

EXERCISE 12: ANIMATION

ASSIGNMENT:

In this exercise you will create a study animation of the Farnsworth House model you created for exercise 8. This exercise will animation basics through the creation of three simple animations.

LEARNING OBJECTIVES:

- Creating a study animation
- Understanding time and keyframes
- Moving the camera through time
- Creating a walkthrough
- Adjusting lights over time
- Introduction to animation file outputs

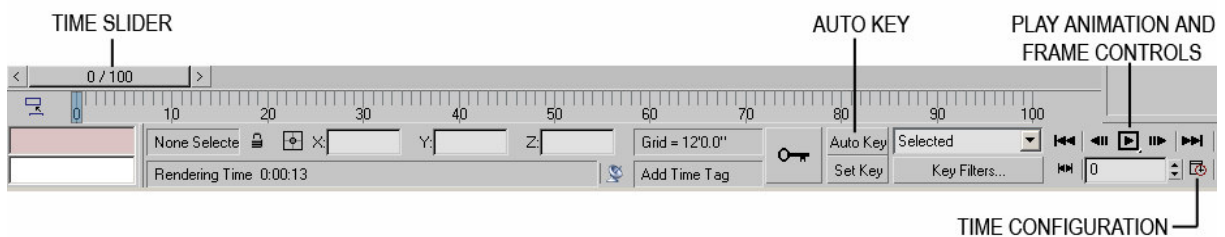
PROCEDURE:

1. Open the file located in your directory named “animation-start.max”
2. From the main menu bar select **File, Save As**, and save the file in your project 12 folder as “**yourname-animation.max**” Be sure to complete this step because you will need the animation-start file in its original state again later in this exercise.

PART A: CREATING A STUDY ANIMATION

This file is very similar to the file you created in exercise 8, with a few exceptions. I have added a sunlight to the scene, added the grid lines to the terraces, and modified the glass material similar to the changes we made in exercise 9. We are going to use this file because it is simpler than the exterior rendering file we created in exercise 9, and will save us valuable rendering time for the purposes of this exercise. You can apply these animation concepts to any level of finished viz file that you like. The more complex the scene is, the longer it will take to generate the animation files.

3. We will be using the following animation tools in this exercise.



4. The time slider currently displays 0 / 100 as shown above. This is showing that the animation is on frame 0 of 100. Each frame is a still image that will be spliced together to create the animation. This is similar to how a flipbook that you might have created as a small child works. This is also how TV and motion pictures are created, rapidly showing a sequence of still images to simulate the effect of motion. You television at home displays still images at a rate of 29.97 frames per second. For our sake, we will round this number to 30. Therefore, the 100 frames shown above represent just over 3 seconds of animation, with each second equal to about 30 frames.

5. For this animation, we will start by adding frames so that we have a longer animated sequence. Click on the time configuration button to open the time configuration dialog box

6. In the animation parameters, change the end time to be equal to 900 as shown in figure 12.01. Click ok. 900 frames will give us about 30 seconds of animation.

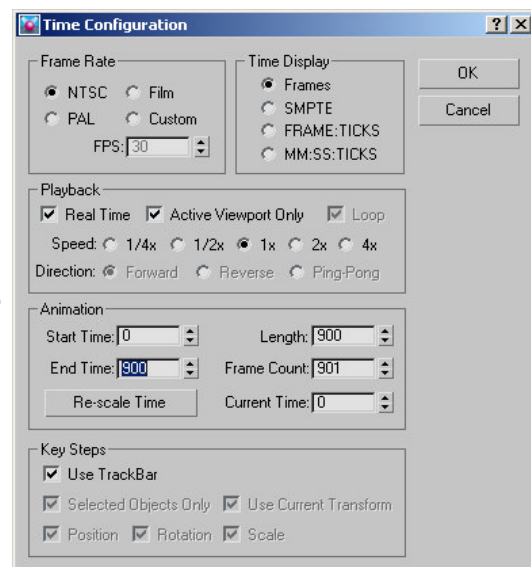


Figure 12.01

7. Click the Autokey button. The button turns red to indicate that it is active. The time slider also displays red as well. Autokey mode is the simplest method for producing study animations. A more advanced method uses the set key mode which will not be covered in this course.
8. Select the Target_Camera01. Also select the select and move tool.
9. Move the time slider to frame 200.
10. With the autokey still activated, and the time slider set to 200, work in the top viewport and move the Target_Camera01 to the location shown in figure 12.02.

