

# Moose's Software Valley



## COMPUTER SPACE SIMULATOR

Version 1.0



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This program is [Free-ware](#) / [Donation-ware](#) – please distribute it and use it freely.

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## Introduction

**Computer Space Simulator** is a remake / recreation of Computer Space, which was the very first coin-operated video arcade game and went on sale in **1971**. Only **1,500** of the machines were ever built, and of these it is estimated that less than 500 of these machines still work / exist.

Computer Space Simulator is for Windows 95, 98, ME, NT, 2000, XP, or later.

The game play in Computer Space consists of you controlling a Rocket and attacking and avoiding the computer controlled enemy Saucers that are trying to shoot you or collide with you. You have an

infinite number of lives, but each game has a set time limit. The object of the game is to have a higher score than the enemy at the end of the time limit.

**The default Rocket controls are :**

Operation	Player 1's Rocket	Player 2's Rocket
Turn Anti-Clockwise	D	K
Turn Clockwise	F	L
Thrust	S	J
Fire / Start a New Game	A	H

N.B. You can change these controls to whatever you like.

This simulator supports the following modes of operation (some only via the Settings screen - see below) :

- Demo
- 1 Player Vs Saucers
- Co-Op 2 Player Against the Saucers
- Player 1 Vs Player 2 (No Saucers)

N.B. "Demo" and "1 Player Vs Saucers" modes are authentic and are available on all Computer Space machines, however "Player 1 Vs Player 2 (No Saucers)" is only available on some Computer Space machines. In addition, "Co-Op 2 Player Against the Saucers" is **not** supported on any real Computer Space machine – i.e. it is NOT authentic at all - but it was far too much fun to leave out !! ;)

Click the "**START**" button to start a game or re-start a game at any time.

You can **PAUSE** the game at any time by hitting the ESCape key or the PAUSE key or by right-mouse clicking on the main window and selecting "Pause Game" from the popup menu.

Click "Settings" while the game is paused or **right-mouse click** anywhere on the main window and select "**Settings**" from the popup menu, and you can edit / change a wide selection of game settings and see the effects of any changes in real time. (See "Settings Screen Options" below).

To get help or find out more, please see this document ("Computer\_Space.PDF") or click "help" while the game is paused or right-mouse click and select "Help" from the popup menu.

You can resize the main game window at any time, and the buttons, bitmaps, etc all re-scale / re-size automatically. Note that the ships and bullets don't change size - they stay the same size regardless of the window size - as this would lead to more interesting game variations. e.g. relatively big ships in a relatively small area or relatively small ships in a relatively small big area, etc. Also, resizing the bullets could make them disappear or be very hard to see.

Computer Space Simulator was developed using **Borland Delphi v5.x**.

**Computer Space Simulator** is for Windows 95, 98, ME, NT, 2000, XP, or later. This program will **NOT** run under Windows 3.x (even with Win32 and WinG installed).

## One Button / One Switch Gameplay :

This simulator also supports One-Button / One-Switch gameplay for either or both players. In this game play mode, "Turn Clockwise" and Fire are the only things you can do – the ship auto-thrusts. So, the "Turn Clockwise" key starts the game and turns your ship and fires your gun– it is the only key you need to press.

Operation	Player 1's Rocket	Player 2's Rocket
Turn Anti-Clockwise	Not Available / Possible	Not Available / Possible
Turn Clockwise	Spacebar	L
Thrust	Auto-Thrust	Auto-Thrust
Fire / Start a New Game	Spacebar	L

N.B. The only differences between the "**Standard**" version and the "**One Click**" version are that the One Click version defaults to one click game play and the spacebar is the default key for starting the game and player 1. The One Click version can be turned into the "Standard" version by un-checking the "**One Button Game: Auto-Thrust, manual turn / fire**" on the "**Rocket Controls**" tab of the **Settings** screen.

## Free-ware / Donation-ware

This program is free-ware / donation-ware. Please distribute and use it freely.

However, if you enjoy using this program, and/or would like to support the continued development of FREE and useful software, please consider making a small donation via **PayPal** (<http://www.paypal.com/>) to [moose@move.to](mailto:moose@move.to)

## Simulator ? Why Not an Emulator ?

First some definitions (N.B. I am relating these definitions to arcade games / software) :

- *Simulator*: A recreation of an existing application or game so that the two programs function and look as identical as possible. For example, if I wanted to simulate the arcade game PacMan, then I'd need to know hundreds or thousands of details about the game so that I could write a program to replicate all of these details as precisely as possible. e.g. I would need to write the code to draw the mazes, etc, and write the code to animate the ghosts and PacMan, and allow the characters to move at the right speeds and in the right directions. And, I'd need know precise details about everything related to the game – e.g. how long an "Energy Pill" turned the ghosts blue, how fast the ghosts move when normal and blue, how these timings / speeds vary on subsequent levels, what happens when PacMan dies, how the scoring works, when does the fruit appear and what points is it worth, etc – so that these could all be recreated accurately within my simulation. At the end of the day, I may spend months of work on the simulator, but it might not be quite 100% accurate. e.g. someone who knew a particular trick on level 55 of the real game might be disappointed that the trick does not work on my simulator. It can be a very time consuming process to accurately reproduce every aspect of the real game.
- *Emulator*: An emulator simulates the underlying hardware on which original software ran, and then allows an exact copy of the original software to run on this artificial layer – usually on a modern computer and operating system. Emulators (e.g. of old arcade games) provide a far more accurate experience than simulators – because the precise details of the software are contained in the copy of the software that is being executed via emulation. To emulate a real PacMan game, I'd need to write a simulator for the CPU(s), graphics processors, sound processors, and all of the other hardware found on a real PacMan machine's circuit boards. Then, I'd need to download the ROMs containing the game code and data for PacMan onto my PC. Finally, I'd need to start this code running on my emulator (which is a simulator of the original machine). If I have simulated

the underlying hardware correctly, then the emulated PacMan game should work and look exactly like the real PacMan game in every way. But, instead of running on ancient hardware inside an old PacMan cabinet, it would be running on a modern computer with a modern operating system. If someone knew a particular trick (e.g. on level 55 of the game), then that trick would still work on the emulator because the original code is running. It can be a very time consuming process to accurately reproduce every aspect of the real game's hardware and electronics, and a very intimate knowledge of the hardware (cpu's, graphics, etc) is required.

- As you will realise from the above discussion, an emulator is a simulator with the level of simulation at least one step removed from the user. e.g. In an emulator, you are simulating the original hardware and then running the original game code on top of this simulated layer. In a simulator, you are simulating the game code which is interacting with the user directly.

So, emulators are very much the "holy grail" in terms of preserving ancient arcade games. Simulators are usually, at best, seen as a stop gap measure until the real machine's hardware can be emulated.

Unfortunately, the control circuits of a real Computer Space machine consist entirely of discreet electronics components. It does not have any CPU(s) or Read-Only Memory (ROM) chips which contain program code or data. If Computer Space did have a CPU and ROM chips, then it could be *emulated* by **MAME** or some other emulator. However, the Computer Space machine's design pre-dates these and other technological advances that were used in subsequent arcade machines. As a result, the only way to emulate this machine would be to emulate all of the electronics used in the machine.

One day an emulator may be able to do this, and we may have computers powerful enough to run such an emulator at satisfactory speeds, but this may not be for years to come.

In the meantime, while working games still exist, I decided to develop an accurate simulation of Computer Space. By the time an emulator can be developed, working Computer Space machines may be extremely rare or even non-existent. If such is the case, then these emulators may rely on my simulator to provide valuable information about the look, feel, and sound of the game.

