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Rendering instructions for 3Dfiles

This guide will outline the procedure to convert a 3DS model into a series of digital files which can be used as input to a 3DHoloprint.

The basic idea is to move a 'virtual camera' through the 3D model – recording sufficient views to support creation of a half-parallax hologram (stereogram).

Process overview:
Prior to this the artist will have created a scene in 3DS. A visible bounding box is added, followed by a camera path to use when capturing the digital data, and then the camera will be created and linked to that path. Then the camera point of view is set and the result previewed. When ready, the output is rendered.

Please try to follow this guide explicitly; changing one or two parameters may result in unusable data files. While the concepts presented here are applicable to any 3D modelling program, the best approach is to contact us if you would like to adapt this process to a different modelling program.

Unit Configuration

The units to be used within the scene should be metric (centimeters) and the origin of the scene to be captured should be 0,0,0 in Cartesian coordinates. Please refer to the figure, below.

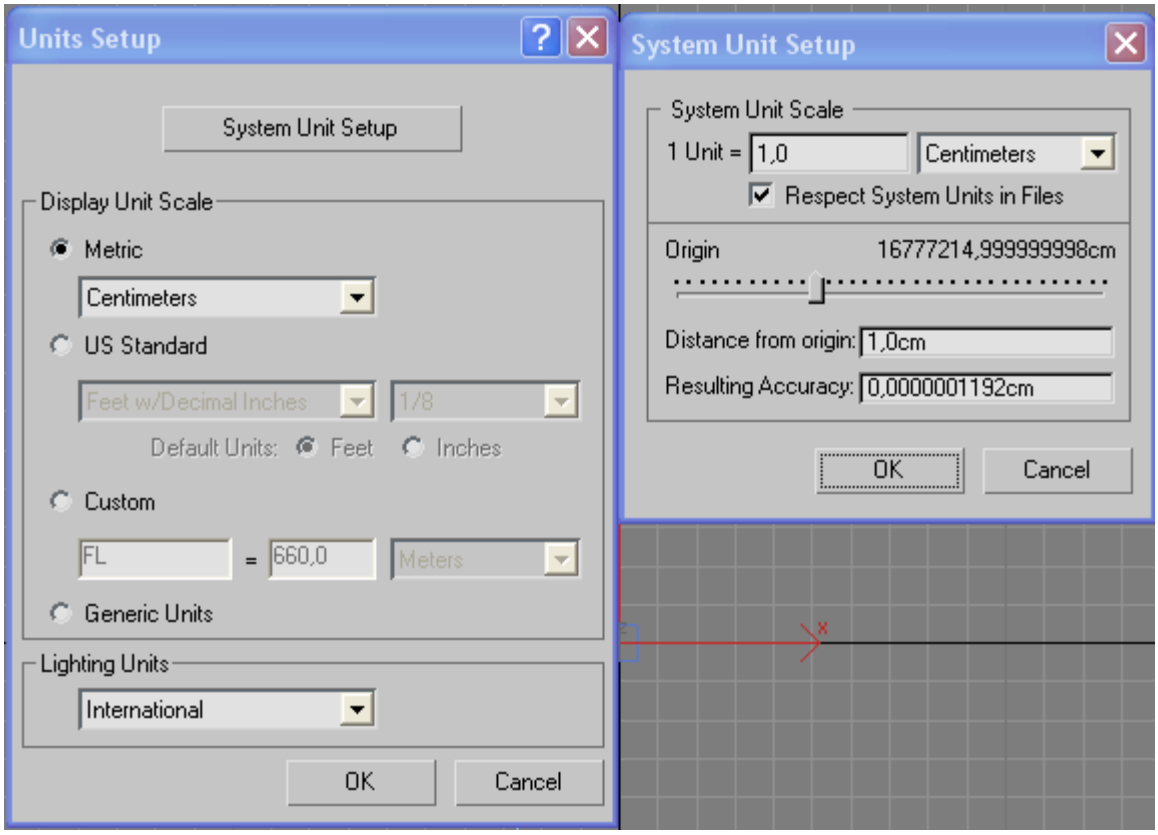


Illustration 1: Unit settings

Bounding BOX

Since the 3DHoloprint can only represent a subset of the 3D space, it is required to determine the bounding box of the data that will be destined for the 3DHoloprint.
By creating a geometric object (a box) that is primarily transparent, one can visualize the portion of the 3D space that will actually be captured and visible in the hologram. It is also possible to plan and visualize any intended 'projection' from the hologram. Since one face of the bounding box represents the image plane or 'glass' of the final hologram, any portion of the model that crosses this surface will appear to project from the hologram. Obviously the project will work best if only a fraction of the overall depth of the 3D space. A safe recommendation is less than 25% projection, and 75% on the back.

The recommended size for the bounding box is to use the same dimensions as the desired holographic print, with a depth of the box equivalent to the width of the print. So, for example, a 60x80cm (WxH) holographic print would leverage a 60x60x80cm (WxDxH) bounding box with its **base** centered on (0,0,0).

