

# Public preview

This is the first chapter of the Blender tutorial guide to be published in december 1999 by Not a Number.

This Tutorial Guide is oriented at new users and will cover all aspects of using Blender. You don't need the Blender Manual to work with this guide, although it is recommended to have it as a reference.

The tutorial guide will contain 5 gallery pages as well as 22 tutorials about modeling, rendering, lighting, animation, post production, and plugins programming. The guide is 100 pages long and will have a full color magazine format for your reading pleasure.

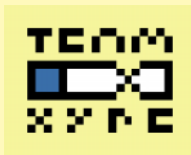
Editor: Bart Veldhuizen

Writers: Bart Veldhuizen, Geno Ruffalo, Jason Nairn, Martin Strubel, Willem-Paul van Overbruggen.

Design: Samo Korosec, teamlxytype

Published by: Not a Number

You can buy the printed tutorial guide at the Blender internet shop:  
<http://www.blender.nl/shop/>



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# Blender Tutorial Book



# The interface



Author: Bart Veldhuizen  
Subjects: user interface  
Level: beginner  
Blender version: freeware

## Introduction

If you are reading this chapter, you are probably feeling like I did exactly one year ago. I had found this extremely interesting looking 3D application (which other users were raving about), but the user interface completely baffled me. I couldn't find the quit function (I had to kill the application instead of exiting it), I saw buttons that seemed to react differently each time I clicked on them and every time something interesting happened, I could not reproduce it.

In the weeks after that, I slowly found out the basic principles behind the Blender user interface. And though it is non-standard, it became clear that it was a very consistent system - it would let me use the same functions in a number of completely different situations.

This chapter will save you weeks of frustration by explaining the basics of Blender's user interface. It will not explain every button or even every

window in detail (that is where the Blender manual comes in), but instead let you see the basic idea behind it.

After finishing this chapter you are ready to work with the rest of the book. Like me, you will find out that Blender's user interface really grows on you; it is one of the most efficient and well-thought out interfaces I have worked with.

Here is what I found to be the Golden Rule of Blender:

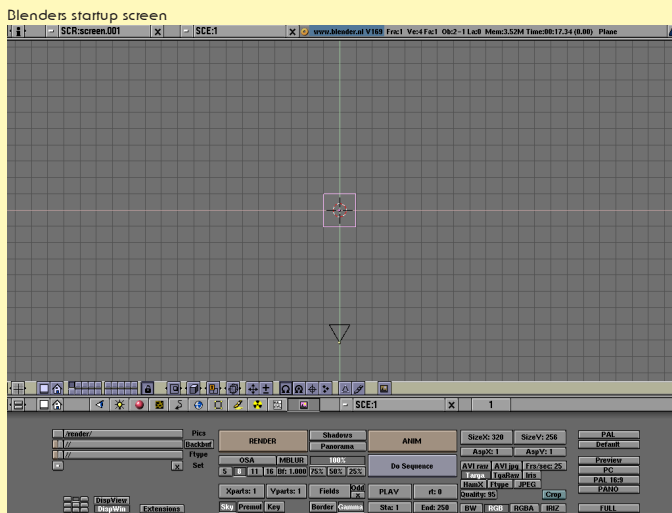
*"Keep one hand on your keyboard and one on your mouse."*

Even while Blender's user interface may be a bit daunting at first, I hope that working with this book will teach you that it is actually a very intuitive one. It was written entirely for working efficiently and quickly and this means that a lot of functions are accessible both by using the keyboard and by using the mouse. Working with hotkeys instead of menus is harder to learn, but the rewards are great.

After a while working with Blender becomes a second nature. Often, my girlfriend watches in amazement at the speed with which I can handle objects, change views, navigate my way around my scene in Blender. Blender has really turned my keyboard and mouse into a glove which reaches into 3D space.

But it all starts with the Golden Rule - remember it while you are working your way through this book!

# Interface



## What am I looking at?

When you first start Blender, your screen will look like this. The screen is divided into three parts; at the top you see the Info Window. Among other things, you will see Blender's version number and some statistics about your current scene.

