

## INTRODUCTION

### ● WHAT IS REALWAVE ?

RealWave® is a standalone program for Windows™ based on true physical equations that is able to calculate the propagation of waves in a polygonal mesh. Different waves with different properties can combine together in the same mesh, resulting in realistic interference effects. Also typical wave behavior as reflection and diffraction effects is easily achieved. RealWave has the ability to calculate the buoyancy of objects and track their motion as they are affected by the waves created in the surface. You only need to place the objects in their initial position and let the program go.

### ● HOW DOES REALWAVE WORK ?

The standard procedure looks like this:

**1. Object import:** The objects that will take part in the simulation must be previously imported in the simulator. RealWave supports the following object formats: **.3ds** (3D Studio objects) **.lwo** (Lightwave object) **.asc/.ase** (3D Studio ascii object), **.obj** (Alias|Wavefront object) and **.dxf** (Autodesk DXF format). All these formats will only create static geometry in RealWave, that is, objects with no animation information.

Additionally, RealWave supports **.sd** files (Next Limit animated scenes). To import animation data from the 3D package you will need to use an animated scene file (**.sd** format). The **.sd** file must be previously exported from the 3D package where the animation has been created. Next Limit provides some specific plug-ins (see download section) for each 3D platform, that will export the animated scene as a **.sd** file readable from RealWave.

**2. Surface and wave definition:** the sea surface can be modified in size and shape to match your scene needs. The **Hypermesh** feature is very useful to create higher resolution areas specially where the action takes place. The **wave** panel will let you create a combination of global (fractal) and local waves. These waves will affect the motion of the objects.

**3. Simulation and data output:** once the simulation is running, the results can be exported to disk as **data files** that are stored for later usage. These data files consist of:

- sequences of **(.bin)** binary files that contains the surface deformation for every frame
- motion files **(.dyn)** that contains the motion of each object
- sequences of **(.bin)** binary files that contains particle information representing the splashes and foam effects
- sequences of **(.tga)** image files that contains the foam texture mask for every frame

All these data files are needed to represent the results of the simulation in the 3D package. Next Limit provides specific plug-ins (see download section) for different 3D platforms. Each plug-in will need certain data files created in RealWave. For example, the Surface Loader plug-in will accept a sequence of **(.bin)** binary files and will automatically create and animate the surface as it has been simulated in RealWave.

### ● WE RECOMMEND

- [LEGAL](#)
- [INTRODUCTION](#)
- [MAIN CONTROLS](#)
- [SURFACE](#)
- [WAVES](#)
- [OBJECTS](#)
- [DAEMONS](#)
- [OPTIONS](#)
- [3DS MAX](#)
- [LIGHTWAVE](#)
- [SOFTIMAGE](#)
- [MAYA](#)
- [F.A.Q.](#)

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**🌐 LET US KNOW YOUR OPINION !**

We would like to hear your suggestions and comments about RealWave. Feel free to contact us at: [info@nextlimit.com](mailto:info@nextlimit.com)

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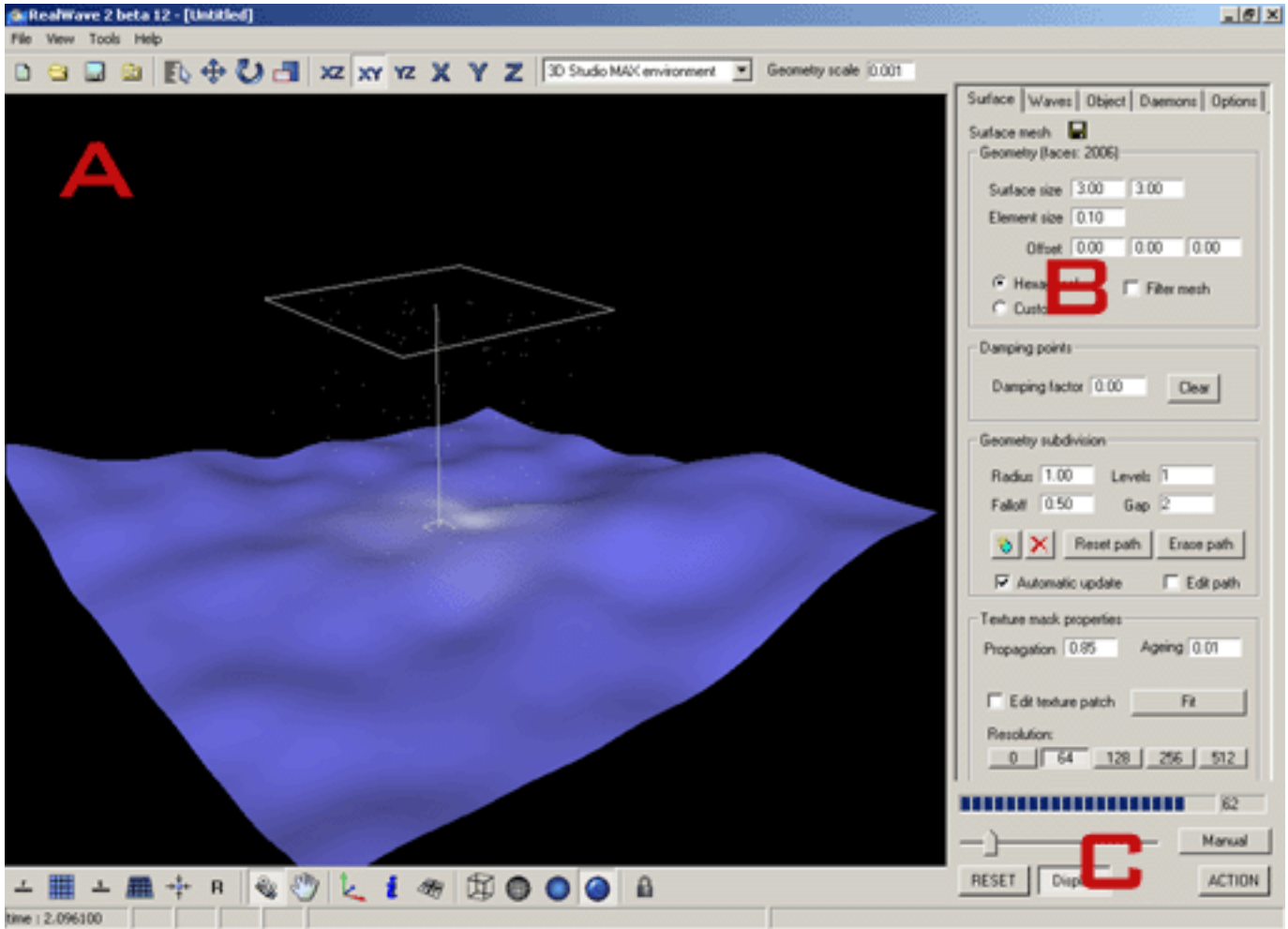
## ● LET US KNOW YOUR OPINION !

We would like to hear your suggestions and comments about RealWave. Feel free to contact us at:



# REALWAVE INTERFACE

The RealWave interface is divided in 3 main areas:



## A - VIEWPORT WINDOW

This window shows the graphic elements of the RealWave environment. When the application starts, only the free surface mesh (blue color) is shown. This free surface represents the water plane in which wave propagation and object motion will take place. User can interact with the graphic window by dragging the mouse and pushing different keys for different purposes. See Mouse controls section for more information.

## B - PARAMETERS PANEL

Several panels can be selected from the right side of the application. Each panel contains different controls related to RealWave's elements. There are five panels: Surface, Waves, Objects, Daemons and Options. See following sections for more information about these panels.

## C - SIMULATION CONTROLS


Contains buttons for starting, pausing and resetting the simulation. See Simulation controls section for more information.


## MOUSE MOVEMENT

- **ROTATE VIEW:** drag mouse with left button pressed.
  - **PAN VIEW:** drag mouse with middle button pressed.
  - **ZOOM VIEW:** drag mouse with right button pressed.
- 


## MAIN TOOLBAR


 Removes all data in the current scene and resets RealWave.

 Load a RealWave workspace scene (\*.rww)

 Save current workspace to disk.


 Load a SD animation file.

 Select object by name.


 Move object.


Rotate object.


 Scale object.


 Constrain the object transformations to X and Z axes.

 Constrain the object transformations to X and Y axes.

 Constrain the object transformations to Y and Z axes.

 Constrain the object transformations to X axis.

 Constrain the object transformations to Y axis.

 Constrain the object transformations to Z axis.

3D Studio MAX environment 

Sets the environment according to your 3D package.

Geometry scale


Sets the scale according to your 3D package. RealWave system unit is 1 meter ( the world axis length ) if your 3D package uses a different unit you must set the proper conversion scale. I.e. if your 3D package unit is inch you must set 0.0254, if it is centimeters you must set 0.01, and so on.

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## VIEW CONTROLS


 Change the display to Front view. Shortcut key: 1


 Change the display to Top view. Shortcut key: 2


 Change the display to Side view. Shortcut key: 3

 Change the display to Perspective view. Shortcut key: 4

 Change the display to Tracking view. Tthe point of view follows the current selected object.

 Reset view to its default position.


 Rotate camera mode. Rotate the point of view dragging the mouse with the left button pressed. Shortcut key: C

 Pan camera mode. Displaces the point of view dragging the mouse with the left button pressed. Shortcut key: P

 Display world axes.

 Display grid.

 Show license info.

 Display selected object in box mode.

 Display selected object in wireframe mode.



Display selected object in flat shaded mode.



Display selected object in smooth shaded mode.



Locks the current object selection.

## SIMULATION CONTROLS



Shows the percentage of frame calculated and current frame number.



Sets the simulation in Adaptive time step. RealWave uses an adaptive time integration scheme, thus in every calculation loop RealWave looks for the best time interval.



Sets the simulation in Manual time step. The slider can be understood as follows:

Left: Top speed

Right: Top accuracy

As a general rule, use always Manual time step with the slider all to left, and move it to the right ( or use the Adaptive time step ) only if you find errors in the simulation (i.e. excessive peaks and surface deformation )



This button will reset the time value to the beginning (0.0 seconds) also resetting the mesh and position of objects.



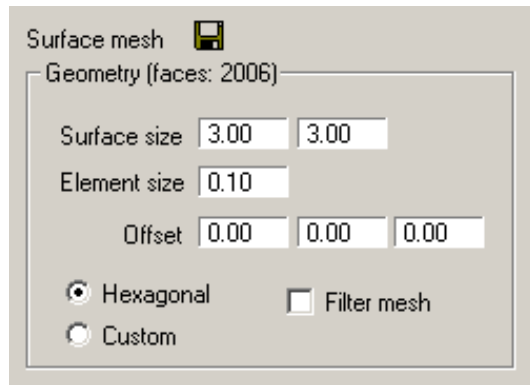
Enable / disable the OpenGL® viewport for speed purposes.



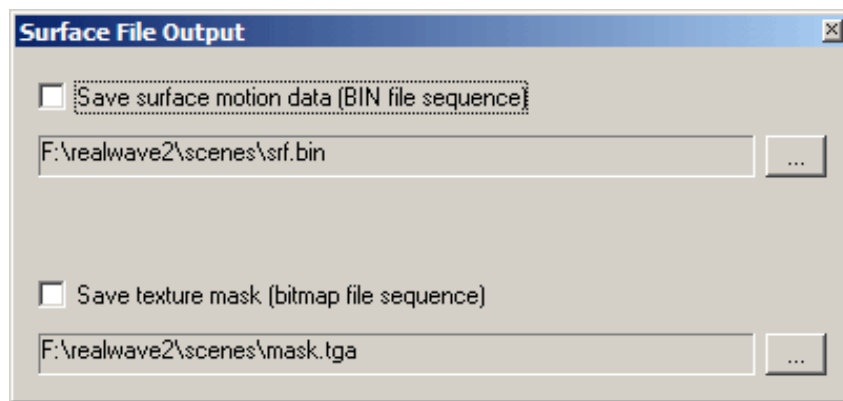
This button will start the simulation. RealWave needs at least a wave or an object inserted in the scene to run. While simulation is running you can change the point of view to see how the program is working. At any time you can press ACTION again to stop the animation or resume it again.

# SURFACE MESH

The Surface mesh section controls the topology of the water surface in your simulation. Units are in meters.

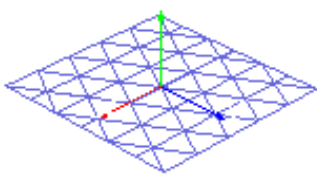


The floppy icon lets you adjust the file options for the surface. Activate the checkboxes for the Surface and the Texture mask, and select the file prefix and the output folder to save the files generated in the simulation.

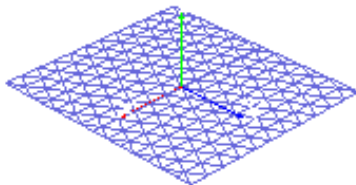


**SURFACE SIZE:** The size of the surface in X and Y directions.

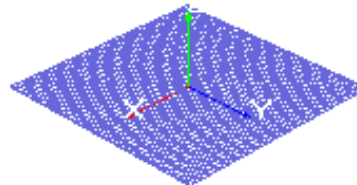
**ELEMENT SIZE:** The size of the subdivisions of the surface.



Element size: 0.5



Element size: 0.25

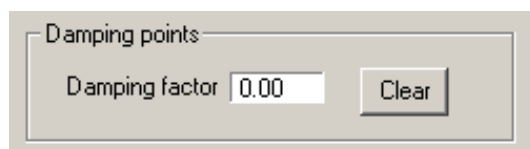


Element size: 0.1

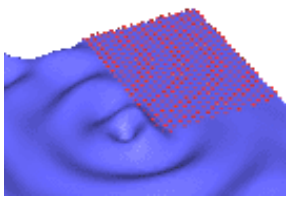
**OFFSET:** Moves the surface in X, Y and Z directions from the world center.

**HEXAGONAL - CUSTOM:** Sets the type of surface to the standard generated by RealWave or a custom object of your choose. The imported surface can be in **.asc** (ASCII format), **.lwo** (Lightwave object), **.obj** (Wavefront object) or **.dxf** (Autodesk DXF format)

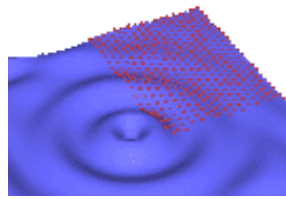
**FILTER MESH:** Smooths the surface to avoid edged peaks.



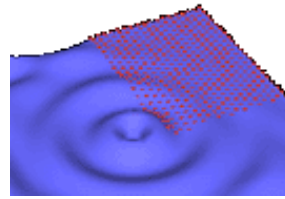
The Damping points are the red points that you mark over the surface pressing the Shift key. These points defines a region of absorption in the surface, and the damping factor defines the strenght of the absorption.



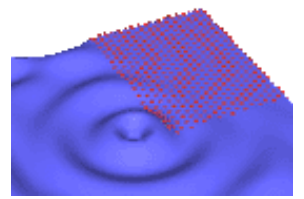
Damping factor: 0



Damping factor: 1



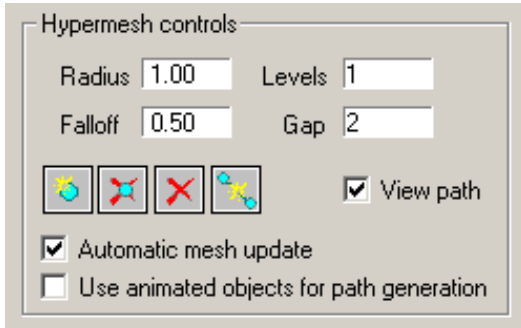
Damping factor: 2




Damping factor: 5

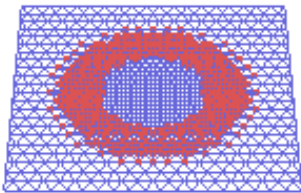
Factor 0 disables the damping and makes the red zone totally rigid.

## HYPERMESH CONTROLS

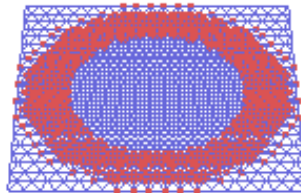


This section controls the settings of the hypermesh (multi-resolution mesh) surface. To use the hypermesh surface simply load a SD file and the path of the animated object(s) will be generated automatically. Another option is to create your own path inside RealWave using the create points button 

**RADIUS:** The size of the "hot zone", the area of max. resolution.

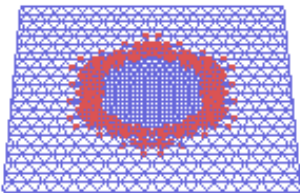


Radius: 1

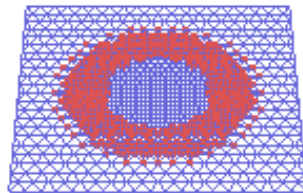


Radius: 2

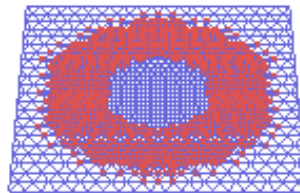
**FALLOFF:** The size of the damping area.



Falloff: 0

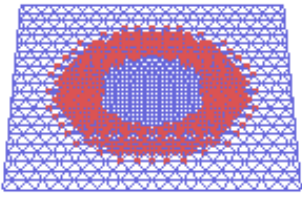


Falloff: 0.5

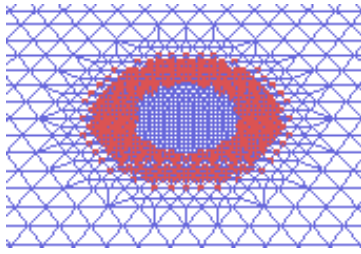


Falloff: 1

**LEVELS:** The number of multiresolution areas.

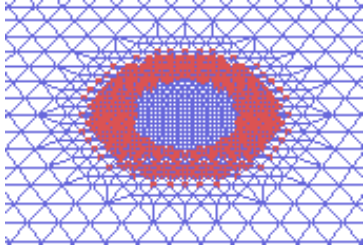


Levels: 2

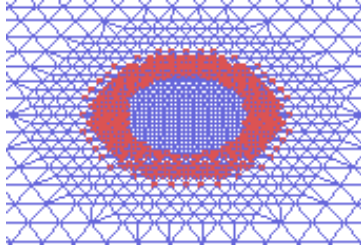


Levels: 3

**GAP:** The size of the "cold zones", the zones outside the center area.



Gap: 2



Gap: 3



: Create a point in the path.



: Deletes the currently selected point in the path.



: Deletes the entire path.

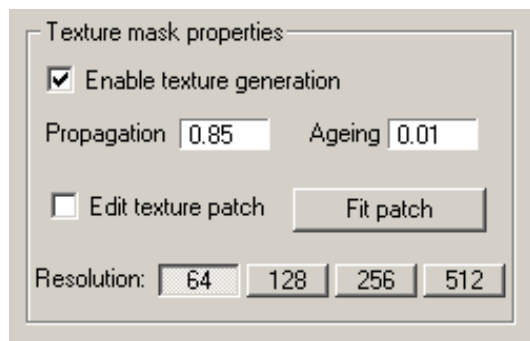


: Breaks the path between two points.

**VIEW PATH:** When this option is checked you can view and edit the control points of the path.

**AUTOMATIC MESH UPDATE:** When this option is checked, the surface topology is updated whenever you move a point. This can be irritating if you are trying to adjust a path in a large surface. In such cases uncheck this option, edit your path and check again to generate the "hot zone" around the path.

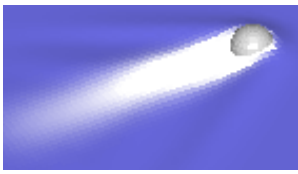
## ● TEXTURE MASK PROPERTIES



The Texture mask section controls the settings of the texture generated by RealWave when the objects touch the surface. You can use this texture as a mask for a foam texture inside your 3D package.

**ENABLE TEXTURE GENERATION:** Enable foam texture generation. The foam is simulated by means of a texture (besides of the particle effects). The foam texture will create a 256 gray levels mask in a bitmap. Object and particles hitting the water surface will contribute to foam generation and will increase the texture color. The foam texture is only visible in the smooth shade view mode.

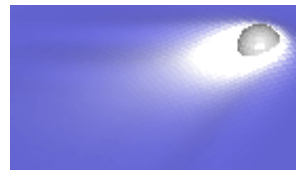
**PROPAGATION:** The foam texture (white) will tend to propagated across the surface. This parameter controls how fast the propagation take place. Usual ranges between 0.1 - 1



Propagation: 0.1



Propagation: 0.5

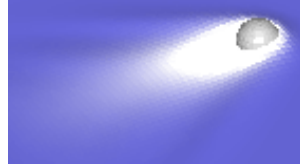


Propagation: 1

**AGEING:** The life (duration in time) of the foam texture. The foam texture (white) will tend to dissipate as time passes. This parameter controls how fast the dissipating process take place



Ageing: 0.005



Ageing: 0.01



Ageing: 0.1

**EDIT TEXTURE PATCH:** Check to adjust the gizmo that controls the size and position of the texture. You may need to adjust the region manually (move icon). Normally the foam region fits to the high resolution area where the action takes place.