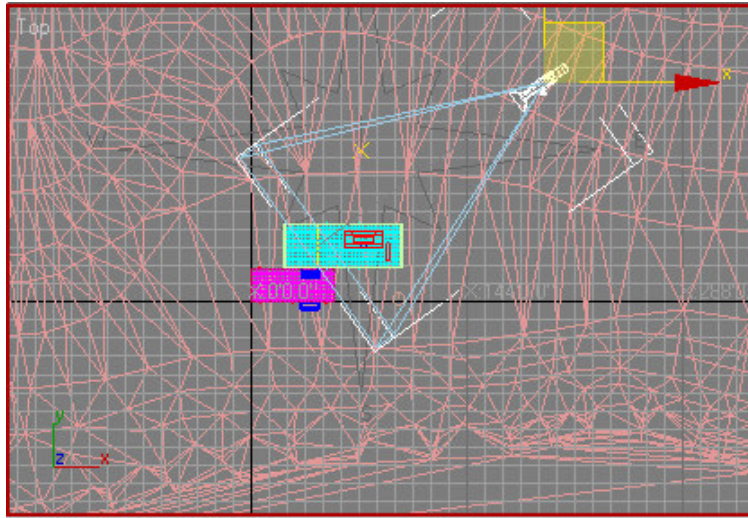


Figure 12.02

11. Now move the time slider to frame 400. Be sure the Target_Camera01 is still selected and the Autokey button is still activated.
12. Move the Target_Camera 01 to the location shown in figure 12.03.

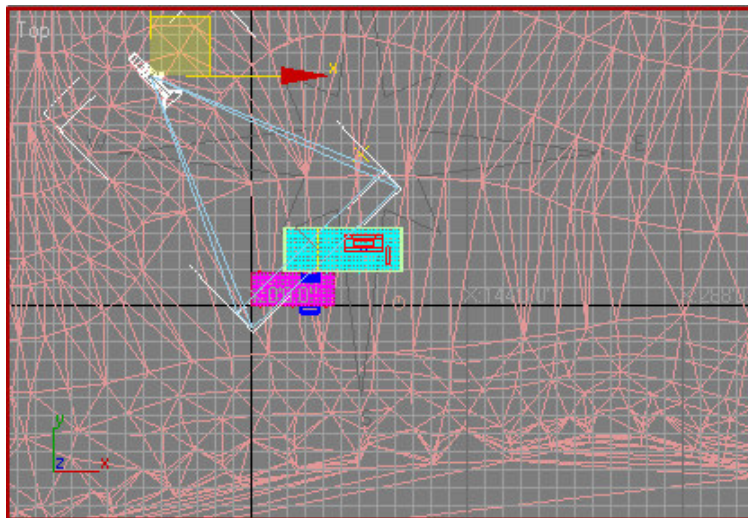


Figure 12.03

13. As you complete each step you will notice that a red rectangle is placed on the time slider at each location. These are keyframes, and indicate the points in time that you have programmed the camera location so far.
14. Now move the time slider to frame 600. Be sure the Target_Camera01 is still selected and the Autokey button is still activated.
15. Move the Target_Camera01 to the location shown in figure 12.04.

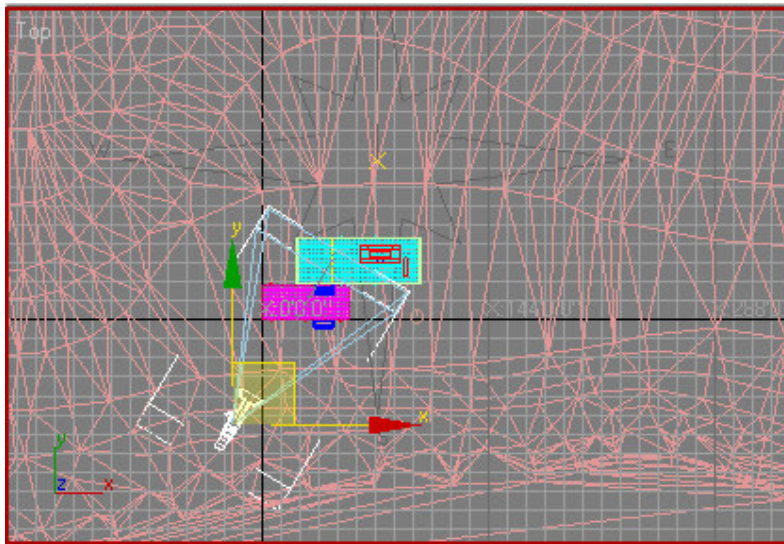


Figure 12.04

16. Finally move the time slider to frame 800, and move the Target_Camera01 to the location indicated in figure 12.05. You may need to zoom in for a better view in the top viewport.