Next is the 3D Window. This window type is used for all the editing in your 3D world. The pink square in the middle is the standard plane. It is pink because it is currently selected. The black triangle on the bottom is the camera. The gray lines are the grid lines of the 3D world - you can use them to align your objects. The cross hairs with the white and red colored circle is the 3D cursor. You can place it anywhere in 3D space. It is used to determine where new objects are placed, but it can also act as a center for rotation or scaling.

The window on the bottom is called the Buttons Window. In this window, you can edit a variety of information about your scene: materials, lights, animation settings, rendering settings - it is all in here.

the window header



Each window has a Header. For the 3D window the header is located at the bottom. You can switch the

position of the header by **RightClicking** on it and confirming the requester that pops up ('Switch header').

Pay special attention to the button on the far left - each window has this icon. This is also the one that completely eluded me in the beginning.

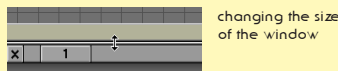
In Blender terms, it is called an Icon Slider button. If you **LeftClick** on it and drag left or right it will change, revealing a number of different icons. Each icon corresponds to a different window type. I will explain the different types later.

You can also click on the left and right half of the Icon Slider to change the window type.



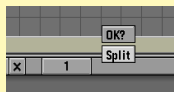
The contents of the Buttons Window can be changed by clicking on one of these buttons. In fact, it is a lot like the Icon Slider button that I discussed, but now all the options are visible. The meaning of the different buttons is explained later in the paragraph 'the Buttons Window'

## Configuring the screen your way



Blender's screen can be reconfigured in any way that you like. To start with, you can change the size of the different windows by placing the mouse pointer over one of the lines separating the different windows. The cursor changes shape to indicate you can now change the window size. **LeftClick** and **drag** to change the window size.

# Blender -> Interface :: beginner



splitting the window up

Adding a new window is similar: move the mouse pointer over a window border and **LeftClick**. A small requester will pop up now. You can confirm splitting the screen by **LeftClicking** on the text 'Split', or by pressing **Enter**. The window which has the focus and has a yellow header (in this case, the top window) is the one that will be split - approaching the window border from below will split the bottom window.

A line indicating the position of the split is now shown. You can move it to the desired position and **LeftClick** to confirm the location.

Cancel the action by moving your mouse pointer away from the requester, or by pressing **Esc**.

Of course, splitting windows works on vertical window borders, too. In this example, I have created three additional 3D Windows by splitting the default 3D Window three times. Each window is now independent from the others. This way, you can create the traditional 4-view window (top, front, right and camera) in Blender. More about this in the paragraph 'the 3D Window'.

If you own a mouse with 2 buttons instead of 3, hold down the **ALT** key and **LeftClick** to mimic the **MiddleButton**.

Removing windows is very much like splitting them; with the mousepointer over a window border, **RightClick**. Confirm the requester. Like splitting, the direction from which you approached the border (or rather, which window has the focus before joining) determines which window 'survives' the joining.



joining two screens into one

## The toolbox - adding a sphere

Almost every Blender function can be accessed by using the keyboard or the mouse. The Toolbox contains most of Blender's functions. You can call up the toolbox either by clicking its icon in the top-right of the Blender screen, or by pressing **SPACE**.

ADD	Load File As	F1
VIEW	Load Last	cb
EDIT	Append File	shift+F1
OBJECT		
OBJECT	Save File as	F2
MESH	Save	cw
CURVE	Save Image	F3
KEY	Save VRML	c F2
RENDER	Save DXF	shift+F2
FILE	Save Video Scape	aw
	Quit Blender	q

the toolbox

This is how the toolbox works: The dark gray buttons on the left are function categories; moving your mouse pointer over them will change the button list on the right. Move your mouse pointer to the right and click on a function button to activate that function. Each button also shows the corresponding keyboard shortcut. In the shortcut notation, **cl<button>** means holding down **CTRL** and pressing the listed button. Similarly, **al<button>** uses the **ALT** key as a modifier.