**FIT:** Automatically adjusts the texture gizmo to the high resolution area of the hypermesh surface.

**RESOLUTION:** The size in pixels of the texture.

# WAVES

To create a new wave, click on the icon next to Scene waves. You can create 3 different kinds of waves.

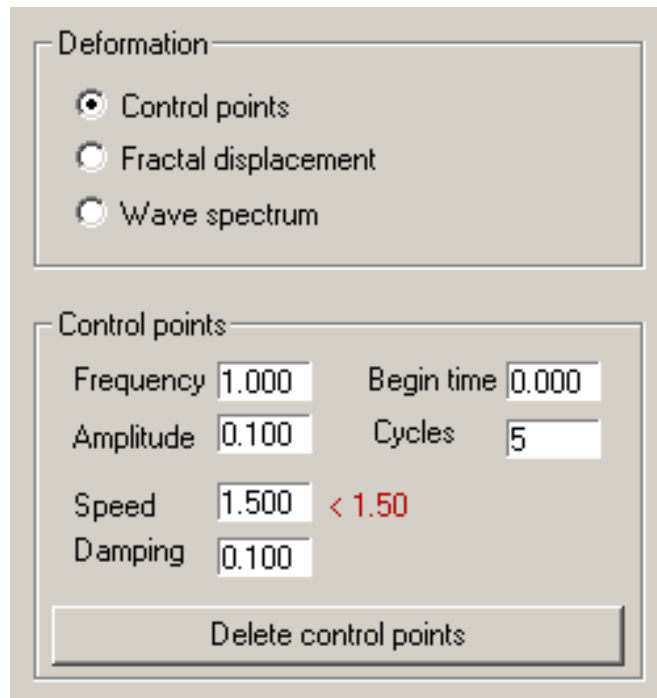
## CONTROL POINTS

This type of wave works by defining certain control points on the surface. The control points will oscillate and deform the surface generating wave propagation. The waves are generated from blue control points, and red control points defines a damping area.

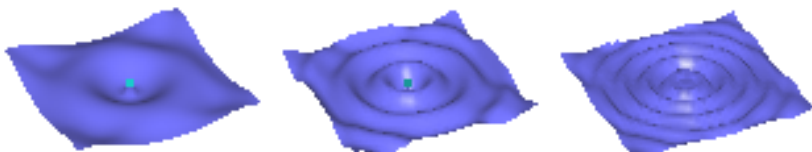
To create blue control points press Ctrl key and select them in the surface dragging a region with the left mouse button.

To create fixed red points press Shift key and select them in the surface dragging a region.

To delete control points press Ctrl + Shift keys and drag a region over the surface.



**FREQUENCY:** The oscillation frequency of the control points. High values could lead to system malfunction. Normal ranges are between 0.5 - 10

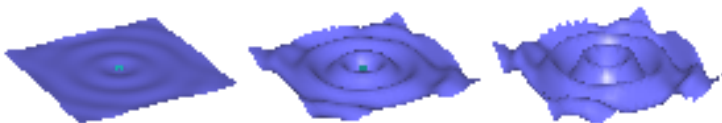


Frequency: 1

Frequency: 2

Frequency: 3

**AMPLITUDE:** The oscillation amplitude of the control points. High values could lead to system malfunction.



Amplitude: 0.1

Amplitude: 0.5

Amplitude: 1

**SPEED:** The wave speed in meters per second. This is a very important parameter. The greater this number the faster the wave will travel. Be careful! If the wave speed reaches certain value it will become unstable. There are two ways to let a wave to move faster, in other words, to increase the wave speed limit:

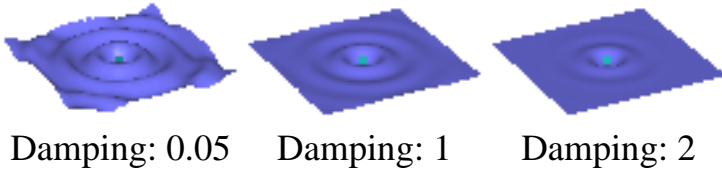
- A. Use 'adaptive' time step or set to 'manual' and reduce the time step factor (slider).

- B. Increase the element size (Surface panel).
- **< 1.50** Recommended wave speed limit. The speed limit depends exclusively on the time step and the mesh resolution. The time step can be changed in the Control window (right bottom area). The size of the elements can be changed in the Surface window. It is very important that the current wave speed does not exceed the recommended speed limit. Otherwise, the surface can become unstable.



**DAMPING:** The dimming of the waves. In real world the motion of the wave decreases along time (losing energy) and, after certain period, the wave disappears. You can achieve the same effect giving some dampiness to the wave. It will cause the wave to reduce its motion as it propagates through the mesh. Eventually the wave will lose completely its energy and won't affect the mesh anymore. This is a damping factor for the selected wave. The greater this value, the sooner the wave will be attenuated. In other words, this parameter controls how far the wave can travel.

[Values]  
 [=0 : no damping]  
 [>0 : damping]



**BEGIN TIME:** It is an offset value (in seconds) that makes the control points to begin the oscillation later. I.e. if you are working at 30 FPS and set a Begin time of 2 your wave will start at frame 60.

**CYCLES:** The number of oscillations of the control points.



**DELETE CONTROL POINTS:** Delete all control points for the current wave.

## FRACTAL DISPLACEMENT

The waves are generated following a fractal pattern. The fractal pattern consists of one primary big size wave and little secondary waves that add detail to the surface.

Deformation

Control points

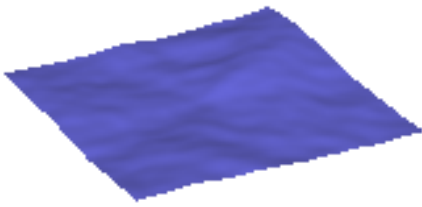
Fractal displacement

Wave spectrum

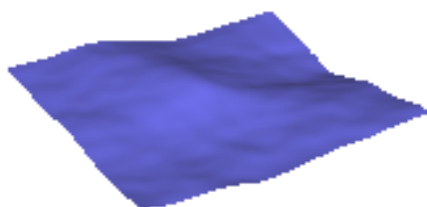
Fractal displacement

Height <input style="width: 50px;" type="text" value="0.500"/>	Map scale
Angle <sup>º</sup> <input style="width: 50px;" type="text" value="0.000"/>	X: <input style="width: 50px;" type="text" value="1.000"/>
Octaves <input style="width: 50px;" type="text" value="4"/>	Y: <input style="width: 50px;" type="text" value="1.000"/>
Slope <input style="width: 50px;" type="text" value="1.000"/>	
Speed <input style="width: 50px;" type="text" value="1.000"/>	

**HEIGHT:** Global height factor of the fractal wave. Fractal waves are a combination of large and small waves. With this parameter the height of large waves is controlled.



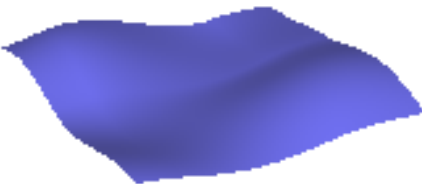
Height: 0.5



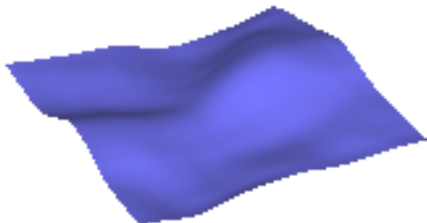
Height: 1

**ANGLE:** The direction of the waves. Default 0 is X negative, and increasing the number means increasing the angle in clockwise direction.

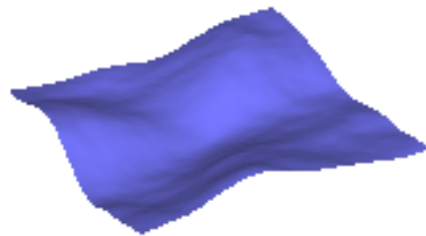
**OCTAVES:** Number of octaves of the fractal wave. More octaves will create a more complex wave. Normal ranges are between 2 and 8.



Octaves: 1

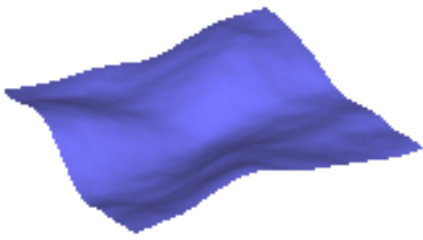


Octaves: 3

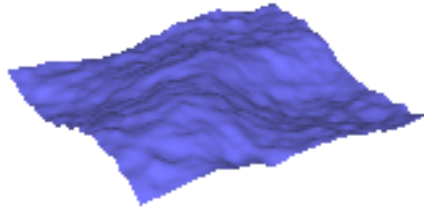


Octaves: 10

**SLOPE:** Local height factor of the fractal wave. Fractal waves are a combination of large and small waves. With this parameter the height of small waves is controlled.



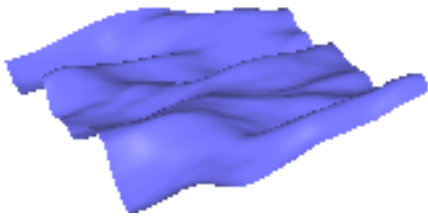
Slope: 1



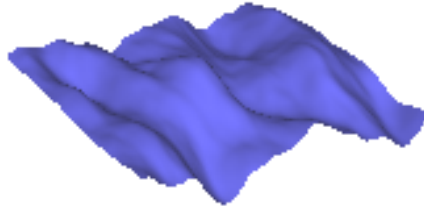
Slope: 5

**SPEED:** The speed of wave propagation over the surface. 1 is approx. 1 meter per second.

**MAP SCALE ( X and Y ):** By default the fractal wave is mapped in a 1x1 rectangular square. By varying this value the waves will be stretched following the new mapping rectangle. Note that the stretching directions will also depend on the Angle parameter.



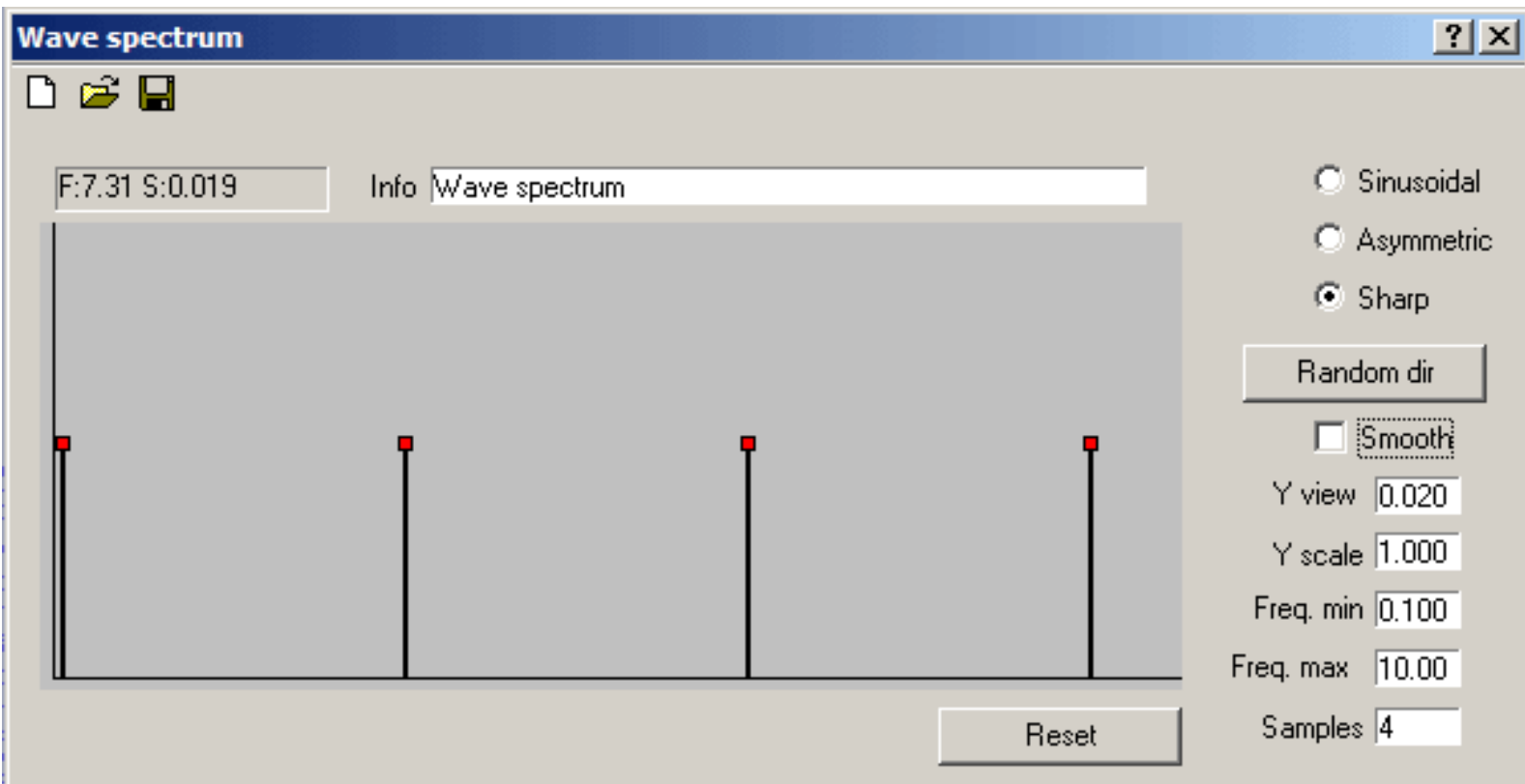
Map scale X: 3



Map scale Y: 3

## WAVE SPECTRUM

The waves are generated following a graphical frequency representation that can be edited with control points. Wave's theory predicts that any complex sea profile can be mathematically represented by an infinite number of sums of simple waves. Although infinite cannot be managed inside computers we can obtain a good approach by sampling discrete points inside an interval. The spectrum of a wave represents a combination of simple waves, each wave represented by its frequency (horizontal axis) and its energy or amplitude (vertical axis). In the spectrum window you can see those waves represented by vertical bars and a red point at the top.



Simply by dragging the mouse with the left button pressed over the red squares you can displace them up and down. By doing this you are changing the amplitude of that specific wave. Probably you would like to reduce the energy of high-frequency waves that are disturbing the surface too much.

Also the spectrum can be represented by means of a spline which is useful to obtain a smooth curvature in the spectrum profile. In this case you can set a lot of samples and produce a smooth variation with a few control points.

**INFO:** Type a descriptive information about your own profile for future use.

**SINUSOIDAL:** the well-know sinusoidal wave.

**ASYMMETRIC:** this wave is slightly thinner at the top than the bottom.

**SHARP:** this wave is sharp at the top and smooth at the bottom.

**Random dir** Press this button to randomize again the waves' direction using the same spectrum.

**SMOOTH:** Switch between spline (smooth) mode and discrete mode. In the smooth mode you should take in mind these mouse controls: Moves control point: drag mouse with left mouse pressed over the control point. Remove control point: click on the control point with CTRL and SHIFT keys pressed. Switch between linear/smooth interpolation: click on the control point with the SHIFT key pressed.

<table border="1"> <tr><td>Y view</td><td>0.020</td></tr> <tr><td>Y scale</td><td>1.000</td></tr> <tr><td>Freq. min</td><td>0.100</td></tr> <tr><td>Freq. max</td><td>10.00</td></tr> <tr><td>Samples</td><td>4</td></tr> </table>	Y view	0.020	Y scale	1.000	Freq. min	0.100	Freq. max	10.00	Samples	4	<p>Maximum vertical length of the bars. This will not produce any change in waves' amplitude.</p> <p>The scale factor for amplitudes. F.e. a value of 0.5 will reduce the amplitude of waves by a half.</p> <p>Set the minimum value of frequency (left side of the interval) for wave sampling.</p> <p>Set the maximum value of frequency (right side of the interval) for wave sampling.</p>
Y view	0.020										
Y scale	1.000										
Freq. min	0.100										
Freq. max	10.00										
Samples	4										

Number of samples evenly spaced inside the interval. **WARNING:** this parameter will cause the spectrum profile to reset.

**RESET:** This option will reset the amplitude of waves to their initial values.

**CLOSE:** Close the spectrum window. You don't need to close the spectrum window to see the behavior of the current spectrum in the surface mesh.

Additionally, in the upper toolbar you can find the following controls:

**NEW SPECTRUM:** New spectrum Reset totally the spectrum window restoring initial conditions.


**LOAD SPECTRUM:** Loads a spectrum from file (SPE format).

**SAVE SPECTRUM:** Saves a spectrum to file (SPE format). Note: when the spectrum is enabled for a wave, its control points will become inactive. In order to switch again to control point's mode you should disconnect the spectrum and **RESET** the scene.


# OBJECTS


This panel controls the properties and behavior of the objects involved in the simulation.

---

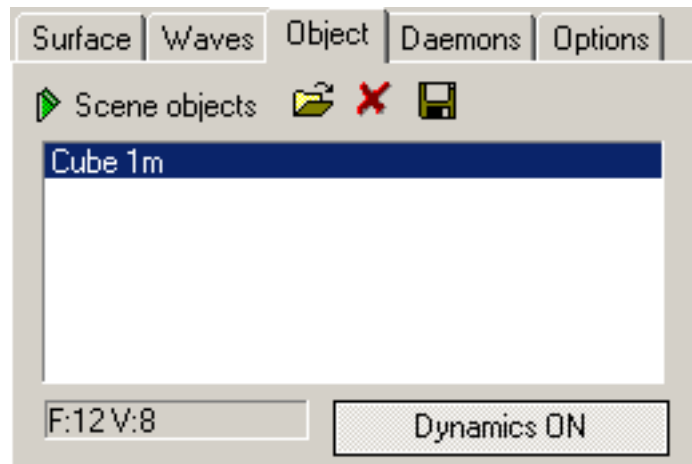
 Import objects in the following formats:

- .asc** (ASCII format)
- .lwo** (Lightwave object)
- .obj** (Wavefront object)
- .dxf** (Autodesk DXF format)

 Removes selected object from scene.

 Saves the motion of an object to a **.dyn** file that you can use later in your 3D package to reproduce the dynamic motion of the object in the 3D scene.

**NOTE:** The object's pivot must be centered ( and oriented to world axis ) for the **.dyn** motion file to work correctly.



**DYNAMICS:** Enables or disabled the Dynamic property of the selected object. By default Dynamic is enabled for imported objects, except for SD animated objects or static objects. The Dynamic property will let the object react to hydrodynamical forces and any other kind of external forces. When an object contains a predefined animation (SD animated scene) or to create static objects, the Dynamic property must remain disabled.

---

## STANDARD PARAMETERS

Standard properties of the object (geometric and physical properties)

- Standard parameters

Position

Angles

Scale

Pivot

CG

Mass

Friction

Initial Velocity

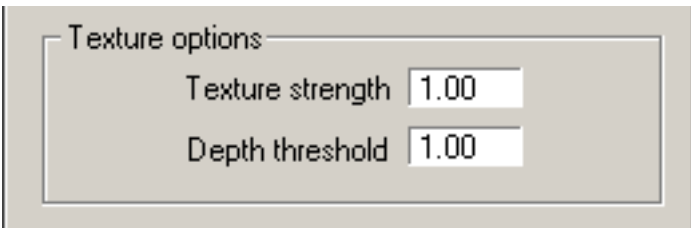
Initial Rotation

**Reset** This button reset all the parameters of the object.

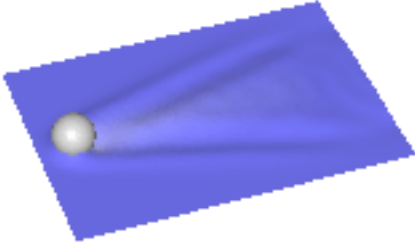
- **POSITION:** Moves the object in X, Y and Z directions.
- **ANGLES:** Rotates the object in X, Y and Z directions.
- **SCALE:** Sets the object scale in X, Y and Z axes.
- **PIVOT:** Moves the object's pivot point in X, Y and Z directions.
- **CG:** Center or Gravity (center of masses). An object tends to rotate around its CG point. It is calculated automatically for all objects. This value affects the dynamical behavior of the object. You can change the Center of Gravity by disabling first the "Auto" button.
- **MASS:** The mass of the objects (in Kg.). By increasing the mass of an object the floating and other physical characteristics are changed like in real world. It is important not to set a too low mass value (~ 1 Kg) since the object could become unstable.
- **Balance Mass** This button will recalculate the mass for the current floating condition of the object. The mass will equal to the floating forces, thus creating a equilibrium state. When this button is pressed, the mass will be calculated so that the object remains floating without going up and down. Note that this feature will not work if the object is totally submerged or in the air.
- **FRICITION:** The object resistance force to air and water. Higher values mean more resistance to air and collisions. A friction value is always needed or the object will never stop its motion. Typical values are around 100 - 1000.
- **INITIAL VELOCITY:** Sets an acceleration for the object in X, Y and Z axes. An initial velocity of the object can be set, normally for testing purposes. You can control the kind of waves the object generates. Note that you can combine this feature with the Dynamic button enabled or disabled.
- **INITIAL ROTATION:** Sets a rotation for the object in X, Y and Z axes. An initial rotation of the object can be set, normally for testing purposes. You can control the kind of waves the object generates. Note that you can combine this feature with the Dynamic button enabled or disabled.