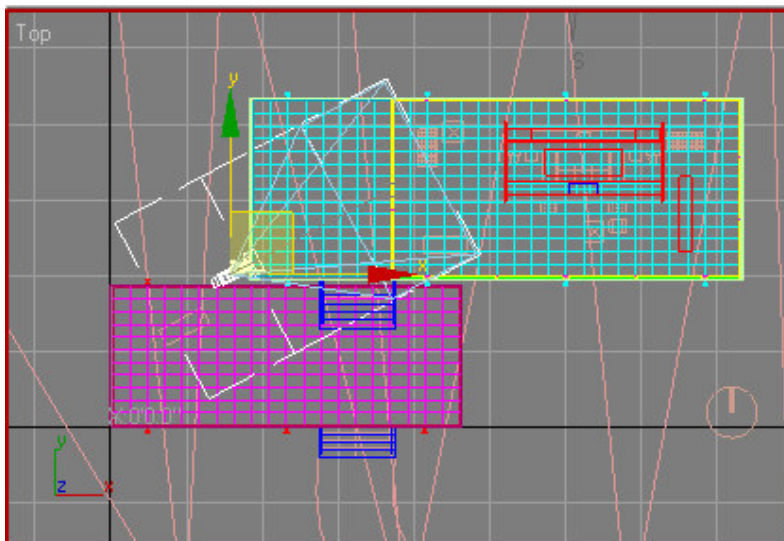


Figure 12.05

17. Activate the Target_Camera01 viewport and then click on the play animation button.



You will see animation you have created play in a continuous loop in this viewport. Notice that the time slider moves as the animation plays. You will see that each camera location that you specified is met, and VIZ connects gaps between. Pause the animation when you have viewed enough, and move the time slider back to 0.

Now that we have viewed the initial animation, it is time to do some fine tuning to the camera path.

18. With the target camera still selected, select the motion tab in the command panel. The motion tab contains most of the animation settings for the object that you have animated. In this case we have animated the camera.

19. Click on the trajectories button as shown in figure 12.06 to view the camera path. The camera path will be displayed with a white line in all of the viewports.

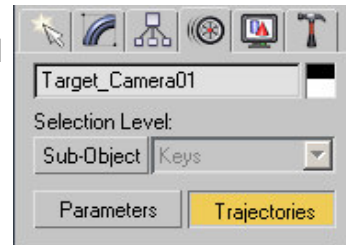


Figure 12.06

20. Click back on the Parameters button to edit the camera's motion parameters.

21. Scroll down to the Key Info (Basic) parameters.

22. Click the right arrow button to select the 2nd key as shown in figure 12.07. Notice that the camera changes to the 2nd key location at time frame 200.

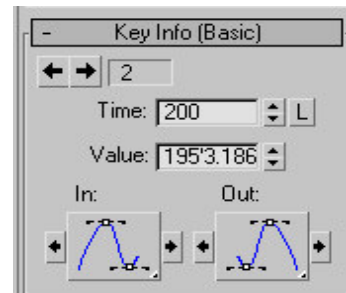
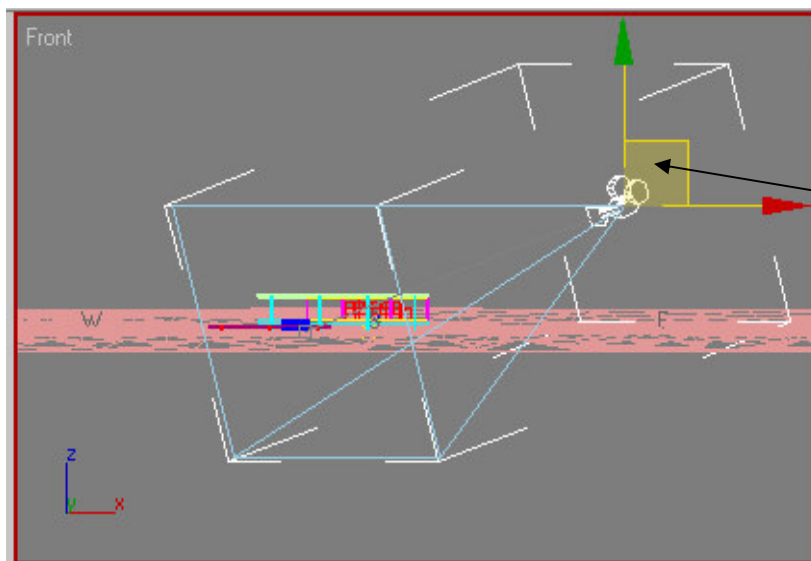