Kevin at **Computer Space Fan** (<http://www.computerspacefan.com/>) has run my simulator side by side with a real Computer Space machine and carefully and painstakingly tweaked the multitude of settings (see below) to make this simulator function as close as possible to the real thing.

So how close is this simulator ? Well, to quote Kevin :

*Awesome! Looks good to me! That's a wrap here folks, let's put it in the can! I would rate the simulator as 9.5 out of 10. Very well done. I am extremely happy with how this has turned out.*

## Installation Instructions

Download the "Computer\_Space.ZIP" file from my web page, extract the contents to a temporary directory (such as c:\temp), and execute the installer (Computer\_Space\_Install.EXE), and follow the prompts through a standard windows application installation.

N.B. You need to have a recent version of **Adobe Acrobat Reader** or a similar program installed on your computer to enable you to view this PDF document. Adobe Acrobat Reader can be downloaded from here :

<http://www.adobe.com/support/downloads/main.html>

## Uninstall Instructions

There are 3 ways to uninstall the simulator, and all have exactly the same result :

1. In Windows Control Panel, double click on the "Add or Remove Programs" option, select "Computer Space" from the list of programs and click "Remove" and follow the prompts through a standard uninstall.
2. Alternatively, use Windows Explorer to navigate to where you installed the Computer Space Simulator (the default location is c:\Program Files\Computer Space) and double click on the UNWISE.EXE and follow the prompts through a standard uninstall.
3. Or, if you prefer, use the Windows START menu to navigate to the Computer Space program group and select the "Uninstall" icon.

## Minimum System Requirements

- Pentium II 500 MHz or higher
- 16 MB of RAM or more
- Windows 95 or later
- Screen resolution of 800x600 in 15 bit colour (32,000 colours) or better.

## Recommended System Requirements

- Pentium II 500 MHz or higher
- A graphics card – rather than on-board video
- 128 MB of RAM or more
- Windows XP or later
- Screen resolution of 800x600 in 16 bit colour (64,000 colours) or better.

## About Computer Space

The following description of Computer Space is courtesy of the **American Museum of the Moving Image On-Line Museum** (<http://www.movingimage.us/exhibitions/cs98/>):

*"Computer Space, the very first coin-operated video arcade game, was the brainchild of Nolan Bushnell. It is based on a mainframe computer game called **Spacewar**, which was developed in the early '60s at the **Massachusetts Institute of Technology**. By the end of the '60s, it was widely known by computer researchers. Bushnell had the idea of adapting Spacewar for commercial use. He waited for computer components to become smaller and cheaper, and then marketed Computer Space, a coin-operated version. Unfortunately, Bushnell overestimated the public's ability to handle what, at the time, must have seemed like a very complex electronic game. Buttons and knobs controlling thrust and gravity were quite a novelty to players accustomed to pinball flippers. While Computer Space was not a commercial success, Bushnell used the \$500 he earned from it to found **Atari**. Simplifying his approach, he invented **Pong**. An avalanche of quarters followed."*

According to Kevin at **Computer Space Fan** (<http://www.computerspacefan.com/>):

*Personally, my guess is that of the original 1,500 machines, half of them are no longer with us, and half of what remains is beyond restoration. The good news is that likely leaves a few hundred machines still out there.*

## Future Changes / Still to Do / Work Outstanding

1. **Better, crisper, clearer bitmaps / images** for the background, overlay panel, monitor screen surround, start button, etc.
2. **Improved sound effects**. i.e. professionally recorded high quality sound samples, created by hooking a real Computer Space's speaker wires directly up to recording inputs and sampling the sounds at CD quality or better. According to Kevin (<http://www.computerspacefan.com/>) :

*The sounds issue will never be resolved unless some brave person wants to narrow down which circuit on the board handles those sounds, hack a pair of alligator clips onto the outputs and record the sounds that way. I am not that brave.*

N.B. All images and bitmaps are kept in the "bitmaps" sub-directory, and all sounds are kept in the "sounds" sub-directory to enable the easy swapping / changing of these as improved versions become available.

3. Move to a more **accurate collision detection system**. i.e. pixel overlap. The current collision detection algorithm is *circle based*, and while the bullets and Saucers are roughly circular, the Rocket is not, and this can cause some false collision events. Although the current collision detection system is probably more accurate and in-line with a real Computer Space machine.
4. Move my code to **Direct/X** and add in a better Full Screen mode.
5. **Support for other input devices: joystick support, gamepad support, mouse support** (for playing the game), etc.

## Features of Computer Space that have been Intentionally Left Out

The following features / bugs in Computer Space have been intentionally left out of this simulation :

1. Scoring in hex, with strange characters instead of numbers or traditional HEX symbols (such as A, B, ... F), and scores that wrap around to 0 after you get to 15. According to Kevin (<http://www.computerspacefan.com/>) :

*... the original machine seems to be designed thinking nobody would ever get much of a score on it. As a result, the score only goes up to 15. And to make matters stranger still, the game originally did not show double digits for a score. So how did it display scores above 9? In a weird symbol. I have counted these weird nonsensical symbols and they proceed until you have scored 15 times, then your score returns to 0 on the sixteenth score. However, that is a quirk of the original machine and we wouldn't want that in our simulation anyway. The flaw is not something most people would understand and is best left out.*

2. Hyperspace mode. According to Kevin (<http://www.computerspacefan.com/>) :

*There is no Hyperspace mode. In the original, it was possible to continue gameplay by inverting the background stars and restarting the clock. It didn't add much to the game, it was merely a kind of "extended play" and, to be honest, I don't play with that enabled on my own Computer Space anyway as I feel it just drags out the game. I also say the game is more fun without hyperspace mode.*

## What's Next

1. The animation and sound engines that I have built are sufficient for me to tackle more recent and far more complex games.
2. The oldest **Discreet Logic** games (which – like Computer Space - didn't contain any CPU or ROMS) are in danger of being lost forever, because of the ravages of time and general wear and tear. As such, I would like to tackle some other early games – especially **Stunt Cycle**. However, I need some near perfect screen shots, sound samples, and detailed information before I can proceed with this. (It has been nearly 30 years since I played **Stunt Cycle** after all ;) ;)

## WEB Links

- **Moose O'Malley's Software Valley** (the *software developer* for this simulation) :  
<http://move.to/moose>

If you enjoy using this program, and/or would like to support the continued development of FREE and/or useful software, please consider making a small donation via **PayPal** (<http://www.paypal.com/>) to [moose@move.to](mailto:moose@move.to)

- **Kevin's Computer Space Fan** web site (the *consultant* for this simulation) :  
<http://www.computerspacefan.com/>

If you enjoy Kevin's web site, please consider making a small donation via **PayPal** (<http://www.paypal.com/>) to [equinox29@hotmail.com](mailto:equinox29@hotmail.com)

- **American Museum of the Moving Image On-Line Museum** :  
<http://www.movingimage.us/exhibitions/cs98/>

- **Fever's Discrete Logistics** :  
<http://www.mameworld.net/discrete/>

- **Multiple Arcade Machine Emulator (MAME™)** :  
<http://www.mame.net>

- **Killer List of Video Games (KLOV) Computer Space page** :  
[http://www.klov.com/game\\_detail.php?letter=C&game\\_id=7381](http://www.klov.com/game_detail.php?letter=C&game_id=7381)

- **Player 1 Stage 1: Bits From the Primordial Ooze** :  
<http://www.emuunlim.com/doteaters/play1sta1.htm>

- **Retro Remakes** :  
<http://www.retroremakes.com/>


- **One Switch Games** :  
<http://www.oneswitch.org.uk>



## Using this program - Settings, Functions and Options









### Main Game Screen

When Computer Space Simulator is run, a splash screen will be displayed for a few seconds, and then the main games window will appear. At this stage, the game will automatically go into '**Demo**' – i.e. **Attract Mode**.