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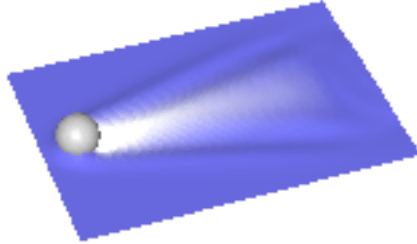
## ● TEXTURE OPTIONS



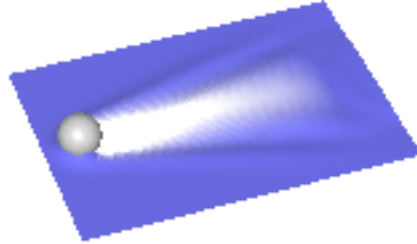
- **TEXTURE STRENGTH:** When an object hits the water it will also contribute by adding energy the foam texture mask. This value controls the strength of the foam mask contribution.



Tex. strength: 0.01

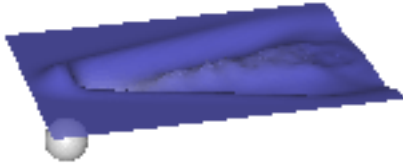


Tex. strength: 0.05

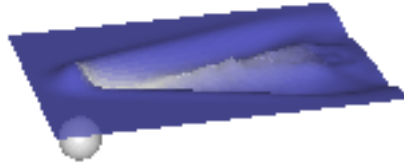


Tex. strength: 0.1

- **DEPTH TRESHOLD:** A submerged object can also create waves (see wave depth threshold) and contribute to the foam texture mask. This value will let the submerged object affect the foam mask.



Depth treshold: 0.7



Depth treshold: 1

---

## ● ADVANCED OPTIONS

Advanced properties of the object (dynamic properties, surface perturbing parameters)

- Advanced options

Animated object (SD scene)

Release object at frame 
 Create path      Stride

Dynamic properties

Voxel resolution      Show vox  
Inertia scale

Wave/Particle generation

Wave strength (V-H)    
Front wake distance       
Perturbing resolution       
Particle drying speed   
Distance to coast   
  
 Show perturbing points

Display

Show normals        
 Show cg  
 Show axis

## ANIMATED OBJECT (SD SCENE)

- **RELEASE OBJECT AT FRAME:** When this option is checked, the animated object coming from an .SD scene will be released. In other words, it will not follow the predefined animation anymore, and will be affected by dynamic motion (floating forces, gravity, etc). This option is useful to combine a predefined animation (for example a guy throwing a beach ball) and the ball floating in the water (ball should be released before it reaches the water).
- **CREATE PATH:** If this option is checked, the animated object (from an .SD scene) will create an Hypermesh adapted to its animated path.
- **STRIDE:** This is the distance between control points of the Hypermesh. Smaller stride values can be used to define a more accurate Hypermesh path.

## DYNAMIC PROPERTIES

- **VOXEL RESOLUTION:** A volume subdivision (voxel) of the object is needed for different calculations (for example, Particle collision). It is important to understand that the higher the resolution, the more accurate these calculations will be, but they will also slow the process and consume more memory. Since the objects are volumetric elements, the number of voxels created will be proportional to the power of three. Therefore slight variations of this value must be done (i.e. from 10 to 15).
- **INERTIA SCALE:** By default (1,1,1) this control affects the rotating behavior of the object. By increasing

a value, the object will become more resistant to rotate in that direction. This is also equivalent to vary the distribution of the mass, moving the mass toward the edges of the object. Physically the inertia scale is the opposition to rotate, and the mass is the opposition to translate.

---

## ● WAKE / PARTICLE GENERATION

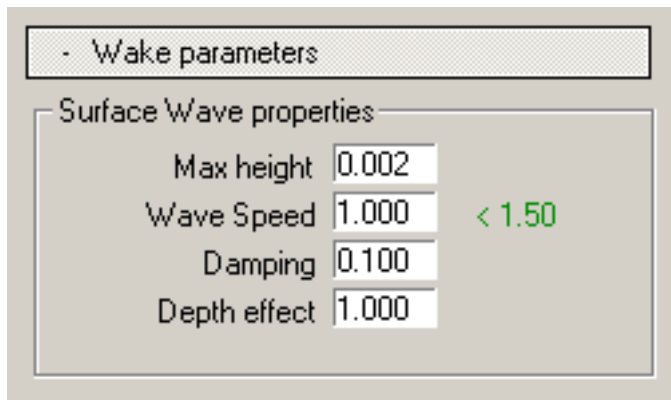
- **WAVE STRENGTH (V-H):** The strength of the wave produced by the object in vertical and horizontal components. Any object will create waves depending on the motion of the object and these strength factors. The horizontal and vertical components of the wave also depend on the horizontal and vertical velocities of the object.
  - **FRONT WAKE DISTANCE:** Any object moving in the water will tend to create a front wave at some distance. This value controls the distance to the front wave. It requires the button "Auto" to be disabled.  
 Auto : The frontal wave distance is automatically calculated depending on the object size. This button can be disabled in order to adjust the frontal wave distance manually.
  - **PERTURBING RESOLUTION:** The perturbing points, placed on the surface of the object, have two important roles:
    - A) To perturb the surface in order to create wave effects
    - B) To emit particlesThe number of perturbing points are controlled by this value. By setting a value of 2, for example, the number of control points is doubled. Usually there is no need to adjust this value unless the number of points is insufficient to generate a convincing wave or particle effect.
  - **PARTICLE DRYING SPEED:** This control affects the drying rate of the perturbing points. The rate of particle emission from the perturbing points will also depend on the wet/dry status. Submerged points are in wet state (particles are emitted). Points above the surface emit particles depending on their dryness.
  - **DISTANCE TO COAST:** Coast line effect (or shallow water effect). This feature lets simulate wave diffraction effects (waves adapting to the coast shape as the depth decreases). It will require an static object (Dynamics OFF) to simulate the coast, island, etc. The coast line area will appear in a different color in the surface mesh. The maximum bending will occur near the object.  
[Values]  
[= 0 : the coast line effect is disabled]
  - **SHOW PERTURBING POINTS:** Displays the perturbing points.
- 

## ● DISPLAY

- **SHOW NORMALS:** Displays the face normals ( the facing direction of polygons ) of the object. It is important that they point outward.
  - **SHOW CG:** Displays the Center of Gravity of the object.
  - **SHOW AXIS:** Displays the axes of the object.
  - Flip Normals Normals are reversed. It should be used only in objects with face normals pointing in the wrong direction (inward). In RealWave the back faces are displayed in a different color than the front faces. Note than in closed objects you should never see a back face (unless you are inside the object).
  - Choose color Change the color of the object
- 

## ● WAKE PARAMETERS

Properties of the wave generated by the object.

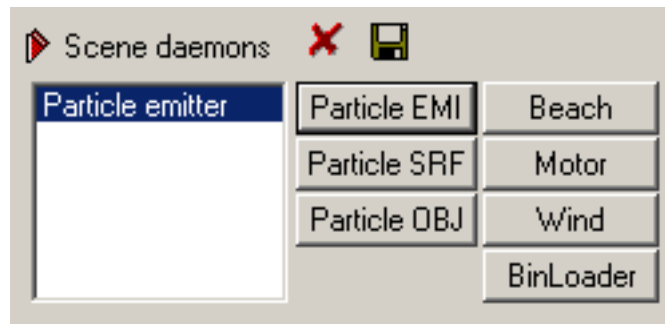


- **MAX HEIGHT:** The oscillation amplitude of the control points. High values could lead to system malfunction.
- **WAVE SPEED:** The wave speed in m/s. This is a very important parameter. The greater this number the faster the wave will travel. Be careful! If the wave speed reaches certain value it will become unstable. There are two ways to let a wave to move faster, in other words, to increase the wave speed limit:  
A. Use 'adaptive' time step or set to 'manual' and reduce the time step factor (slider).  
B. Increase the element size (Surface panel).  
**< 1.50** : Recommended wave speed limit. The speed limit depends exclusively on the time step and the mesh resolution. The time step can be changed in the Control window (right bottom area). The size of the elements can be changed in the Surface window. It is very important that the current wave speed does not exceed the recommended speed limit. Otherwise, the surface can become unstable.
- **DAMPING:** This is a damping factor for the selected wave. The greater this value, the sooner the wave will be attenuated. In other words, this parameter controls how far the wave can travel.  
[Values]  
[=0 : no damping]  
[>0 : damping]
- **DEPTH EFFECT:** The object will perturb the mesh, not only when it hits the surface, but when it moves underwater at certain depth. The depth control will specify the maximum permitted depth where submerged objects can create waves. Note that the strength of the perturbation will linearly decrease as depth increases.  
[Ranges]  
[=0 : Depth factor is disabled. Submerged objects do not affect the surface]  
[>0 : depth limit]


# DAEMONS

This panel let you add special elements to the simulation like particle emitters, forces, etc.

---



 Delete selected Daemon.

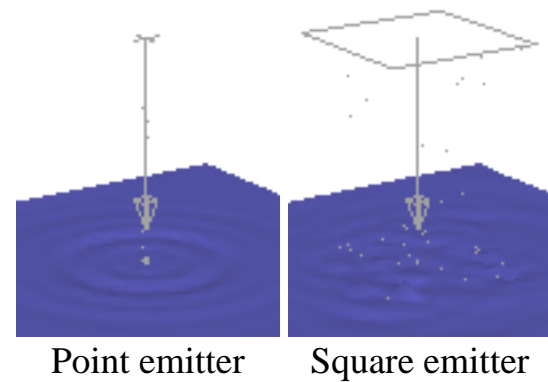
 Sets the Output file options for particle Daemons. You can save the particles in the following formats:

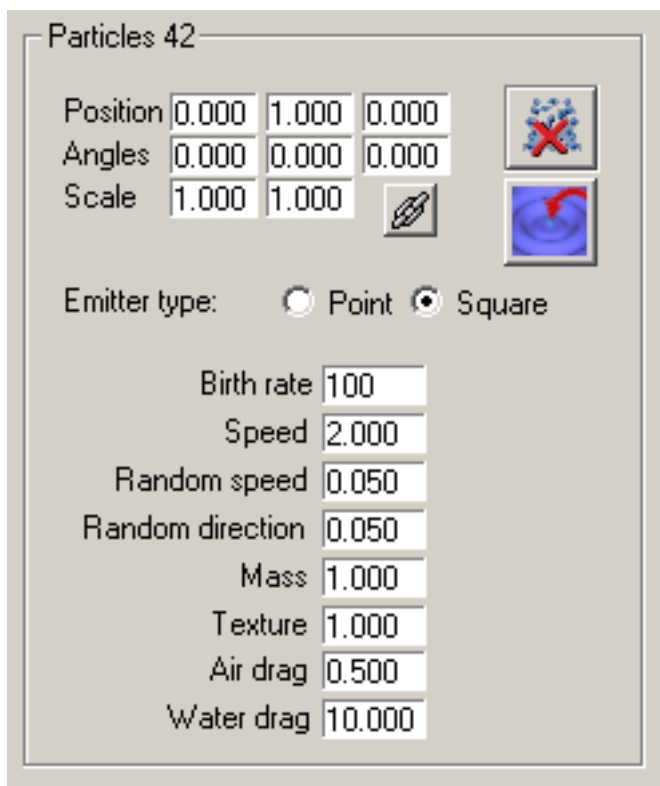
- .bin ( RealWave format readable by RealWave plugins )
- .lwo (Lightwave particle file)
- .asc (ASCII format)


---

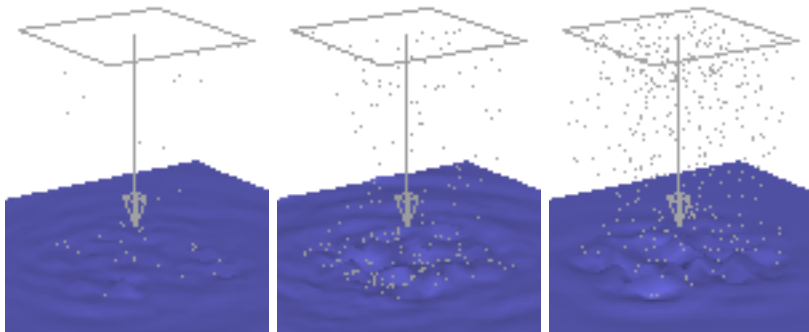
## PARTICLE EMITTER

There are 2 types of emitters: point and square.





-  Link the daemon's position and rotation to an object.
- **POSITION:** Moves the emitter in X, Y and Z directions.
- **ANGLES:** Rotates the emitter in X, Y and Z axes.
- **SCALE:** The size of the Square emitter in X and Y axes.
- **BIRTH RATE:** This value controls the number of particles to be created in each iteration. If no particles are created for a certain birth rate, just increase the value until the particles are available.

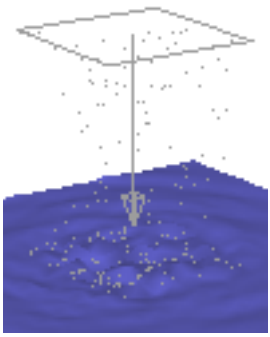


Birth rate: 1

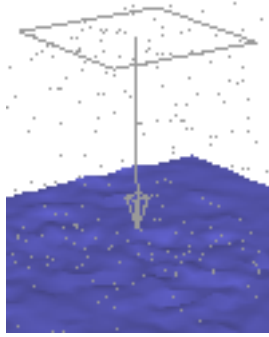
Birth rate: 5

Birth rate: 20



- **SPEED:** The speed in meters per second.
- **RANDOM SPEED:** Sets a speed variation to particle emission.
- **RANDOM DIRECTION:** Sets a direction variation to particle emission.

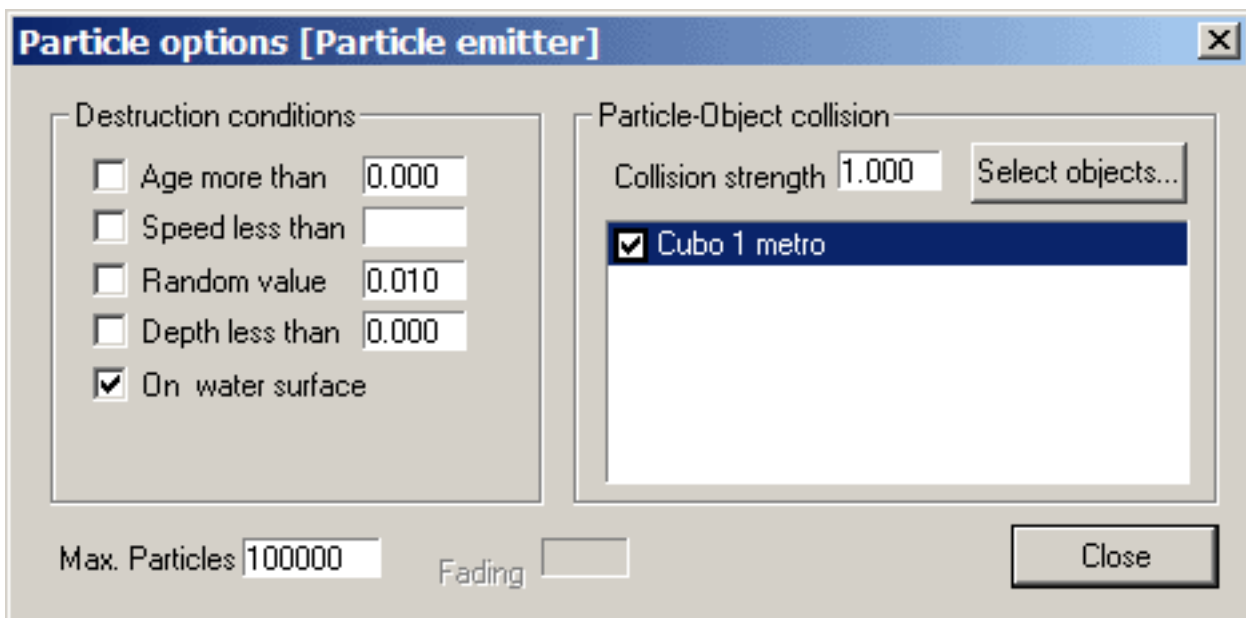


Random dir factor:  
0.05



Random dir factor: 3

- **MASS:** The mass of each particle. The mass property is used in the particle-object collision event. When a particle impacts with an object, the energy will be transferred to the object (particles can push the object)
- **TEXTURE:** The particles can affect the water surface and contribute to the foam mask. This value affects the contribution strength.
- **AIR DRAG:** Sets the particle to air resistance.
- **WATER DRAG:** Sets the particle to water resistance.
- **AFFECT SURFACE:** Makes the particles to generate waves at surface collision.
- **AFFECT OBJECTS:** Make the particles dynamically affect the selected objects.
-  The particles can affect the surface and generate waves. When the function is enabled, the wave parameter control for this wave will be opened.
-  Opens the Particle Advanced window. This window contains particle destruction conditions and object-collision controls.



### DESTRUCTION CONDITIONS

- **AGE MORE THAN:** The particle will die when it reaches this age (in seconds)
- **SPEED LEES THAN:** The particle will die when its velocity is below this value

- **RANDOM VALUE:** The particle will die at a random event
- **DEPTH LESS THAN:** The particle will die if the depth is less than this value
- **ON WATER SURFACE:** The particle will die when it hits the surface. Note that submerged particles could continue alive.

## PARTICLE-OBJECT COLLISION

This is the list of objects than can collide with particles. The collision will take place at voxel level, therefore it is important to check the voxel resolution for those objects. A higher voxel resolution will suppose a more accurate collision detection between particles and objects.

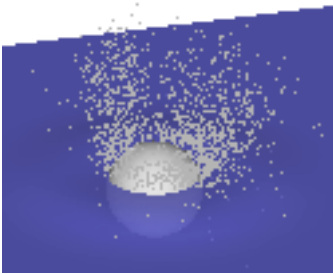
The check button in this list tells RealWave to kill the particle when it collides (check enabled) with the object or just bounce (check disabled).

- **COLLISION STRENGTH:** The particles can collide with the objects. The strength of the collision can vary from non-elastic (0) to perfect elastic (1).
- Set all the objects than the particles can collide to.

**MAX PARTICLES:** Maximum number of particles for the scene. This is a limit control to prevent scene overloading.


---

## PARTICLE OBJECT





Object emitter. This daemon will emit particles from the perturbing points of the chosen object.