ADD	Mesh	sp
VIEW	Curve	>>
EDIT	Surface	>>
OBJECT	Text	
OBJECT	MetaBall	
MESH	Empty	A
CURVE		
KEY	Camera	A
RENDER	Lamp	A
FILE	Ita	A
	Lattice	A

adding a mesh..

Clicking some buttons will reveal a third layer of functions. For example, if you wish to add a sphere to your scene, first select 'Add' from the categories list in the Toolbox. Next, **LeftClick** on the button labeled 'Mesh'.

MESH	>Plane	A
VIEW	>Cube	A
EDIT	>Circle	A
OBJECT	>UVsphere	A
OBJECT	>Icosphere	A
MESH	>Cylinder	A
CURVE	>Tube	A
KEY	>Cone	A
RENDER	>	
FILE	>Grid	A
	>	
	>Duplicate	D

..selecting its type

The button list on the right now changes to offer you a choice between the different primitives that Blender knows. **LeftClick** on 'UVsphere' to add a sphere to your scene.

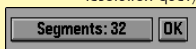


the blender screen after 3 splits

# Interface

Area	Context	Grid	Space	Units	Time	View	Render
File	Edit	Color	Offset	0.000			
Scene	Scene	Scale	Offset	0.000			
Text	Text	Offset	0.000				

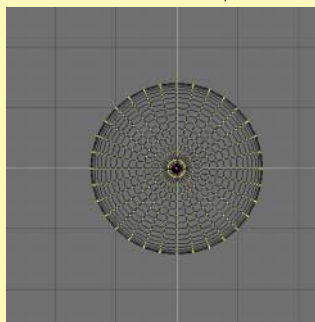
resolution query



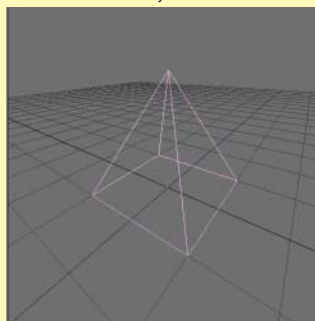
editing the values



the sphere added



this object is not in editmode



When adding objects like a sphere, Blender wants to know which resolution you require. A sphere with a high resolution looks smoother than a low-resolution sphere, but it also requires more memory and is slower to manipulate and render.

These buttons work like the Icon slider you saw earlier: **LeftClick** on the 'Segments' button and drag left or right to increase or decrease the value. Also, you can click on either side of the button to change the value step by step.

Yet another way to change the value is to hold down **SHIFT** and **LeftClick** the 'Segments' button. This will change the button into a text input. You can now type a value into the field directly. Press **ENTER** when you have entered the correct value.

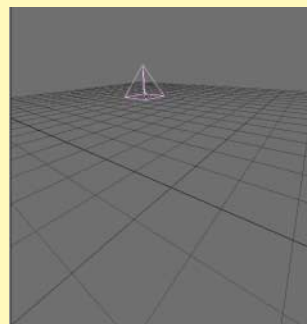
Finally, click on the OK button to set the value of the 'Segments' variable.

In the case of the sphere, you will need to set a second parameter, 'Rings'. After doing this, a sphere will show up at the location of your 3D Cursor. Instead of showing up in pink or black, the sphere is drawn with small yellow dots. This mode is described in the paragraph 'Edit Mode'.

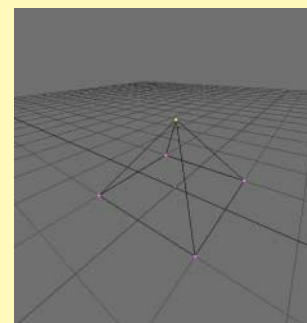
## About Editmode

When you are working in 3D space, you can basically perform two types of operations: operations that affect an object as a whole and operations that affect the geometry of an object, but do not affect the object's global properties. An example of the former is moving an object to another location. An example of the latter is shaping a nose on a face.

In Blender, you have to indicate which of the two you want to use. This is where editmode comes in.