Button	Function
	Start a game. Which game is started depends on which of these game types is currently selected on the Settings screen : <ul style="list-style-type: none"><li>• 1 Player Vs Saucers</li><li>• Co-Op 2 Player Against the Saucers</li><li>• Player 1 Vs Player 2 (No Saucers)</li></ul>

### Pause Game Menu

When the game's main window has focus, you can press **ESC** to pause the game or demo. When this happens a menu will appear with the following buttons.

Button	Function
 Continue	Resume – i.e. un-pause - the current game / demo.
 Demo	Start the Demo mode – i.e. "Attract Mode" - if it isn't already been shown.
 Start 1P Vs Saucers	Start a 1 Player game. i.e. Player 1 fighting against the enemy saucers.
 Start 2P Co-Op	Start a 2 Player co-operative game. i.e. Both Players fighting together against the enemy saucers.
 Start 2P Deathmatch	Start a 2 Player Death-match game. i.e. Player Vs Player.
 Help	Display this help file.
 Settings	Display the Settings screen.
 Exit Program	Exit the program.

### Right-Mouse Click Menu Options

You can also **right-mouse click** on the main game window at any time and a pop-up menu will appear, and you can then choose the following options :

- **Settings**  
Show the **Settings** screen. This is the same as pressing '**ESC**' and clicking the "Settings" button.
- **Hide Attraction Panel, Start Button, etc**



If you select this option, then you can play the game and the game's screen will take up the full window. i.e. you will not see the Attraction Panel, Start Button, etc. Selecting this option again will show the Attraction Panel, Start Button, etc again.

- **Hide Window Titlebar**

Selecting this option will hide the main game window's title bar. Selecting this option again will show the main game window's title bar. This setting is NOT saved on exit because windows without title bar are a pain to deal with, move around, etc.

- **Pause Game**

Pause the game. This is the same as pressing "ESC".



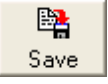

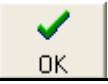
- **Help**

Show this help file. This is the same as pressing "ESC" and clicking the "Help" button.

- **Exit**

Exit the program. This is the same as pressing "ESC" and clicking the "Exit" button.

## Settings Screen Buttons

Button	Function
 Help	Display the online help. i.e. load the file "Computer_Space.PDF" into Adobe Acrobat Reader or whatever PDF reader you have installed as the default reader on your PC.
 Load	Load enables you to load settings from an INI file. See "Save" below. N.B. Once you load the settings from another INI file, they will be saved in the main "Computer_Space.INI" file and NOT saved back into the INI file from which they were loaded unless you use the "Save" button.
 Save	Save allows you to save the current settings to a separate INI file. This may be useful for people who want to make up their own game variations. You can save each variation to a file with its own name. You can also share these INI files with friends (e.g. by emailing the INI file to them) and they can load it and play the game with your settings.
 Defaults	This button restores the "Factory Defaults". i.e. the program and game settings that Kevin at Computer Space Fan ( <a href="http://www.computerspacefan.com/">http://www.computerspacefan.com/</a> ) determined as being the most realistic and accurate after running the simulator side-by-side with a real Computer Space machine.
 OK	Close the settings screen.

There are several other settings screen buttons, and these are described below with the settings they apply to.

## Settings Screen Options

Right-mouse click anywhere on the main window, and select "**Settings**" from the popup menu, and you can edit / change a wide selection of game settings and see the effects of any changes in real time.

Type of Setting	Setting Name	Setting Meaning / Background Information
General	1. Air Resistance / Friction	How thick the atmosphere is. A value of 0 indicates that there is no air resistance, and the Rocket will never slow down unless you use its thrusters or crash. A value of 1 is light air resistance. Higher values mean higher air resistance, and the Rocket will slow down and stop more quickly.
General	2. Game Time Limit in Seconds (0=No Limit)	The time limit is seconds for each game. A value of 0 indicates that there is no time limit – i.e. the game goes on forever.
General	3. Flash Screen for Millisec	When a Rocket or Saucer is killed, the screen is flashed for this many milliseconds.
General	4. Limit the Frames Per Second	If this setting is checked, then the game will be limited to 33.33 frames per second (timer resolution = 30 millisec, and $1000 / 30 = 33.33$ fps), regardless of how powerful the computer is you run it on – well, within reason anyway – if you run it on a 386 you will get less !! ;) Certainly anything like a Pentium III PC or later will run the simulator at 33.33 fps. If this setting is not checked then it will run the game at about 100 frames per second (timer resolution = 10 millisec, and $1000 / 10 = 100$ fps) – provided your hardware can handle this rate, and you are running Windows 2000 or later.
General	5. Show Speed, Angle, Thrust, etc Information	The status boxes at the top of the screen were invaluable during the development and testing of this game. This option has been left there just in case others want to see the status information.
General	6. Disable Sound Effects	If this setting is checked, then no sound effects will be heard.
General	7. Player scores for Rocket-Saucer collision	If this setting is checked, then the player will score 1 point even if they ram a Saucer. If this setting is NOT checked, then they will score no points if they collide with a Saucer.
General	8. Saucer scores for Rocket-Saucer collision	If this setting is checked, then the CPU will score 1 point if they collide with the Rocket. If this setting is NOT checked, then the CPU will score no points if they collide with a Rocket.
General	9. Disable Collision Detection	If this setting is checked, then no collision detection will occur, so bullets will not hit / kill enemies, and Saucers will pass straight through the Rocket if they collide without causing any harm.
General	10. Initial Saucer Positioning	This setting affects how the saucers are initially placed with respect to the Rocket : <ul style="list-style-type: none"> <li>• Lenient - Saucers will be placed a reasonable distance away from the Rocket. The simulator will try and place the Saucers away from the middle part of the screen.</li> <li>• Authentic - Saucers can appear anywhere - even next to or on top of the Rocket. Warning: This means your Rocket may collide with a Saucer and explode as soon as it appears !</li> </ul>
General	11. Game Type (When you start the next game)	Available game types are : <ul style="list-style-type: none"> <li>• 1 Player Vs Saucers</li> <li>• Co-Op 2 Player Against the Saucers</li> <li>• Player 1 Vs Player 2 (No Saucers)</li> </ul> <p>N.B. The selected game type will be played when you start the next new game ! Click the "Start" button to start a new game at any time.</p> <p>Also note that the real Computer Space does <b>NOT</b> have a "Co-Op 2 Player Against the Saucers" mode, but this was too good and too much fun to leave out.</p>