Object emitter

 Cubo 1 metro

Creation:  Waterline  Wet surface



Birth Rate	100	
Initial Speed	1.000	
Parent Obj. Speed	1.000	
Speed threshold	0.500	
Depth threshold	0.000	
Random direction	0.500	
Horizontal strength	0.500	
Vertical strength	0.500	
Side emission	0.500	
Mass	1.000	
Texture strength	1.000	
Air drag	0.500	
Water drag	10.000	

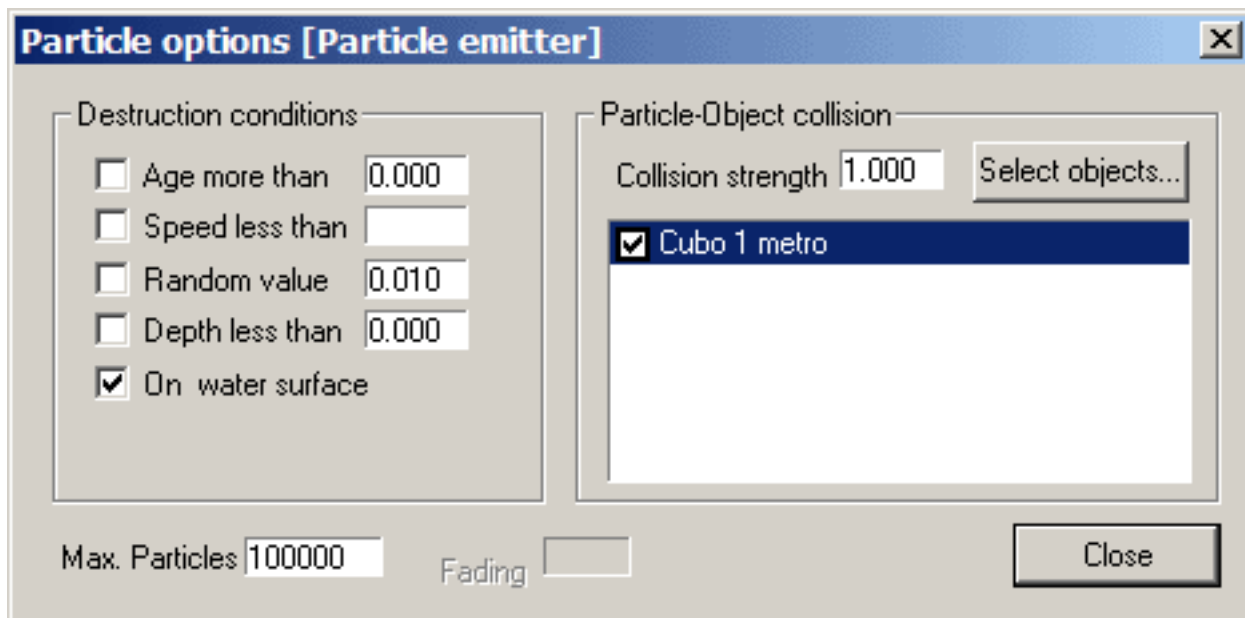


Lets you select the object for particle emission.

- **WATERLINE:** The particles are created only in the area which crosses the water surface. It is the default and normal value.
- **WET SURFACE :** The particles are created in the wet areas of the object. The wet areas are defined by submerged faces or faces which are still not dry (it does depend on the drying factor).
- **BIRTH RATE:** This value controls the number of particles to be created in each iteration. If no particles are created for a certain birth rate, just increase the value until the particles are available.
- **INITIAL SPEED:** The speed in meters per second.
- **PARENT OBJ SPEED:** The particle will acquire a certain amount of the speed of the emitter object (from 0% to 100%).
- **SPEED THRESHOLD:** Only the areas of the object which are moving faster (relative to the surface) than this threshold value will emit particles.
- **DEPTH THRESHOLD:** If this value is greater than zero, only the areas of the object below this depth value will emit particles.
- **RANDOM DIRECTION:** Adds a random factor to emission direction.
- **HORIZONTAL STRENGTH:** An horizontal strength factor for the particle emission.
- **VERTICAL STRENGTH:** A vertical strength factor for the particle emission.
- **SIDE EMISSION:** By default, more particles are created in frontal areas of the object than in the lateral areas, "frontal" and "lateral" depend on the relative motion through the water. This parameter will affect this behavior, balancing the birth rate between frontal and lateral faces.
- **MASS:** The mass of each particle. The mass property is used in the particle-object collision event. When a particle impacts with an object, the energy will be transferred to the object (particles can push the

object)

- **TEXTURE STRENGTH:** The particles can affect the water surface and contribute to the foam mask. This value affects the contribution strength.
- **AIR DRAG:** Sets the particle to air resistance. A dragging coefficient to avoid particles accelerating in excess.
- **WATER DRAG:** Sets the particle to water resistance. A dragging coefficient to avoid particles accelerating in excess.
-  The particles can affect the surface and generate waves. When the function is enabled, the wave parameter control for this wave will be opened.
-  Opens the Particle Advanced window. This window contains particle destruction conditions and object-collision controls.



## DESTRUCTION CONDITIONS

- **AGE MORE THAN:** The particle will die when it reaches this age (in seconds)
- **SPEED LEES THAN:** The particle will die when its velocity is below this value
- **RANDOM VALUE:** The particle will die at a random event
- **DEPTH LESS THAN:**The particle will die if the depth is less than this value
- **ON WATER SURFACE:** The particle will die when it hits the surface. Note that submerged particles could continue alive.

## PARTICLE-OBJECT COLLISION

This is the list of objects than can collide with particles. The collision will take place at voxel level, therefore it is important to check the voxel resolution for those objects. A higher voxel resolution will suppose a more accurate collision detection between particles and objects. The check button in this list tells RealWave to kill the particle when it collides (check enabled) with the object or just bounce (check disabled).

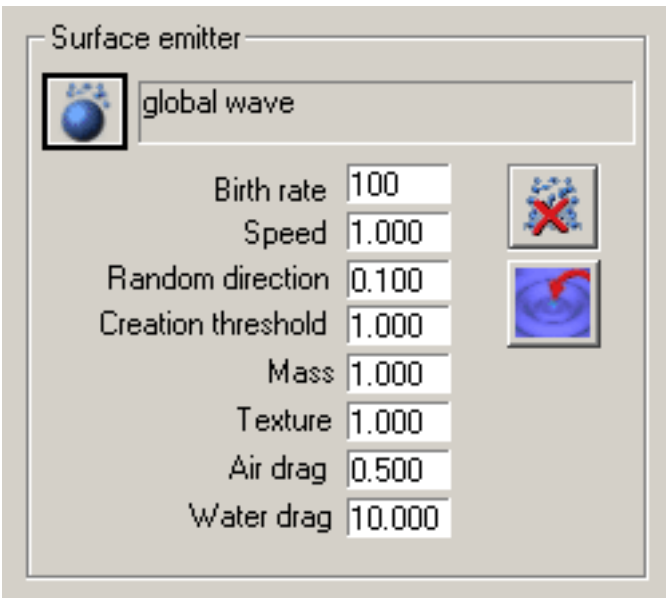
- **COLLISION STRENGTH:** The particles can collide with the objects. The strength of the collision can vary from non-elastic (0) to perfect elastic (1).


- **Select objects...** Set all the objects than the particles can collide to.

## PARTICLE SURFACE





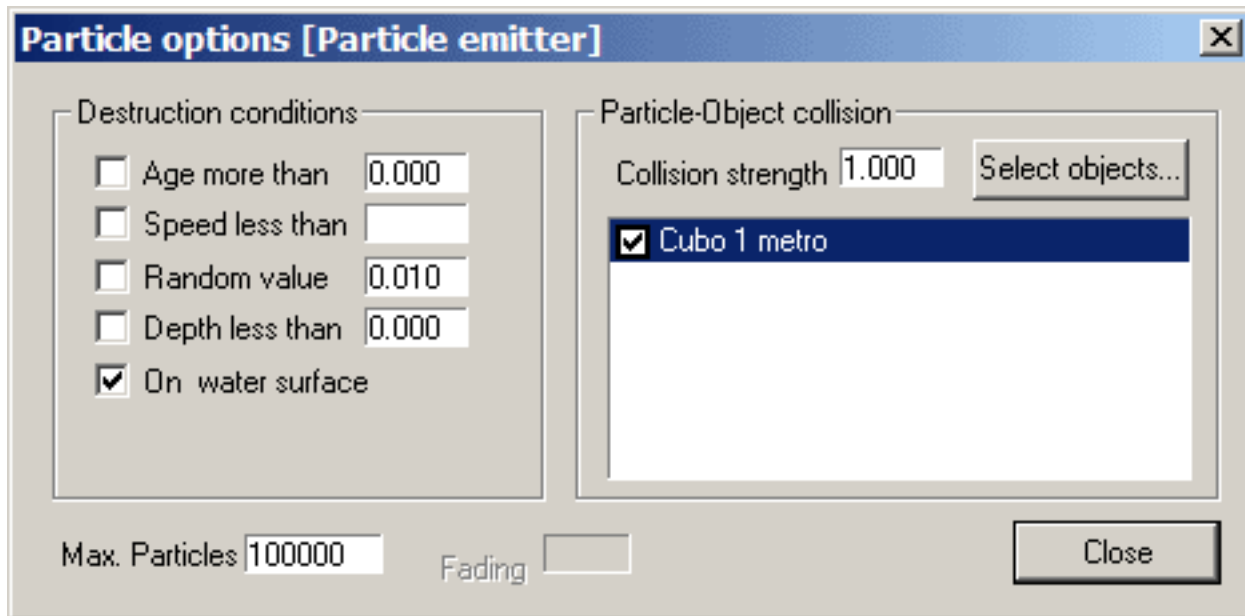
Surface emitter. This daemon will emit particles from the crest of the waves. It is useful in combination with the fractal wave.



 You can choose a specific wave for particle emission or a global wave that will affect the entire surface area.

- **BIRTH RATE:** This value controls the number of particles to be created in each iteration. If no particles are created for a certain birth rate, just increase the value until the particles are available.
- **SPEED:** The speed in meters per second.
- **RANDOM DIRECTION:** Adds a random factor to emission direction.
- **CREATION THRESHOLD:** Surface areas that move at a speed faster than this threshold will create particles. By setting a higher value, the particles created will decrease.
- **MASS:** The mass of each particle. The mass property is used in the particle-object collision event. When a particle impacts with an object, the energy will be transferred to the object (particles can push the object)
- **TEXTURE:** The particles can affect the water surface and contribute to the foam mask. This value affects the contribution strength.
- **AIR DRAG:** Sets the particle to air resistance. A dragging coefficient to avoid particles accelerating in excess.
- **WATER DRAG:** Sets the particle to water resistance. A dragging coefficient to avoid particles accelerating in excess.

-  The particles can affect the surface and generate waves. When the function is enabled, the wave parameter control for this wave will be opened.
-  Opens the Particle Advanced window. This window contains particle destruction conditions and object-collision controls.



## DESTRUCTION CONDITIONS

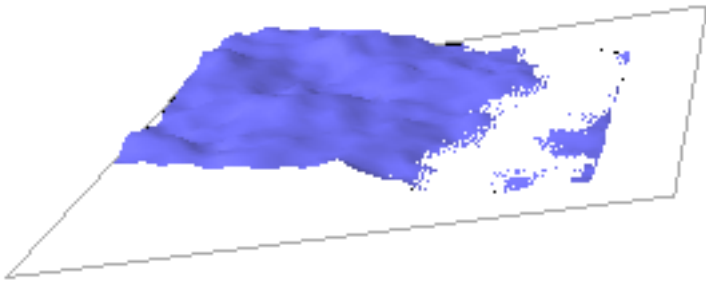
- **AGE MORE THAN:** The particle will die when it reaches this age (in seconds)
- **SPEED LEES THAN:** The particle will die when its velocity is below this value
- **RANDOM VALUE:** The particle will die at a random event
- **DEPTH LESS THAN:**The particle will die if the depth is less than this value
- **ON WATER SURFACE:** The particle will die when it hits the surface. Note that submerged particles could continue alive.

## PARTICLE-OBJECT COLLISION

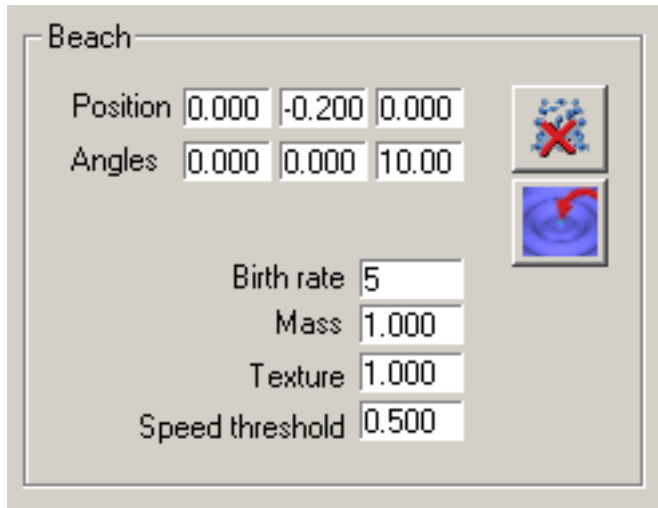
This is the list of objects than can collide with particles. The collision will take place at voxel level, therefore it is important to check the voxel resolution for those objects. A higher voxel resolution will suppose a more accurate collision detection between particles and objects.



The check button in this list tells RealWave to kill the particle when it collides (check enabled) with the object or just bounce (check disabled).

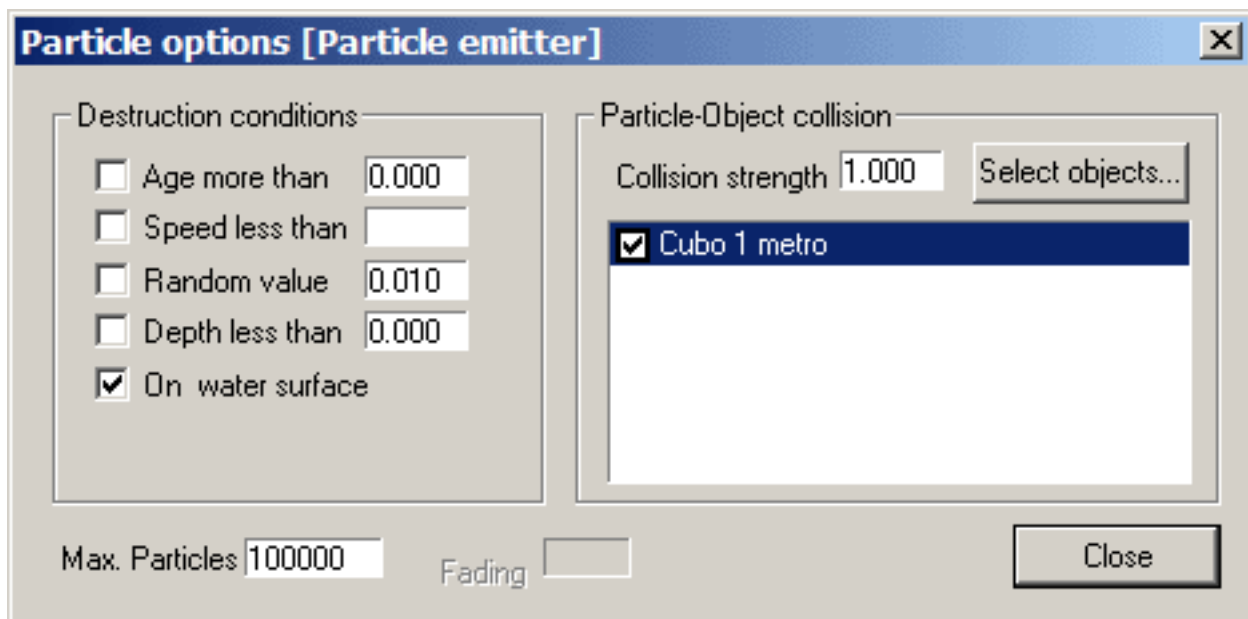
- **COLLISION STRENGTH:** The particles can collide with the objects. The strength of the collision can vary from non-elastic (0) to perfect elastic (1).
- **Select objects...** Set all the objects than the particles can collide to.



Beach. A plane simulating a straight beach can be placed at certain angle forcing the surface to create particles near the coast line. The particles will climb the plane and go back.



- **POSITION:** Moves the gizmo plane in X, Y and Z directions.
- **ANGLES:** Rotates the gizmo plane in X, Y and Z directions.
- **BIRTH RATE:** This value controls the number of particles to be created in each iteration. If no particles are created for a certain birth rate, just increase the value until the particles are available.
- **MASS:** The mass of each particle. The mass property is used in the particle-object collision event. When a particle impacts with an object, the energy will be transferred to the object (particles can push the object)
- **TEXTURE:** The particles can affect the water surface and contribute to the foam mask. This value affects the contribution strength.
- **SPEED THRESHOLD:** Particles are created along the beach line only if their speed is above the threshold.
-  The particles can affect the surface and generate waves. When the function is enabled, the wave parameter control for this wave will be opened.
-  Opens the Particle Advanced window. This window contains particle destruction conditions and object-collision controls.



## DESTRUCTION CONDITIONS

- **AGE MORE THAN:** The particle will die when it reaches this age (in seconds)
- **SPEED LEES THAN:** The particle will die when its velocity is below this value
- **RANDOM VALUE:** The particle will die at a random event
- **DEPTH LESS THAN:**The particle will die if the depth is less than this value
- **ON WATER SURFACE:** The particle will die when it hits the surface. Note that submerged particles could continue alive.

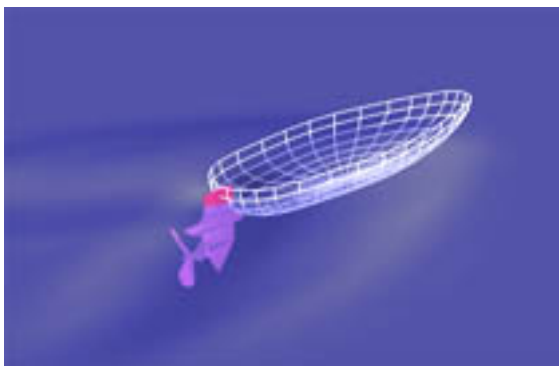
## PARTICLE-OBJECT COLLISION

This is the list of objects than can collide with particles. The collision will take place at voxel level, therefore it is important to check the voxel resolution for those objects. A higher voxel resolution will suppose a more accurate collision detection between particles and objects.

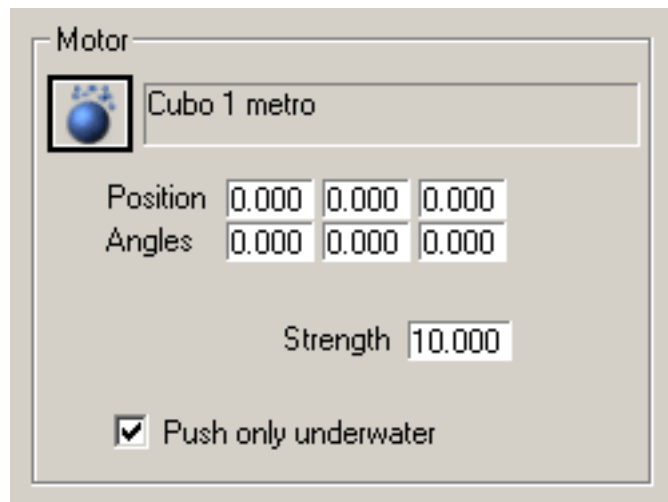
The check button in this list tells RealWave to kill the particle when it collides (check enabled) with the object or just bounce (check disabled).

- **COLLISION STRENGTH:** The particles can collide with the objects. The strength of the collision can vary from non-elastic (0) to perfect elastic (1).
- **Select objects...** Set all the objects than the particles can collide to.

## MOTOR



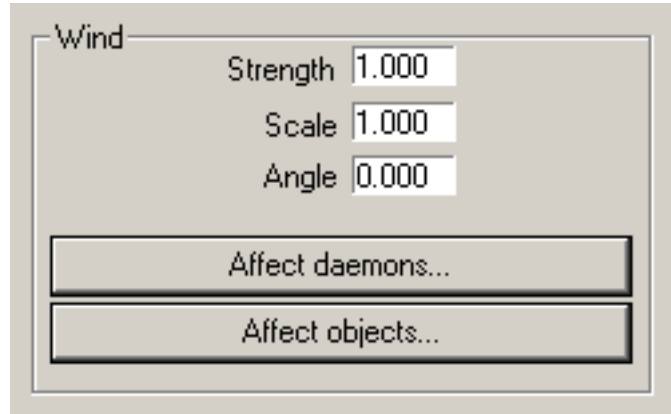
Motor. This daemon will add a pushing force at some relative position in any object, simulating the engine of a boat.


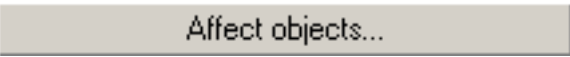


- **POSITION:** Moves the motor in X, Y and Z directions.
  - **ANGLES:** Rotates the motor in X, Y and Z directions
  - **STRENGTH:** A strength factor for the pushing force.
- 

## WIND

This daemon creates a force that affects selected particles and objects in a given direction.

