

# **NAVIGATOR**

**COLLABORATORS**

	<i>TITLE :</i> NAVIGATOR		
<i>ACTION</i>	<i>NAME</i>	<i>DATE</i>	<i>SIGNATURE</i>
WRITTEN BY		July 22, 2024	

**REVISION HISTORY**

NUMBER	DATE	DESCRIPTION	NAME

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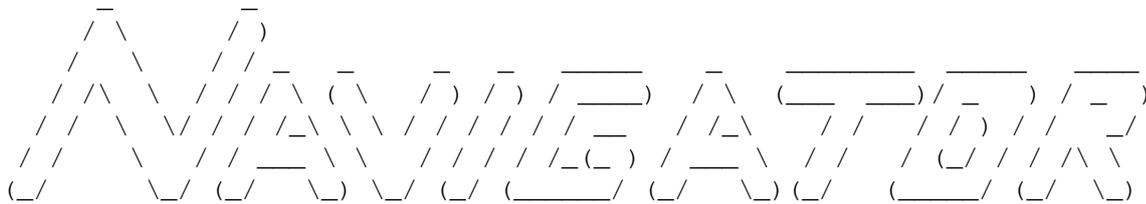
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## Chapter 1

# NAVIGATOR

### 1.1 NAVIGATOR User Guide



A Virtual Reality presentation system for the Commodore Amiga

Design and Coding by Michiel den Outer

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### 1.2 NAVIGATOR Introduction

Introduction  
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This program allows you to walk, drive and fly around in a 3 dimensional computer generated world in realtime. It is used to visualize architectural, industrial and artistic designs for presentation or analysis purposes.

You can use this program - live at your presentation  
- tape it to VHS  
- print out some pictures

Since computer power is limited a realtime 3D computer model is always a compromise between graphic detail and animation speed. Therefore pictures generated by this program can't be compared to photo-realistic images

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produced by 3D modelling software like Imagine and Lightwave.

However a realtime interactive model has a lot of advantages over a precalculated animation :

Precalculated Animation	Navigator model
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#### Immersion

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Looking at an non interactive animation is like looking through a window : the world looks convincing but you are no part of it.	Entering a realtime interactive computer model is like stepping through a door. You can walk around, look around and get the feeling of
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#### Interactivity

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The animation is fixed and cannot be changed.	At any time you control the position and orientation of the viewpoint.
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#### Animation

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Artificial, mathematical movements like perfect lines, circles etc can be	Since the animation is interactive all movements are as natural as they can be
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#### Cost

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Rendering a single photorealistic frame takes hours even on the fastest computers. Considering that an animation must be at least 25 frames a second, this kind of computer animation is very expensive.	No computing costs, everything is computed in realtime.
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#### Hardware requirements

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-a fast processor	-a fast processor
-Megabytes of memory	
-Gigabytes of Harddisk Space	

#### Completeness

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You see what the animator wants to see. This means that you get an incomplete, subjective impression.	By looking around you can see the object from it's best but also from it's worst sides. This means that you get a complete and objective impression.
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I hope you agree that a realtime interactive model gives you the best impression at the lowest cost.

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## 1.3 NAVIGATOR System Requirements

System requirements  
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This version requires:

- a 68020 CPU or higher
- Amiga DOS 2.0 or higher
- a 15 Mhz monitor

AGA users will enjoy 24 bit colours, a 128 colour copper background and 256 colours in all resolutions. Older machines are limited to 32 colours lowres and can't display the superhires resolution.

You can make your animation more smooth by installing :

- fast ram
- 32 bit ram
- a faster/newer processor

-Navigator is not very memory hungry, but be sure to have some fast ram because it's twice as fast.

-Since this program uses integer maths the use of a mathematical coprocessor will not effect performance at all.

## 1.4 NAVIGATOR Installing

Installing  
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To install Navigator simply make a new drawer on your harddisk and drag the the Navigator icon in it.

Navigator requires 'Worlds:' to be assigned to the directory where you keep your worlds. This directory will be used as the default directory by the file requester.

Example : Assign Worlds: dhl:Navigator/Worlds

The workbench files you need are :

- asl.library in the libs directory
- MultiView in the 'sys:utilities' directory

## 1.5 NAVIGATOR Loading

Loading  
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Double click it's icon from the workbench to run the program. A filerequester will be presented allowing you to select and load a World from disc.

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You can also start the program from the Shell and use the world-file as an argument.

Example : Navigator worlds:games/jaguar.naf

## 1.6 NAVIGATOR FileFormat

Fileformat

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The Navigator Editor and FileFormat are currently not published and will not be in the near future.

However I've written an utility to convert Navigator files into AutoCAD DXF format. This allows you to view the model in almost all CAD and 3D-Modelling programs on every computer system.

## 1.7 NAVIGATOR Control

Control

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Since this program is aimed at designers and not at computer freaks, the control is kept very simple and straight forward. Most users won't touch anything but the mouse.