This is an example of an object that is not in editmode. Operations like translating (**G**), rotating (**R**) or scaling (**S**) affect the object as a whole. For example, translating moves the entire object somewhere else.



In contrast, when you select **E** you enter editmode. The object is redrawn and the separate points of which it consists are drawn. (These points are known as vertices, by the way). If you select a vertex by **RightClicking** on it, you can then translate only this point, while leaving the others unaffected. In this way, you change an object's shape.

If you select more than one vertex, you can also rotate or scale them. In this case, the vertices are rotated or scaled around their median point.

## Loading and saving your work

By now you have probably created a Blender scene which you might want to save to disk, or you would like to

# Blender -> Interface :: beginner

take a look at the .blend files that we have included on the CD-Rom that comes with this book. Blender has a lot of file loading and saving options - even to the point that you can use Blender as a filemanager.

ADD	Load File As	F1
VIEW	Load Last	c/b
EDIT	Append File	shift+F1
OBJECT		
OBJECT	Save File as	F2
MESH	Save	c/w
CURVE	Save Image	F3
KEY	Save VRML	c/F2
RENDER	Save DXF	shift+F2
FILE	Save VideoScape	a/w
	Quit Blender	q

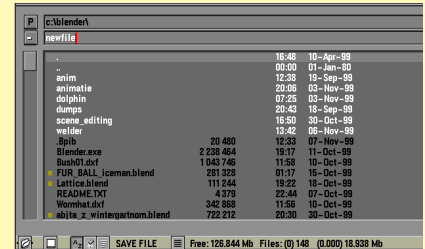
In this part I will briefly describe the basic file loading and saving mechanisms. As always, these functions can be accessed either from the Toolbox or by using a hotkey.

## Saving a blender file

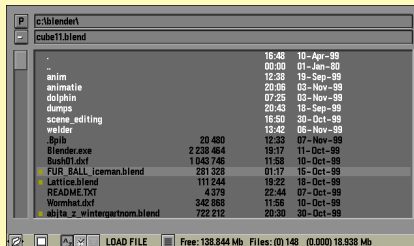
Open the File Window by pressing . This window works in the same way as above. Additionally, you can now enter a new filename in the filename box. To do this, **LeftClick** in the filename box and enter a new name.

Use the keys **NumPad** and **NumPad** to automaticall increase or decrease the versionnumber of a file before loading or saving

the save file - window



## Loading a blender file



Call up the File Window by pressing . In this window, files are shown in black and directories in white text. The .blend files are also indicated with a small yellow square in front of them.

The first method to load a file is by **LeftClicking** on a filename. This will copy the name to the filename box at the top of the window (the second textbox from the top). Pressing will then actually load the file. Alternatively, you can also **MiddleClick** on a file which will cause it to be loaded immediately.

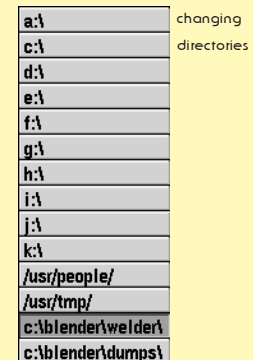
Navigating to the parent directory is done by clicking on the '.' directory in the list or by clicking on the 'P' button at the top of the window. Sometimes you may want to refresh the filelist; for example when another program has been writing or changing files in the current directory. In that case, click on the '.' directory.

If you try to save over an existing file, Blender will show you this warning. To confirm this request, either press or **LeftClick** on the filename. To cancel it, you can press or move the mouse away from the requester.

saving current file - warning



Returning to a directory where you have already been (and saved or loaded a file), or changing the current drive that you are working on is easy; just click/hold on the '.' button at the top of the File window. Select an entry to directly jump to this directory.



## Saving an image

To save an image that you have rendered, just press . From now on saving the file is the same as saving a regular .blend file. The only difference is that you can select the file format in the Display Buttons window. This window is discussed in detail below.

the display buttons





# Interface

## Saving an animation

Saving an entire animation is done differently; you first need to enter a filename for your animation in the Display Buttons window and then press the 'Anim' button. From then on, all the animation frames are saved using the filename that you just entered as a base. Read more about this in the Display Buttons section below.