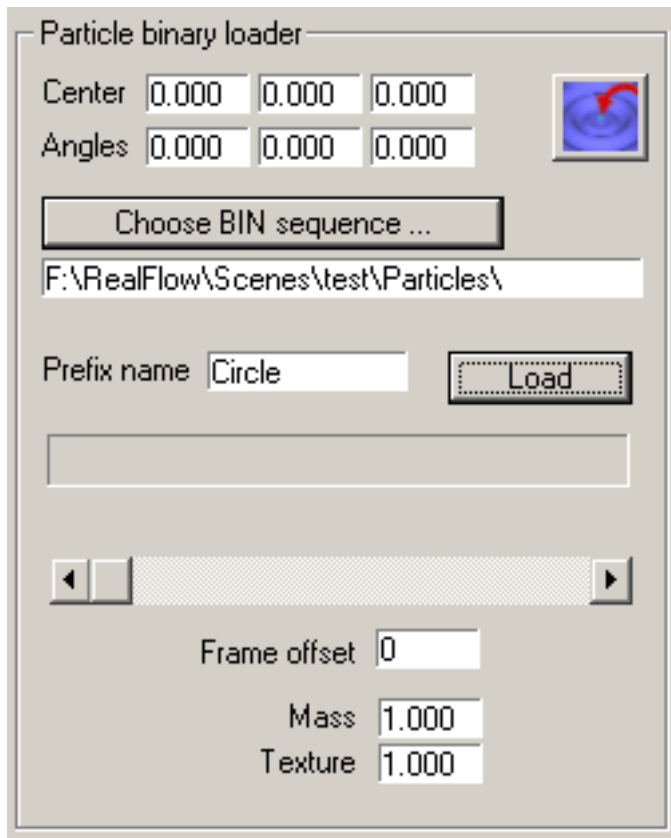


- **STRENGTH:** A strength factor for the pushing force.
  - **SCALE:**
  - **ANGLE:** The direction of the wind.
  -  Set the daemons that will be affected by the wind.
  -  Set all the objects than the particles can collide to.
- 

## BIN LOADER

Binary Loader. This daemon will load the .BIN particle files (either from RealFlow or RealWave) and will import them at the position and angles specified in the parameter list. The imported particles can create waves and

affect the objects.



- **CENTER:** Moves the particle emitter origin in X, Y and Z directions.
- **ANGLES:** Rotates the particle emitter origin in X, Y and Z directions
- **Choose BIN sequence ...** Lets you select the particle binary (.bin) file sequence.
- **OFFSET:** Sets an offset in frames for particle sequence start.
- **MASS:** The mass of each particle. The mass property is used in the particle-object collision event. When a particle impacts with an object, the energy will be transferred to the object (particles can push the object)  
**TEXTURE:** The particles can affect the water surface and contribute to the foam mask. This value affects the contribution strength.

# OPTIONS

This panel controls the general options of the simulation.

---

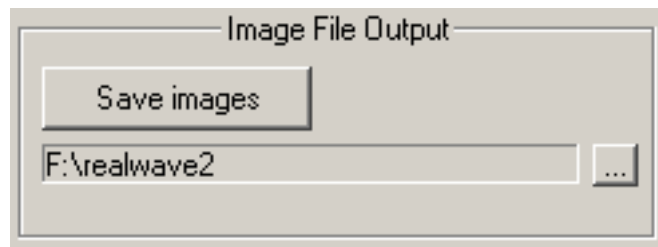
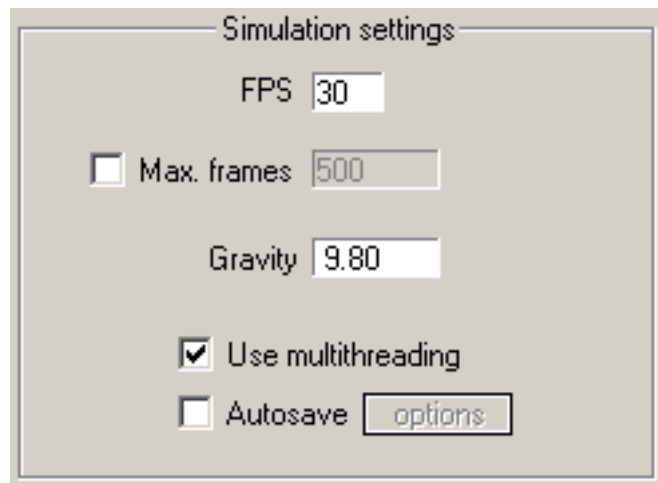
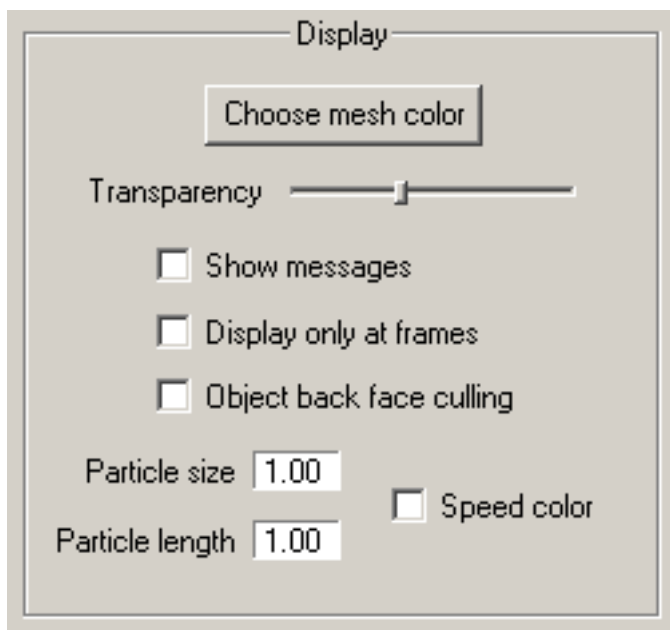


Image sequences or AVI animation of the OpenGL display can be exported. In such case it is important to not minimize the application.

When this button is checked you can set a path and prefix name to save an AVI, JPEG or Targa files.



- **FPS:** TFrames per second. This parameter should match the FPS value in the 3D platform, otherwise there could be unwanted frame offsets. Note that different FPS values will not affect the simulation time, only the number of files exported to disk.
- **MAX. FRAMES:** This should be enabled in order to let the system calculate until the maximum number of frames is reached.
- **GRAVITY:** Value of gravity, affects all the elements in RealWave. Default value is 9.8
- **USE MULTITHREADING:** Enable / Disable the multithreading capabilities of RealWave. There is only support for two processors.
- **AUTOSAVE:** Workspaces can be saved to disk as backup to avoid losing information in very complex scenes when an unexpected error occurs.



- **CHOOSE MESH COLOR:** Changes the surface color.
- **TRANSPARENCY SLIDER:** You can set the transparency of the mesh for visualization. Useful to see the objects below the surface.
- **SHOW MESSAGES:** Opens a window that displays RealWave messages.
- **DISPLAY OBJECT AXES:** Show / hide the axes of all objects. You can show / hide individually in object's advanced properties.
- **DISPLAY ONLY AT FRAMES:** Refresh the OpenGL displays only at frame end. By default RealWave refresh the screen in every calculation loop. Several loops can be done inside a frame. You can enable this option to save time in display refreshing (recommended in non-accelerated graphic cards).
- **OBJECT BACKFACE CULLING:** Displays only the faces with normals pointing away from view.
- **PARTICLE SIZE:** The size of particles in the viewport. Only for viewing purposes.
- **PARTICLE LENGTH:** The length of the particles when represented as arrows-  
 [Values]  
 [= 0 : points]  
 [> 0 : arrows]
- **SPEED COLOR:** The particles will be colored, representing the speed, from red (high speed) to green (low speed).

# 3D STUDIO MAX

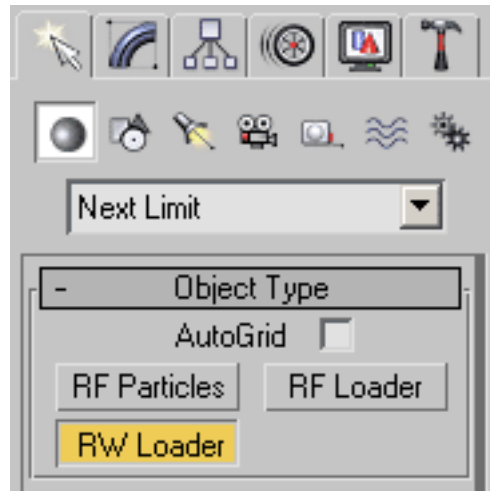
---

## INSTALLATION

Copy RFPACK.DLO, RWPACK.DLO and SCENEDATA.DLU in the plugins folder.

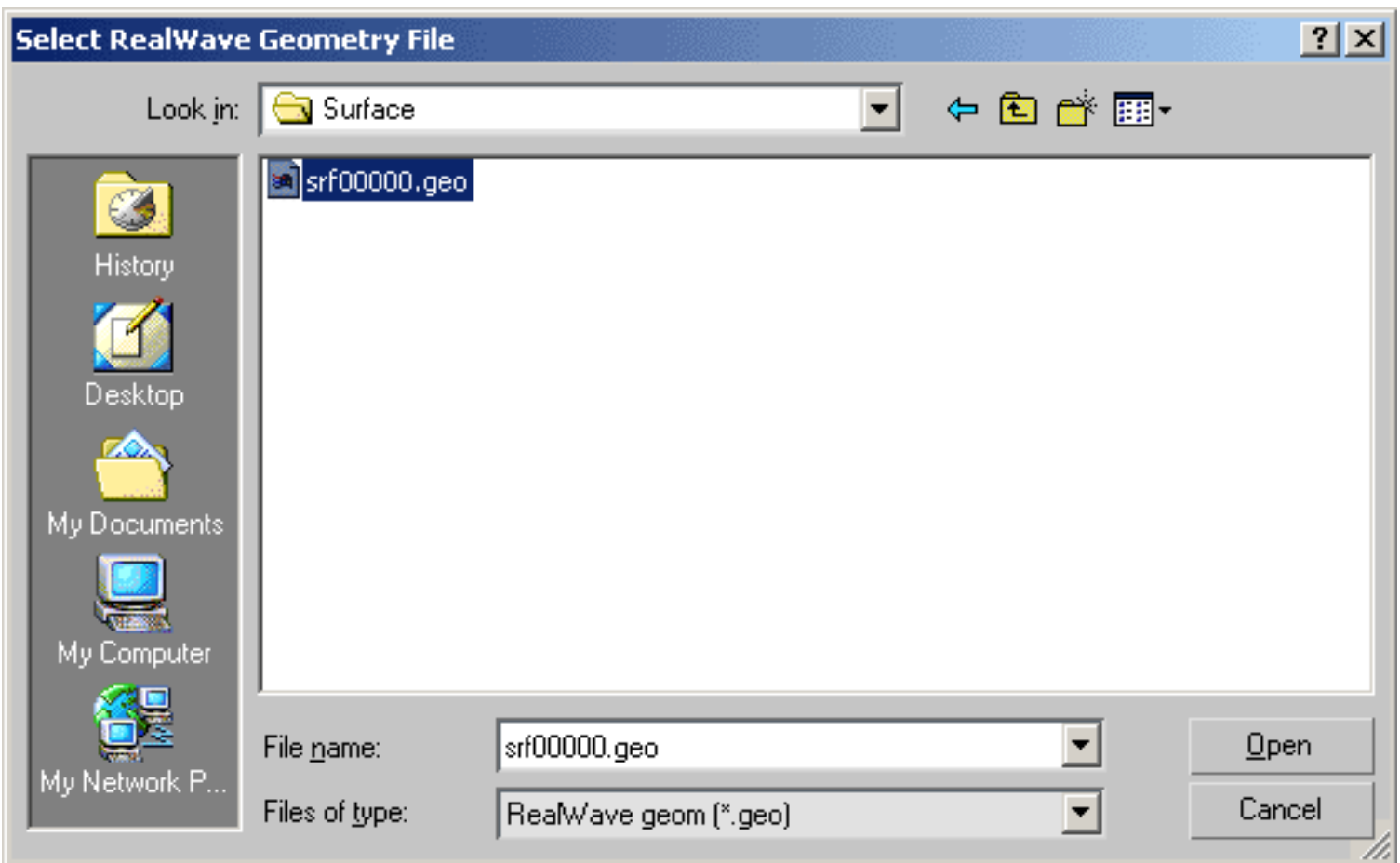
---

## ● REALWAVE SURFACE LOADER

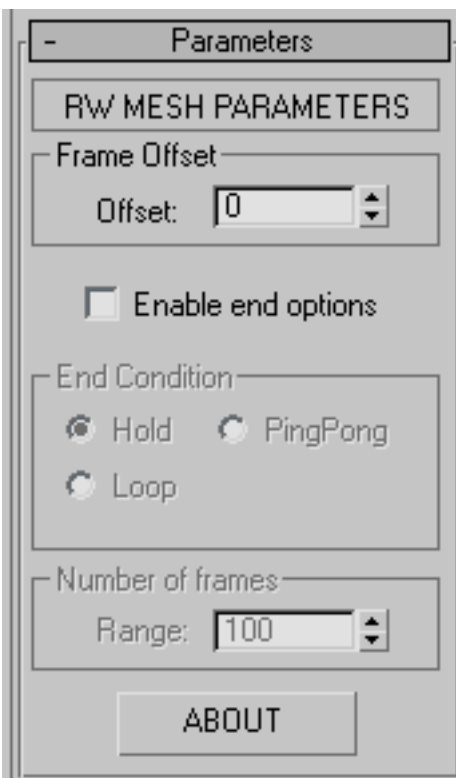


This plugin can be found in the Geometry panel in the Next Limit section. Click RW Loader button.





Click on the Select Directory button, select the folder where you saved your files from RealWave ( **.geo** and **.bin** files ).



**FRAME OFFSET:** Set a positive or negative frame offset for the surface sequence.

The end condition sets what to do when your 3D scene is larger than the RealWave sequence.

**HOLD:** Keep the last frame of the RealWave sequence.

**PINGPONG:** Makes the RealWave sequence infinitely plays forward-backward.

**LOOP:** RealWave sequence restarts at first frame when the last is reached.

**RANGE:** Sets the duration (in frames) of the simulation.

Click CREATE SURFACE and the surface mesh will be created in the viewport.

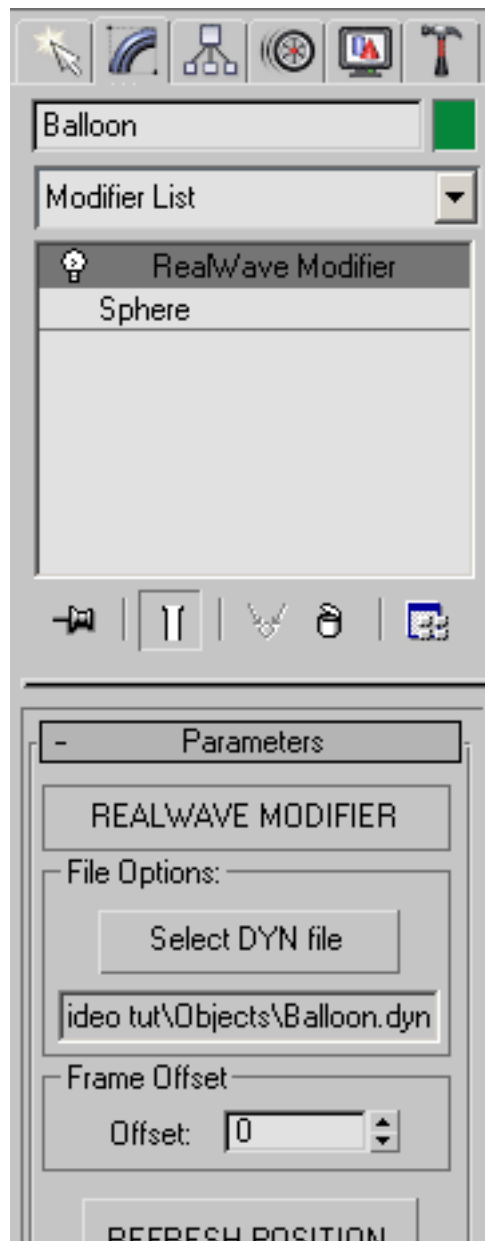
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## ● REALWAVE OBJECT MODIFIER

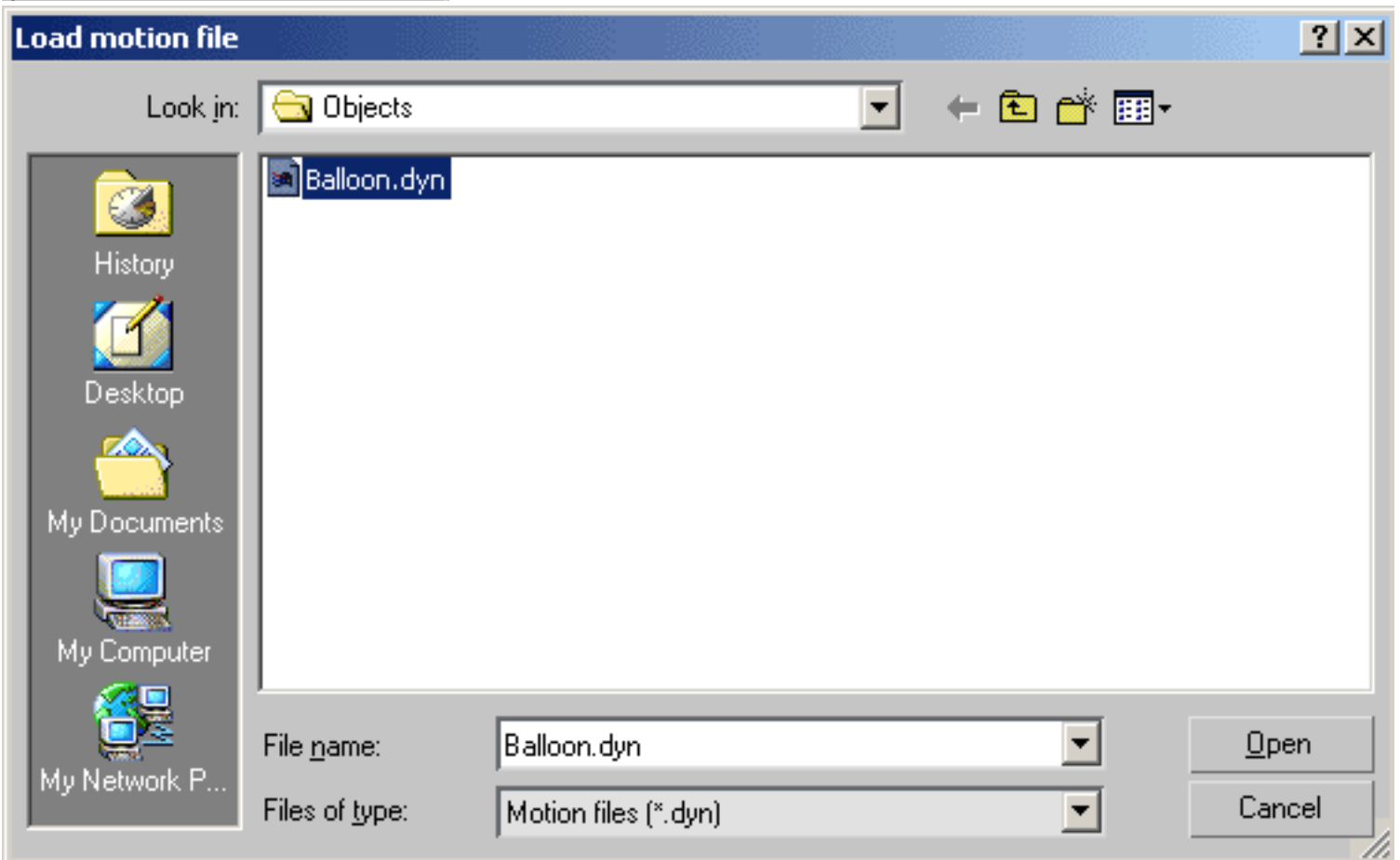
This plugin can be found in the Modifiers panel.

This plugin gives the dynamic motion of the objects you've used in your simulation in RealWave ( if you saved the respective **.dyn** file ).

**NOTE:** The object's pivot must be centered ( and oriented to world axis ) for the **.dyn** motion file to work correctly.



ABOUT



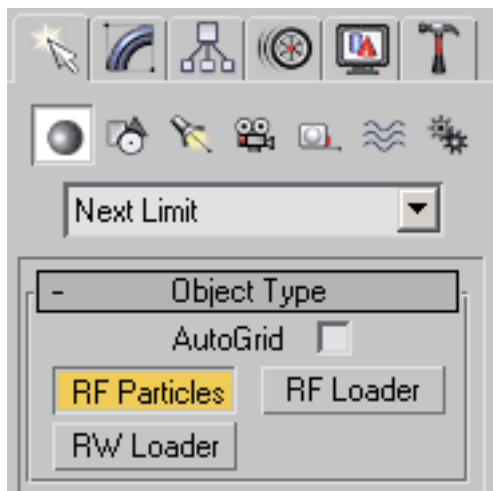
**SELECT DYN FILE:** Selects the **.dyn** file containing the object's dynamic motion you saved from RealWave simulation.