<F1> WALK MODE (default)

- use mouse up/down to walk forward/backwards
- use mouse left/right to change direction
- use mouse left/right with right button pressed to step to the left/right
- use mouse up/down with left button pressed to look up/down
- use mouse up/down with both buttons pressed to control height

<F2> DRIVE MODE

- use mouse left/right to steer
- use +,- keys to control speed

<F3> FLY MODE

- use mouse left/right to roll
- use mouse up/down to climb/dive
- use +,- keys to control speed

<F4> ROTATION MODE

By pressing this key you start rotating around your current position.

- use mouse up/down with both buttons pressed to control the

radius.

-use mouse with right button pressed to control the angles.

<F5> SHADED HORIZON

Uses Amiga's famous Copper chip to produce a shaded horizon.

<F6> DRAW MODE

- 1 Solid/Colours most realistic mode
- 2 Wireframe/Colours good for understanding relationships
- 3 Solid/Black&White good for Black&White printing
- 4 Wireframe/Black&White fastest in blitter mode !

<F7> SURFACE DETAIL

<F8> GRAPHICS ENGINE ( What code is used for graphic operations )

1 ROM ( Amiga-Dos graphics library functions )  
Since these functions are part of the operating system they should always work. But for maximum performance you have to hit the hardware more directly...

2 Blitter ( Amiga's custom graphic chip )  
This chip is capable of producing ultra smooth scrolling platform games but has a little talent for drawing polygons. Since this chip is asynchrone to the CPU the use of a faster processors makes no sense in this mode.

3 CPU ( Motorola 68020 code ) ( default )  
The fastest method for the fastest Amiga's. Fasten your seatbelts for the 68040 !!!

<F9> SYSTEM STATE

1 KILLSYSTEM ( default )  
-128 colour custom copperlist  
-multitasking is turned off  
-interrupts are still working, so playing a Protracker module in the background is possible.

2 NORMAL  
-multitasking is ON  
-uses 2 intuition-screens for screen swapping.  
-press p to pause.

<F10> RESOLUTION

1 LOWEST  
320\*256 pixels (PAL, Low Res, No Lace)  
lowest PAL resolution for smoothest animation.

2 HIGHEST

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1280\*512 pixels (PAL, Super High Res, Laced)  
Uses 1 draggable intuition screen. Multitasking is turned on allowing you to grab and print the screen. Although high resolution looks nice it slows down animation speed and eats chip ram. Therefore animation is not supported in this mode. You have to press <F10> again to go back to normal animation mode.

o OVERSCAN

352\*283 pixels (PAL, Low Res, No Lace, Standard Overscan )  
The Amiga is capable of filling the entire screen which is perfectly suitable for video applications. Use this screen mode if you want to prevent the 'computer look'.

-> some modes cause incompatibility with overscan, the screen will be filled with crap, but the system won't crash.

l INTERLACE

Use this for video applications

<, > VIEWANGLE

Using a higher Viewangle rises the perspective and gives the suggestion of a wider and bigger world. Use this variable the same way a photographer uses his zoom lens.

z, x DETAIL LEVEL

Use a low level to simplify the model or to increase animation speed.

(, ) ROTATION SPEED ( 1/16 Degrees / 1/50 sec )

-, + TRANSLATION SPEED ( unit / 1/50 sec )

-> Please note that these variables are completely independent of the animation speed : it is possible to walk very slowly in 50 frames a second and fly at mach2 in 1 frame a second.

8 WINDOW SIZE

4 6 Use your numeric keyboard to adjust the window.

2

g GREY/COLOURS

Left Blank Key 24 BITS/12 BITS COLOURS

If you have an Amiga 1200 you can force Navigator to use 12 bit colours.

i INTENSITY COLOURS

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The Amiga is capable of producing 'illegal' colors. These colors look fine on a monitor but when they are put on video tape the results can mean a terrible picture. This option tries to prevent this effect by keeping the colour values below 80%

<Spacebar> NORMALIZE Viewpoint and Viewdirection  
-height=170 ( normal human eye height )  
-no banking ( horizon is horizontal )

<Help> VIEW VARIABLES  
-> Navigator uses the same font as your workbench. Navigator assumes the font to be 8 pixels wide.

Please note that by displaying this help screen, the animation speed will slow down.

<Esc> QUILTS PROGRAM

b SHOW BOUNDING BOXES

e STEP TROUGH ELEMENTS

c STEP TROUGH CONVEX OBJECTS

## 1.8 NAVIGATOR contacts

Contacts

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If you are a professional architect, industrial designer or graphics artist and you want a Navigator model of your design, please contact me at the following address :

Michiel den Outer  
Populierenlaan 59  
2925 CP Krimpen a/d IJssel  
Tel. 01807-20798  
Holland

## 1.9 NAVIGATOR Copyright

Copyright

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The Navigator system is Copyrighted (C)1994 by Michiel den Outer. All rights

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reserved.

However the Navigator Viewer can be freely distributed as long as this doc file is included, both files are unchanged and no money is charged.

Commercial use is prohibited.

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