Figure 12.07

23. Make sure the autokey button is still activated.

24. Use the select and move tool to move the camera up in the Z axis as shown in figure 12.08. Work in the front viewport.



Move the camera up slightly to this location

Figure 12.08

25. Back in the motion panel, select the right arrow in the Key Info (basic) rollout to select keyframe 3 which is at time frame #400.
26. Again working in the front viewport move the camera up slightly in the Z direction as shown in figure 12.09.

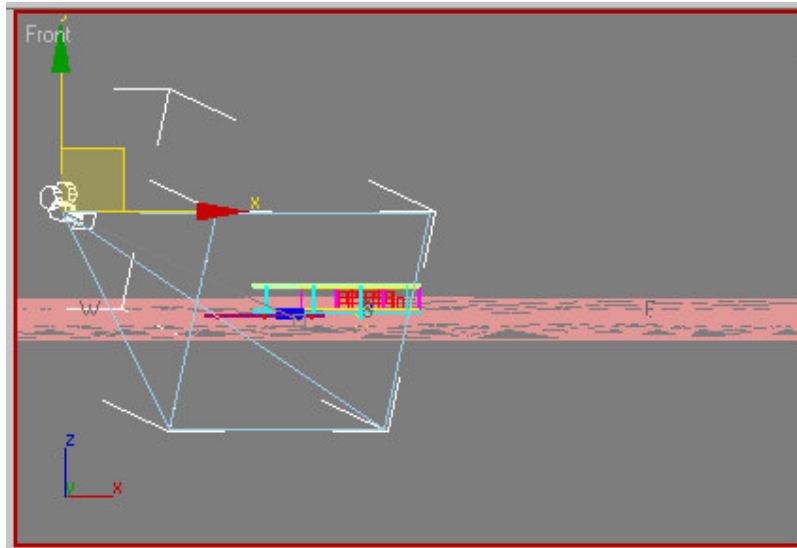


Figure 12.09

27. Again in the motion panel, select the right arrow in the Key Info (basic) rollout to select keyframe 5 which is at time frame #800.
28. Again working in the front viewport move the camera down in the Z direction so that it is located under the roof canopy of the building as shown in figure 12.10.