**FRAME OFFSET:** Sets a positive or negative frame offset for the object's motion sequence.

**REFRESH POSITION:** Reloads the motion file.

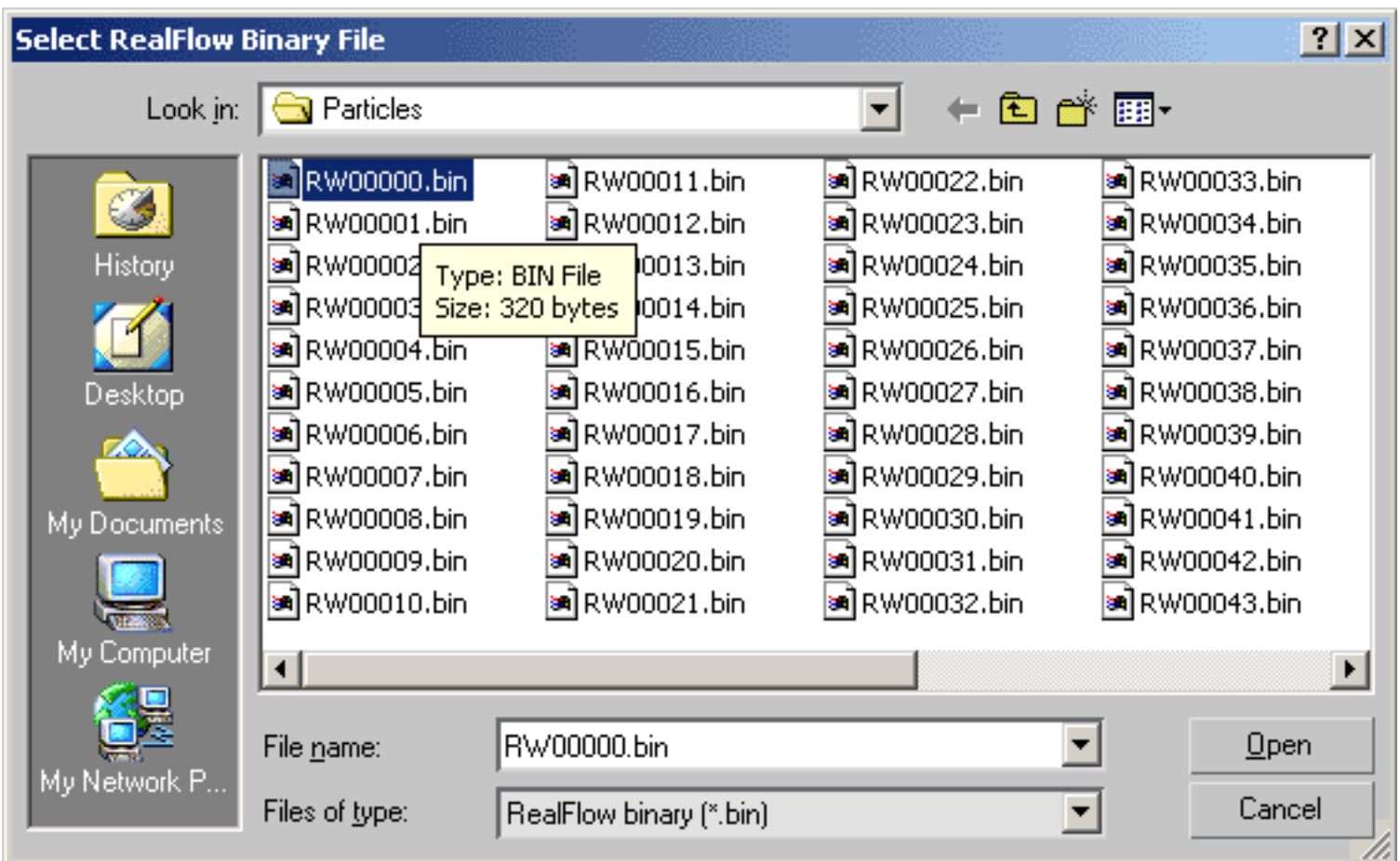
---

## ● REALWAVE PARTICLE LOADER

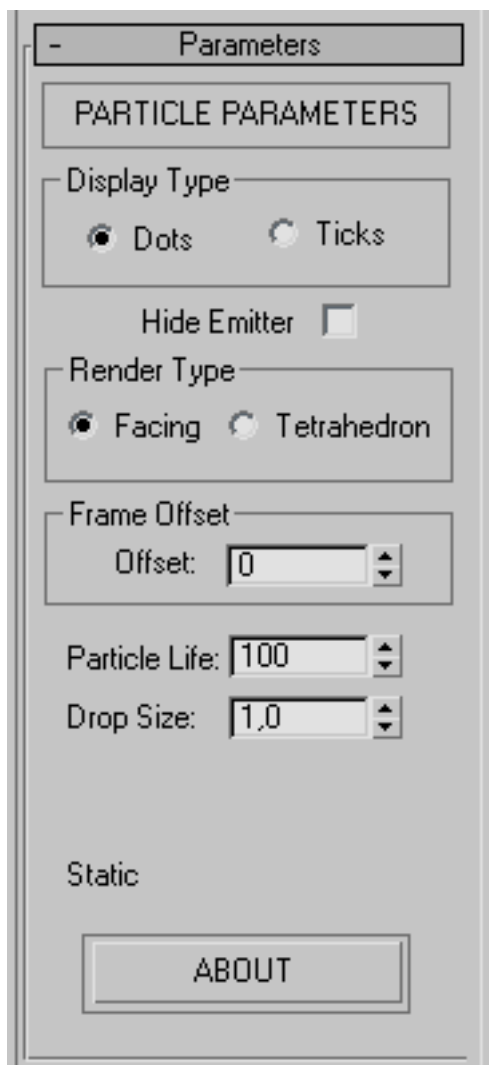


This plugin can be found in the Geometry panel in the Next Limit section. Click RW Loader button.





Click on the Select Directory button, select the folder where you saved your files from RealWave ( **.geo** and **.bin** files ).



**FRAME OFFSET:** Set a positive or negative frame offset for the surface sequence.

**PARTICLE LIFE:** Same as 3dsmax standard particles. It is a particle time counter useful for some materials.

**DROP SIZE:** Sets the size of each particle in current units.

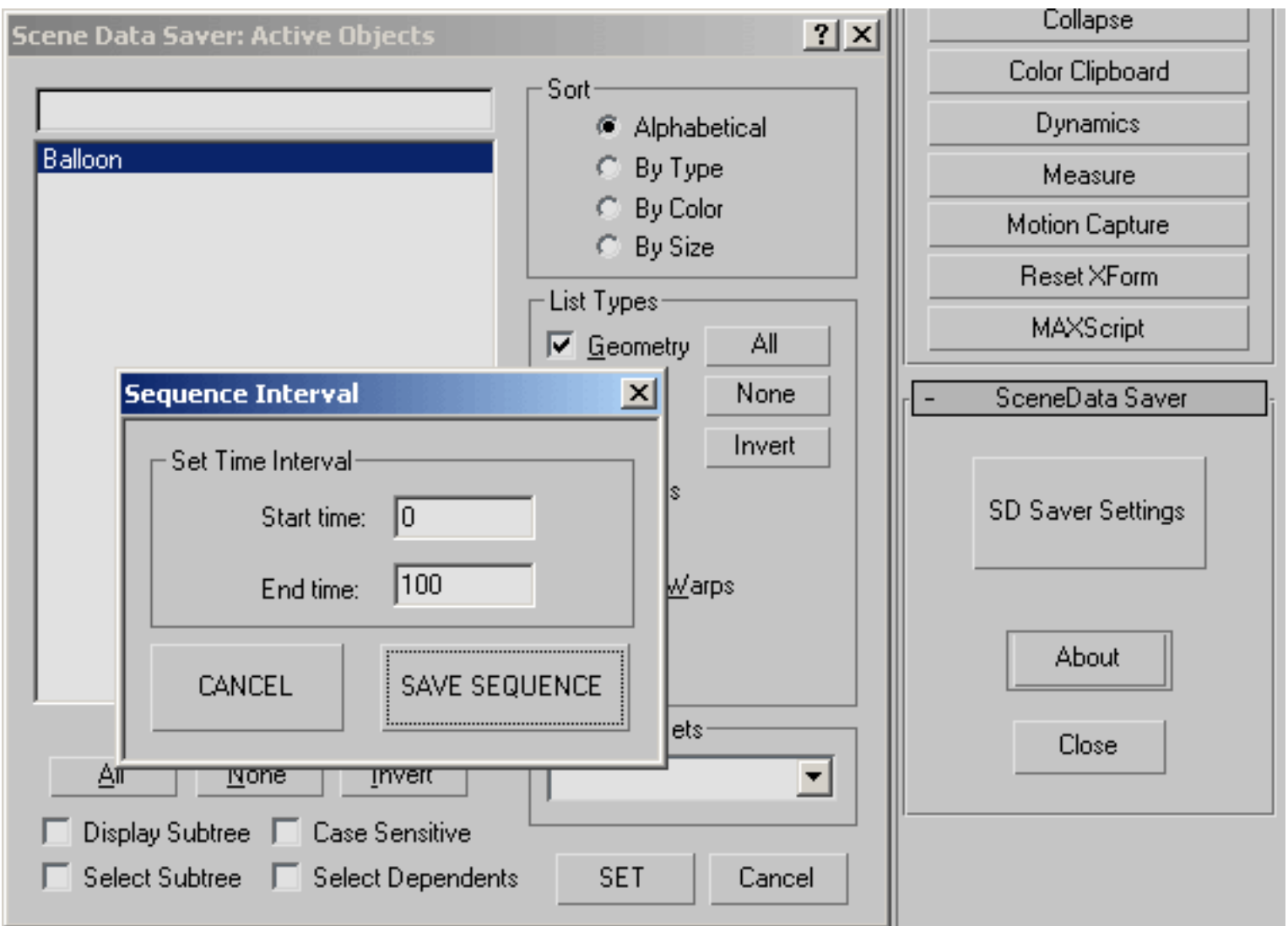
**STATIC:** When your particles are loaded the number of particles are displayed.

Click CREATE PARTICLES and the particles will be created in the viewport.

---

## ● SCENE DATA SAVER

This plugin can be found in the Utilities panel (click the MORE... button). The function of this plugin is to export your animated objects to the **.sd** format ( readable by RealWave )



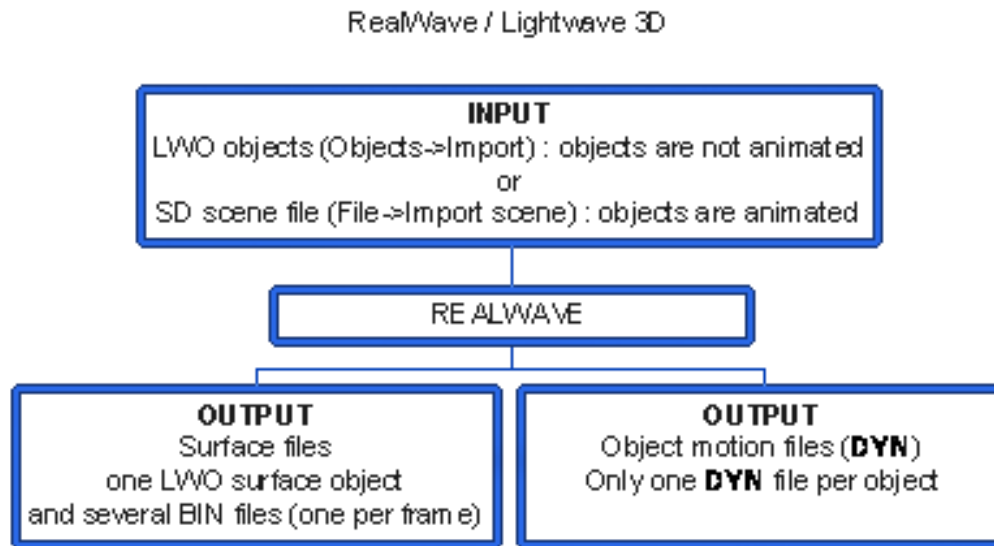
**SD SAVER SETTINGS:** Select the objects to be involved in the RealWave simulation. Click the SET button and set the time interval, then click SAVE SEQUENCE

# LIGHTWAVE

---

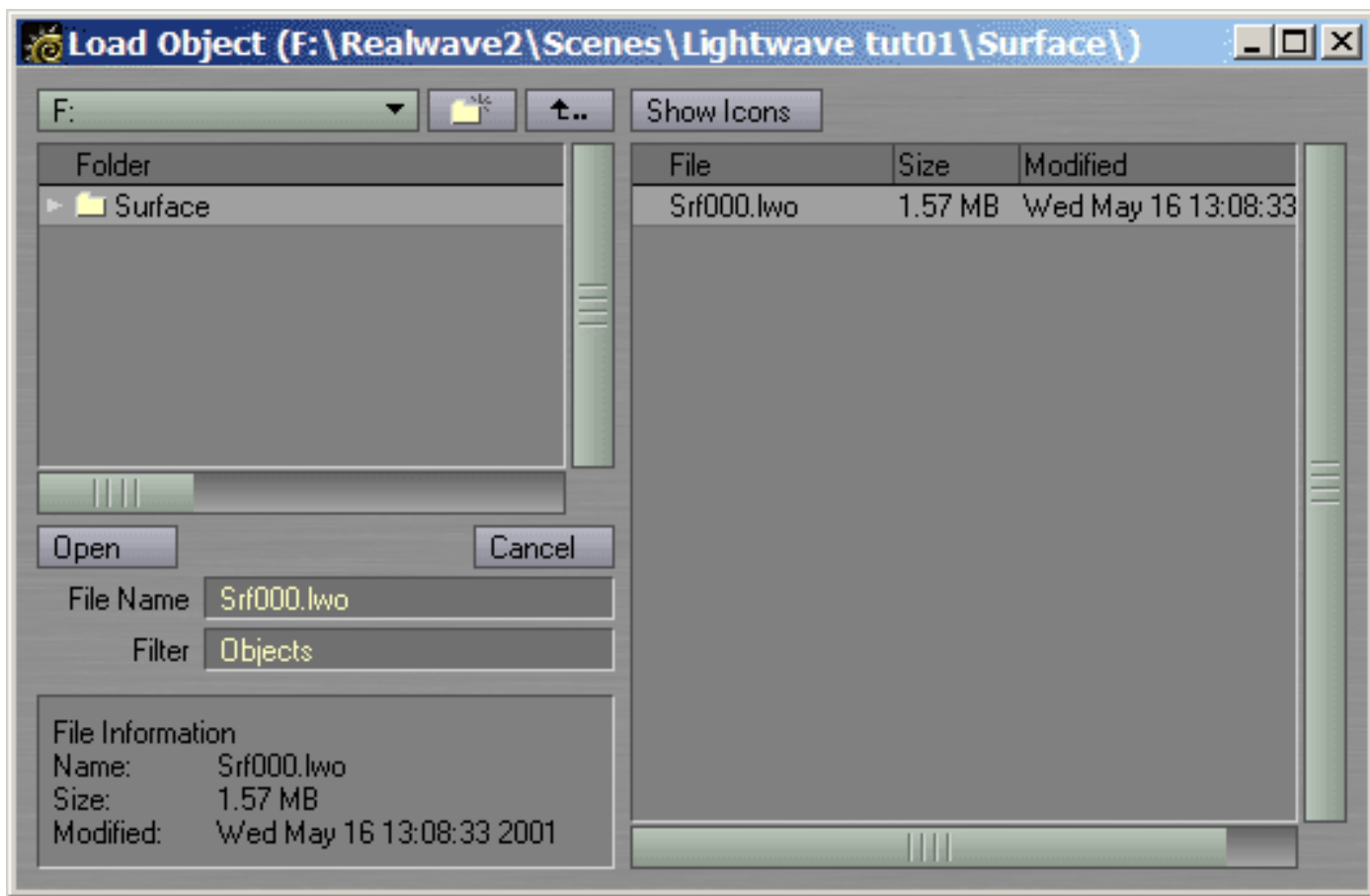
## INSTALLATION

1. Copy the plug-in files to the Lightwave's plugins folder
2. Use the Add Plugins button (Extra Panel) to activate the plugins.
3. This is a schematic layout showing the way RealWave works in conjunction with Lightwave:

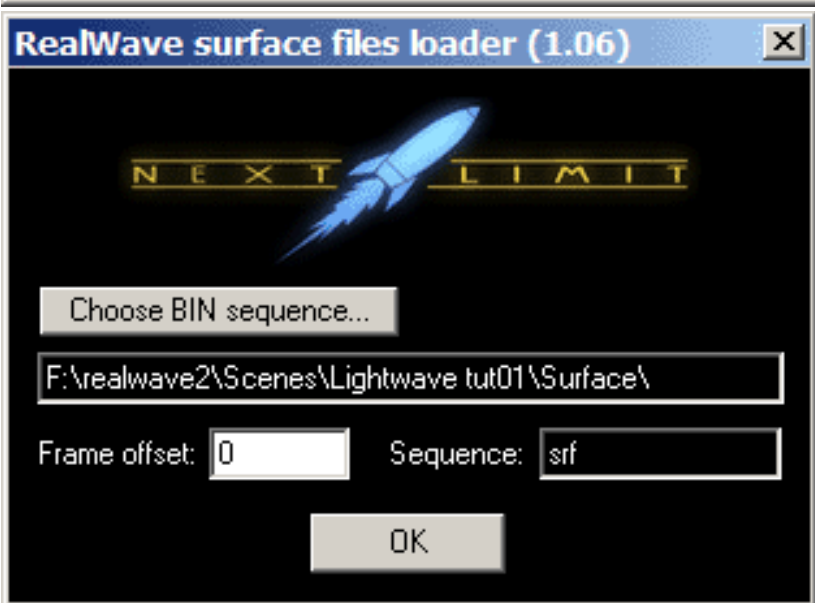
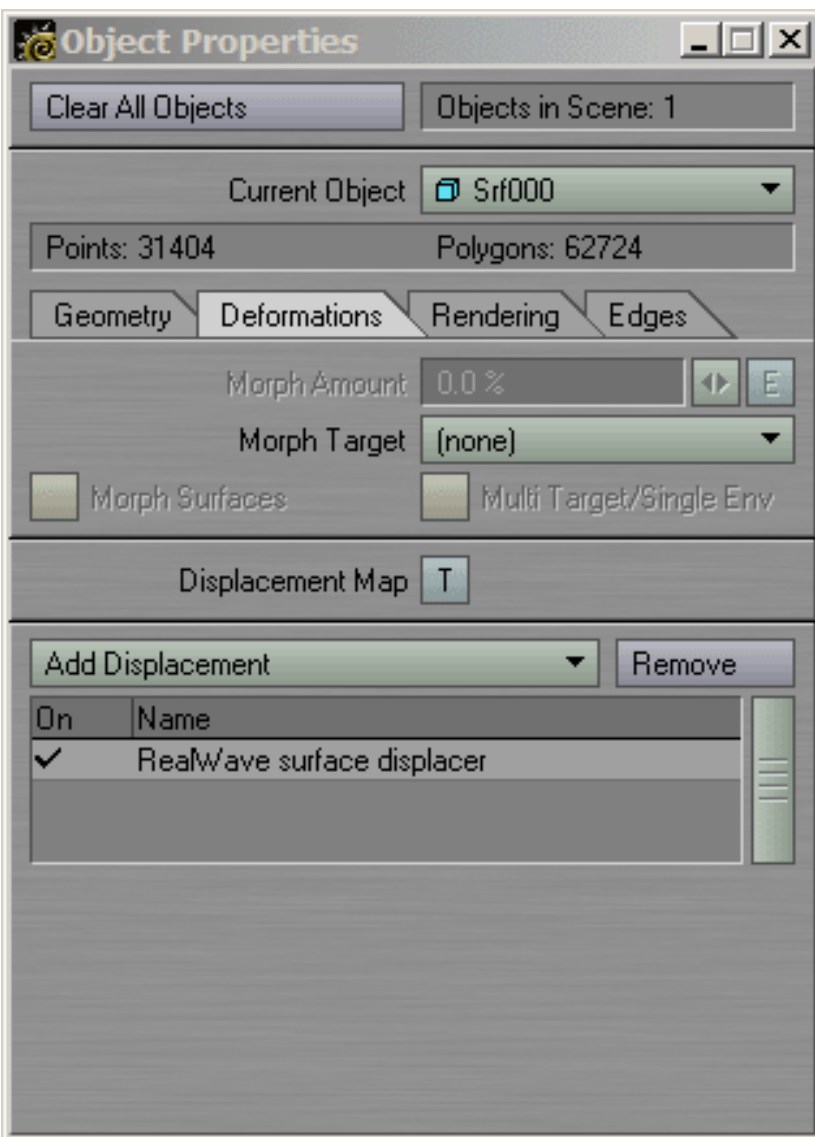


## SURFACE BINARY LOADER ( RWDISP.P ) ( OBJECT DISPLACEMENT PLUGIN )

1. Before you use this plug-in you must load the LWO surface file that RealWave has saved in the specified directory. RealWave will always save a LWO surface file at the beginning of the simulation.