Now try the same but hold down the **SHIFT** key before you click the mouse button. The view is now translated instead of rotated.

Finally, the **CTRL** key allows you to zoom in and out.

To toggle between perspective and orthogonal view, press **NumPad 5**.



In the 3D window, you can display your scene in a number of modes. Especially if you don't have 3D hardware this can make a huge performance difference. To toggle between wireframe and solid view, press **Z**. Solid view can display a scene with some shading even though you have not yet defined a lamp.

Switch to (real) shaded view with **SHIFT Z**. If you have not defined a lamp yet, the scene will be completely black.

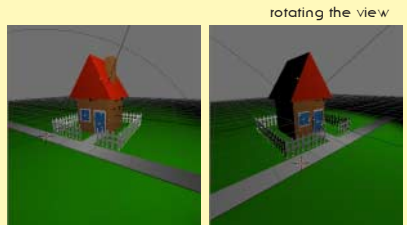
## The 3D Window

The 3D window is where you will spend most of your time in Blender. In this window, you can rearrange the objects in your scene, edit their individual vertices (vertices are the points that make up an object), define animation, add lights and cameras, ...

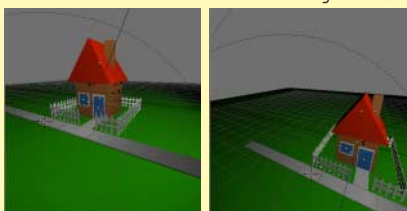
if you own a mouse with two buttons instead of three, skip ahead and read about the Info Window in 'The Blender Windows: a summary'

The first thing to know about the 3D view is how you can navigate through it. I am not talking about moving objects, but about moving your viewpoint - how can you examine objects? How does an object look from another side? Do the different parts have the correct color? Did I add a little detail correctly?

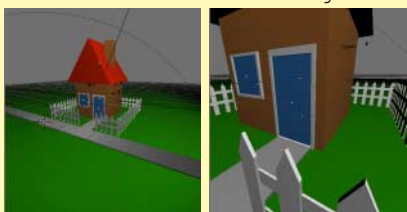
Blender uses a very simple yet intuitive method for changing the view in 3D. To get started, **MiddleClick**, **hold** and **drag** your mouse around. Do you see what happens? Without any modifiers, **MiddleClick**, **hold** and **drag** rotates your 3D view.