Type of Setting	Setting Name	Setting Meaning / Background Information
General	12. Stay On Top Of Other Windows	When "Yes" is selected, the Settings window will stay on top of all other windows, which means you can overlap the main window or any other window and still have the entire settings window visible. This is useful when you are changing lots of settings.
General	13. Show Attraction Panel, Start Button, etc	This setting defaults to "checked". If you uncheck this setting, then you can play the game and the game's screen will take up the full window. i.e. you will not see the Attraction Panel, Start Button, etc.  N.B. You can also right-mouse click on the main game window and select " <b>Hide Attraction Panel, Start Button, etc</b> " from the popup menu.
Rocket	14. Ship Thrust	A measure of the Rocket's thrust. 0 is no thrust. 1 is a very weak thrust. 20 is a very strong thrust.
Rocket	15. MAX Ship Speed	How fast the ship can move (at maximum speed).  <b>WARNING: If this value is too large, then the Rocket might pass right over the Saucers or the Saucer's bullets without colliding with them.</b>
Rocket	16. Ship Turn (i.e. Rotate) Rate	A measure of the Rocket's thrust. 0 means that the Rocket will Not turn. A value of 1 means that the is a very weak thrust. A value of 30 is a very strong thrust.
Rocket	17. MAX Bullets on Screen	The maximum number of bullets that the Rocket can have on-screen at any time. 0 means that the Rocket cannot fire at all. 1 means that the Rocket can fire only one bullet at a time, and it will not be able to fire again until the bullet is removed from the screen. e.g. by hitting a Saucer or by moving it's allocated maximum distance.
Rocket	18. Bullet Speed	How fast the Rocket's bullets can move (at maximum speed). N.B. You will only see the effect of this change when you fire the next bullet.  <b>WARNING: If this value is too large, then the Rocket's bullets might pass right over the Saucers without colliding with them.</b>
Rocket	19. Gun Reload Time (Millisec)	How long it takes the Rocket's gun to reload, in milliseconds. As soon as a bullet is fired, the gun waits this many milliseconds before it can be fired again. As soon as this many milliseconds has passed, it will be able to fire again, providing the "MAX Bullets on Screen" hasn't been exceeded, otherwise you will have to wait for a bullet to hit a Saucer or reach it's maximum movement distance before you can fire the gun.
Rocket	20. Bullet Travel Distance (Pixels)	How far the Rocket's bullets can move (in pixels) before they are automatically destroyed. e.g. a value of 500 indicates that the bullet will move 500 pixels before it is destroyed / removed.
Rocket	21. Bullet Type – Straight or Steerable	If the bullet type is "Straight" then the Rocket's bullets will move in a straight line in the direction in which they are fired. If the bullet type is "Steerable", then you can steer the bullets into targets by turning the Rocket in the desired direction.
Rocket	22. Player Death Delay (Millisec)	After the Rocket is killed (e.g. by a Saucer collision), how many milliseconds before the game is reset and play can commence. This setting provides a nice pause in the middle of the action.
Rocket	23. Rocket Hit Points	How tough is the Rocket to kill ? i.e. how many Saucer bullets need to hit it to kill it.
Saucer	24. Saucer Speed	How far the Saucer can move (at maximum speed) – the saucers always move at maximum speed.  <b>WARNING: If this value is too large, then the Saucers might pass right over the Rocket or the Rocket's bullets without colliding with them.</b>
Saucer	25. Millisec Between Frames of Animation	The amount of time in milliseconds between frames of animation of the Saucer. Smaller values indicate that the Saucers are animated more quickly.

Type of Setting	Setting Name	Setting Meaning / Background Information
Saucer	26. Number of Saucer's On Screen at Once	The number of Saucers on screen when the game is first started or when the game is reset during play.
Saucer	27. Reinstate all Saucers when number equals	This value indicates when the entire squadron of Saucers should be reinstated. For example, if you have 5 Saucers on screen, and you set this value to 2, then the original 5 Saucers will be reset on the screen when 3 are killed.
Saucer	28. Distance between Saucer Centres (in Pixels)	This setting allows you to specify how close the Saucers are together when they are in formation. A value of 100 indicates they are 100 pixels apart. A value of 0 means that they are all on top of each other. If this value is too low, or the number of Saucers on screen is high, then Saucers may overlap on each other, and (to the Rocket's point of view) they may require several hits to kill because only 1 Saucer will be hit at a time.
Saucer	29. Change Direction Every so many Millisec	This setting allows you to specify how often the Saucers change direction.
Saucer	30. Change Direction Increment (in Degrees)	When the saucers change direction indicates, they will change in an increment of this many degrees. For example, if this is set to 45 degrees, then the saucers will only be able to head in the directions 0, 45, 90, 135, 180, and so on.
Saucer	31. Gun Reload Time (Millisec)	How long it takes each Saucer's gun to reload, in milliseconds. As soon as a bullet is fired, the gun waits this many milliseconds before it can be fired again. As soon as this many milliseconds has passed, it will be able to fire again, providing the "MAX Bullets on Screen / Saucer" hasn't been exceeded, otherwise the Saucer will wait for a bullet to hit the Rocket or reach it's maximum movement distance before it can fire the gun.
Saucer	32. MAX Bullets on Screen / Saucer	The maximum number of bullets that each Saucer can have on-screen at any time. 0 means that no Saucer can fire at all. 1 means that each Saucer can fire only one bullet at a time, and it will not be able to fire again until the bullet is removed from the screen. e.g. by hitting the Rocket or by moving it's allocated maximum distance.
Saucer	33. Bullet Speed	How fast each Saucer's bullets can move (at maximum speed). N.B. You will only see the effect of this change when a Saucer fires the next bullet. <b>WARNING: If this value is too large, then the Saucer's bullets might pass right over the Rocket without colliding with it.</b>
Saucer	34. Bullet Travel Distance (Pixels)	How far each Saucer's bullets can move (in pixels) before they are automatically destroyed. e.g. a value of 500 indicates that the bullet will move 500 pixels before it is destroyed / removed.
Saucer	35. Intentional Error in Bullet Trajectory (Degrees)	This is a very basic Artificial Intelligence (AI) setting for the Saucer's attacks. If this setting has a value of 0, then each Saucer will target (and hit) the centre of the Rocket with every shot, unless the Rocket manages to move out of the way. A value of 10 indicates that there will be up to 10 degrees of error in the Saucer's firing direction, meaning the bullet may go anywhere from 10 degrees too high (or left) or 10 degrees too low (or right).
Saucer	36. Saucer Death Delay (Millisec)	After a Saucer is killed (e.g. by a Rocket bullet) and the number of saucers left drops below the "Reinstate all Saucers when number equals" setting, then this setting specifies how many milliseconds before the game is reset and play can commence. This setting provides a nice pause in the middle of the action.
Saucer	37. Saucer Hit Points	How tough is each Saucer to kill ? i.e. how many Rocket bullets need to hit a Saucer to kill it.

Type of Setting	Setting Name	Setting Meaning / Background Information
Rocket Controls	Player 1 and Player 2	<p>Click on the label or the box containing the currently defined key, and you will be prompted to press a key, which will then be used to perform the selected operation from now on.</p> <p>There are also 3 buttons for each player's controls to automatically assign pre-defined sets of control keys : Arrows+Spacebar, WASD, and ASDF.</p> <p>You can assign the same keys to both players – and this is pretty cool when you want to play 2 Player Co-Op against the Saucers – as then <b>you control both ships and they fly in formation.</b></p>
Rocket Controls	One Button Game: Auto-Thrust, manual turn / fire	<p>If this setting is checked then the player's rocket will thrust all the time, and a single selected key will be used to fire the rocket's weapon, turn the rocket clockwise, and steer the bullet.</p> <p>There is a separate setting for each player, so neither, either or both players can have "One Button Game" checked.</p>

## Warranty

This software and the accompanying files are provided "as is" and without warranties as to performance or merchantability or any other warranties whether expressed or implied. The user assumes the entire risk of using this software.

If you do find any faults with this program, email me and let me know, and I will do my best to fix it ASAP.