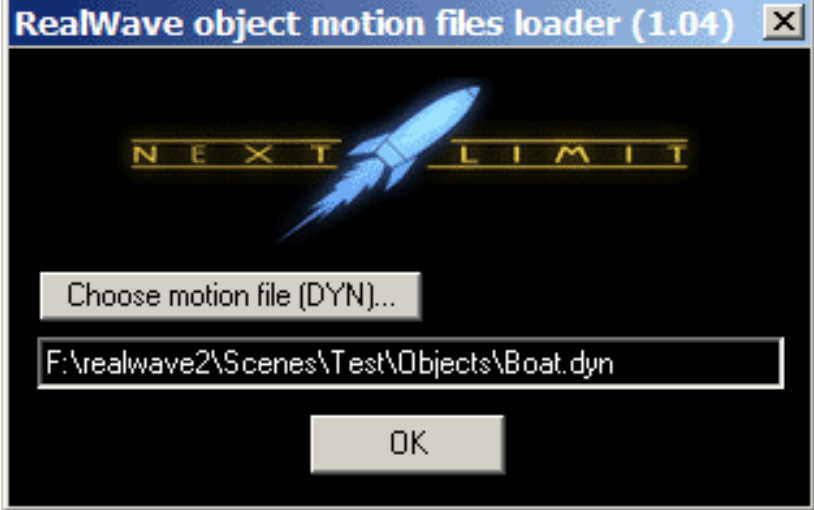
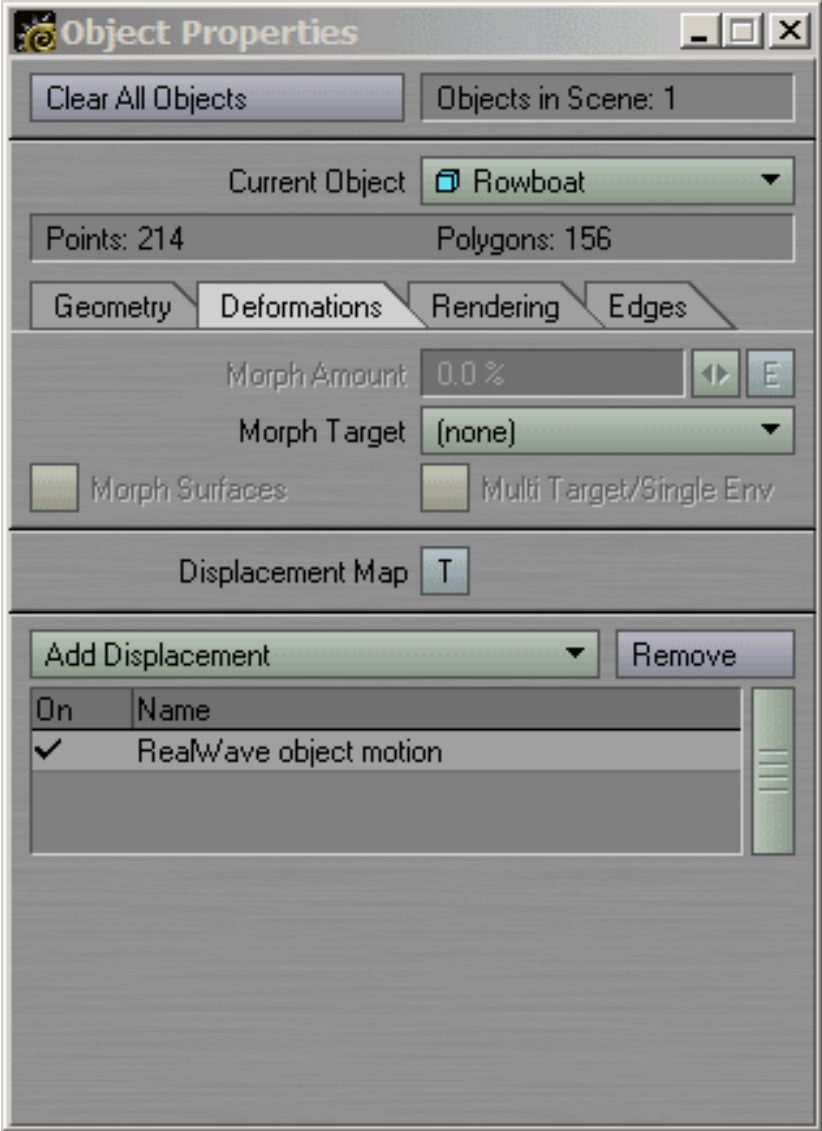
2. open properties and apply the RealWave surface displacer plug-in to the object and point to the output directory (where the binaries have been exported). You will see that the surface's vertices acquire the same deformation.



3. Then click OK to close the window and check if the points of the mesh are displacing correctly, by dragging the time slider in Lightwave. If points don't move probably the directory or prefix specified are wrong.

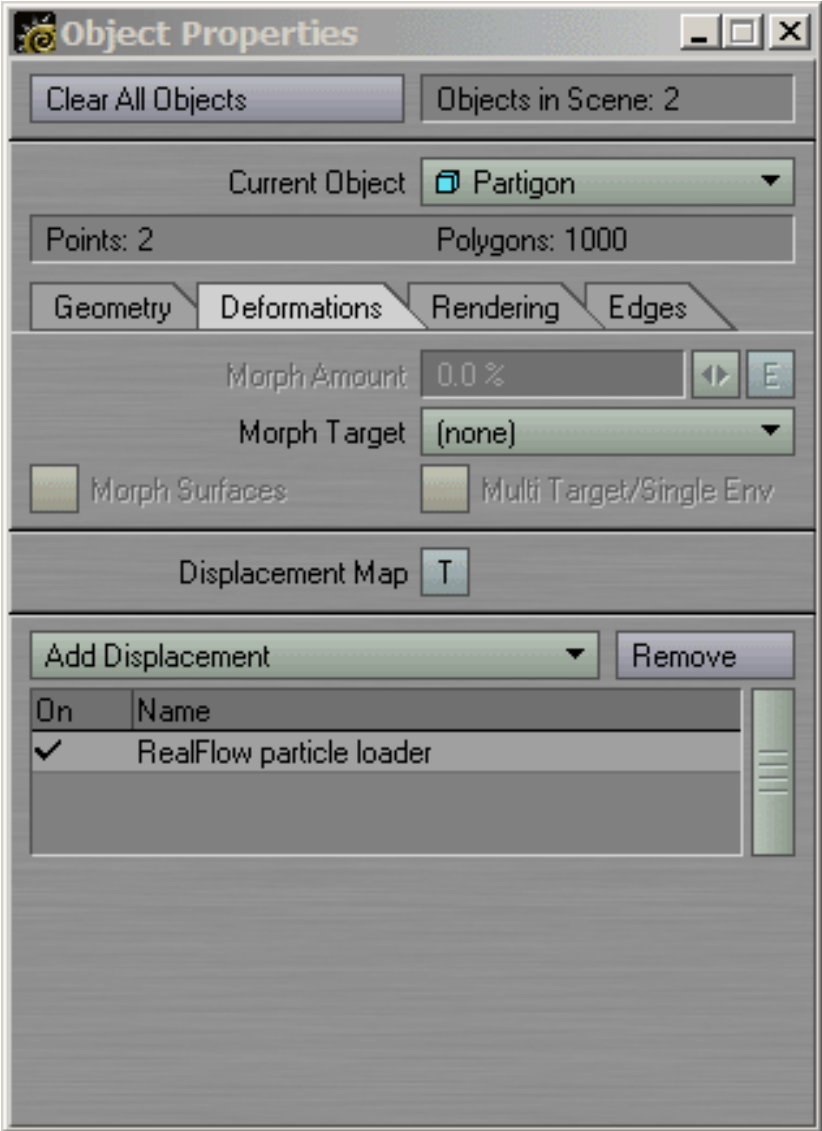
# OBJECT MOTION LOADER ( RWDISP.P ) ( OBJECT DISPLACEMENT PLUGIN )

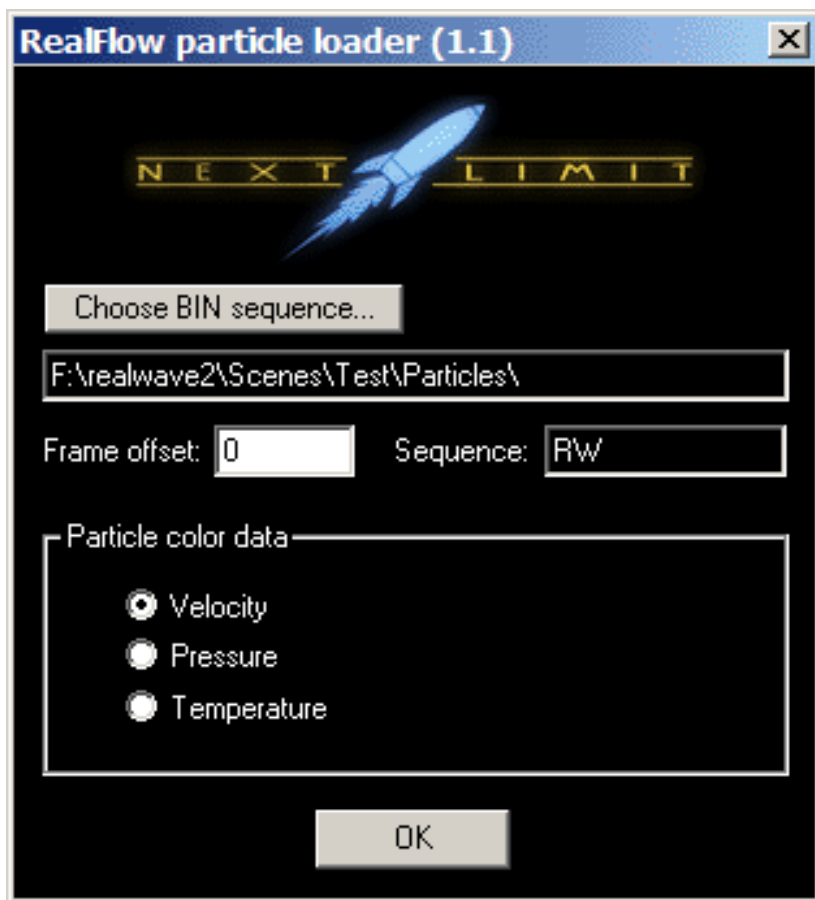
1. In RealWave, turn on the DYN output option for each object you want its motion to be exported (Objects panel). Set the file name. Make sure the environment is set to Lightwave compatibility (upper toolbar). Run the simulation. After the simulation is finished, go to Lightwave and apply to your object the **RealWave object motion** plug-in. Open the options panel and choose the DYN file.



## PARTICLE LOADER PLUGIN

1. Add a Partigon to the scene in order to apply the RealFlow Particle Loader (RPL).
2. Apply the RealFlow Particle Loader. Open Options and choose a particle file sequence.



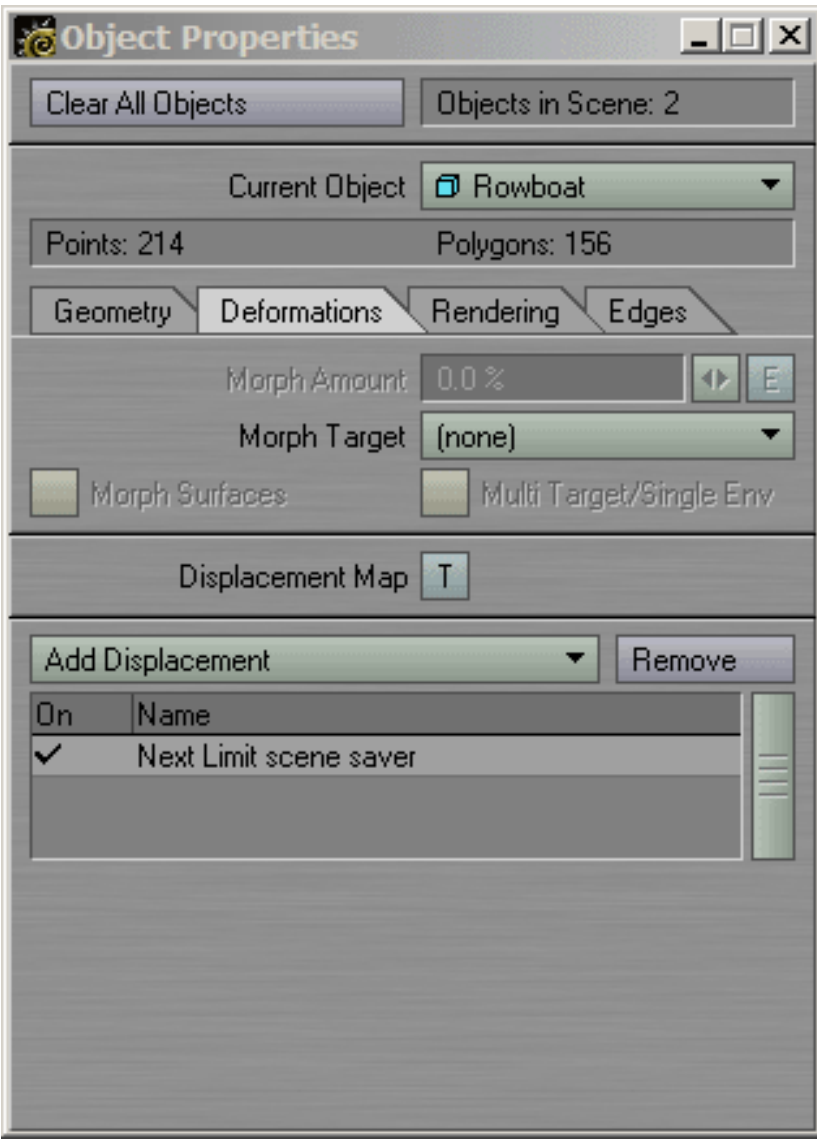


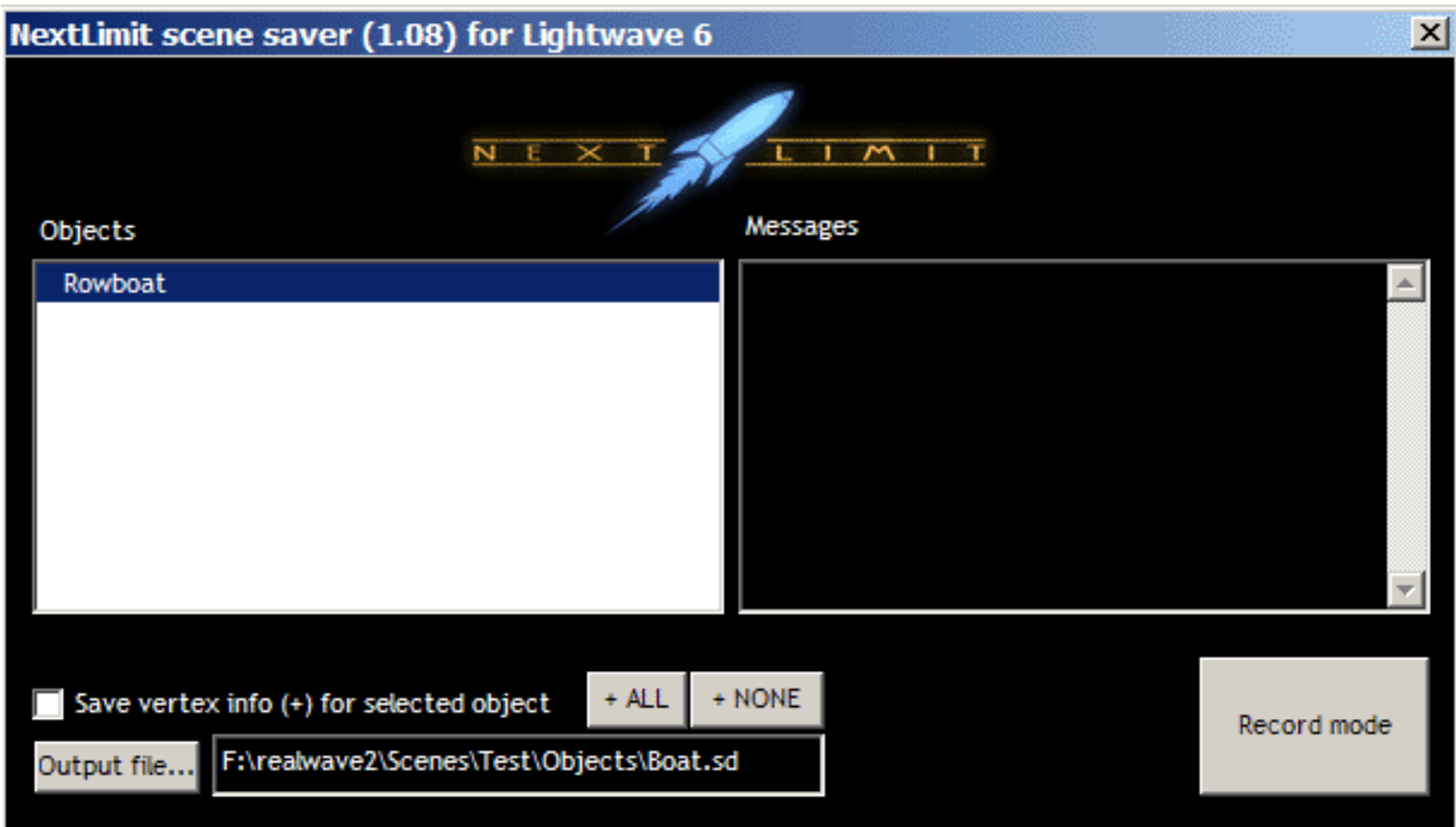
Probably there are no particles at frame 0, so go to frame 1 or beyond.

---

### THE SCENE .SD ( RFSD.P ) OBJECT DISPLACEMENT PLUGIN

1. The file RFSD.P is a plug-in for Layout, which saves the scene data to a SD file.
2. Apply the **Next Limit scene saver** plug-in to the objects you want to include in the SD file.





Double-click the **Next Limit scene saver** to open the options window.

3. In the **Next Limit scene saver** window you can see a box list. It contains the name of the objects that have the plug-in applied.
4. Select the SD file where the data will be saved, by clicking the OUTPUT FILE button.
5. The vertex info check button ('at the bottom side of the list box) controls what kind of data is saved for each object. When it is unchecked, only position, rotation, scale and pivot is saved. This is useful when the object doesn't contain any other displacement plug-in that could change the relative vertex position. In other cases if you want to get the object deformation in RealFlow, the vertex info button should be checked and the 'VX' label should appear at the left side of each object's name. Take in mind that, for every frame, all the object's vertices will be saved and the file size will increase. To set the vertex info check button, select the object from the list box and check or uncheck the vertex info button, or use the shortcuts VX ALL or VX NONE if you want to set on/off this feature for all the objects.
6. Once all the parameters have been set, you are ready to save the scene to the SD file. Click the RECORD button and, following, click the PREVIEW button in Lightwave. When the preview run you will see some messages in the plug-in window indicating what frame is being saved.
7. When the preview has finished and before doing any other thing, click the RECORD button again. Then the SD file will be closed and it will be ready to be imported into RealWave.