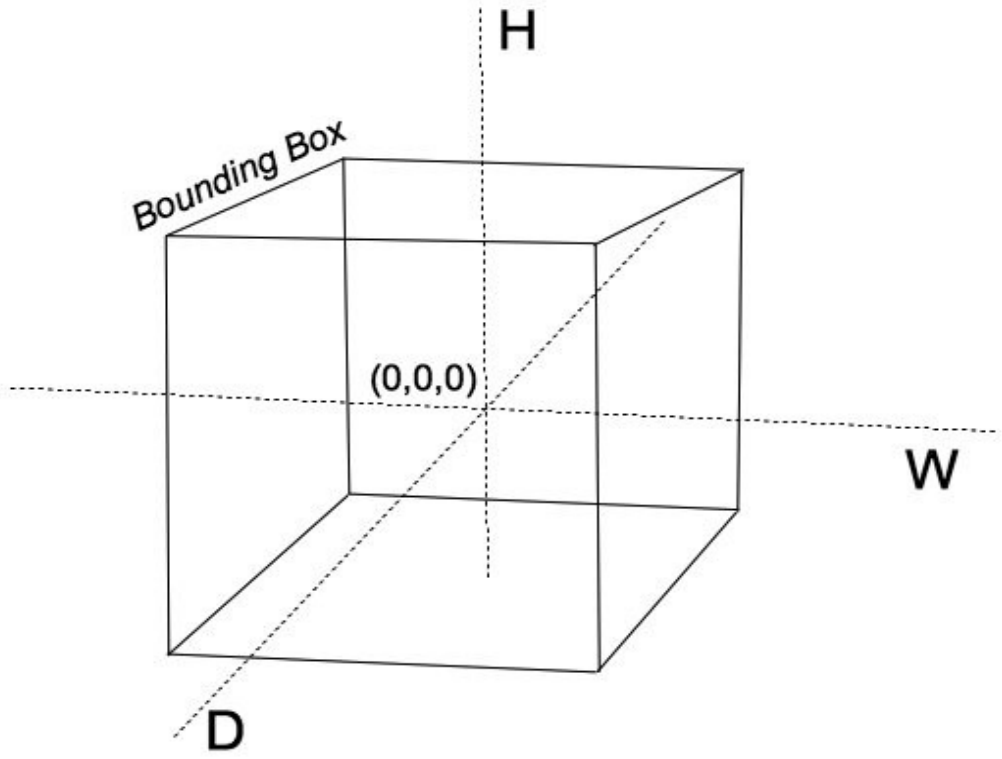


Illustration 2: Bounding Box for Visualization

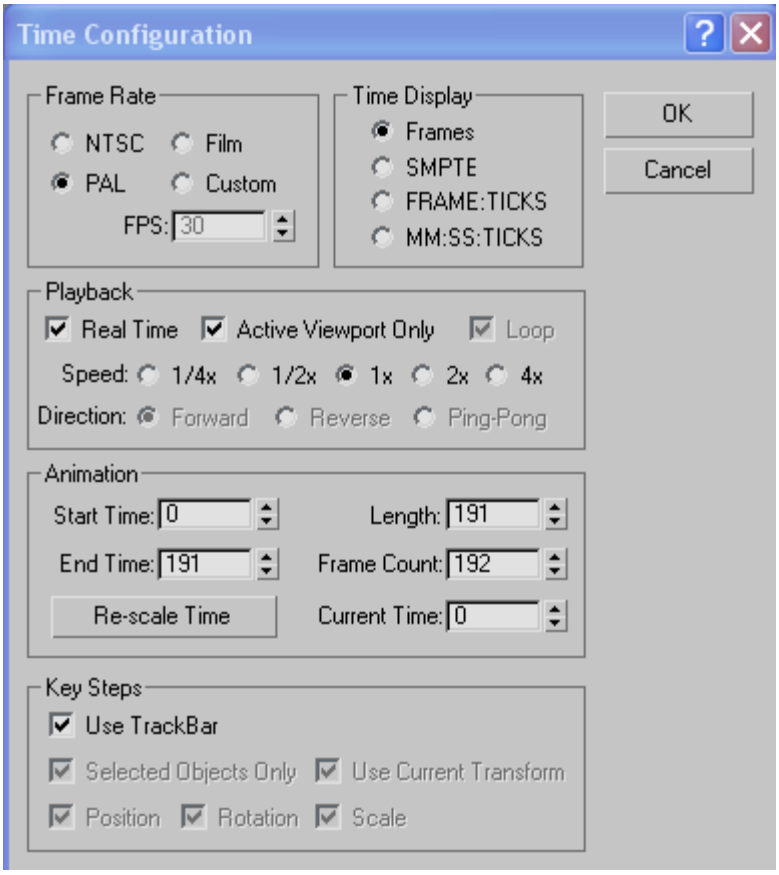
Configuring the virtual Camera

As mentioned above, the 3D scene is captured via a 'virtual camera' moving through the 3D space. In particular, facing the origin and rotating around it along an arc. We have adopted a left to right rotation, along an arc of radius equal to the largest dimension of the output print, sweeping an angle of 120°, but mapped to 192 individual frames.