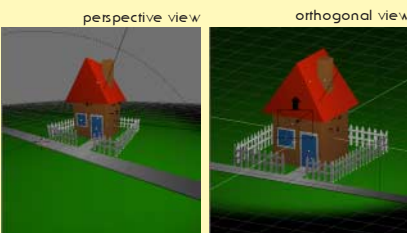
rotating the view



translating the view

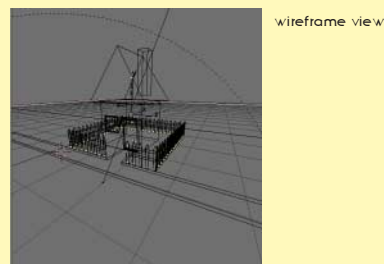


zooming the view

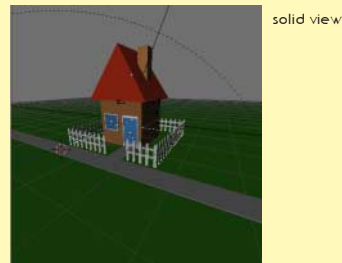


perspective view

orthogonal view



wireframe view



solid view

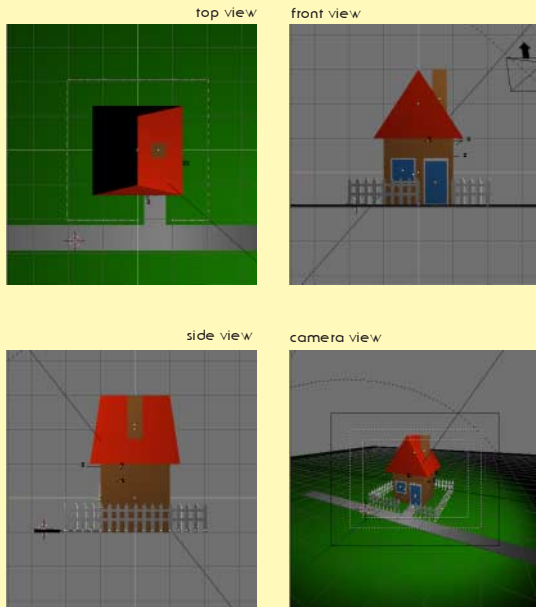


shaded view



# Blender -> Interface :: beginner

Aside from navigating around 3D space to look at your objects, you can also use a few hotkeys to quickly switch to standard views. Use **NumPad 7**, **8**, **9** and **0** to switch to top view, front view, side view or camera view.



the Home icon

Sometimes you may get lost inside 3D space a bit. To restore the view, either click on the Home icon at the bottom of the 3D window, or press **HOME**. Blender will resize the view to include every object in your scene.

On some systems you may need to press the numlock key to get the numpad to work.

If you want to get a specific object into view and not the entire scene, first select the object by **RightClick** on it (the object will turn pink to indicate it is selected). Next, press **NumPad 7**.

A similar function like the previous one, you can also zoom in to the selected object and hide all other objects at the same time by pressing **NumPad 7**. To unhide your objects, press **NumPad 7** again.

## The display buttons

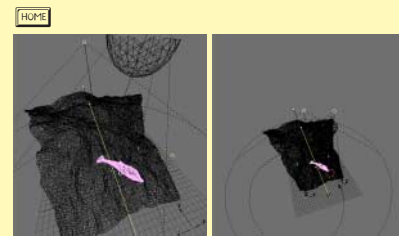
Once you are ready to render your image or save it to disk, you need the Display Buttons window. In this window you can control all the parameters that have to do with items as rendering quality, rendering size, animation length and animation filenames.



To define the image size you can either select a preset value from the row of buttons on the far right or set an image size yourself by changing the SizeX and SizeY values. For preview rendering, you can also render the image at 25%, 50% or 75% of the final output size.

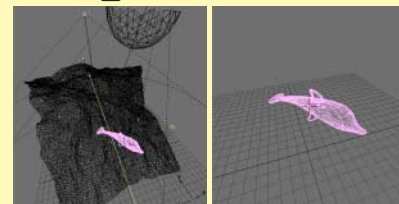


restoring the view of the whole scene;



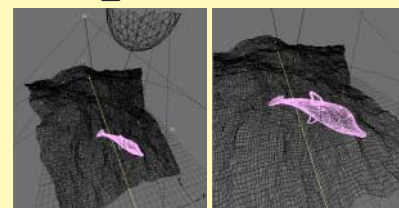
centering the selected object and hiding others;

**NumPad 7**



centering the selected object;

**NumPad 7**



# Interface

Turn anti-aliasing on or off with the OSA button. Control the image quality with the oversampling buttons 5, 8, 11 or 16. A higher value will result in a better image quality at the penalty of a longer rendering time.

rendering animations and stills



Start rendering by selecting the 'Render' button or by pressing the **F12** key. A separate window will pop up. **ESC** aborts rendering. **F11** will toggle the rendering result window.