## ● INSTALLATION

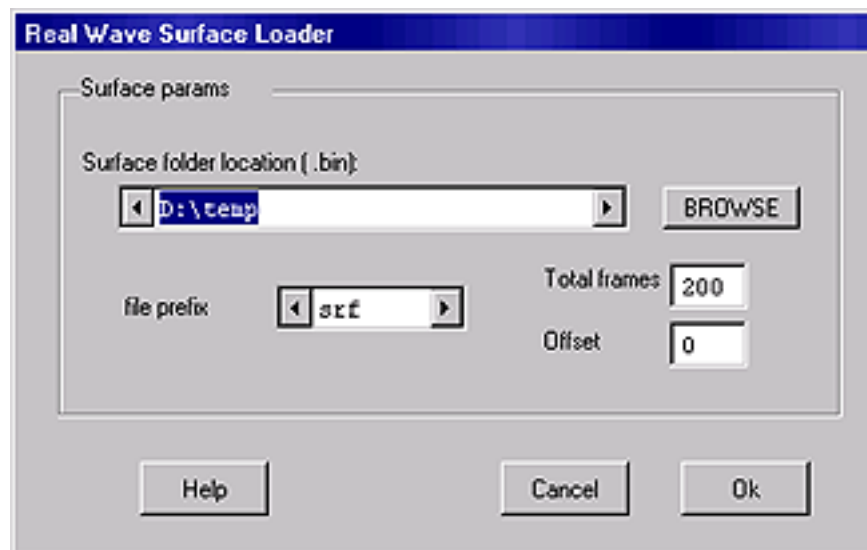
RealWave plug-ins for Softimage|3D consist in five files:

- SceneDataSaver.cus
- REALWAVE-SurfaceLoader.cus
- REALWAVE-MotionObject.cus
- Realwave.dll
- RealWaveIcon.hrc

Open SIPACKRW.ZIP and run SETUP.EXE. If the installation fails, manually copy the five plugin files to the model folder ( under 3D\custom\model )

## REALWAVE SURFACE LOADER

This part of the plug-in loads the mesh surface into the scene. To start go to MODEL module and open the *effect* menu. Select REALWAVE - Surface Loader +  
The panel 'Real Wave Surface Loader' will appear:



First select the folder directory where the collection of **.bin** and **.geo** files are located. The browse button will help you to reach it. Just select one of the .bin files of the sequence. You can also type the path folder location in the edit box.

If the prefix of the files are srf..., don't change it. This is the default prefix in RealWave.

**TOTAL FRAMES:** The amount of files the folder selected contains. If you don't know it, don't mind. You can change the total frames in the Softimage environment directly.

**OFFSET:** The number of empty frames (without animation data), that the animation of the surface will have.

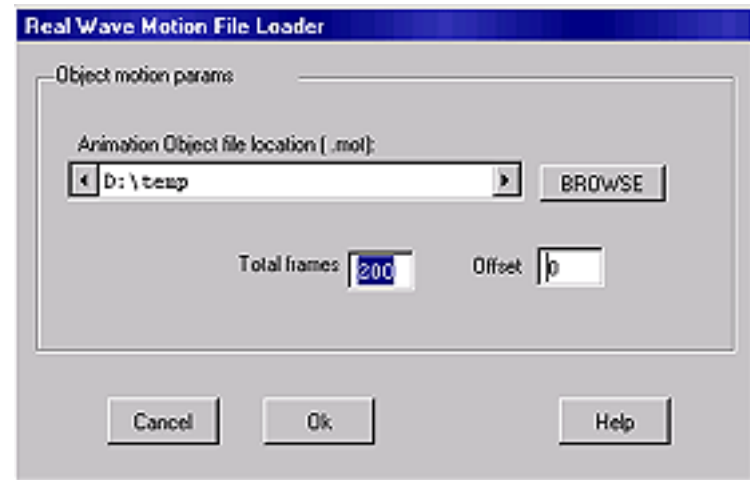
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## ● REALWAVE MOTION OBJECT

This plugin loads the animation data of the floating objects into the Softimage|3D environment.

To start select the floating object from the scene and place it at the initial position. After applying the effect is not possible to move the object.

Open MODEL module and open the *effect* menu. Select REALWAVE - MotionObject + The panel 'Real Wave Motion File Loader' will appear.



**BROWSE:** Select the file directory where the **.dyn** file is located.

Set the total frames and offset parameters of the animation. The meaning is the same that in the former part.

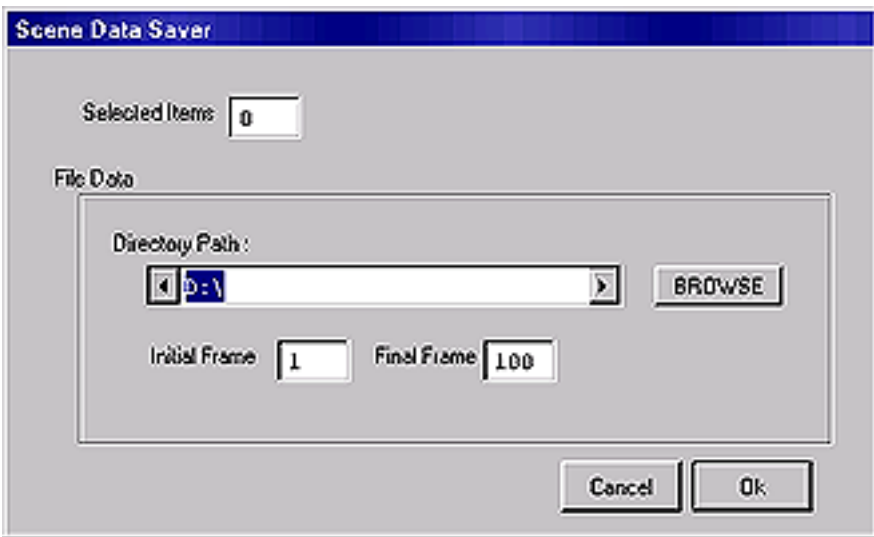
Push OK button and the object will be placed at the initial position, like was in RealWave environment, with the origin placed at the point you placed the object first. If the object was scaled in RealWave, the same scaling will have in Softimage.

---

## ● SCENE DATA SAVER

This plug-in saves the motion of objects selected in the scene.

Select the animated objects you want to export and go to MODEL module and open the *effect* menu. Select 'Scene Data Saver'.



This panel informs you the number of selected items. Verify it. Select the file name and the directory where the **.sd** file will be placed. The default initial and final frame values can be changed.

After all settings push OK button, and the file **.sd** will be saved in the selected directory.

# MAYA

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The RealWave plug-ins for Maya are packed along with the RealFlow plugins for convenience purposes. Both programs share the same file format for particles and animated scenes ( **.sd** files ), so the Particle Loader and the Scene Data saver are the same.

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## ● INSTALLATION

To install the plug-ins, open the **.ZIP** file and run setup.exe. You don't need to decompress the files.

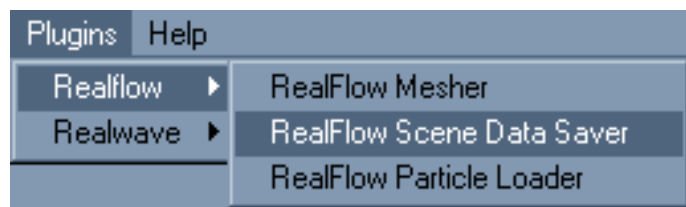
If setup.exe can't install the plug ins, do it manually. It is straightforward.

**.mel** script files must be placed in the folder: **\ scripts \ startup**

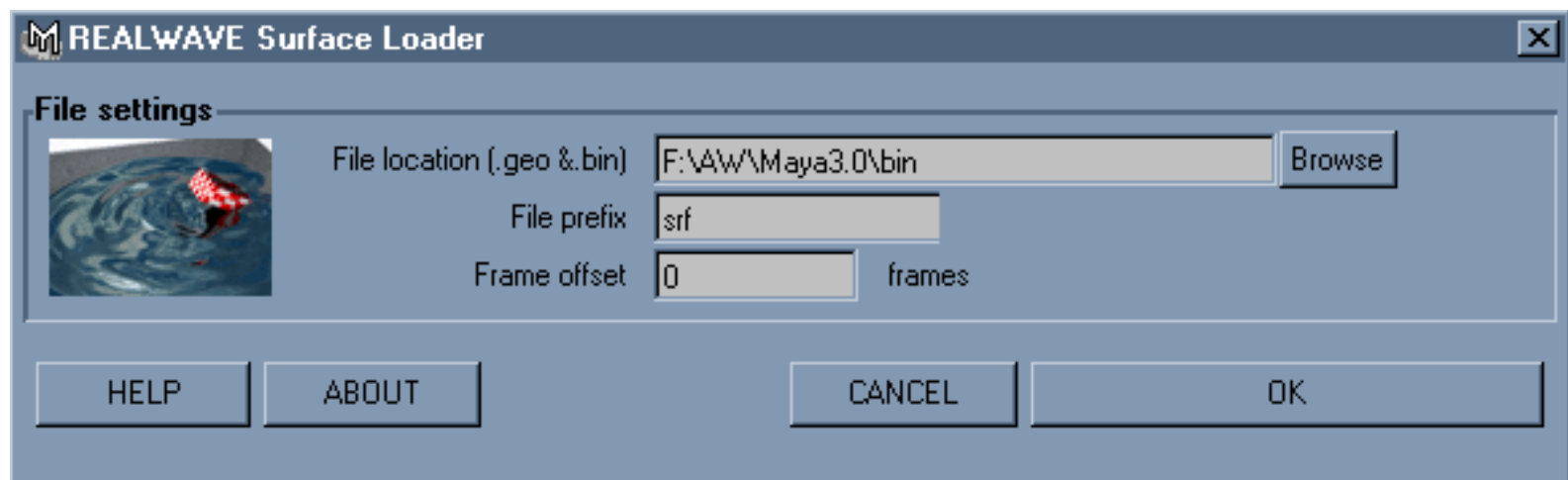
**.mll** object files and **.bmp** icon files must be located at: **\ bin \ plug-ins**

## USE

Once the files have been placed in the correct folders, the plugins can be accessed from the main menu.



## ● REALWAVE SURFACE



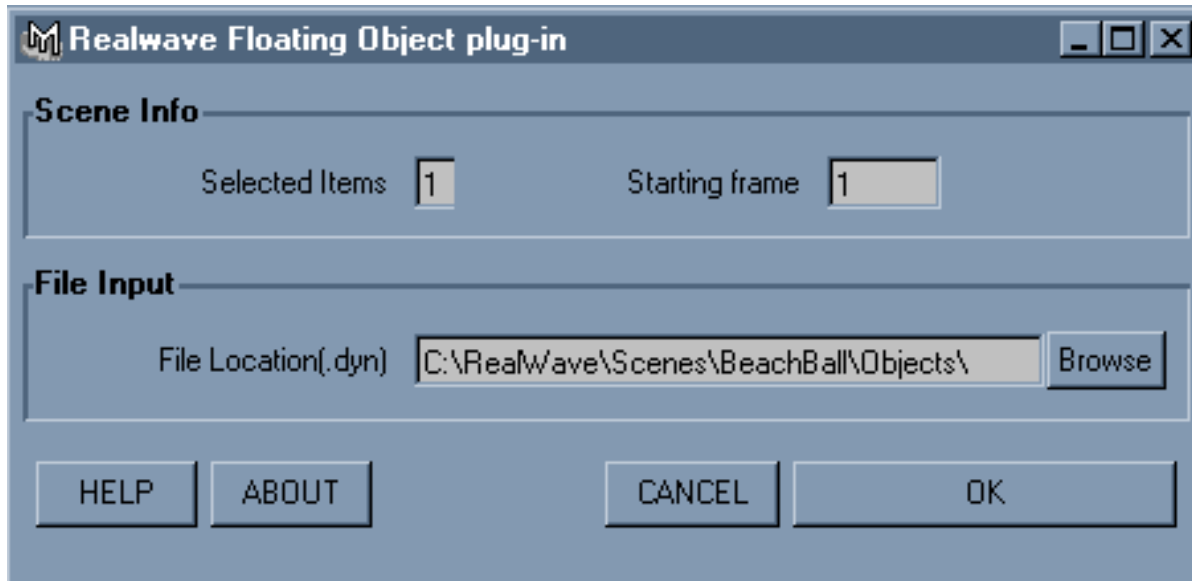
This plugin loads the mesh surface into the scene. Select the folder directory where the collection of **.bin** and **.geo** files are located. The browse button will help you to reach it. Just select one of the .bin files of the sequence. You can also type the path folder location in the edit box.

**FILE PREFIX:** If the prefix of the files are srf..., don't change it. This is the default prefix in RealWave.

**FRAME OFFSET:** The number of empty frames (without animation data), that the animation of the surface will have.

---

## ● FLOATING OBJECT PLUGIN

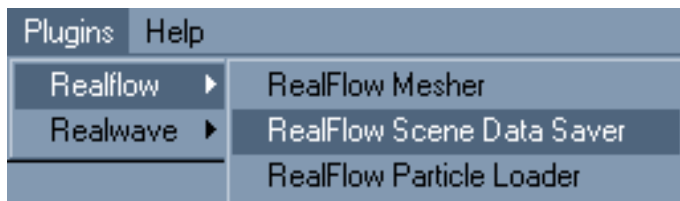


This plugin loads the animation data of the floating objects into the Maya environment. To start select the floating object from the scene and place it at the initial position.

**FILE LOCATION:** Select the file directory where the **.dyn** file is located.

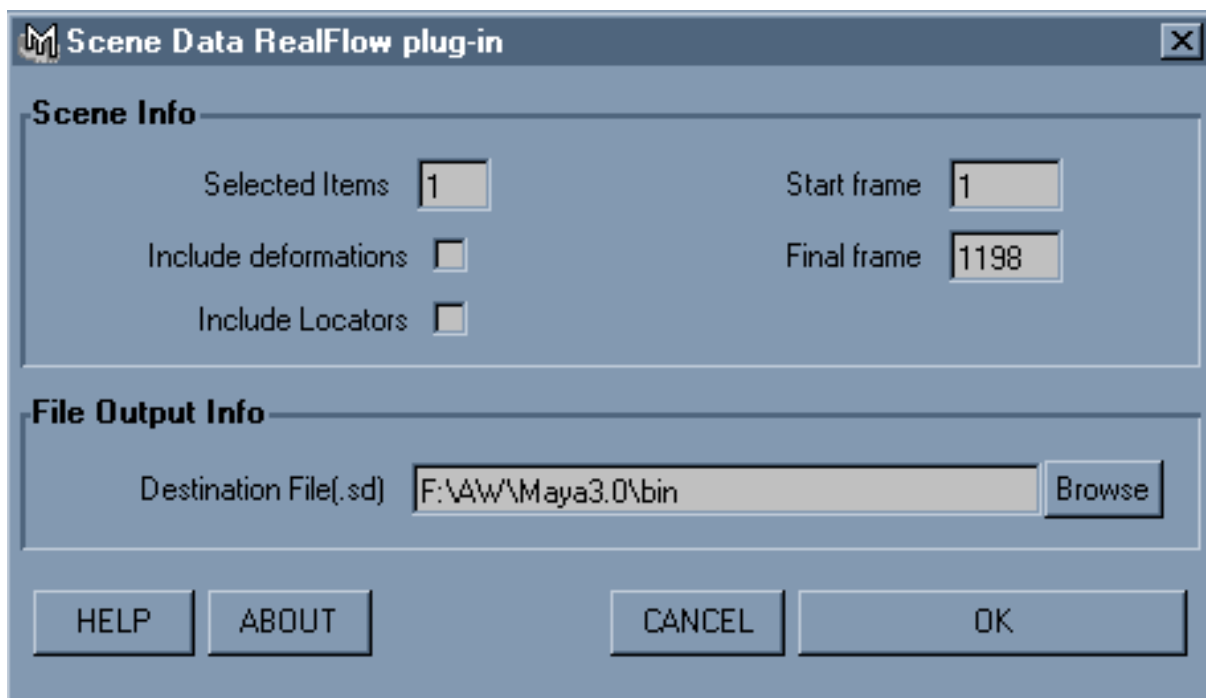
---

## ● SCENE DATA RealFlow plug-in



This plugin allows the user to export animated objects in **.sd** format ( readable by RealWave ). Just select the objects you want to export and fill the next panel with the required scene and file information.

The Scene Data saver for MAYA looks like this:



## SCENE INFO

There are some scene parameters one must fix before saving the **.sd** file to disk:

*Selected Items:* Informs to the user about the number of items selected before applying the effect.

*Include deformations:* Check this box to include object deformations together with the scene data files. Otherwise, objects only will save geometry transformations ( scaling, rotation, translations ).

*Include Locators:* Maybe you'd like to export locators to the RealFlow environment in order to link a daemon or emitter to them. Check this control to include locators in the scene information.

*Start frame / final frame:* Set the initial and final frame of the scene sequence you want to be saved.

## FILE OUTPUT INFO

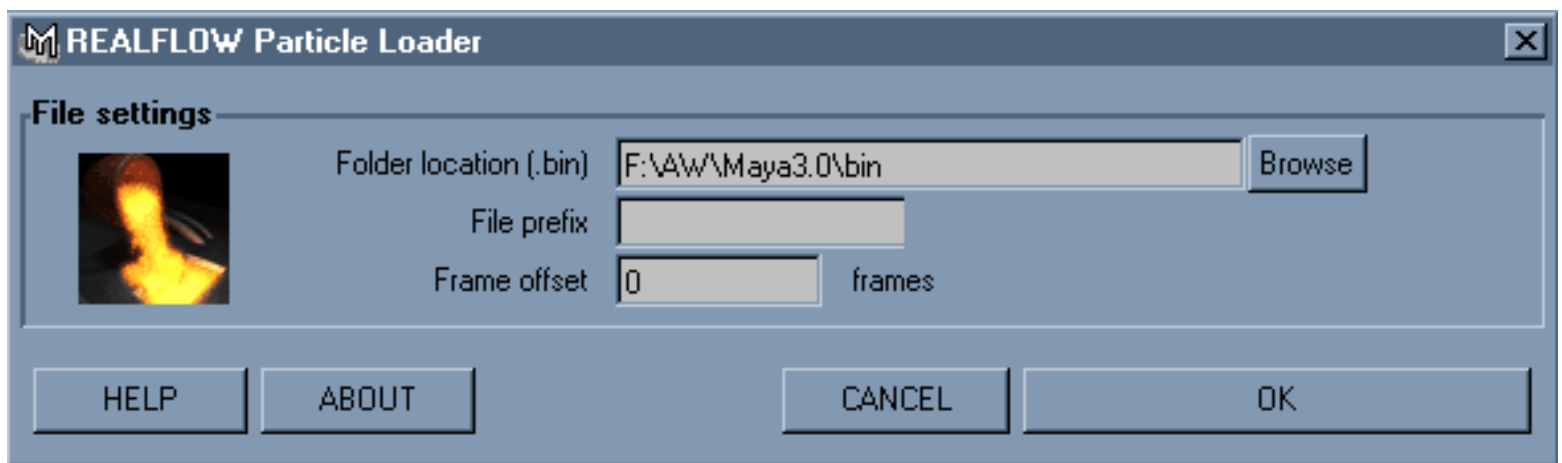
Choose the destination file for the **.sd** file. When OK is pressed, the scene is played from the initial to the final frames specified, and the **.sd** file will be saved to disk.

For long animations or complex scenes, the **.sd** file may be very large. Try to export simple objects with not many faces. It is better to work with light versions of the geometry in order to avoid long and tedious collision calculations.

You must realize that working with the deformed version of the exported objects files produces very cumbersome files.

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## REALFLOW PARTICLE LOADER



Use this plug-in to import particles into Maya.

Just select the file sequence location (by clicking one of the files of the sequence or just typing the folder path in the edit box) and press OK button.

**Prefix** is automatically updated when clicking one file of the sequence. But if you select the folder by typing directly in the edit box, then you should specify the prefix of the file sequence by hand.

# FREQUENTLY ASKED QUESTIONS

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This section contains the answer to the most frequent troubles that appear when working with RealWave

## ● WHY I'M UNABLE TO SELECT CONTROL POINTS ?

No control points appear when trying to select them. First you must create a new wave. If you have an object already present in the scene it has its own wave. To add control points you must create another wave (by pressing the NEW WAVE button). Then click and drag with mouse over the points you want while pressing Ctrl Key. You can create as many waves as you wish. Every wave can have its own collection of control points with its parameters.

## ● WHY THE ORIENTATION OF THE AXIS DIFFERS FROM MY 3D PLATFORM ?

RealWave supports different axis orientations due to its support of different 3D packages. Go to File / Preferences and set the correct platform compatible environment.

## ● WHY MY OBJECTS DOESN'T APPEAR ON THE SCREEN WHEN I LOAD A SCENE DATA FILE ?

First of all verify that the object has been loaded. Go to Objects module and verify that it appears in the list of objects present in the scene. The number of faces and vertices of the selected objects is shown in the correspondent boxes. Go to Objects module and select the object you want to visualize. Then go to the controls that are in the bottom of the screen and push 'Center view'. The view will be centered in the selected object. If it is still invisible, try to zoom in the scene (dragging with the right button of the mouse). If the objects loaded are different in size that the original verify the scale factor in File / Preferences. To reset the view to the original one, press the 'reset view' button that is beside the former one.

## ● MY WAVE IS OUT OF CONTROL...

Try with a smaller amplitude or set a higher value of damping.

## ● THE SIZE OF MY OBJECTS IS TOO BIG OR TOO LITTLE

Then set the correct geometry scale value in the upper numeric control labeled 'Geometry scale' and click RESET.