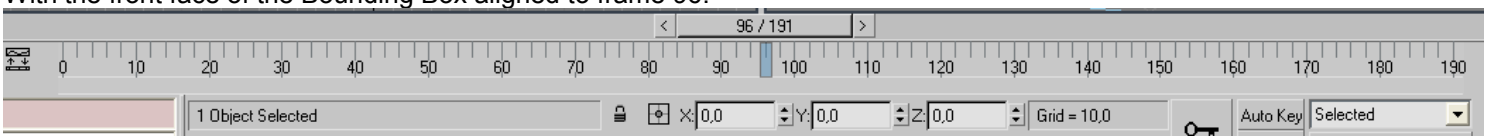
The swept angle, speed of rotation and radius of arc, etc. are all parameterised within 3DS, as shown in the following tables.

Time Configuration

Make sure the corresponding 3DS scene settings for Time Configuration are as follows:



With the front face of the Bounding Box aligned to frame 96.



Arc Creation (Camera Path)

Create an arc around the origin from 210° to 330° (for a total swept angle of 120°).
Specify the radius to be 2x the largest dimension of the output print.
Use the following navigation: *Create/Shapes/Arc*
After creating the arc, select and manually specify the origin to be (0,0,0).
Use the following navigation: *Select and Move*

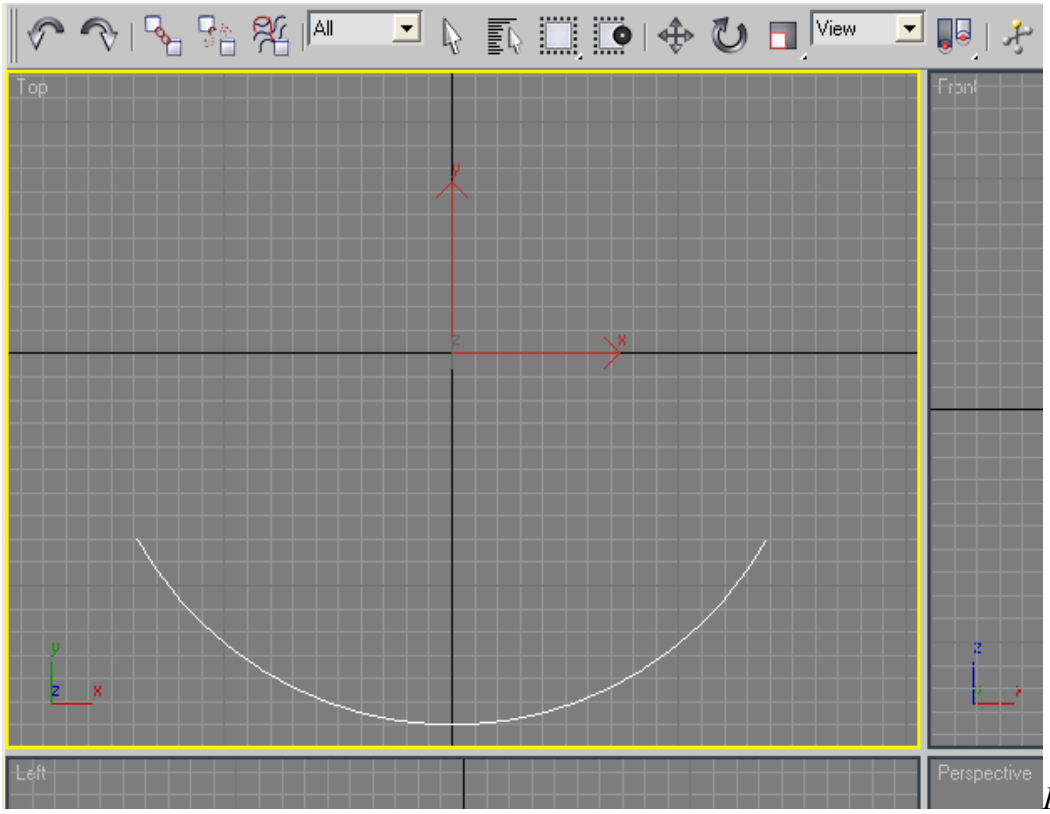
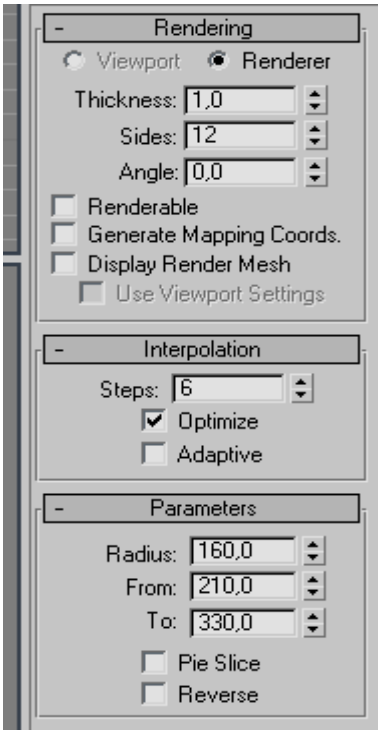