## Amendment History

Ver	Release Date	Changes / Comments
v0.0001  Private, very early and *very* rough pre-release alpha version.	31-Mar-2005	<ul style="list-style-type: none"> <li>Private, very early and *very* rough pre-release alpha version.</li> <li>Initial Release - for testing / feedback / comment / etc by Kevin who owns a real Computer Space and runs the Computer Space web site at <a href="http://www.computerspacefan.com/">http://www.computerspacefan.com/</a></li> <li>Added some status displays : H&amp;V Rocket speed, H&amp;V Rocket thrust, and Rocket Angle.</li> <li>Added the Rocket, which you can manually fly around - you can turn and thrust - no firing yet. The Rocket handles just like in Asteroids – a point which Kevin was worried about.</li> <li>Added a nice space, nebula, and stars background bitmap - which is nothing like what the real machine has, but it'll do until I can get something more like the real Computer Space.</li> <li>Added the Rocket, which you can manually fly around - you can only turn and thrust, no firing yet.</li> <li>The program code is heavily based on my previous code / animation work for my <b>Game Prototypes 1-6</b> (only #5 was released on my web site), my <b>Solar System Simulator</b>, and my <b>Robot Simulator</b> (not released at this time), etc.</li> </ul>
v0.0002  Private, very early and *very* rough pre-release alpha version.	4-Apr-2005	<ul style="list-style-type: none"> <li>Added some more status displays : Number of Sprite on Screen, Frames Per Second, and overall Rocket Speed.</li> <li>Added 2 saucers - they don't attack or change direction, and they aren't aligned right, but at least they are there.</li> <li>Create an extra frame of animation for the saucer - so, now there are 2 frames of animation.</li> <li>Improve rocket handling, acceleration, physics.</li> <li>Added the ability to fire the gun on the Rocket - although the bullet appears next to the rocket or in the middle of the rocket, instead of at the snout of the rocket, but I will fix this soon.</li> <li>Added Settings Screen - Right-Mouse click anywhere on the main screen, and select "Settings" from the popup menu, and you can edit / change some game settings and see the effects of any changes in real time. Settings</li> </ul>

Ver	Release Date	Changes / Comments
		include : Air Resistance Factor, Limit the Frames Per Second, Stay on Top of All Other Windows, along with Rocket Thrust, Max Rocket Speed, Rocket Turn Rate, Max Bullets on Screen at Once, Bullet Speed, Gun Reload Time, and Maximum Bullet Travel Distance.
v0.0003  Private, very early and *very* rough pre-release alpha version.	8-Apr-2005	<ul style="list-style-type: none"> <li>Added a Splash Screen on start-up.</li> <li>Added a bunch more settings options : you can now change the number of saucers, the distance between the saucers, the flying formation of the saucers (horizontal, vertical, or random), saucer speed, speed of animation, change saucer speed, and the ability to specify the milliseconds between saucer direction changes. More settings / options to come.</li> <li>Added the ability to change the Rocket's control keys to whatever you like.</li> <li>Added the ability to turn-off the angle, speed, etc display status displays.</li> <li>Improve rocket handling, acceleration, physics.</li> <li>Add the ability for saucers to change direction in formation. This needs more work as I don't have enough information about how the saucers move in a real Computer Space machine - I think they may move in increments of 45 degrees only.</li> <li>Fix where the Rocket's bullets appear - they now appear at the snout of the rocket as they should.</li> <li>Added a realistic Computer Space background - which I created / edited from a screen shot of a real Computer Space machine in action. (Had to remove the rocket, saucers, score, and clean it up).</li> <li>Resize the rocket and saucer bitmaps to half of their previous size to make them more in-line with a real Computer Space machine.</li> <li>Save all form positions and sizes on exit. Like all settings in this program, they are automatically restored next time the program is run.</li> <li>Massive changes to my code behind the scenes - to facilitate adding new and more complex functionality, multiple players, etc. Move to a better / more streamlined design to make re-using my code easier in the future.</li> </ul>
v0.0004  Private, very early and *very* rough pre-release alpha version.	11-Apr-2005	<ul style="list-style-type: none"> <li>On the Rocket Controls settings, change the Editboxes to StaticTexts because they are more appropriate. Also allow the user to click the labels or the static text boxes to change each control option, and add some help text to the screen to tell people what to do to change the controls.</li> <li>Add circle based collision detection - not 100% accurate, but it will probably do.</li> <li>Add support for sound - explosions, Rocket thrust, weapon fire, etc. However, a full set of sound samples is required. In the meantime, I am using various sounds from a real Computer Space.</li> <li>Initially I used the good old Windows API's PlaySound function, but then I changed everything over to using Direct/X Sound functions and buffers - which provides a far superior result when lots of sounds are playing at once.</li> <li>Add a bunch of new options on the Settings screen : "Disable Sound Effects", "Reinstate all saucers when number equals", "Game Time Limit in Seconds (0=No Limit)", "Player Death Delay (Millisec)", "Player scores for Rocket-Saucer collision", and "Saucer scores for Rocket-Saucer collision".</li> <li>Make the bullets solid white blocks - as requested.</li> </ul>
v0.0005  Private, very early and *very* rough pre-release alpha version.	13-Apr-2005	<ul style="list-style-type: none"> <li>Add a bunch of new settings : "Disable Collision Detection", "Saucer Gun Reload Time (Millisec)", "Intentional Error in Bullet Trajectory (Degrees) (for Saucers)", "MAX Bullets on Screen / Saucer", "Saucer Bullet Speed", "Saucer Bullet Travel Distance (Pixels)", "Change Direction Increment (in Degrees)", "Saucer Death Delay (Millisec)", and "Flash Screen for Millisec".</li> <li>You can now <b>PAUSE</b> the game by pressing the <b>ESC</b> key or <b>Pause</b> key (when the game window has focus) or right-mouse click on the main window and select "Pause Game" from the popup-menu., and you can chose to continue the game, quit the current game, or exit the program.</li> <li>Provide a hot link to <b>Kevin's Computer Space Fan web site</b> from the main window.</li> <li>Bring the game further into line with a real Computer Space machine : <ul style="list-style-type: none"> <li>Add transparent score and timer displays.</li> <li>Game timer now counts up instead of down.</li> <li>Make the timer always show 2 digits. i.e. show a leading zero if the elapsed time is less than 10 seconds.</li> <li>The running lights on the flying saucers are now stationary when the saucers are holding still or travelling vertically as required - in line with a real Computer Space machine. i.e. the frames of animation are only changed when the saucer's horizontal speed is not equal to 0.</li> <li>The saucers now move in increments of 45 degrees only – in line with a real Computer Space machine.</li> <li>Change the Saucer destruction processing to match a real Computer Space machine : when a saucers is hit, the whole screen flashes but no explosion is shown on the screen, and both saucers disappear for a</li> </ul> </li> </ul>