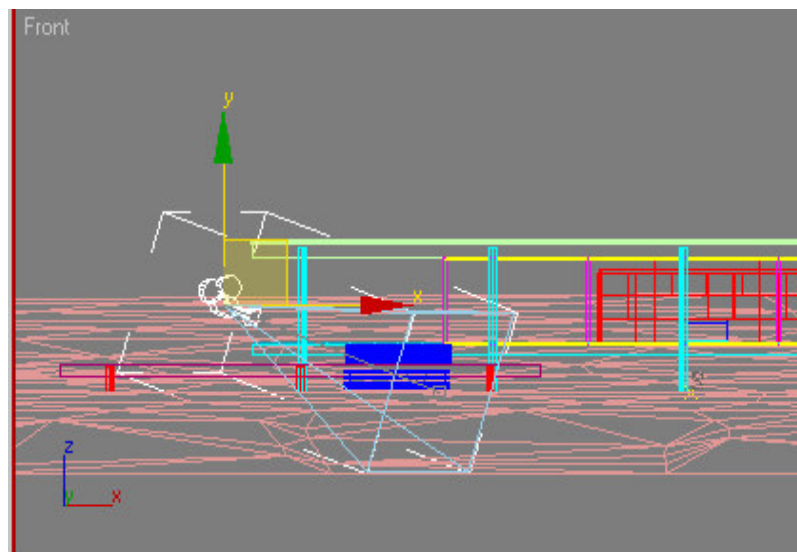


Figure 12.10

29. You will notice that this last keyframe is still not a very good view because the target of the camera is too low.
30. With the Autokey button still activated, use the select by name tool to select the Target_Camera01.Target.
31. Be sure that you are still working at the 800th frame. You may notice that once you select the target all of the other keys disappear, this is because the keyframes that you previously created are associated with the camera, not that the target is the active object, there are no keyframes yet.
32. Use the select and move tool, working in the front viewport, to move the target up until your view matches figure 12.11. The target will now move slowly upwards from frame 0 through frame 800.

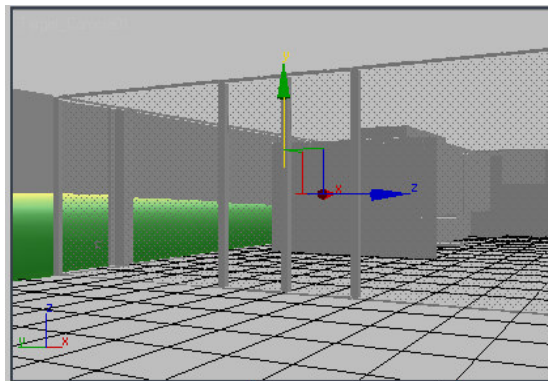


Figure 12.11

33. Unselect the target. Set the Target_camera01 viewport to be active, and use the play animation button to get a preview of the animation that we have created so far. When you are finished viewing the animation, set the time slider back to 0.
34. Use the select by name tool to select the Target_Camera01.
35. In the motion tab of the command panel, click on the trajectories button to view the current camera path. Your path should look similar to figure 12.12.

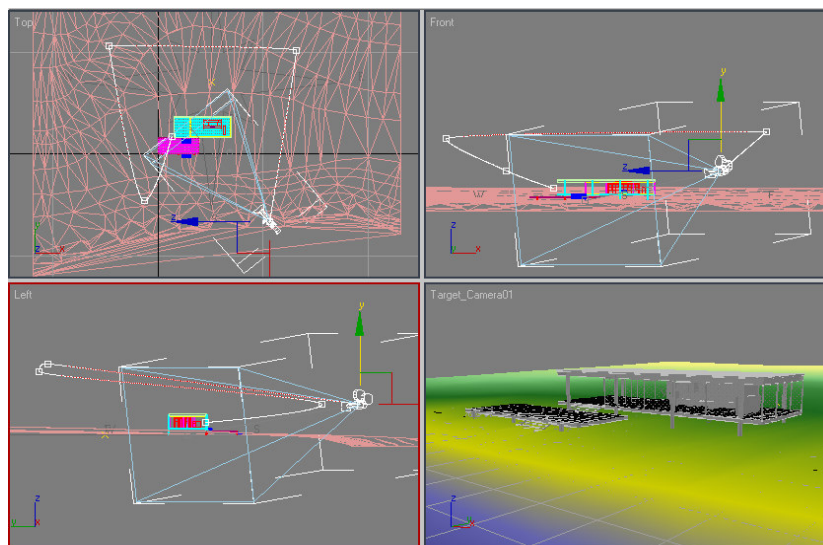


Figure 12.12

36. To ease the abrupt changes in the camera path we will add a few more keyframes. We will use the same method that we previously used to set the keyframes in the first portion of this exercise.
37. Make sure that the Target_Camera01 is selected.
38. Verify that the Autokey button is currently activated.
39. Move the time slider to frame #100, and use the select and move tool in the top viewport to move the camera to the location shown in figure 12.13. Moving the camera with the Autokey selected will automatically set a new keyframe at this location.
40. Next move the time slider to frame #300, and use the select and move tool in the top viewport to move the camera to the location shown in figure 12.13.
41. Finally move the time slider to frame #500, and use the select and move tool in the top viewport to move the camera to the location shown in figure 12.13.
42. Deselect the camera and turn the Autokey function off.
43. Select the Target_Camera01 viewport and use the play animation button to preview the animation. Set the time slider back to 0 when you are finished previewing the animation.