Illustration 3: Arc specifies left to right sweep from 210 to 330 (120 degrees total)

Refer to the table below for more details. ***Note*** *that radii depend on the size of the bounding box / output hologram.*



From an overhead (top) view:
1) Create a circular arc sweeping 120 degrees which represents the trajectory of the camera.
Navigation:
Create/Shapes/Arc

2)Using the following table, specify the radius of the arc dependent on the size of output print

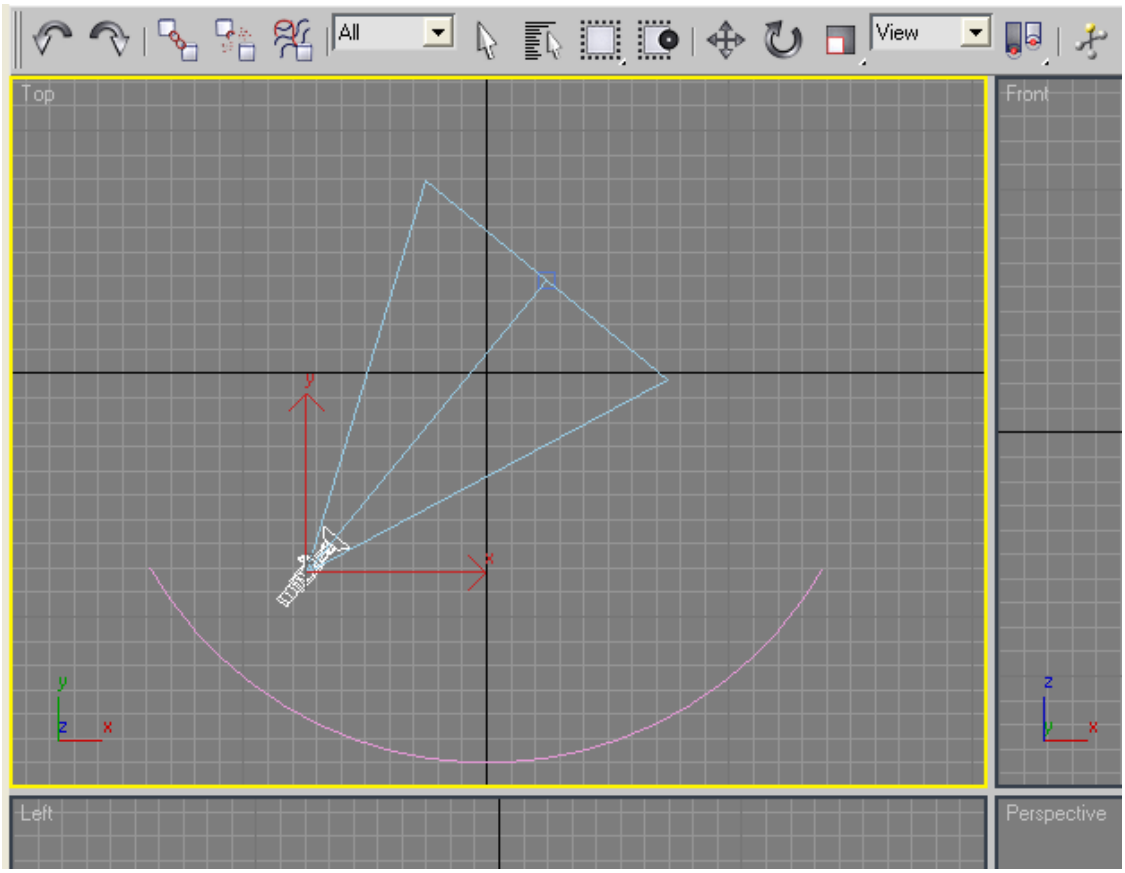
Output Hologram size => Camera Arc Radius