Press 'Anim' to render an entire animation. When rendering an animation, enter the basename of the animation frames in the 'Pics' field. Each file will be automatically named <basename>+framenumber. For example: frame0001, frame0002 etc. After rendering, press the 'Play' button to play back your animation.

selecting the output format



Select a file format with the buttons labeled 'Targa', 'TgaRaw', 'Iris', ... For animations, you can also choose 'AVI raw' and 'AVI jpeg' and define the number of frames per second for these files.

the Windows Mediaplayer has problems playing back Blender's AVI-raw and jpeg files, but the Quicktime4 player plays them back correctly.

setting the start/end frame of the animation



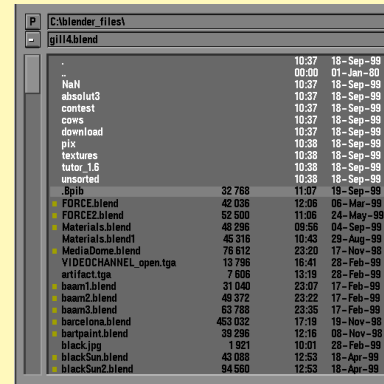
To set the animation start and end frame, change the 'Sta' and 'End' values. Pressing **SHIFT** **←** and **SHIFT** **→** will automatically jump to the start and end frame.

## The Blender windows: a summary

This section gives a summary of the most important windows in Blender. It does not try to be complete nor to explain each window in detail. Most of the windows contain pointers to other chapters where it is discussed in more detail.

### The file window

- F11** for loading,
- F2** for saving.



**LeftClick** to select a file and press **Enter** to load it, or **MiddleClick** to both select and load it.

To save a file, enter a name in the filename field (the second one from the top) and press **Enter** to confirm the filename. Press **Enter** again to save the file. If you have already entered a filename earlier, pressing **F2**, **Enter** will save, too.

Entering a new directory name in the directory box (the one on the top) will create the new directory for you after asking confirmation.

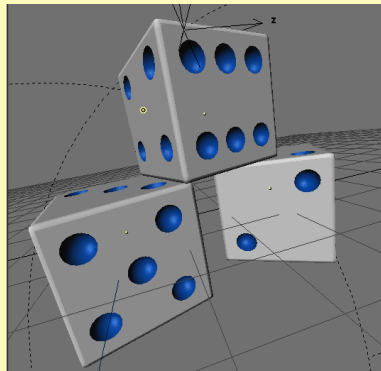
# Blender -> Interface :: beginner

## The image select window



This window type works exactly like the file load window, but all recognized image files are shown as thumbnails. An example of where this window is used is in the Texture Buttons window, for loading image texture maps.

## The 3D window (SHIFT F5)



This window allows you to manipulate the objects in your scene directly by dragging (G), rotating (R) or scaling them (S).

top view:	NumPad 7
front view:	NumPad 1
right view:	NumPad 3
perspective off/on:	NumPad 5
camera view:	NumPad 0
solid mode off/on:	Z
shaded mode:	CTRL Z

You can navigate through 3D space by dragging with the **MiddleButton**; this will rotate your view. Dragging with **MiddleButton** button and holding the **SHIFT** key will translate the view, and holding down **CTRL** will allow you to zoom.

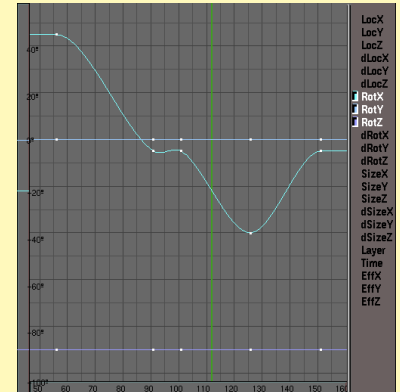
## The IPO window (SHIFT F6)

In this window you can edit the timelines that are associated to different object properties, like their position and rotation, but also their color or layer. The different object properties or 'channels' that are available are shown on the right. You can select channels by **LeftClicking** on them - **SHIFT** will extend the selection.

Enter editmode by pressing **E**. You can now edit the individual vertices of the curves or change their curvature.