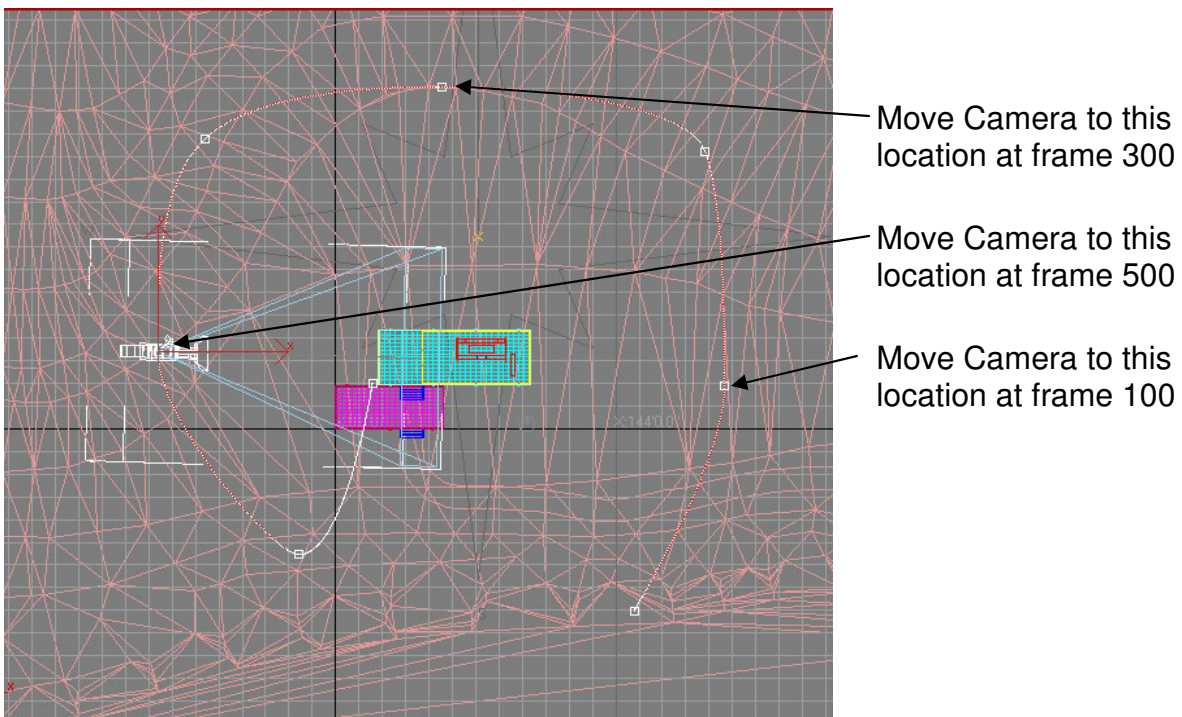


Figure 12.13

CREATING A PREVIEW ANIMATION

Up to this point we have been previewing the animation through the Target_Camera01 viewport only. In this next section, we will create a preview animation that will give us a crude idea of what our final rendering will look like. The preview animation will allow us to view the animated camera path with the speed and timing of the final animation. The final animation, as you will see in the next section, will take some time to render. The preview animation is a good way to test your animation before committing to the time required for the final output.

44. Activate the Target_Camera01 viewport.

45. From the main menu bar, choose animation, make preview to open the make preview dialog box.

46. In the frame rate parameters, change the every nth frame to be 3 as shown in figure 12.14. This will render ever 3rd frame, reducing the rendering time, but also reducing the quality of the preview

47. Click create. If a video compression dialog box opens, just select OK. A small version of the animation will be shown in the center of the screen, and then a final version of the preview will open in windows media player to be viewed.