Ver	Release Date	Changes / Comments
		<p>second or two before they re-spawn. Use the options on the Settings Screen to change the delays, flash times, etc.</p> <ul style="list-style-type: none"> <li>○ Use a better / more accurate font for the scores and timer in the game's main window - the FREEWARE "SF Square Head" from <a href="http://spacefonts.8m.com/">http://spacefonts.8m.com/</a> is used, and this gives nice square digits which are very much like the real machine.</li> <li>○ Add the Rocket, Saucer, Time labels and icons on the right hand side of the screen. Let me know if you like this idea Kevin.</li> </ul> <ul style="list-style-type: none"> <li>• Convert the text file accompanying the program into a nicely formatted PDF document- see <b>Computer_Space.PDF</b>.</li> <li>• Create a "<b>Settings Glossary and Help</b>" to explain the effect of each setting / option - see Computer_Space.PDF.</li> <li>• Add a Help button to the Settings Screen and a help option on the popup menu which loads the Computer_Space.PDF.</li> <li>• Show a lit control panel at the bottom of the screen. Let me know if you like this idea Kevin. (A clearer, crisper image would be nice though ... Kevin ?)</li> <li>• Forwarded Computer Space Simulator v0.0005 to <b>Fever</b> at <b>Discrete Logistics</b> (<a href="http://www.mameworld.net/discrete/">http://www.mameworld.net/discrete/</a>) to ensure he knows about and is kept informed about this project.</li> </ul>
v0.0006  Private, very early and *very* rough pre- release alpha version.	15-Apr-2005	<ul style="list-style-type: none"> <li>• Yiiikes – during PDF creation yesterday my PC started hanging (it turns out that this was because of the "Planetary-X" font I was using in a document), but before I worked out where the problem was I had to kill some applications. As it turns out I lost the following changes / fixes for v0.0050 during this : Screen Flashing and the time delay for resetting the saucers. Both of these are now reinstated / fixed.</li> <li>• Add new setting : "Initial Saucer Positioning" (see #10 above), which allows you to make the initial positioning of the saucers less suicidal.</li> <li>• Bring the game further into line with a real Computer Space machine : <ul style="list-style-type: none"> <li>○ When the rocket is hit, the screen now flashes and, in addition, the graphic of the rocket spins clock-wise really fast.</li> <li>○ Add a Computer Space <b>Attract Mode</b>. i.e. what the machine does when no-one is playing it. In Attract Mode, the rocket disappears and the saucers just fly around without shooting at anything, the scores and timer are not updated, and no sounds are made.</li> <li>○ Ensure I have implemented the correct Saucer bullet processing : If a Saucer is hit by a Rocket's bullet, any bullet(s) that they had on screen continue in a straight path – they are not removed when the Saucer that fired them is killed. The Saucer's bullets are removed, of course, when they move their allotted distance.</li> </ul> </li> <li>• Reduce the rotation angle step size of the Rocket from 10 to 5 degrees – which gives a much smoother rotation at slower speeds. (I tried 1 and 2 degrees as well, but could not discern any improvement / benefit over 5 degrees).</li> <li>• A new and complete set of sound effects – thanks to Kevin for preparing these.</li> <li>• Add support for these new sounds, and add code to keep on playing a sound over and over in a loop while a sprite is on-screen (e.g. while a bullet is travelling), and while a certain action is happening (e.g. Rocket rotating) - which is in line with a real Computer Space machine.</li> <li>• Use a "Start" button image taken from a photo of a real Computer Space machine.</li> <li>• Add a TV / Monitor screen surround around the game screen – just like on a real Computer Space machine. I created this image by editing a photo of a real Computer Space machine, but I have zero artistic ability, so it is pretty rough / crappy / jaggy.</li> <li>• Installer – to handle the installation of fonts, bitmaps, sounds, etc, and the creation of directories and program group. At the end of installation, Computer Space Simulator will automatically run.</li> <li>• Switch to multiple timers / threads to run the game and handle the processing. Re-design the main loop so that the CPU much less than 100% of the CPU is utilised. Even at 100 fps, on my ancient Pentium III 667 Windows XP machine, Computer Space Simulator now only uses about 2% of the CPU.</li> <li>• Add more control over bullet and ship speed. Having to specify a whole number of pixels per frame may was too limiting at slow speeds. All speeds now are multiplied by 0.1 behind the scenes. So, a speed of 30 now equals a speed of 3 previously. As a result of this change, the speeds on the settings screen are no-longer in the units "Pixels moved per Frame".</li> <li>• Add a "Restore Factory Defaults" button to the settings screen. (N.B. The factory default settings aren't correct / complete yet).</li> <li>• Reduce the "Computer_Space.PDF" size from 743 KB to 83 KB.</li> <li>• Note Well :</li> </ul>



Ver	Release Date	Changes / Comments
		<ul style="list-style-type: none"> <li>○ The installer will automatically overwrite your INI file (with a blank one) if you install over the top of your previous version - so keep a backup if needed.</li> <li>○ The ship and bullet speeds settings have a new scale to allow for more precise and slower movements.</li> </ul>
v0.0007  Private, very early and *very* rough pre-release alpha version.	15-Apr-2005	<ul style="list-style-type: none"> <li>• Add Steerable Shells for the Rocket. Yaaahhooooo !! :) Steerable shells sure improve the game and make it a lot more fun.</li> <li>• Fix the calculations for the bullet moved distance.</li> <li>• Fix the pause game function – the new timer / thread designs weren't pausing, but they are now.</li> <li>• Fix the Restore Defaults functionality – some of the settings were not being restored properly – there appears to be a bug in Windows <i>EraseSection</i> INI file method.</li> <li>• Make the Pause screen / functionality available all the time – even during the demo.</li> <li>• Add "Help" and "Settings" buttons to the Pause screen.</li> <li>• If you press "ESC" while the Pause screen is displayed, the game will continue.</li> <li>• Bring the game further into line with a real Computer Space machine : <ul style="list-style-type: none"> <li>○ Correct Collision processing as described by Kevin "When either the Saucers collide with the Rocket or the Rocket collides with either Saucer, all bullets are removed from the screen when the ships explode. In fact, all action momentarily freezes for that brief second."</li> </ul> </li> </ul>
v0.0008	18-Apr-2005	<ul style="list-style-type: none"> <li>• Incorporate Kevin's game settings (which he has carefully checked and verified side by side against a real Computer Space machine) as the "Factory Defaults" for the simulator.</li> <li>• Bring the game further into line with a real Computer Space machine : <ul style="list-style-type: none"> <li>○ Add flame / exhaust coming out of the Rocket when it is using thrust. I drew the flame animations by hand after seeing the Quicktime movies of the game in action. This fixed Kevin's reported discrepancy : "Oh, and I should have mentioned, when the rocket is using thrust, there are two pixels lit in its tail area, to look like a flare of light coming out."</li> <li>○ Change the "MAX Bullets on Screen / Saucer" setting to "MAX Bullets on Screen Group of Saucers". This fixed Kevin's reported discrepancy : "The flying saucers only fire one shot. These guys are still firing two shots, so if that can be adjusted that would help".</li> <li>○ Fix Kevin's reported discrepancy : "The rocket's bullet is continuing to survive even after it hits the saucers. It should disappear."</li> <li>○ Fix Kevin's reported discrepancy : "If the Rocket gets hit [by a Saucer bullet], its shot goes all wonky. What do I mean by wonky? Well even if it was headed straight for the saucers, once the Rocket is hit, the bullet will turn randomly in tight circles and erratically, usually missing the target. Hard to explain. If the saucers kill the rocket and the Rocket has a bullet in transit, it should waver about erratically (though for some reason the opposite is not true for the saucers' shots)."</li> </ul> </li> <li>• Tighten up the circle based collision detection (and fix a bug in my code) to remove most false collision events.</li> <li>• Enable and activate the "Bullet Type" setting – so the Rocket can have steerable or straight bullets.</li> <li>• Add some additional settings "for fun" : "Rocket Hit Points" and "Saucer Hit Points". These and the other settings enable you to make some cool game variations. e.g. make a tough Rocket that can withstand ramming Saucers and getting hit by many bullets.</li> <li>• Add in the ability to save and load settings to and from separate INI files. This makes it easy to make up your own games and share them with friends.</li> <li>• Add in support for cooperative and death match game types via the "Game Type (When you start the next game)" option on the Settings screen and draw additional "Rocket Saucer Time" labels to support these modes of play. Available game types are : <ul style="list-style-type: none"> <li>○ 1 Player Vs Saucers</li> <li>○ Co-Op 2 Player Against the Saucers</li> <li>○ Player 1 Vs Player 2 (No Saucers)</li> </ul> <p>I've gotta say that these are really cool. Even when playing on your own, if you are playing cooperatively and have both ships set with the same controls then you can do some spectacular synchronised flying and some great double barrelled saucer shooting !! Even though the real Computer Space doesn't have a "Co-Op 2 Player Against the Saucers" mode, this is too good and too much fun to leave out.</p> </li> </ul>
v0.0009	19-Apr-2005	<ul style="list-style-type: none"> <li>• Make the "Start" button stay active all the time, so you can start a new game or re-start a game at any time - simply by clicking it with the mouse - as requested by Kevin.</li> <li>• Add a "Start New Game" button to the Pause screen - as requested by Kevin.</li> <li>• Add in form resizing / scaling - so you can re-size the game window and the buttons, bitmaps, etc all re-scale / re-size automatically.</li> </ul>