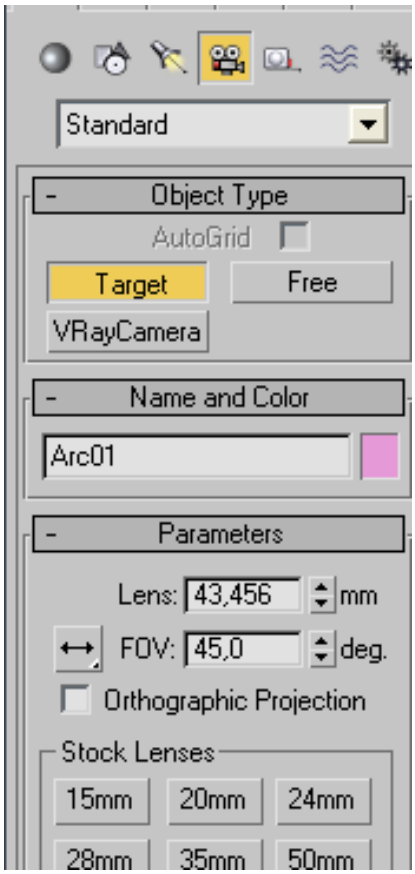
60X80 (or 80x60):	**160cm**
60X40:	120cm
30X40:	80cm
30X20 or smaller:	60cm

3) Set start and end of circular Arc to be from 210 degrees to 330 degrees (120 degrees total).

4) Select the Arc and manually set the centrer of the Arc to be x=0/y=0/z=0 using "Select and Move"

Create a Camera target





From an overhead (top) view:
Create a camera target and specify the field of view (FOV) of the camera target using the table below.

Holoprint Size - FOV of camera

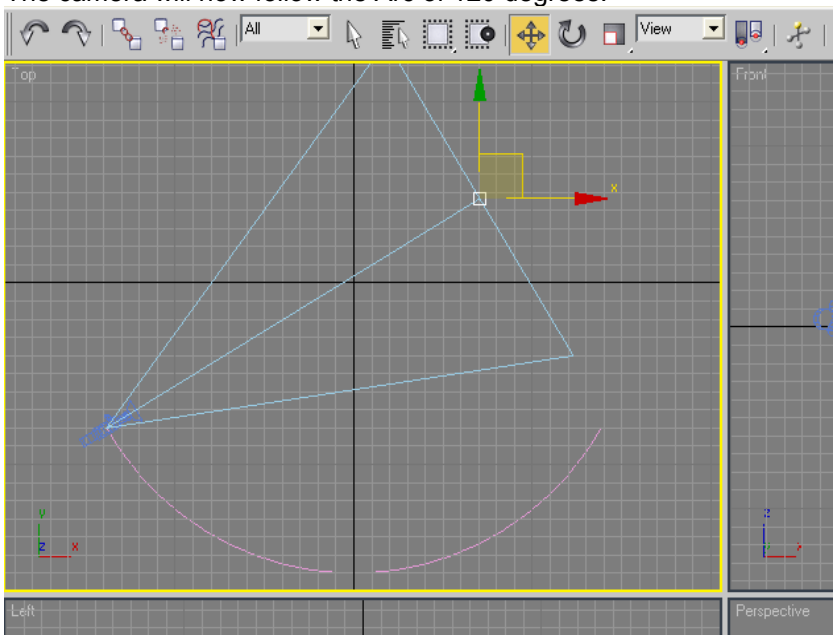
60X80:	**21.24 degrees**
60X40:	
30X40:	
30X20:	

As an example, for 3Dholoprint of 60x80cm.
FOV = 21.24 deg

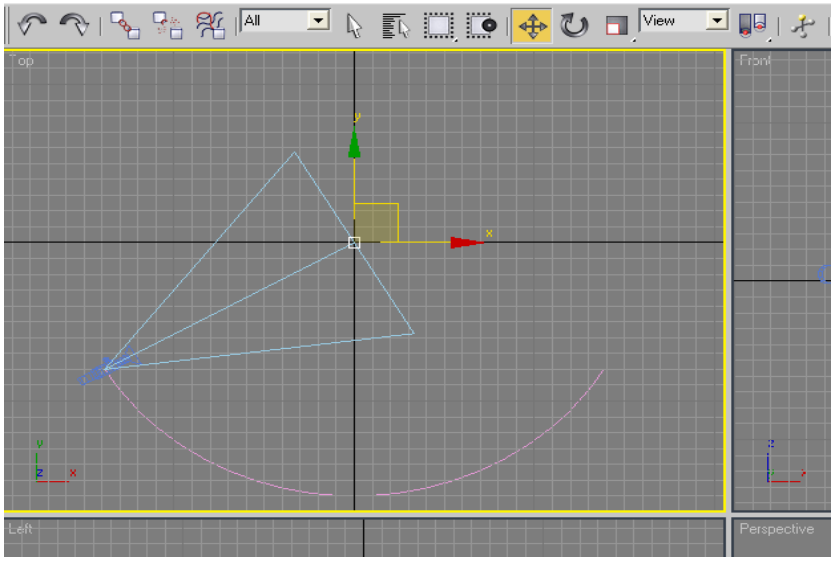
Verify Lens and FOV settings as show to left as well as language – Focal length vs. FOV.