48. Close windows media player after you have viewed the preview animation.

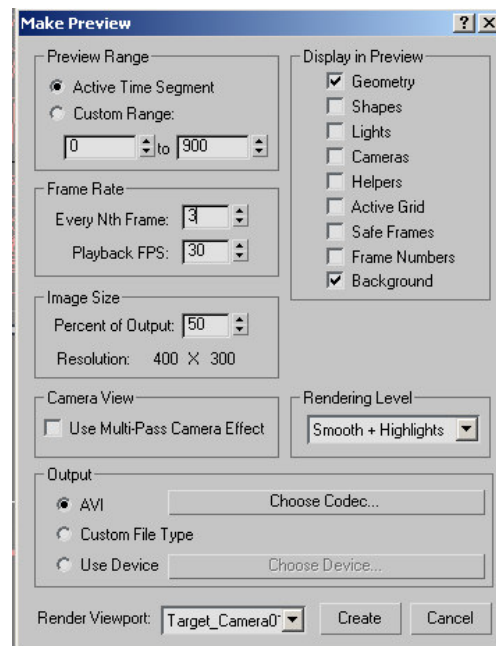


Figure 12.14

CREATING THE FINAL ANIMATION

48. Click on the render scene dialog toggle to open the render scene dialog box as shown in figure 12.15.

49. Under the time output parameters select the active time segment radio button as shown in figure 12.15.

50. In the output size, select 320 x 240. This will create a small animation, but will help save rendering time. For this final output, viz will need to render all 900 frames to create the animation.

51. Scroll down to the render output dialog box and click on the files button as shown in figure 12.16

52. The render output file dialog box will open.

53. Select AVI file (*.avi) in the save as type parameters.

54. Name the file "yourname-animation" in the file name box, and save the file in your project directory for exercise 12. Click Save.

55. In the AVI file compression dialog box select OK.

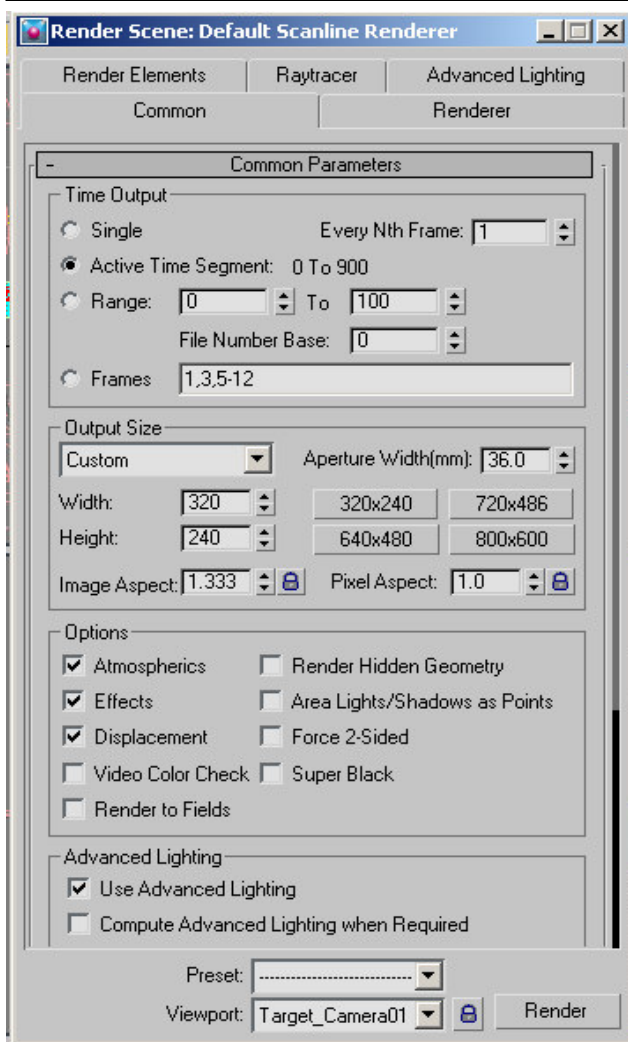


Figure 12.15

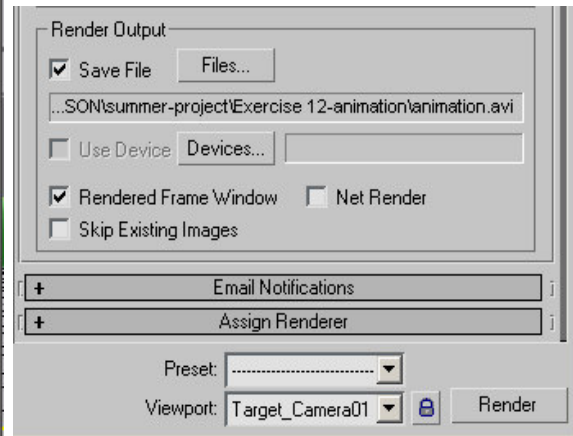


Figure 12.16

Note: The next step can take as much as 30-40 minutes to render. