of the screen has two functions. When you enter the Contract House, the computer will print "Searching for FULFILLED and OUTDATED contracts." After the search is complete, the computer will ask you for a contract number.

To select a contract, press the corresponding number key. To avoid selecting any contracts, press <ESC>.

The contract must be returned on or before the due and on the appropriate planet for payment. Any overdue contracts will be erased automatically at any planet. No more than sixteen contracts may be held at one time. Payment automatically occurs when a product that fulfills the contract is on the planet within the due date and the user enters the Contract House. No contract is binding and failure to fulfill it does not carry any penalty.

THE TRAVELER'S TERMINUS

PURPOSE:

In the Traveler's Terminus you may take-on and discharge passengers.

OPERATION:

The Traveler's Terminus is a dataport onto which you enter your ship's passenger capacity and other information.

IMPLEMENTATION

The Traveler's Terminus screen is broken up into five sections. In order, from top to bottom, they are: preferred immigrants area, the current offering area, current orbiter loading area, carried-passenger average sophistication, and the partial command list area.

When you first enter the Traveler's Terminus, you have the choice of either loading or unloading travelers. To load travelers, press <L>. To unload travelers, press <U>.

Loading Travelers

After pressing <L>, the computer will need to know onto which orbiter you want to load travelers. Next, you will have to enter the number of passengers desired. The computer will then add the travelers to your current load and average them in with your current average sophistication. Note: This will change the value of your current passenger loading downward, if the new travelers are of a lower sophistication than your current average.

Unloading Travelers

After pressing <U>, the computer will need to know which orbiter to unload. Next, you will need to enter the number of passengers to unload. The computer will subtract the passengers and add your commission, if any.

Transporting Passengers

When you return to the main ship (See **Departures**), any passengers on your shuttle will automatically be unloaded and placed into the cryogenic vault. Once you have the passengers, take them to a planet that needs immigrants. Consult the Culture List (Appendix G) and the Planet List (Appendix B) to find a suitable planet.

Exiting Travelers' Terminus

Press <ESC> to return to the Starport menu.

DEPARTURES

PURPOSE:

Departures allows you to repair and refuel your shuttles and then return to the main ship in orbit above the planet.

OPERATION:

The Departures area contains facilities for the repair and refueling of hundreds of different types of shuttles. The constant muted roar of chem-fueled jumpers and the sub-sonic pulsing of electro-gravitic drives fills the air.

IMPLEMENTATION

Departures can be broken up into two sections. The first is pre-flight, the second, ascent and docking.

Pre-flight

The pre-flight screen is broken up into three sections. From top to bottom they are: orbiter status area, user input area, and the command list area.

To repair an orbiter, press <R>. The computer will then ask you for an orbiter. Enter a number between 1 and 5. The computer will display the orbiter's type, maximum energy, minimum energy, maximum damage, and current damage, if the lander selected is on the ground. Next, the computer will need the number of damage points to be repaired. If the port sophistication is high enough and you have enough credits, the orbiter will be repair.

To fuel an orbiter, press <F>. The computer will then ask you for an orbiter. Enter a number between 1 and 5. The computer will display the orbiter's type, maximum energy, minimum energy, maximum damage, and current damage, if the lander selected is on the ground. Next, the computer will need the amount of energy to be put into the orbiter. Enter a positive number up to the displayed maximum. If there is room and sufficient funds, the computer will store the energy in the orbiter.

To board an orbiter, press and then press the corresponding number key of the orbiter you wish to

board. Boarding an orbiter is necessary so that the computer knows where you are in case of an orbiter crash. If you neglect to choose an orbiter before launching, the computer will select an orbiter for you automatically.

To exit back to the Starport Menu, press <ESC>.

To launch the orbiters, press <L>.

Important:

Do not try to refuel an orbiter until you are ready to leave. Starport regulations prohibit fully-fueled spacecraft that are not immediately ascending to orbit. If you do purchase fuel and then exit Departures, you will be charged but the fuel will not be placed on any of the orbiters.

Ascent to Orbit

After <L> is pressed, the computer switches screens and begins the automatic countdown. The countdown may not be aborted.

After the countdown and launch, the screen will clear and up to five areas will fill in with data on each of the orbiters. Each section of the screen will have data on: orbiter number, current altitude, target altitude (docking altitude), current damage, and fuel. The fuel supply is represented by a horizontal bar beneath each of the active orbiter displays. The last 25% of the bar is red, as a low fuel warning. The bar will slowly shrink as fuel is consumed.

An orbiter's status can be changed by pressing the corresponding number key. For example, if orbiter #4 has an "ascending" status, pressing <4> will change it to "aborted," (descending). Pressing <4> again would change the status back to "ascending." Once a ship has landed or docked, its status may not be changed.

If an orbiter's status changes to "LOS," this means that you have lost contact with that orbiter. During an "LOS," status, you are unable to send commands or receive data from that particular orbiter. Your own orbiter will not go to "LOS" status, you are on it and able to give commands in person. The frequency of "LOS" coming up is directly proportional to a planet's hostility.

RESULTS

The first part of the study was a pilot study to determine the feasibility of the study. The pilot study was conducted in a small number of schools and the results were used to plan the main study.

2.1. Description of the study

The study was conducted in a number of schools in the London area. The schools were selected on the basis of their size and the number of children in the school. The study was conducted over a period of 12 months.

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APPENDICES

A: STARSYSTEM LIST

LOCAL GROUP STARS

Name	Galactic Coordinates			Type
	X	Y	Z	
Ce Ente Calad	-2	13	-10	Giant
Clytios	8	-7	-3	Giant
Delmos	-10	18	-5	Neutron
Douglas-Ouyang	4	21	13	Main
Eros	-29	-9	13	Main
Evrytton	1	-10	-11	Giant
Godel	12	4	-7	Main
Hope	0	0	0	Main
Icharr	4	5	4	Main
Kochab	-6	0	0	Main
Nillock	-1	-9	9	Main
Phobos	-11	19	-4	Main
Prisa	2	-1	-3	Main
Pyxis	-1	5	-3	Main
RCJ 2336B	2	-5	8	Giant
Toascella	-7	-2	-10	Main
Twain	8	-7	3	Main
Vromus	9	-4	-7	Main
Zhlsou	16	7	13	Main
Zworzykn's Star	1	2	-18	Dwarf

MAIN:

A main sequence star. The type of star that typically forms planets.

GIANT:

Thousands of times larger than a main sequence star, the giant star has an extremely short lifespan.

DWARF:

A main sequence star that has exhausted all of its fuel. Very old and unlikely to have planets.

NEUTRON:

The remains of a giant star that has exploded. Extremely dense, emitting little or no heat.

B: PLANET LIST

LOCAL GROUP PLANET LIST

Name	Starsystem	Type	Radius	CUL	PS	SP	DD	DSP
Aquesca	Evrytion	Gaseous	65,000	N/A	N/A	N	N	N/A
Arbest	Eros	Habitable	5,800	7	96	Y	Y	96
Au Cassbo	Ce Ente Calad	Gaseous	24,000	N/A	N/A	N	N	N/A
Auerl Ise	Douglas-Ouyang	Habitable	5,800	1	24	N	N	N/A
Austlberg	Godel	Airless	7,100	N/A	N/A	N	N	N/A
Axla	Hope	Habitable	6,300	7	83	Y	Y	80
Bahnir	Pyxis	Habitable	5,100	8	57	Y	Y	61
Baines	Nilock	Gaseous	65,000	N/A	N/A	N	N	N/A
Ballolsol	Nilock	Habitable	4,800	5	61	N	N	N/A
Benison	Zhisou	Habitable	6,500	6	66	Y	Y	68
Beurn	Icharr	Habitable	4,500	9	40	Y	N	N/A
Cetus Amicus	Icharr	Habitable	4,800	7	80	Y	Y	80
Clyde	RCJ 2336B	Airless	5,100	N/A	N/A	N	N	N/A
Diftalpa	Deimos	Airless	9,900	N/A	N/A	N	N	N/A
Echawwa	Nilock	Gaseous	16,900	N/A	N/A	N	N	N/A
Feredkor	Douglas-Ouyang	Airless	5,200	N/A	N/A	N	N	N/A
Fewel	Pyxis	Habitable	6,400	7	74	Y	N	N/A
Glalla	Hope	Airless	12,000	N/A	N/A	N	N	N/A
Grotto	Pyxis	Habitable	5,000	6	76	Y	N	N/A
Hslang Bao'	Toascella	Airless	8,700	N/A	N/A	N	N	N/A
Ivloze	Prisa	Habitable	5,100	1	32	Y	N	N/A
Jembam Touk	Toascella	Airless	12,000	N/A	N/A	N	N	N/A
Kiskismok	Vromus	Gaseous	50,000	N/A	N/A	N	N	N/A
Maelstrom	Phobos	Airless	9,100	N/A	N/A	N	N	N/A
Mlga Kambut	Douglas-Ouyang	Habitable	6,950	8	54	Y	N	N/A
Milokarr	Toascella	Habitable	6,800	9	55	Y	N	N/A
Mlunbleter	Vromus	Gaseous	9,800	N/A	N/A	N	N	N/A
Myl	Pyxis	Habitable	4,100	3	36	Y	N	N/A

B: PLANET LIST

LOCAL GROUP PLANET LIST

Name	Starsystem	Type	Radius	CUL	PS	SP	DD	DSP
Oba Autuahn	Phobos	Gaseous	12,560	N/A	N/A	N	N	N/A
Pelador	Ce Ente Calad	Gaseous	9,200	N/A	N/A	N	N	N/A
Peschallia	Eros	Airless	8,900	N/A	N/A	N	N	N/A
Philos	Hope	Airless	7,800	N/A	N/A	N	N	N/A
Raya Alba	Hope	Gaseous	9,900	N/A	N/A	N	N	N/A
Rouvchorra	Toascella	Habitable	5,000	4	31	Y	N	N/A
Schnorr	Vromus	Gaseous	64,500	N/A	N/A	N	N	N/A
Schrelos	Phobos	Habitable	4,100	4	29	Y	N	N/A
Selpichuk	Eros	Airless	13,500	N/A	N/A	N	N	N/A
Serendipity	Kochab	Habitable	6,200	7	63	Y	Y	79
Sirrial	Douglas-Ouyang	Habitable	4,300	3	60	Y	N	N/A
S'romoka	Godel	Airless	9,000	N/A	N/A	N	N	N/A
Stowe	Twain	Habitable	6,400	2	67	Y	N	N/A
Temblon	Twain	Airless	6,000	N/A	N/A	N	N	N/A
Thor	Godel	Gaseous	6,500	N/A	N/A	N	N	N/A
Trygleve	Kochab	Gaseous	6,900	N/A	N/A	N	N	N/A
Vromus Prime	Vromus	Habitable	6,700	7	87	Y	Y	86
Zeath	Prisa	Habitable	6,000	7	79	Y	Y	78

Table abbreviations:

CUL	.....	Culture number
PS	.....	Population sophistication
SP	.....	Starport present
DD	.....	Drydock present
DSP	.....	Drydock sophistication
N/A	.....	Not applicable

HABITABLE:

A planet capable of supporting human life. The surface can be mined and it is very likely that there is a starport on the surface and a drydock in orbit.

AIRLESS:

A planet lacking an atmosphere. Hostile to human life although the surface may be mined.

GASEOUS:

A planet characterized by a dense poisonous atmosphere, an ice core, and a constantly changing surface. This type of planet cannot be mined or landed upon.

C: PARTS LIST**SHIP PARTS LIST****HYPERDRIVE
SYSTEM 0**

#	type	dp	sz	eu (a)	vs	range (b)	soph	cost (☛)
0	Quantum Divsn	15	5	10,000	8	7	70	35,000
1	Cee Squared	15	6	30,000	9	9	80	40,000
2	Interspace Prod	16	6	45,000	9	11	85	45,000
3	Jonisiodal D2	17	7	50,000	10	14	85	55,000

(a) Energy units used per light-year of travel.

(b) Range in light-years.

**SUB-LIGHT DRIVE
SYSTEM 1**

#	type	dp	sz	eu (a)	vs	grav (b)	ore IV/min (c)	soph	cost (☛)
4	Ion	15	5	200	7	2	1	45	20,000
5	Rynox Disprsmnt	15	5	274	6	5	0	60	20,000
6	Fission	12	4	326	7	30	4	50	24,000
7	Fusion	16	5	350	4	100	2	65	29,000
8	Induced Gravity	20	2	500	10	300	0	80	36,000
9	Thruster	18	8	600	12	500	0	90	38,000
10	Picametric	20	10	1300	8	1000	0	95	48,000

(a) Energy units used for gravities/minute of aceleration in 1/1000th's of an energy unit.

(b) Maximum gravities of acceleration.

(c) Units of Ore IV/minute consumed.

**BRIDGE
SYSTEM 2**

#	type	dp	sz	vs	soph	cost (☛)
11	Xorconn	4	4	4	60	3,000
12	Blathchzeck	5	4	4	65	5,000
13	Trentificus	9	6	5	75	9,000

Abbreviations used in this list:

.....Part Catalog Number

DP:Damage Points

VS:Visibility

COSTBase Part Cost (in credits) ☛Credits

SZ:Size (# of hulls req.)

EU:Energy Units

SOPH:Part Sophistication

TYPE:Brand Name or Type of Part

C: PARTS LIST**SHIP PARTS LIST****ACCUMULATORS
SYSTEM 3**

#	type	dp	eu (a)	vs	modules (b)	soph	cost (☛)
14	Alkis Group	5	10,000	1	8	45	1,000
15	Zeus Storage	7	20,000	1	6	50	1,500
16	Voltac Group	10	45,000	2	3	80	1,800

(a) Energy units of storage per module.

(b) Number of modules per hull maximum.

Note:

No more than 24 modules of any type may be carried on board your ship.

**CONVERTER
SYSTEM 4**

#	type	dp	sz	eu (a)	vs	eu/ore IV (b)	soph	cost (☛)
17	Fuel Cell	8	2	5,000	1	3	55	10,000
18	Fission	10	4	9,000	3	4	45	8,000
19	Fusion	12	5	12,000	4	8	60	15,000
20	Mass Conversion	16	8	25,000	8	17	95	35,000

(a) Energy units produced per second.

(b) Energy units produced per unit of Ore IV converted.

**DOCKING ADAPTER
SYSTEM 5**

#	type	dp	sz	vs	soph	cost (☛)
21	Toloollo	8	4	7	55	2,500
22	Koto Company	10	4	7	60	3,000

**INERTIAL COMPENSATOR
SYSTEM 6**

#	type	dp	sz	eu (a)	vs	gravs max (b)	soph	cost (☛)
23	Franklin Lab	1	3	10	1	5	70	17,500
24	Gelt Industries	2	3	60	2	10	80	19,000
25	Vromus	5	6	100	2	300	80	22,000
26	Athik Technical	4	4	300	5	1000	90	30,000

(a) Energy units used per gravity of acceleration/second.

(b) Maximum number of gravities that can be compensated.

C: PARTS LIST

SHIP PARTS LIST

**ORBITAL SCANNER
SYSTEM 7**

#	type	dp	sz	eu (a)	vs	range (b)	soph	cost (€)
27	Manx	3	2	1,500	4	30,000	55	10,000
28	Hai' Systems	4	2	750	4	65,000	70	13,000
29	Psion	7	3	1,000	3	100,000	85	18,000

(a) Energy units used per scan.

(b) Maximum scanning range in kilometers.

**RESOURCE SCANNER
SYSTEM 8**

#	type	dp	sz	eu (a)	vs	range (b)	accuracy (c)	soph	cost (€)
30	Petroscan	1	1	2,000	2	500	20%	55	12,000
31	NDT Inc.	3	2	2,000	3	1,000	25%	65	13,000
32	Rosisnski	3	2	2,500	3	5,000	20%	70	16,000
33	Agean Technical	4	2	1,500	4	5,000	15%	80	18,000
34	Axian Corprate	6	3	1,000	3	10,000	15%	85	20,000
35	Psion	9	5	2,000	5	10,000	5%	90	23,000

(a) Energy units used per scan.

(b) Maximum scanning range in kilometers.

(c) Percentage error (-/+).

**HIGH DEFINITION SCANNER
SYSTEM 9**

#	type	dp	sz	eu (a)	vs	range (b)	max mag (c)	soph	cost (€)
36	Rosisnski	2	3	2,000	5	10,000	250%	70	17,000
37	Axian Corprate	3	2	1,500	4	15,000	380%	75	17,000
38	Psion	1	1	1,500	2	28,900	510%	85	20,000

(a) Energy units used per scan

(b) Maximum scanning range in kilometers.

(c) Maximum magnification percentage.

**MISSILE RACK
SYSTEM 10**

#	type	dp	sz	eu	vs	msu/rack (a)	capacity (b)	soph	cost (€)
39	Standard	5	1	0	2	20	20	55	5,000

(a) Missile size units per missile rack.

(b) Maximum number of racks on board your ship.

C: PARTS LIST**SHIP PARTS LIST****MISSILE LAUNCHER
SYSTEM 11**

#	type	dp	sz	eu (a)	vs	msl/slv (b)	soph	cost (€)
40	Woden Arma	5	1	100	5	2	55	11,000
41	Woden II	7	1	125	5	4	60	12,500
42	Giaperelli	10	2	400	9	8	70	21,000

(a) Energy units to launch a salvo.

(b) Missiles per salvo maximum.

**LASER PROJECTOR
SYSTEM 12**

#	type	dp	sz	eu (a)	vs	range (b)	pulse (c)	dam (d)	soph	cost (€)
43	Zeus	10	4	15,000	8	5,000	20	4	60	11,000
44	Woden Boltfire	12	4	17,500	8	5,000	18	8	65	13,000
45	Sunstorm	8	5	20,000	10	10,000	7	10	70	14,000
46	Franklin IV	10	5	25,000	10	5,000	3	20	75	17,000
47	Sunstorm HF	11	6	31,500	12	10,000	6	25	85	19,000
48	Franklin VI	13	7	30,000	13	15,000	10	35	90	24,000

(a) Energy units per pulse fired.

(b) Range in kilometers.

(c) Seconds between pulses.

(d) Damage inflicted per pulse.

**SHIELD GENERATOR
SYSTEM 13**

#	type	dp	sz	eu (a)	vs	dp blkd (b)	soph	cost (€)
49	Koto Company	10	2	1,000	1	3	65	8,000
50	Hai' Systems	14	2	1,200	1	4	70	9,500
51	Repellent	11	3	1,800	2	8	75	18,000
52	Axian Corprate	20	4	1,700	3	14	85	20,000
53	Voltac Group	15	4	2,000	2	14	80	18,000
54	Woden Plate	25	5	1,900	4	20	90	23,000

(a) Energy units per damage point absorbed.

(b) Damage points blocked maximum.

C: PARTS LIST

SHIP PARTS LIST

**ELECTRONIC COUNTERMEASURE
SYSTEM 14**

#	type	dp	sz	eu (a)	vs	effect (b)	soph	cost (⌘)
55	Voltac Group	2	1	2,000	1	5%	65	7,000
56	Entrohaad	3	1	1,500	1	11%	70	13,000
57	Woden Confusior	5	2	6,000	2	18%	85	19,000

(a) Energy units per missile jamming attempt.

(b) Percentage of effective attempts.

**ASSAULT CAPSULES
SYSTEMS 15-19**

#	type	dp	sz	eu (a)	vs	saf (b)	crew (c)	soph	cost (⌘)
58	Woden I	20	1	100	5	175	6	65	11,000
59	Koto Conqrer	27	1	175	5	250	11	70	17,000
60	Woden II	30	1	270	6	290	18	75	20,000
61	Voltac Group	42	1	400	7	315	17	80	28,000
62	Woden Assault+	60	1	1,000	9	400	24	90	30,000

(a) Energy units required for launch (in 1000's of energy units).

(b) Surface attack factor.

(c) Crew required to launch.

**ORE PROCESSOR
SYSTEMS 20-24**

#	type	dp	sz	eu (a)	vs	ore cap (b)	crew (c)	efc (d)	soph	cost (⌘)
63	Columni	10	1	75,000	5	25,000	20	27%	70	16,000
64	Datar Grubber	15	1	100,000	6	75,000	23	36%	75	22,000
65	Voltac Group	20	1	150,000	8	135,000	18	71%	85	24,000
66	Dirtmaster	30	1	240,000	9	200,000	8	93%	90	29,000

(a) Energy units required for launch.

(b) Total Ore capacity in units.

(c) Crew required to launch.

(d) Ore recovery efficiency.

Note:

Processing rate is constant for all processors.

**CARGO HOLD
SYSTEM 25**

#	type	dp	sz	vs	soph	cost (⌘)
67	Standard	5	2	2	50	5,000

C: PARTS LIST**SHIP PARTS LIST****CRYOGENIC VAULTS
SYSTEM 26**

#	type	dp	sz	eu (a)	vs	capa (b)	loss (c)	soph	cost (€)
68	Ageless Ind.	3	1	250	1	100	77%	60	7,000
69	Proxima	2	1	325	1	250	89%	65	9,000
70	Kintopir' tern	5	1	200	1	270	98%	75	14,000

- (a) Energy required to revive 1 person.
 (b) Capacity in number of persons.
 (c) Percentage of persons who survive the revival process.

**ORBITAL SHUTTLES
SYSTEMS 27-31**

#	type	dp	sz	eu (a)	vs	psngr (b)	carg (c)	ore (d)	soph	cost (€)
71	Quentrix	20	1	10,000	4	3	100	180,000	65	10,000
72	Columni	25	1	25,000	5	5	150	360,000	70	15,000
73	Datar	30	1	30,000	7	11	200	600,000	70	17,000
74	Icarus	30	1	37,000	7	20	230	750,000	75	20,000
75	Axian Corprate	35	1	48,000	8	56	300	1,000,000	85	25,000

- (a) Energy units required for launch.
 (b) Maximum passenger capacity.
 (c) Cargo capacity (in cargo size units).
 (d) Maximum Ore capacity in units.

**AUTODOCTOR
SYSTEM 32**

#	type	dp	sz	eu (a)	vs	cures (b)	soph	cost (€)
76	Salven	2	1	1,000	1	65%	60	6,000
77	Primile	3	1	1,400	1	75%	70	9,000
78	Trithens	1	2	9,000	2	90%	90	13,000

- (a) Energy units per casualty healed.
 (b) Percentage of successful cures.

C: PARTS LIST**SHIP PARTS LIST****ORE STORAGE
SYSTEM 33**

#	type	dp	sz	vs	stored (a)	soph	cost (€)
79	Baynus	5	5	5	900,000	40	2,000
80	Datar	5	7	7	1,250,000	45	4,000
81	Voltac Group	8	9	9	2,000,000	50	7,000

(a) Maximum Ore capacity in units.

**CREW QUARTERS
SYSTEM 34**

#	type	dp	sz	vs	accom (a)	soph	cost (€)
82	Kraakobinir	2	1	1	40	50	2,000
83	Vromus	4	2	2	65	55	4,000
84	Pullenmot	7	3	3	128	55	5,000
85	Axian Corprate	9	3	4	213	65	7,000

(a) Maximum crew accomodated.

**RESCUE POD
SYSTEM 35**

#	type	dp	sz	eu (a)	vs	pers/pod (b)	soph	cost (€)
86	Colli	8	1	10,000	3	50	55	1,500
87	Baynus	4	2	30,000	5	200	70	2,000

(a) Energy units needed to launch rescue pods.

(b) Maximum persons/pod.

**COMPUTER
SYSTEM 36**

#	type	dp	sz	vs	capcty (a)	soph	cost (€)
88	AE 3504	1	1	1	10	65	10,000
89	Alkis 2	1	1	1	12	75	12,000
90	AF 2198	2	1	1	15	85	13,000
91	CA 6605	2	2	2	17	90	17,000
92	GF 8738	3	2	2	22	95	20,000

(a) Maximum timeshare units capacity.

C: PARTS LIST**SHIP PARTS LIST****MASS STORAGE
SYSTEM 37**

#	type	dp	sz	vs	capcty (a)	soph	cost (€)
93	Skandis	2	1	1	25	60	5,000
94	Datar	3	1	1	35	65	6,000
95	Dictonne	5	1	1	40	75	8,000

(a) Maximum timeshare units capacity.

CREW ARMOR

#	type	af (a)	soph	cost (€)
0	Pan' tra	2	58	100
1	Kevex	3	67	200
2	Woden Gyfal	5	79	300

(a) Attack factor per unit of armor.

Note:

Crew armor does not use the standard parts numbering system.

D: PROGRAM LIST**COMPUTER PROGRAMS**

#	type	timeshare	description
0	Weapon	5	Weapons tracking and launch control
1	Autofire	2	Not implemented at this time
2	Amphib Assault	4	Controls assault capsule attacks
3	Defense	5	Reduces incoming missile accuracy by 6%
4	Resource	2	Scans body orbited for ore concentrations
5	Docking	4	Controls ship-to-ship docking maneuvers
6	Shuttle Control	1	Controls ascent and descent of orbital shuttle
7	Sub-C Navigation	5	Calculates and controls ship sub-light maneuvers
8	Hyper Navigation	5	Calculates and controls ship hyper-space maneuvers
9	Market	4	Analyzes cargo category and sophistication

Computer software costs 1,500 credits per program

E: WEAPON LIST

WEAPONS

#	type	MSU	Range	AC	DAM	SP	cost (⌘)	effects
0	DNT	1	15,000	97	5	50	1,000	general damage
1	Fission	3	15,000	96	10	50	1,500	general damage
2	Fusion	4	15,000	96	20	55	2,000	general damage
3	Neutron	3	10,000	92	5	55	2,000	mostly anti-personnel
4	Field Effect	8	10,000	90	0	70	2,700	only anti-personnel
5	Proton	10	7,500	93	50	65	3,000	general damage
6	Empulse	13	10,000	73	0	85	5,000	burns-out electronics
7	Ptarki	6	7,500	68	10	85	5,000	avoids shield effect
8	Stealth	5	10,000	85	30	80	5,000	negates ECM effect
9	Nova	20	7,500	47	150	95	20,000	general damage

Table abbreviations:

- MSU**Missile size units
- AC**Accuracy in percent
- DAM**Damage
- SP**Sophistication

Note:

Range is measured in kilometers. Accuracy is measured with defense program running, otherwise add 6% to a maximum of 100%.