Link the Camera to the Arc

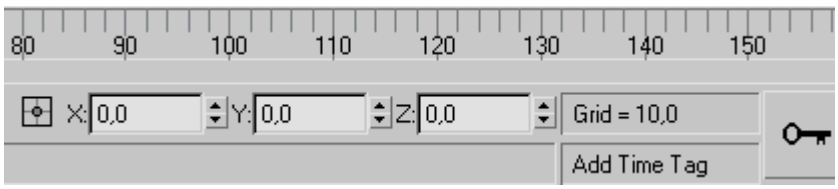
Set the Arc as the Camera target path using navigation:
Animation / Constraint / Path
and selecting the Arc created previously.
The camera will now follow the Arc of 120 degrees.



Set the Camera 'Point of View'



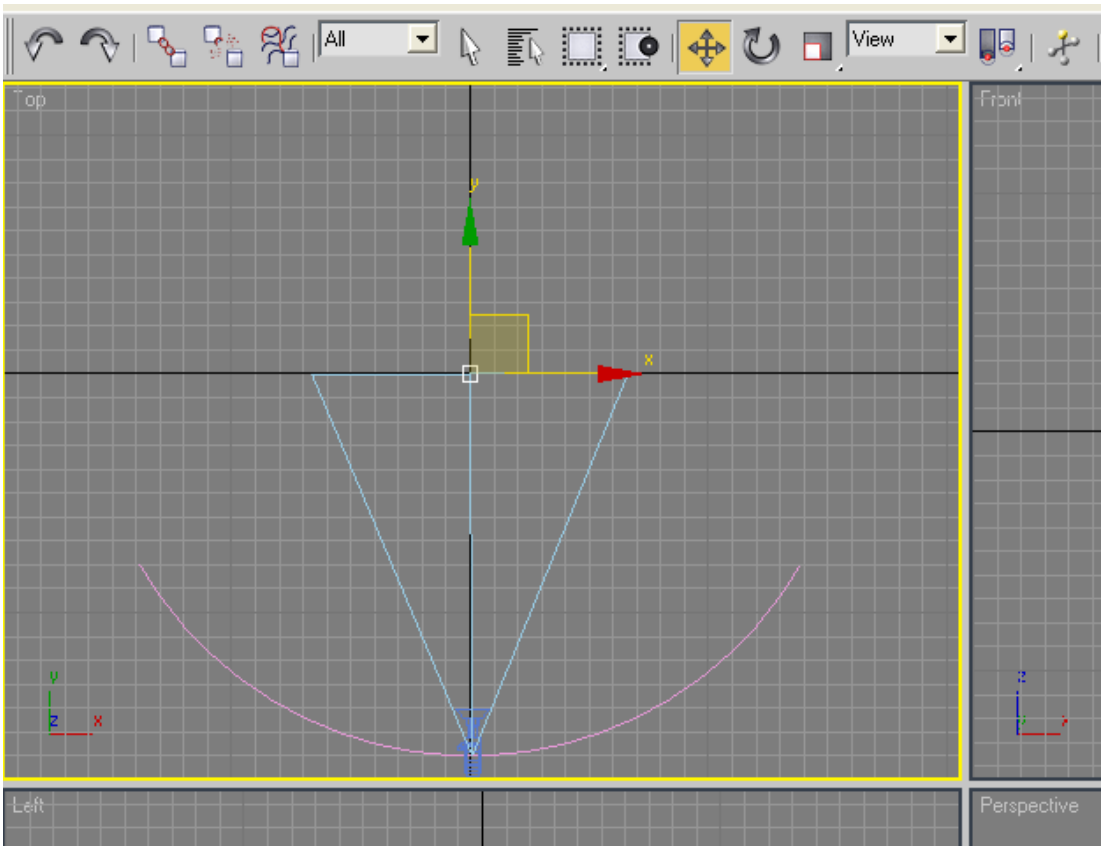
Using navigation:
"Select and Move"
set the direction of the camera to the origin (x=0/y=0/z=0)



Preview the hologram:

Verify step / navigation to get here

Survey the scene from various angles by sliding the cursor across frames (see below).
In particular ensure that image (frame) 96 is the front (center) view of the object.
If for some reason the camera velocity does not appear to be linear, double check the camera settings (above).