Ver	Release Date	Changes / Comments
		<ul style="list-style-type: none"> <li>N.B. At this stage, the ships and bullets do not change size - they stay the same - and I thought this would lead to more interesting game variations. e.g. relatively big ships in a relatively small area or relatively small ships in a relatively small big area, etc. Also, resizing the bullets could make them disappear or be very hard to see.</li> <li>Add an "Uninstall" icon to the Computer Space program group on installation - as requested by Kevin. This gives you 3 ways to uninstall the program – see "Uninstall Instructions" above.</li> <li>Change Kevin's web site from "Computer Space Fans" to "Computer Space Fan" as requested by Kevin.</li> <li>Change default Player 1 keys from Arrows, Space to ASDF as requested by Kevin.</li> <li>Change default Player 2 keys from WASD to HJKL as requested by Kevin.</li> <li>Add 6 additional buttons to the Rocket Controls settings tab to automatically assign pre-defined sets of control keys.</li> <li>Add EXE checking at run-time – to warn the user if someone (e.g. a hacker) or something (e.g. a virus) has modified the Computer_Space.EXE file. (This is a standard feature of all of my software).</li> <li>Develop my own high-resolution timer because I wasn't happy with the resolution / control of the standard Windows Timer. The game will now try to get 50 fps on all machines – provided the hardware can handle it. My Pentium III 667 can, so anything better than this should as well – unless it has some crappy on-board video, then it might struggle.</li> </ul>
v0.0010	20-Apr-2005	<ul style="list-style-type: none"> <li>Without running the game in a timer loop, the game runs at 400-600+ frames per second on my Pentium III 667 system (Windows XP, 384 MB RAM, crappy TNT2 video card). However, the game uses almost 100% of the spare CPU cycles, and this isn't playing nice with other applications that may be running or that may need to run. So, I've been exploring various timers / thread processing, especially in the past few versions.</li> <li>I've tried 3 or 4 third party timer components for Delphi – and all of them have had issues or caused problems. I've created my own threads and synchronised them, but for some unknown reason the main form's canvas became disconnected at random intervals (maybe 5 seconds, maybe 4 hours, maybe never).</li> <li>For the best compromise all round, and to get this project finished asap, I've returned to the good old TTimer component provided with Delphi. It doesn't give great frame rates, but then you don't need more than 30 fps for this golden oldie. At some future time, when I have more time to explore things, then I will revisit the above.</li> </ul>
v0.0011	21-Apr-2005	<ul style="list-style-type: none"> <li>Bring the game further into line with a real Computer Space machine : <ul style="list-style-type: none"> <li>If the Players die, remove the saucer bullets, but don't re-spawn the saucers. This fixed Kevin's reported discrepancy : "One minor thing (heh heh I'm gonna get a smack for this): if the saucers kill me, they respawn in a new place just like I do. The original machine only had whoever died do the respawning. Any way we can tweak that up? Sorry to bring this up now at the end but I just realized it". No worries, piece of cake to fix Kevin.</li> </ul> </li> <li>Reinstate the missing SF Square Head fonts to the install application.</li> <li>How close is the current version of the simulator to a real Computer Space ? Well, according to Kevin : <ul style="list-style-type: none"> <li><i>I have played yours side-by-side with my actual machine and got the INI file the way I like it, I would definitely give yours at least an 8 out of 10 if not 9.</i></li> </ul> </li> </ul> <p>And I replied "OK, thanks. Bugger, I was hoping to get at least a 9 !! :)" So, there's more work to do ...</p>
v0.0012	28-Apr-2005	<ul style="list-style-type: none"> <li>Enlarge / resize all of the bitmaps in the game's main window to completely cover the window - this will make skinning the simulator dead easy in the future. i.e. change the bitmaps, change the rockets, saucers, etc images, and you can make a completely new look for the game. More on this later ... ;) )</li> <li>Save the value for the Saucer setting "Bullet Travel Distance (Pixels)" – somehow I had missed the code to save this setting to file.</li> <li>Bring the game further into line with a real Computer Space machine (there are lots of new changes as Kevin has been watching a real Computer Space machine very closely and has noticed lots of new things) : <ul style="list-style-type: none"> <li>Incorporate Kevin's latest game settings (which he has carefully checked and verified side by side against a real Computer Space machine) as the "Factory Defaults" for the simulator. According to Kevin: <ul style="list-style-type: none"> <li><i>Ok to start with find attached the de facto standard for the INI file. This is as close as I can get to the original machine.</i></li> </ul> </li> <li>Use a new "Attraction Panel" image provided by Kevin and his camera – this new image looks better than the old one. According to Kevin: <ul style="list-style-type: none"> <li><i>Secondly I have two pictures of the attraction panel attached, I hope at least one will work for you. If not let me know more speficially the angle you want and I'll see what I can do.</i></li> </ul> </li> <li>Make saucer bullets invincible. i.e. allow them to carry on when the ship that fired them is destroyed, and allow them to carry on even if they hit an enemy ship. (This is contrary to some of the changes made above – e.g. v0.0008 - but results from closer observations by Kevin). According to Kevin:</li> </ul> </li> </ul>