F: PARTIAL PRODUCTS LIST

PARTIAL PRODUCTS LIST

Name	Type	CS	SP	Description
Quentwir	food	10	20	Calegrain ale.
Flamold	life	54	21	Large jelly-like beast, ignites spontaneously.
Vizvia	furn	6	22	Stiff-back chair made of dense vegetable matter.
Sloboe	arti	2	23	Miniature hand pumped instrument.
Shanook	life	12	24	Excrete Uroos paste.
Ghan Eggs	pers	3	25	Ostrich-size eggs, very tasty.
Cawnta Baba	food	2	26	Fried Baba-plant pseudopods.
Gomapard	arti	2	27	Musical instrument, difficult to use, very pleasant sounding.
Lu Onodasto	life	25	28	Liquid black colored, feed on solar energy.
Kheff	narc	2	29	Hallucenogenic drug.
Terclus Koftnu	food	1	30	Vegetable paste, sweet tasting.
Manual Fleen	arti	16	31	Old style oscillating polisher.
Bah Truf	food	1	32	Rare spice, irresistable taste.
Propapedo's Findal	life	87	34	Used as a war-animal, for riding or pulling.
Benick's Beer	food	15	35	Mildly alcoholic chocolate drink.
Jymroppa	medi	21	36	Bark, dipped in water and eaten, for easing stress.
Tassrygma	educ	2	37	Primer of common alphabets.
Mawick Marwanda	life	2	38	Furry 5-legged animal used as a child's pet.
Bavardo	life	10	39	Roving bushcreepers, aggressive to other plants.
Vegamite	clth	2	40	Extruded vegetable-based cloth.
De'ur Knid	entr	3	42	Musical instrument.
Indrusegg	pers	5	43	Used for befundi quiver removal.
Etllevob	pers	1	44	Mechanical wrist chronograph, low accuracy.
Millitiasias	food	1	45	Seeds excrete a potent natural food preservative.
Wert	misc	2	46	Scented candle, fumes have antiseptic qualities.
penet-Autuple	arti	67	48	Light sculptures named after the artist.
Verga Leaves	medi	1	50	Valuable heart stimulant.
Sildeo	food	50	51	White, crystalline bread.
Kebmoha	tool	2	52	Electronically controlled fluid valve.
Dentebrite	pers	1	55	Tooth polish.
Mexe	pers	12	56	Personal exercise machine.
Insta-shelter	misc	20	57	Portable lightweight all-climate shelter.
Fanalsl	food	9	58	Livestock feed-cracker.
Vel'dran	pers	2	59	Portable high intensity light source.
Rug Beasts	furn	1	60	Moss-like growth used as natural carpet.
Dre'jkid Durf	tool	1	61	Holographic image recorder.
Nuhg	pers	15	62	Reversable static field shower.

F: PARTIAL PRODUCTS LIST

PARTIAL PRODUCTS LIST

Name	Type	CS	SP	Description
Replent 433-435	misc	20	63	Synthetic food preservative.
Derata Coat	misc	12	64	Energy absorbant paint.
Hip Fog	clth	1	65	Field-controlled gas cloud worn on lower body.
Qui-bieh Kiff-dro	clth	3	66	Blood-dyed garment, a rage on high sophistication planets.
Porta-clense	pers	1	67	Portable shower (20 applications).
Pullarts	food	11	70	"The candy made of sunlight!" — Wewush.
D' Viper Slenep	weap	10	72	Ultrasonic paralyzer.
Baefiscz	food	185	74	Grak' narka Fig-Beef, in sheeted form.
Pemexin Parts	semi	5	75	Rapid-hardening shape-conforming parts.
Frentizine	medi	1	76	Semi-spectrum immunization drug.
Mour's Fingerpiece	jewl	1	80	Relief carving.
Aiugh educ	educ	7	80	Automated opponent for Bento-stempo trainees.
B. Doshniva's Tyna	clth	3	80	Brobo Doshniva's latest Fashion Craze.
Zheezni	life	5	81	Bioengineered child's pet.
T'tar's Gravitramp	furn	112	81	Creates local zones of differing gravity.
Pupbapy	life	1	81	Naturally attracted to excellent vocalists.
KCLA Lambate	arti	2	82	From the art-tech of Vowlotan.
Nullgravs	tool	5	83	Repellor attachments to carry heavy objects.
Afrasiyab Memoirs	educ	2	84	Crystal-coded memoirs of the baasra-Afrasi
Svengall	life	1	85	Amoeba-like 1 meter diameter, emits euphoric scent.
Mangle	tool	2	86	Used to fill spaces, expands until reaching a wall.
Wewush: Gastrologica	entr	3	87	Wewush's crystalfax of the great foods of the L.G.
Shk-tar	food	1	89	Bevy of artificial creature, eaten alive.
Hexarine	food	2	94	Engineered fruit, a Wewushian favorite.

Table abbreviations:

CS Cargo size

SP Sophistication

G: CULTURE LIST

A GUIDE TO CULTURAL EPOCHS

Since the latter part of the Nineteenth Century (Common Era), historians have been dividing cultures into "epochs." Epochs are the turning points in the history of a culture. For example, the rise of George Louis I was a new epoch in New Europe culture.

All the cultures in the Local Group have undergone a careful examination and classification by the Janet Leader Foundation on Arbest. These classification codes help the traveler to determine what the import and immigration restrictions are.



G: CULTURE LIST**A GUIDE TO CULTURAL EPOCHS**

CODE	EPOCH	DESCRIPTION	ACCEPT IMMIGRANTS	ILLEGAL PROD TYPES
1	Pre-Cultural	Clans, tribes, no politics. A chaos of primitive expression.	YES	(NONE)
2	Fuedallism	Rural art, naturally shaped. Warriors and Priests in power.	NO	ARTI, EDUC, INFO
3	Breakdown of Fuedallism	Exhaustion of early art forms, the Reformation.	YES	ARTI, NARC, ENTR, PERS, JEWL
4	Formation of Aristocratic States	Mature art, new forms of math, philosophical world views and puritanical religions opposed to growing absolutism.	NO	ARTI, EDUC, NARC, PERS, JEWL, FURN, CLTH, FOOD
5	Absolutism	Aristocracy held in check by King/Tyrant with Bourgeoisie. The zenith of mathematical thought, intellectualization of art, the great conclusive systems of thought.	YES	WEAP
6	Revolution and Napoleonism	Bourgeoisie against alliance of King/Tyrant and Aristocracy. The Victory of Money over Blood. Exhaustion of art forms.	NO	EDUC, TRAN, INFO, WEAP,
7	Transition from Napoleonism to Caesarism	The epoch of Contending States. Dominance of Money ("Democracy") Rational social ethics replace Religion. Final world sentiment. Conceptual art. Final Thought in Mathematics.	YES	NARC, SLAV, BOGU
8	Caesarism	Victory of Force-Politics over Money. The decay of nations into a formless mass, soon to be made into an Imperium of gradually increasing despotism. Archaic, exotic art.	NO	EDUC, WEAP, BOGU
9	Final Political Form	The world as a spoil. Primitive human conditions thrusting up into the highly civilized mode of living.	NO	(NONE)

H: SHIP DATA

Name	Section Size/Visibility								Cost (€)
	1	2	3	4	5	6	7	8	
ZM-110	3/6	6/7	96/10	6/2	12/4	6/2	16/6		21,605
Explorer 6A	108/7	96/4	108/7	16/4	48/6				56,025
Ignia	25/10	21/1	21/5	21/5	12/4	16/7			17,285
Al Vexan	6/7	3/4	4/5	32/8					11,900
T'ul Edur	24/10	7/1	2/3	2/3	6/8	6/8	15/3	3/7	22,300
DN-300	4/8	6/6	16/6	6/4	36/7	2/6			13,430
DN-310	9/6	48/7	52/3	52/7	52/7	22/5			34,200
Horizon II	5/5	60/8	5/3	31/5	4/5				18,645
Kosygin	31/7	24/5	8/5	9/3					14,755
Radpo' ol	18/8	6/1	24/3	17/7	17/7	4/6			15,650

I: GLOSSARY OF TERMS

ACCUMULATOR:

Stores energy, essentially a large battery. The use of these allow a greater energy expenditure in a minimum amount of time, necessary for hyperspace entry.

AIRLESS:

A planet which lacks a breathable atmosphere. Totally hostile to unprotected humans.

ARMOR:

A term referring to the self-powered suits crew members use on assault capsule missions and boardings. They enhance the user's senses and give increased mobility/strength.

ASSAULT CAPSULE:

Space-age troop carrier with small attack capabilities of its own. Usually used to clear a hostile area prior to deployment of ore processors. See ORE PROCESSORS.

AUTODOCTOR:

Automated surgeon able to diagnose and treat simple illnesses and injuries.

BOOT:

Term meaning to start the computer using a particular disk. This is done by placing the disk in the drive and then turning on the power to the computer.

BRIDGE:

The section of the ship from where the captain commands.

CARGO HOLD:

The area of the ship where cargo is stored.

COMPUTER:

A machine which processes data using predefined instructions which are provided by a human operator. Used to control much of the equipment on the ship.

CONVERTER:

Transforms Ore IV into energy. See ORE IV.