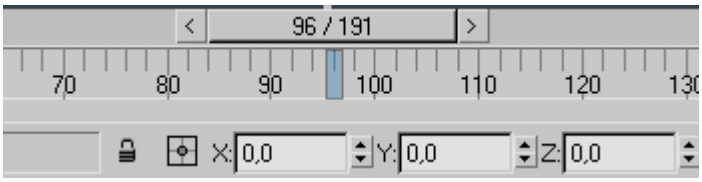


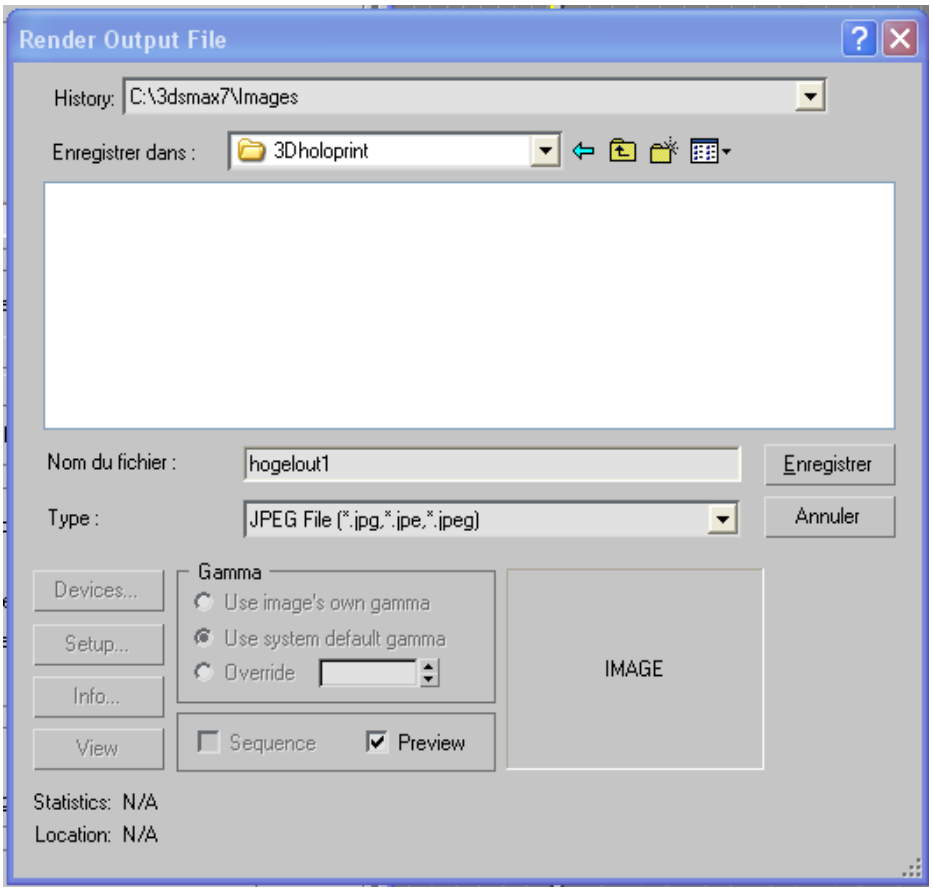
Illustration 4: Center on Image 96

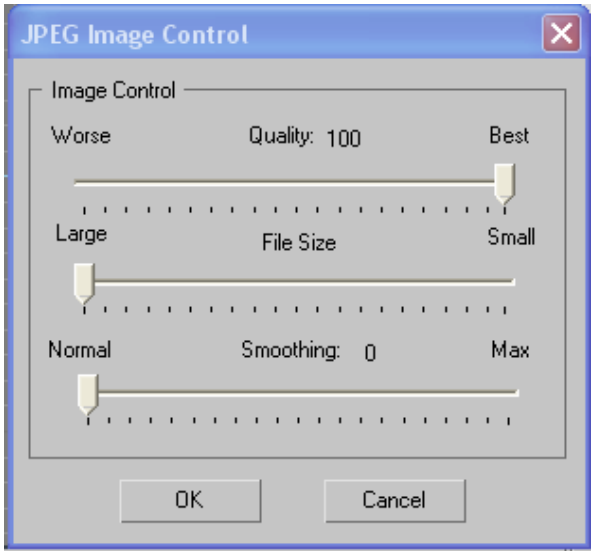
Render

Complete the settings as specified below and then press the Render button.

Specify Render output destination

Use navigation "*files*" and specify a base name for output data. Validate step / navigaton to get here