Ver	Release Date	Changes / Comments
		<ul style="list-style-type: none"> <li>▪ <i>When both the rocket and the saucers are destroyed, their bullets keep moving. In fact even a victorious hit still has the bullet flying after its target is destroyed. So please make bullets invincible.</i></li> <li>○ Make sure that the saucers have a good chance of being on the move when they respawn. According to Kevin: <ul style="list-style-type: none"> <li>▪ <i>Is it possible to make the saucers moving when they respawn? I find the ones in your simulation are stationary at first and that makes them easy prey. The original machine could have them stationary or moving, completely random.</i></li> </ul> </li> <li>○ Make the Rocket(s) spawn and respawn at random locations – even on the screen edge. According to Kevin: <ul style="list-style-type: none"> <li>▪ <i>The rocket is always starting in the center, it should respawn randomly anywhere on the screen. Yes the rocket can even appear on the edge of the screen, it is THAT random.</i></li> </ul> </li> <li>○ Make the Rockets spin longer and faster when destroyed. (Details in video blurry and hard to see - due to compression, but I've done my best). According to Kevin: <ul style="list-style-type: none"> <li>▪ <i>The rocket should spin way faster when it gets destroyed. Instead of one circle it spins multiple times (I will be sending you video of this in another email). Ok here is a really good video of what the rocket looks like when it fires its thrust. It even shows the explosion effect. You can't make out the screen flash very well but you can see how the rocket spins super fast when it gets hit.</i></li> </ul> </li> <li>○ Add a background "hum" sound which is played during the game. According to Kevin: <ul style="list-style-type: none"> <li>▪ <i>And it occurred to me that in the brief times when nothing is happening, the silence is really noticable. So I made a little wav file of the background hum of the game. Maybe you could add this in so the silence isn't so deafening? I agree the background hum should only occur when someone plays a game, not in demo mode.</i></li> </ul> </li> <li>○ Saucer Running Lights – these do move all the time. i.e. they should not be stopped when the saucer is stopped or moving vertically (contrary to changes for v0.0005). According to Kevin: <ul style="list-style-type: none"> <li>▪ <i>Actually it's even a little different from the way I described originally. I thought they were motionless when the saucers were motionless but I was wrong.</i></li> </ul> </li> <li>○ Saucer Running Lights – in the videos that Kevin has sent me, the saucer running lights are really very interesting. The lights go one way and then slow down, stop, change direction and speed up in the other direction, and this cycle repeats over and over. The speed of slowing down and speeding up is random, as is the amount of time spent going in each direction. They really are fascinating to watch. I have tried to simulate this behaviour. According to Kevin: <ul style="list-style-type: none"> <li>▪ <i>Also, the running lights on the flying saucers appear to me to be static to the screen. The reason they appear to "move" when they are drifting is actually a trick of the screen. The lights stay stationary but because the saucers are moving, it appears that they are moving along the surface of the saucer.</i></li> </ul> <p>The Saucer Running lights now do this in the simulator, but I think it still needs fine tuning. Let me know what you think Kevin.</p> </li> <li>○ Rocket Wonky Bullets : Have another go at the Rocket Wonky Bullet behaviour – when the Rocket dies, if it has a bullet on screen, then it goes all wonky. (Please email some video footage of this Kevin). However, I have very little detail to go on, so it is all wild guesses. According to Kevin: <ul style="list-style-type: none"> <li>▪ <i>Finally, if your rocket shoots but is destroyed, you've got its bullet going in a circle, it should meander all over the screen for the duration it lasts.</i></li> </ul> </li> <li>○ Saucer Sprites – to have a chance of getting the running lights right, I needed more than the 2 frames of animation I had for the saucer, so I drew another 4 frames of animation.</li> <li>○ New Rocket Sprites – which closely match the "Rocket malformed because of Diode Matrix" feature of the real Computer Space. This is another interesting feature of the real game. According to Kevin: <ul style="list-style-type: none"> <li>▪ <i>As an example, the graphic of the rocket is not actually symmetrical on the real machine. I had a very close look at the schematics and I noticed that the diodes which make up that image are laid out on a matrix in such a way that the intersection of lines that create each point of light must not intersect with each other. Therefore the dots are very close to being symmetrical but they are not.</i></li> </ul> <p>I have drawn new Rocket sprites which Kevin reports are very close to the real machine.</p> </li> <li>○ Rocket Thrust – actually consists of a very small and simple "fire" – much simpler and smaller than the thrust I had drawn for v0.0008. According to Kevin: <ul style="list-style-type: none"> <li>▪ <i>By the way, did you notice that the thrust on the rocket is actually a lot simpler than the graphics you made? I don't know if you want to adjust your graphics further or not.</i></li> </ul> </li> </ul>

Ver	Release Date	Changes / Comments
		<ul style="list-style-type: none"> <li>Phew !!! Well that's about all for this release – it seems like a heap of changes for this version, but in reality, *very* few code changes were required. This is very encouraging indeed, as it means that I have built very robust animation and sound engines. (Mind you, you would expect this from someone who has been eating, sleeping, and breathing software development for the past 25 years ... ;) LOL ! ;)</li> </ul>
V0.0013	29-Apr-2005	<ul style="list-style-type: none"> <li>Bring the game further into line with a real Computer Space machine : <ul style="list-style-type: none"> <li>Rocket Wonky Bullets : A mazingly, Kevin's happy with my recent wild guesses about the Wonky Bullet behaviour, which just goes to show that shooting fish in a barrel can sometimes work. ;) LOL !! ;) According to Kevin: <ul style="list-style-type: none"> <li><i>I like the wonky bullets, looks good to me.</i></li> </ul> </li> <li>Stop the "Bullet Moving sounds" when a Rocket or Saucer is hit. According to Kevin: <ul style="list-style-type: none"> <li><i>Finally, not sure how accurate this is, but is it possible to kill the sound of the bullets AFTER they strike their target? I know the bullets are invincible and continue on until their lifetime ends but I admit the sound is slightly annoying to me. I think it might be better if the sound for the bullets is on only until they strike their target. Obviously if the shots miss the sound will continue for as long as the shot goes but in the case of a successful hit, caqn we make the remainder of the bullet's life silent? Just want to see if that's less annoying.</i></li> </ul> </li> <li>Saucer Running Lights – synchronize them across all saucers. According to Kevin: <ul style="list-style-type: none"> <li><i>Also, on the original machine, both saucers have identical light patterns. Yours are moving independantly.</i></li> </ul> </li> <li>Saucer Running Lights – improve the speed and fluidity of movement. According to Kevin: <ul style="list-style-type: none"> <li><i>The running lights are not quite right, is it possible to add even more intermediate frames to the animation? As you can see from the videos I've sent you the movement of the lights is fairly fluid but these ones don't quite look fluid enough.</i></li> </ul> </li> </ul> <p>N.B. I still don't think they are right Kevin, but they are improved in this new version. I'll keep tinkering ...</p> <li>Awesome news, Kevin's feedback about v0.0013 was : <ul style="list-style-type: none"> <li><i>I think we have a winner! Everything looks pretty good to me.</i></li> <li><i>Let's see, I would say your simulator is a solid 9 out of 10 at this stage.</i></li> </ul> </li> <li>But, I wont be happy until I get at least a 9.5 / 10 !! ;)</li> </li></ul>
V0.0014	10-May-2005	<ul style="list-style-type: none"> <li>Add in full support for the Maximise window setting – and this is now properly restored next time the program is run.</li> <li>Make the main window a proper re-sizable window. Now form resizing / scaling is fully functional - so you can re-size the game window and the buttons, bitmaps, etc all re-scale / re-size automatically. Thanks for reporting this Kevin.</li> <li>Pausing the game now immediately halts the playing of *all* sounds and un-pausing the game immediately starts the playing *all* sounds that were playing before the game was paused.</li> <li>Add "Start 1P Vs Saucers", "Start 2P Co-Op", and "Start 2P Deathmatch" buttons to the Pause window.</li> <li>Add support for <b>One Button / One Switch</b> game play so I could enter this game in the <b>Retro-Remakes</b> programming competition at : <a href="http://www.retroremakes.com/">http://www.retroremakes.com/</a></li> <li>Add a new setting "Show Attraction Panel, Start Button, etc", which defaults to "checked". If you uncheck this setting, then you can play the game and the game's screen will take up the full window so you will not see the Attraction Panel, Start Button, etc. You can also right-mouse click on the main game window and select "Hide Attraction Panel, Start Button, etc" from the popup menu. As requested by Kevin : <ul style="list-style-type: none"> <li><i>By the way Mike, I had a small consensus from people about whether or not they'd like the attraction panel or not and it seems the best suggestion is to have that as an optional selection. So, if possible, can we make the simulator the way it is now, but if a player wants to run the game full screen, they just put a checkbox in somewhere and it plays without the attraction panel?</i></li> </ul> </li> <li>Pressing the Player 1 or Player 2 "fire buttons" now starts a new game – if the game is in "Demo" mode. i.e. attract mode.</li> <li>Bring the game further into line with a real Computer Space machine : <ul style="list-style-type: none"> <li>Speed of Saucers – make the saucers always move at maximum speed. I said to Kevin : <ul style="list-style-type: none"> <li>"One thing I might be wrong on is the Max Saucer Speed setting. This value is used to generate some random numbers in the rage : -Max Saucer Speed &lt;= n &lt;= Max Saucer Speed, and these determine your horizontal and vertical speeds. So, if Max Saucer Speed was 15, then you may end up with a horizontal speed of 3 or 10 or -15 or anything else in the range -15 to 15 and a vertical speed of 1 or -10 or 0 or 15 or anything else in the range - 15 to 15. Is this correct ? Or should the saucers always be moving at maximum speed ?"</li> </ul> </li> </ul> </li> </ul>