You can read more about the IPO window in the chapter 14

IPO window



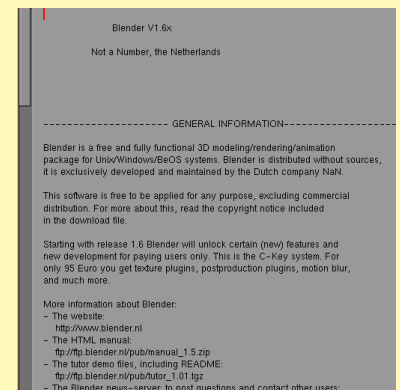
## Text edit window (SHIFT F11)

The Text Edit Window is mainly used for writing Python scripts, but also if you do not have a C key this window can be extremely valuable. It is often a good idea to keep notes of your animation projects. Information that I always forget (especially after a couple of weeks!) are the maps that I have used, the scenes that I have defined, important frame numbers, well, you get the picture.

A big advantage of using the Text Edit Window is that the notes are stored inside the .blend files - this way you can never loose your notes again!

When creating a new Text Edit Window, you have the choice of creating a new text object, or to import an existing text file. In that case, a File Window will be opened

text edit window



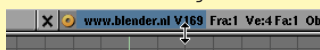
# Interface

and you can select a file as usual. Of course, you can have more than one text object in your Blender file.

## The info window

The Info Window does not have a hotkey. Instead, it is 'hidden' at the top of your screen. To reveal it, drag down the top window border on your screen as indicated in the picture.

revealing the info window



the info window



The Info Window shows you the settings of Blender. Among other things, you can tell Blender where to store autosave files, when to save them (use the 'Time' value) and how many versions to keep on disk.

Here, you can also activate Blender's tooltips function. Tooltips will appear in the right corner of the header of the Info Window, right next to the Blender URL and version number.

You can make your settings permanent by pressing **CTRL U** and confirming the requester that pops up. (Please note, that this entire book assumes that you have not changed the default Blender settings file!)

If you have purchased a C-key, your user name will show up here.

Important note for owners of a two-button mouse: activating the 2-mouse option will cause Blender to simulate a **MiddleClick** when you hold down **ALT** and **LeftClick**.

lamp buttons



## Lamp buttons (**F4**)

The Lamp Buttons will only show when a lamp has been selected. With these buttons, you can change all the parameters of lamps, like their color, energy, type (regular lamp, spotlight or sun). You can also control the quality of shadows by manipulating the clipping values and shadow buffer sizes.

You can read more about lamps in the chapter 6.

## Material buttons (**F5**)

Material Buttons are only shown when an object has been selected. This window allows control over properties as object color, shininess, transparency, textures, texture types, texture projection methods.

You can read more about assigning materials in chapter 2. More information about texturemaps is available in chapter 3.

## Animation buttons (**F6**)

In the left part of the Animation Buttons window you can set properties for things like curve following, automatic object duplication and object tracking.

The middle part of the window contains the interface to object effects like particle systems and the wave effect. Pressing the 'New Effect' button and selecting an effect from the effects list on the right will attach a new effect to the currently selected object and display the list of options for this effect.

The standard effects are: particle system (read more about that in chapter 10), wave and build.

# Blender -> Interface :: beginner

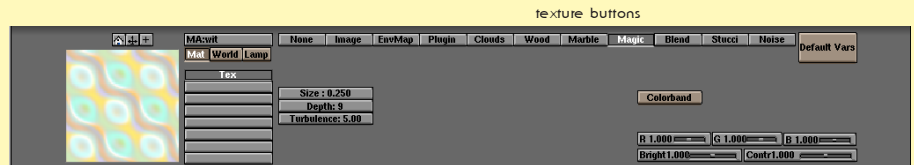
## World buttons (F9)

With the World Buttons window you can set up horizon colors, ambient lighting, fog effects and starfields. It is used in the chapter 10.



## Edit buttons (F9)

The buttons that are shown in the Edit Buttons window depend on the kind of object that you have currently selected.



## Display buttons (F10)

Using the Display Buttons, you can control the way Blender will render your images. Set the image size with the SizeX and SizeY buttons and control the image quality by setting an OSA (Over Sampling) value. Higher values result in better image quality, but a longer rendering time.



Select the 'Render' button to render a still image, or the 'Anim' button to render a range of images. (For animations, the 'Sta' and 'End' values determine the length of the animation).



## edit buttons



## display buttons