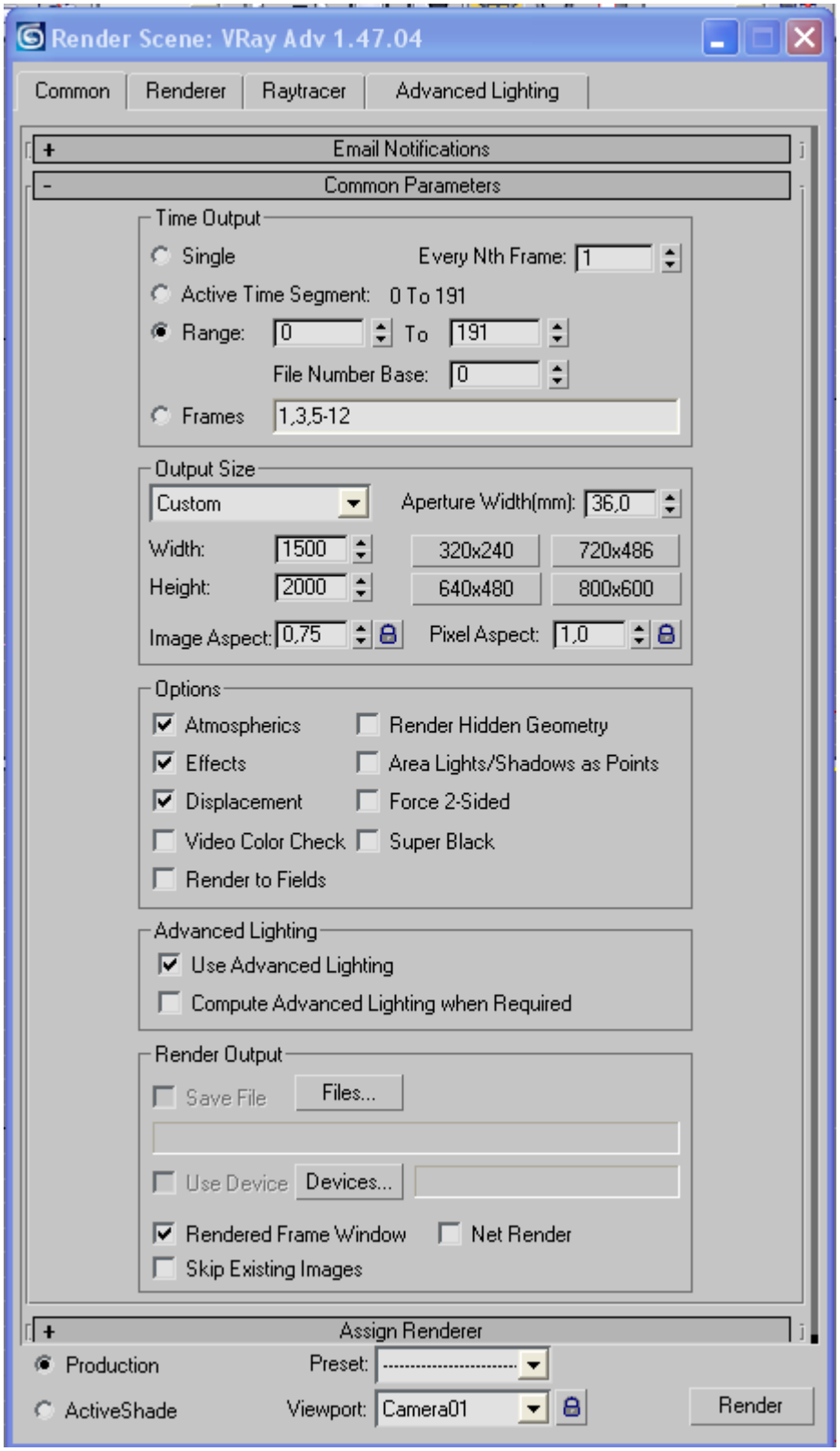




Select JPEG file type, with the following settings:
Quality: best
Files Size: large
Smoothing: normal

Render Settings

Specify the number of frames, output sizes and viewport as specified below. Some values are automatically derived.



Render Scene parameters:

Time Output (Frames):

Range 0 to 191
Every Nth Frame = 1

Output Size:
Custom:
Set width and height in pixels as 25x the output print size in cm (use table below).

Custom Width and Height (aspect)
60X80cm: W=1500/H=2000 4:3
60X40cm: W=1500/H=1000 3:2
53.3x40cm:W=1333/H=1000 4:3
30X40cm: W=750 /H=1000 4:3
30X20cm: W=750 /H=500 3:2
26.6x20cm: W=666 /H=500 4:3

Special Print:
Custom Width and Height (aspect)
80X60cm: W=2000/H=1500 4:3
40X60cm: W=1000/H=1500 3:2
40X53.3cm: W=1000/H=1333 4:3
40X30cm: W=1000 /H=750 4:3
20X30cm: W=500 /H=750 3:2
20X26.6cm: W=500 /H=666 4:3

The example shown on the left is for 60x80cm print.

When data entry is complete press the render button at the bottom right of the form.

Submit for Printing

Send the rendered data to Atelier Gentet

Using MegaUpload – send the file(s) to a common storage point and notify us of the location and your plans for printing (number of copies, etc.) via the website order form.

Number of copies per print (standard print is 60x80cm):

Quantity / print	Size of subprint WxH	Aspect	format (height is direction of illumination)
1	60X80cm:	4:3	portrait
2	60X40cm:	3:2	landscape
2	53.3X40cm:	4:3	landscape
4	30X40cm:	4:3	portrait
8	30X20cm:	3:2	landscape
9	20X26.6cm:	4:3	portrait

Number of copies per print (special print is 80x60cm):

Quantity / print	Size of subprint WxH	Aspect	format (height is direction of illumination)
1	80X60cm:	4:3	landscape
2	40X60cm:	3:2	portrait
2	40X53.3cm:	4:3	portrait
4	40X30cm:	4:3	landscape
8	20X30cm:	3:2	portrait
9	26.6X20cm:	4:3	landscape

Using conventional mail – send us a DVD or CD containing the digital data.