CREW ARMOR:

See ARMOR.

CREW QUARTERS:

A section of the ship which contains sleeping, food preparation, recreation, and sanitary facilities for the crew.

CRYOGENIC VAULT:

Low temperature (98 degrees K) storage for humans who are nonessential to the operation of a vessel. Traditionally used to hold passengers.

CRYSTAL-FAX:

Information burned into a crystal, used as a lasting storage medium.

I: GLOSSARY OF TERMS**DIMENSION-SET:**

Any object in normalspace occupies three physical and one time dimension. These four defining dimensions are called a dimension-set.

DOCKING ADAPTER:

Attached to the exterior of the ship, it seals around the outside of another ship's airlock. With a docking adapter, transfer of goods and personnel can be conducted without using breathing equipment.

ECLIPTIC:

Imaginary plane on which all of the planets in a starsystem ride. See STARSYSTEM.

ECM:

See ELECTRONIC COUNTERMEASURE.

ELECTRONIC COUNTERMEASURE:

Commonly referred to as ECM. ECM is the process of interfering with missile guidance systems. Use of ECM greatly reduces the chance of being struck by a missile.

FAX-SHEET:

Any printout from a computer. A facsimile.

FRANKLIN LABORATORIES:

A major industrial force behind the space effort. FL holds all the major patents for the hyperdrive and many other essential spaceflight components. Its virtual monopoly during the opening years of starflight enabled it to gain a hold in every aspect of the spacing industry. Often spending as much as 65% of its yearly income on research and development, Franklin Labs has greatly aided colonies of the First and Second Stellar Expansions in creating viable home companies capable of advanced technical achievements.

GASEOUS:

A planet whose atmosphere is much too dense to breath. Typically lack a stable surface, composed mainly of ice with a strong surface gravity. Uninhabitable.

HABITABLE:

A planet which can support human life.

HABITABLE ZONE:

Theoretical band around a star where planets which can support human life are found.

HIGH DEFINITION SCANNER:

Creates a detailed picture of the object being scanned. Usually used for spacecraft identification.

I: GLOSSARY OF TERMS**HYPERDRIVE:**

Propulsion system that allows travel at faster-than-light speeds by "kicking" the spacecraft into a new dimension-set called hyperspace. Once in hyperspace, the spacecraft can almost instantaneously reenter normalspace many light-years away.

HYPERSPACE:

A space that co-exists with normalspace. Access is possible only through the expenditure of enormous amounts of energy. Hyperspace is believed to be void of matter except when spacecraft are "kicked" into it from our dimension-set. No matter/energy artifacts have ever been found there, not even debris left-over from hyperdrive-propelled spacecraft.

HYPERSPACE BOOSTER:

Discovered near the end of the First Stellar Expansion, the hyperspace booster increases the range of mankind's exploration because of its ability to add to the hyperspace entry energy of a spacecraft, allowing greater than normal distances to be traveled. One of the chief disadvantages of the booster is that booster-assisted travel is strictly one way.

INERTIAL COMPENSATOR:

Creates a localized gravity field, which isolates the interior of a spacecraft from the effects of inertia, thus protecting the occupants from undue wear-and-tear.

KLEPTNIR:

The ancient Dormir (See "Old Xirae" in Ruetter's, XIRAE: DIALOGUES WITH THE PAST) phrase meaning "awaiting your return." Farewell, goodbye.

LANDER:

Generic term referring to any type of vehicle used for transport between a planet's surface and low orbit (under 5000 km).

LASER PROJECTOR:

A device which emits an incredibly powerful beam of coherent electromagnetic radiation.

LIGHT-YEAR:

The distance light covers in one Standard year; approximately 30 trillion kilometers or 6 trillion miles.

MASS LIMIT:

Anything above a certain mass cannot enter hyperspace; MASS LIMIT refers to this value.

MASS STORAGE:

A peripheral device for the computer which stores programs.

I: GLOSSARY OF TERMS**MISSILE LAUNCHER:**

The actual device which releases the missile and provides initial course guidance.

MISSILE RACK:

A word referring to the system of racks, conveyors, and lifts used to bring the missile from its storage area into firing position.

NORMALSPACE:

An abbreviation for normal space/time, which is the space of everyday experience.

ORBITAL SCANNER:

Uses a large part of the electromagnetic spectrum to create an image of the space surrounding a ship.

ORBITAL SHUTTLE:

Used for surface-to-orbit operations only. Merchants use them to carry cargo to and from starports. They are slow and unable to attain an orbit much higher than 5600 km. Commonly referred to as an "orbiter."

ORE I:

Generic term referring to metals such as iridium, titanium, and paladium.

ORE II:

Form of processed silicon used in making ballistic transfer computer chips.

ORE III:

Nonspecific term referring to metals similar to composition to steel.

ORE IV:

Combination of the two radioactive isotopes of hydrogen.

ORE PROCESSOR:

Portable mining device, used to extract Ores I-IV from surface rock. It has little defense capability and the site on which it mines must be relatively flat and hard.

ORE STORAGE:

The area in the ship where ore is stored.

PART:

A device which can be used aboard a spacecraft. See SYSTEM.

PROCESSOR:

See COMPUTER.

I: GLOSSARY OF TERMS

PRODUCT:

Any of the items available for purchase on a Buyer's Board. An item from the Buyer's Board.

RESCUE POD:

Large plastic bubble with a 2 hour air supply for up to 20 people. Often used by pirates for personnel transfer in lieu of docking.

RESOURCE SCANNER:

Used to scan planetary surfaces for traces of Ores I through IV; indicates optimum mining sites.

SHIELD GENERATOR:

Has limited capability to repel matter and energy. Used to protect a ship from attack or other hazards.

SIZE:

A characteristic of a part; the number of hulls required to house a particular part.

STARPORT:

Giant landing field and trading post. A starport is usually the economic center of a planet. Many services are available at a starport, ranging from trade to orbiter maintenance and refuelling. The only place where an orbital shuttle may safely land.

STARSYSTEM:

A term referring to the total collection of planets orbiting a star. The volume of space enclosed by the orbit of the outermost planet.

SUB-C:

See SUB-LIGHT.

SUB-LIGHT:

Below the speed of light. Usually refers to travel between planets in the same starsystem.

SUB-LIGHT DRIVE:

Term referring to the engines a spacecraft uses to travel about in normalspace. A sub-light drive cannot propel a spacecraft faster than the speed of light. In this age they are used solely for maneuvering inside starsystems.

SYSTEM:

A part used to perform a particular function. The hyperdrive motor is the hyperdrive system. A part.

I: GLOSSARY OF TERMS**VISIBILITY:**

The measurement of relative size. A system may take up 5 hulls (size 5) but because it is in a section of the ship which is surrounded by other sections (a section visibility lower than 5) it is very difficult for a theoretical outside observer to see. A lower visibility means that a part will stand less chance of being hit by enemy fire.

XIRAE:

Native inhabitants of the planet Baliolsol (the only sapient alien race in the Local Group). The Xirae are an ancient race, whose past high culture was destroyed by unknown forces over 100,000 years ago.

XIRAEN:

Of or pertaining to Xirae.

J: UNIVERSE BULLETIN BOARD

The Universe Bulletin Board System is provided for registered owners of Omnitrend's Universe. The purpose of the bulletin board is to allow players of Universe with a medium to exchange ideas and experiences with other players. In addition, new product announcements for Universe-related products will be placed on the bulletin board.

The bulletin board may be accessed via modem at either 300 or 1200 baud on the Omnitrend Software order line, (203) 658-6917, during the following times:

Monday through Friday: 7 pm to 9 am

Saturday: 3 pm to Midnight

Sunday: All Day

To access the bulletin board, dial the order line during the times listed above. The bulletin board will begin by prompting you for your username and password. Refer to your registration card to obtain this information. Note that when you enter your password, the numbers are not echoed on the screen. This is to help insure the secrecy of your password.

An on-line help facility is available to assist you in using the bulletin board. You will be allowed two hours of connect time per month on the system. If indicated, your account will be established immediately on receipt of your registration card. If not indicated, you may establish an account by contacting us by mail.

The Universe Bulletin Board is a complementary service to players of Universe. Omnitrend Software reserves the right to discontinue this service at any time.

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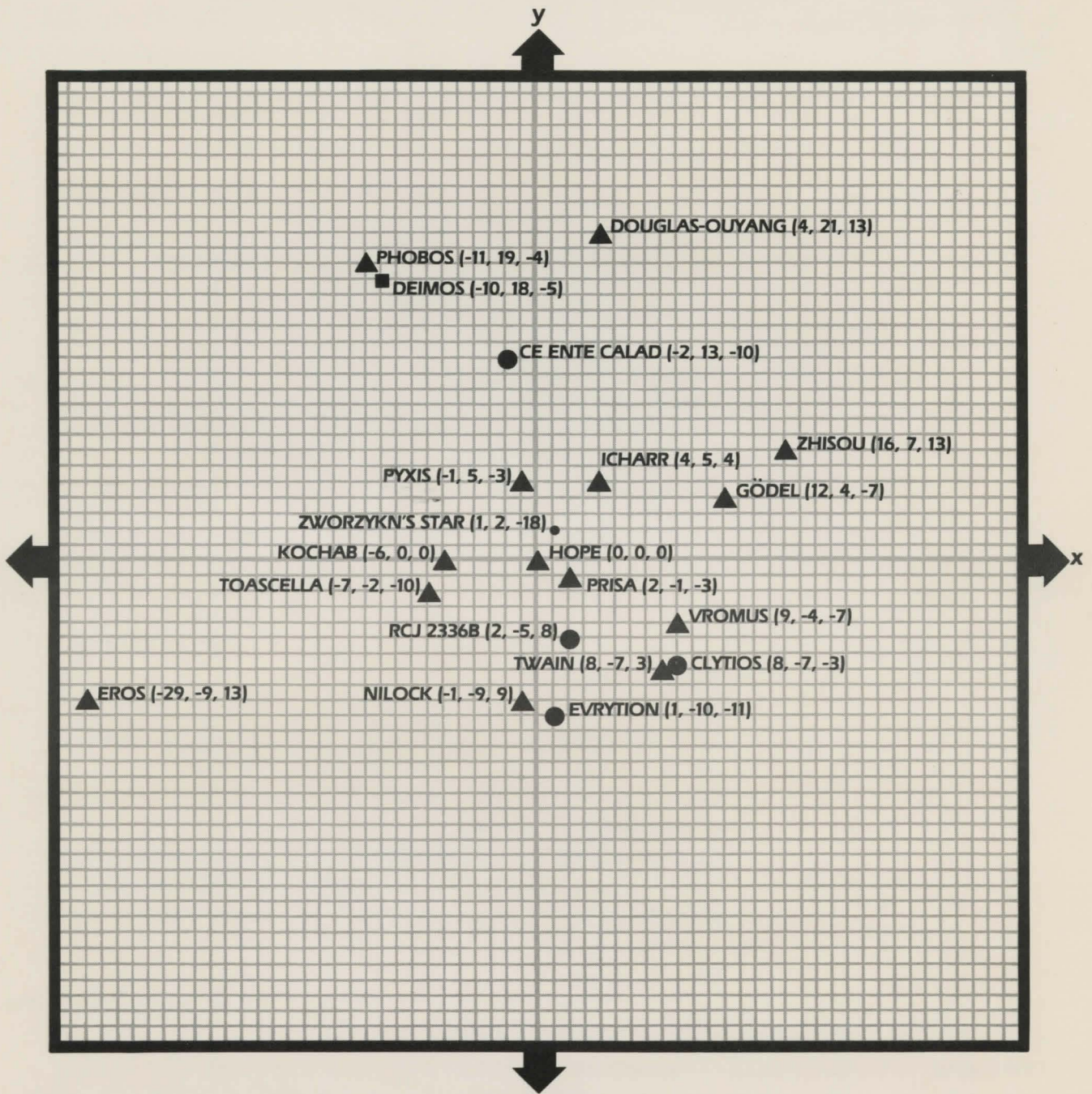
QUICK REFERENCE CARD

SECTION	SUB-SECTION	CURRENT DISPLAY	KEYPRESS	FUNCTION	
SUB-LIGHT DRIVE	Select Scale		START	Exit from Drive Systems.	
			OPTION	Choose between planetary and solar scale.	
			SELECT	Scan on the displayed scale.	
	Solar Scan			START	Return to Select Scale .
				OPTION	Choose between destinations.
				SELECT	Transfer to the current object.
	Planetary Scan		If cursor is next to "R:" and you wish to skip manual entry	RETURN	Skips manual entry of destination.
			If cursor is next to "R:" and you wish to manually enter coordinates	num input	Enter radius. Continue to enter coordinates until the computer displays "TRANSFER CONFIRMATION."
			If "DESTINATION SELECT"	START	Return to Select Scale .
			(same as above)	OPTION	Advances to next destination.
			(same as above)	SELECT	Calculates transfer orbit.
			If "TRANSFER CONFIRMATION"	START	Aborts transfer, advances to next destination.
	(same as above)	OPTION	Enables/disables visual transfer.		
	(same as above)	SELECT	Executes transfer and returns you to Select Scale .		

ABBREVIATIONS USED IN THE QUICK REFERENCE CARDS:

- num Input Numeric input.
Type in a number (either positive or negative) and press <RETURN>.
- RETURN , <F>, <ESC>, etc. Press the key with the same label.
- 1...5 , 0...9 , etc. Press any of the keys from the first number to the second.
- Q,W,E,R,T Press any of the keys listed.
- up arrow , left arrow , etc. ... Press the corresponding arrow key. **Do not** use these keys in conjunction with the <CTRL>, <CONTROL>, or <SHIFT> keys.
- Y/N Press either the Y (for yes) or the N (for no) key.

LOCAL GROUP MAP



KEY

- ▲ Main Sequence Star
- Giant
- Neutron Star
- Dwarf
- x, y, z Absolute Coordinates

QUICK REFERENCE CARD

SECTION	SUB-SECTION	CURRENT DISPLAY	KEYPRESS	FUNCTION
HYPERDRIVE	Local Group Chart		up arrow	Move cursor up one line.
			down arrow	Move cursor down one line.
		If "V" column has "Y" on same line as cursor	OPTION	Go to Planetary Bodies .
		If cursor turns into a ">" on line as "X:"	OPTION	Computer is now ready for manual numeric input.
		If cursor is a ">" on the line with "X:"	num input	Enter x, y, and z coordinates.
		If cursor is a ">" on the line with "X:" and you have entered coordinates	SELECT	Computer calculates a hyperspace jump and goes to Local Group Map screen.
		If cursor is on any other line	SELECT	Computer calculates a hyperspace jump and goes to Local Group Map screen.
	Local Group Map		OPTION	Return to Local Group Chart .
			SELECT	Execute hyperspace jump.
	Planetary Bodies		START	Return to Local Group Chart .

QUICK REFERENCE CARD

SECTION	SUB-SECTION	CURRENT DISPLAY	KEYPRESS	FUNCTION
WEAPONS		If the bottom of the screen is blank	<T>	Select a target.
		(same as above)	<L>	Fire laser.
		(same as above)	<M>	Fire missile(s).
		(same as above)	<O>	Go to the Emergency Systems menu.
		(same as above)	<D>	Dock with target.
		(same as above)	START	Exit from Weapons.
	Target Select	Computer is asking for a target	1 ... 4	Selects target.
		"Viewmag?"	up arrow	Increase tactical viewer magnification by 10%.
		(same as above)	down arrow	Decrease tactical viewer magnification by 10%.
		(same as above)	RETURN	Begin tactical high definition scan.
		"Visual Damage?"	Y/N	Select flashing damage display.
	Laser	"Confirm"	<C>	Laser lock-on confirmed; fire laser.
	Missiles	Computer lists all missile types and current stores of each	0 ... 9	Selects a missile type.
		"Salvo Size?"	num input	Select number of missiles to fire in salvo.
		"Confirm?"	<C>	Confirms lock-on and firing.
	Emergency		<O>	Overload hyperdrive.
			<R>	Launch rescue pods.
	Overload	Computer is displaying overload countdown	<A>	Aborts countdown to overload.
	Dock/Boarding	"Number of boarders? ...	num input	Enters number of crew to board target ship.
		Computer is displaying the boarding battle	<R>	Retreat back to main ship.

QUICK REFERENCE CARD

SECTION	SUB-SECTION	CURRENT DISPLAY	KEYPRESS	FUNCTION
PARTS REMOVAL			SELECT	Advances pointer to next systems.
			OPTION	Reverses pointer to previous system.
			space bar	Changes the current system's status.
PARTS PURCHASE			START	Exit Parts Removal.
			OPTION	Advances pointer to next section .
			SELECT	Highlight a section for input.
			START	Exit Parts Purchase .
	Parts	"PARTS" is highlighted ...	num input	Input system, part number, and quantity if necessary. Computer displays part cost.
		(same as above)	RETURN	Exit Parts .
		"PARTS" is highlighted and part cost is displayed	OPTION	Aborts purchase.
		(same as above)	SELECT	Purchase the displayed part.
	Ore IV	"ORE IV" is highlighted	num input	Input number of units of Ore IV to purchase. Computer displays cost.
		(same as above)	RETURN	Exit Ore IV .
		"ORE IV" is highlighted and cost is displayed	OPTION	Abort purchase.
		(same as above)	SELECT	Purchase displayed quantity of Ore IV.
Hulls	"HULLS" is highlighted ...	num input	Input number of hulls to purchase. Computer displays cost.	
	(same as above)	RETURN	Exit Hulls .	
	"HULLS" is highlighted and cost is displayed	OPTION	Abort purchase.	
	(same as above)	SELECT	Purchase displayed quantity of hulls.	

QUICK REFERENCE CARD

SECTION	SUB-SECTION	CURRENT DISPLAY	KEYPRESS	FUNCTION
	Programs	"PROGRAMS" is highlighted	num input	Enter the number of the program you wish to buy. Computer displays the cost.
		(same as above)	RETURN	Exit Programs .
	Weapons	"WEAPONS" is highlighted	num input	Enter missile number and quantity. Computer displays price.
		(same as above)	RETURN	Exit Weapons .
		"WEAPONS" is highlighted and cost is displayed	OPTION	Aborts purchase.
		(same as above)	SELECT	Purchase displayed quantity of missiles.
	Crew	"CREW" is highlighted ...	num input	Enter number of crew to be hired. Computer displays cost.
		(same as above)	RETURN	Exit Crew .
		"CREW" is highlighted and cost is displayed	OPTION	Abort hiring.
		(same as above)	SELECT	Hire the displayed quantity of crew.
	Provisions	"PROVISIONS" is highlighted	num input	Enter number of provisions to be purchased. Computer displays cost.
		(same as above)	RETURN	Exit Provisions .
		"PROVISIONS" is highlighted and cost is displayed	OPTION	Abort purchase of provisions.
		(same as above)	SELECT	Purchase displayed quantity of provisions.
	Armor	"ARMOR" is highlighted	num input	Enter type and quantity of armor. Computer displays cost.
		(same as above)	RETURN	Exit Armor .
		"ARMOR" is highlighted and cost is displayed	OPTION	Abort purchase.
		(same as above)	SELECT	Purchase displayed quantity of armor.

QUICK REFERENCE CARD

SECTION	SUB-SECTION	CURRENT DISPLAY	KEYPRESS	FUNCTION
HULL PLACEMENT		Computer displays "Section: "	num input	Selects section of ship to place hulls.
		Computer displays "Quan: "	num input	Enter quantity of hulls.
PARTS PLACEMENT		(same as above)	START	Exit Hull Placement .
		Computer displays "Section: "	num input	Enter section number for part placement.
		You have entered a section number	num input	Enter a new section number.
		(same as above)	OPTION	Move backwards to previous part.
HIGH DEFINITION SCANNER		(same as above)	SELECT	Moves forward one part.
		(same as above)	START	Exit Part Placement .
		If display is "Scan Target"	1 ... 4	Computer asks for magnification.
		If display is "Scanner Mag"	up arrow	Increase scanner magnification by 10%.
		(same as above)	down arrow	Decrease scanner magnification by 10%.
		(same as above)	RETURN	Begin scanning target spacecraft.
		If 3D picture and data are displayed	START	Go to "Scan again?"
		If display is "Scan again?"	Y/N	<Y> returns you "Scan Target," <N> exits section.

QUICK REFERENCE CARD

SECTION	SUB-SECTION	CURRENT DISPLAY	KEYPRESS	FUNCTION
ORE PROCESSORS	Mining Sites		OPTION	Moves arrow to next mining site.
			START	Exit Ore Processors .
	Processor Loading		SELECT	Use selected landing site.
			1 . . . 5	Change load status of Ore processor(s).
	Descent Grid		<ESC>	Exit Ore Processors .
			<L>	Launch Ore Processor(s).
	Mining Screen		1 . . . 5	Change descent status of Ore Processors.
			Q,W,E,R,T	Get a landing site reading for Ore Processors 1-5.
			<C>	Select Ore Processor receiving commands.
			1 . . . 4	Mine Ore 1-4 on selected Processor.
			<5>	Stop all mining on selected processor.
			<L>	All Ore Processors return to main ship.
ASSAULT CAPSULES	Assault Sites		OPTION	Move arrow to next landing site.
			START	Exit Assault Capsules .
	Select Landing Zones		SELECT	Use selected landing site.
			1 . . . 5	Change load status of Processors 1-5.
			up arrow	Move dot one square up.
			down arrow	Move dot one square down.
			left arrow	Move dot one square left.
			right arrow	Move dot one square right.
	Descent		SELECT	Land current Assault Capsule on this zone. Advances to next one or launches if no more.
			1 . . . 5	Change descent status of Assault Capsule 1-5.
	Battle		Q,W,E,R,T	Get a landing site reading for Assault Capsule 1-5.
			1 . . . 5	Return Assault Capsule 1-5 to main ship.

QUICK REFERENCE CARD

SECTION	SUB-SECTION	CURRENT DISPLAY	KEYPRESS	FUNCTION
CARGO MANIFEST			up arrow	Move arrow pointer up.
			down arrow	Move arrow pointer down.
			1 . . . 5	Moves cargo item on pointer row onto Orbital Shuttle 1-5.
			<0>	Moves cargo item on pointer row into cargo hold.
			SELECT	Scroll manifest down one line.
			OPTION	Scroll manifest up one line.
			START	Exit Cargo Manifest .
LAUNCH ORBITERS	Load Orbiters		<ESC>	Exit Launch Orbiters .
			OPTION	Advance to next section and highlight.
			SELECT	Change currently highlighted area.
		If "ENERGY" is selected	num input	Enter percentage energy to load.
		If "CREW" is selected	SELECT	Crew load status changes.
	If "ORE" is selected	num input	Enter quantity of Ore to load onto orbiter.	
	If "PSNGR" is selected	num input	Enter number of passengers to load onto orbiter.	
			START	Launch orbiters.
		Once orbiters are launched	1 . . . 5	Change descent status of orbiters 1-5.
REPORT STATUS			OPTION	Move arrow to next selection.
			SELECT	Display status of selected system or exit if on " * * EXIT * * "
		If computer is displaying status of a section	START	Return to Report Status menu.

QUICK REFERENCE CARD

SECTION	SUB-SECTION	CURRENT DISPLAY	KEYPRESS	FUNCTION	
PROGRAM CONTROL			START	Exit Program Status .	
			up arrow	Move row pointer one row up.	
			down arrow	Move row pointer one row down.	
			OPTION SELECT	Change column pointer. Change value pointed at by row and column pointer.	
BUYER'S BOARD			<ESC>	Exit Buyer's Board .	
			0 ... 9	Purchase product 0-9.	
PORTMASTER			<ESC>	Exit Portmaster .	
			up arrow	Move row pointer up one row.	
			down arrow	Move row pointer down one row.	
			<L>	Loading selected item onto current orbiter.	
			<C>	Go to Change Orbiter .	
		Change Orbiter		1 ... 5	Change current orbiter to 1-5.
SELLER'S BOARD			<ESC>	Exit Seller's Board .	
			<A>	Add an item from any orbiter.	
			<R>	Go to Remove Item .	
		Remove Item	If computer is displaying "ITEM NUMBER?"	0 ... 9	Removes item 0-9 from Seller's Board.
				<P>	Go to Item Pricing .
		Item Pricing	If computer is displaying "ITEM NUMBER?"	0 ... 9	Enter number of item to price.
				num input	Enter new price.
				<S>	Start bidding.
		If computer is displaying "BIDDING UNDERWAY"	<H>	Halts bidding.	

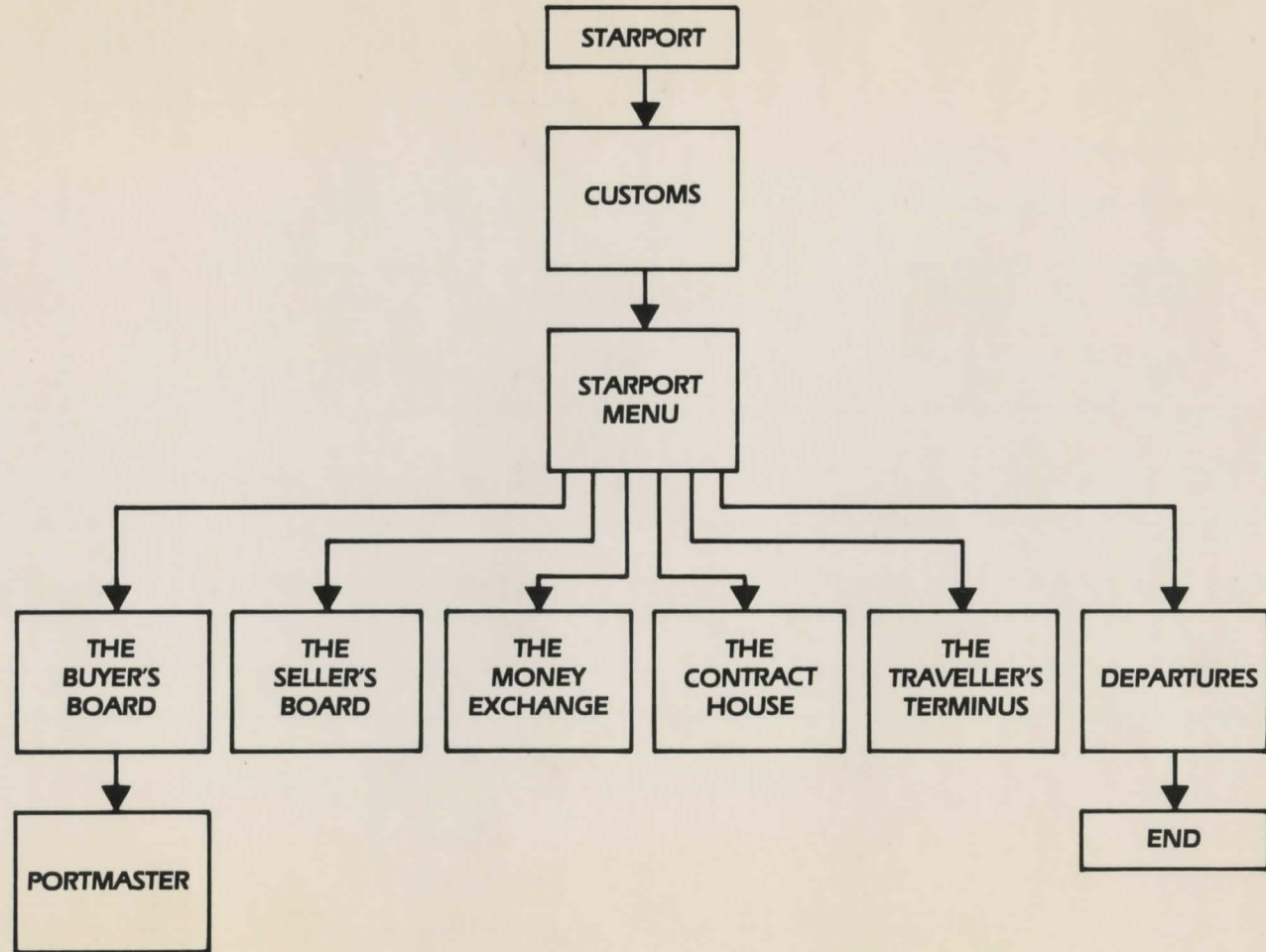
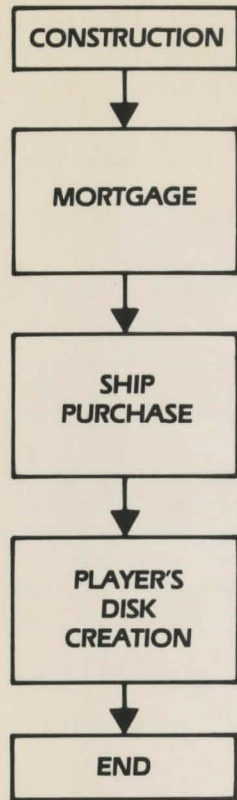
QUICK REFERENCE CARD

SECTION	SUB-SECTION	CURRENT DISPLAY	KEYPRESS	FUNCTION
MONEY EXCHANGE			<ESC>	Exit Money Exchange .
			<E>	Go to Exchange .
			<T>	Go to Transfer .
	Exchange		<1>	Go to Xchng Ore-Credits .
			<2>	Go to Xchng Ore-Ore .
	Xchng		<C>	Exchange Credits-to-Ore.
	Ore-Credits		<O>	Exchange Ore-to-Credits.
			If computer is displaying "Number of Credits?" num input	Enter number of credits to be exchanged for Ore.
			If computer is displaying "Units of Ore?" num input	Enter units of Ore to be exchanged for credits.
	Xchng Ore-Ore		If computer is displaying "Exchange which Ore?" 1 ... 4	Enter Ore to exchange from.
		If computer is displaying "To which Ore?" 1 ... 4	Enter Ore to exchange to.	
Transfer		If computer is displaying "Xchng from which Orbiter?" 1 ... 5	Enter orbiter to remove Ore from.	
		If computer is displaying "To which Orbiter?" 1 ... 5	Enter orbiter to put Ore into.	
CONTRACT HOUSE			<ESC>	Exit Contract House .
			1 ... 5	Select contract 1-5.

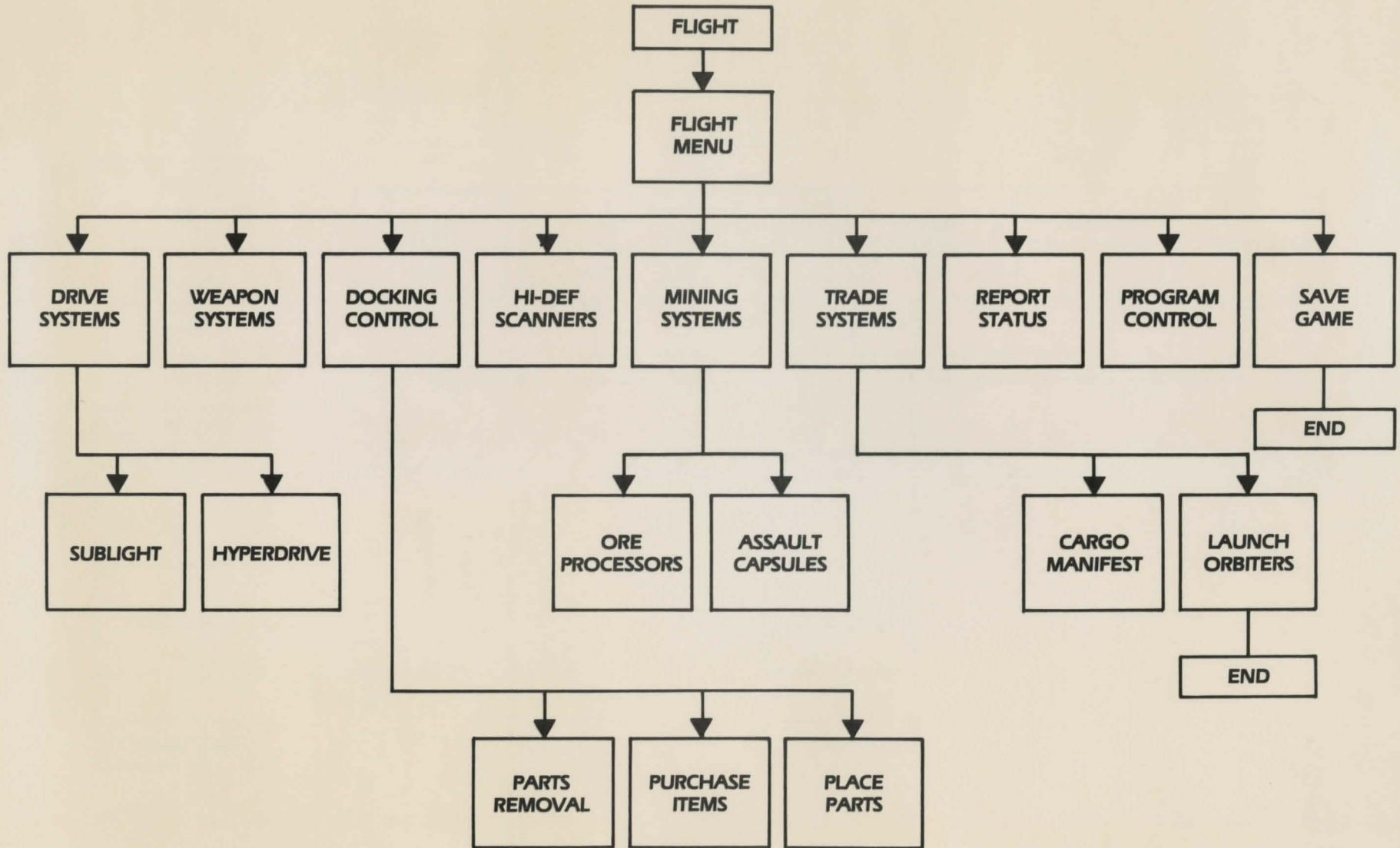
QUICK REFERENCE CARD

SECTION	SUB-SECTION	CURRENT DISPLAY	KEYPRESS	FUNCTION
TRAVELER'S TERMINUS			<ESC>	Exit Traveler's Terminus .
			<L>	Go to Load Travs .
			<U>	Go to Unload Travs .
	Load Travs	If computer is displaying "Which Orbiter?" 1 ... 5		Enter orbiter to load pas- sengers onto.
		If computer is displaying "How many passengers?":..... num input		Enter number of pas- sengers to load onto selected Orbiter.
	Unload Travs	If computer is displaying "Which Orbiter?" 1 ... 5		Enter orbiter to unload passengers from.
	If computer is displaying "How many passengers?":..... num input		Enter number of pas- sengers to unload from selected Orbiter.	
DEPARTURES			<ESC>	Exit Departure .
			<R>	Go to Repair .
			<F>	Go to Fuel .
				Go to Board .
			<L>	Launch Orbiters. Go to Ascent .
	Repair		1 ... 5	Enter orbiter number 1-5.
		Computer is displaying "Repair how many points?" num input		Enter number of points to be repaired.
	Fuel		1 ... 5	Enter orbiter to be fueled.
		Computer is displaying "How much energy?":..... num input		Enter number of units to be put into selected orbiter.
	Board Ascent		1 ... 5	You board spacecraft 1-5 for the ascent.
		1 ... 5	Change ascent status.	

UNIVERSE FLOWCHART



UNIVERSE FLOWCHART



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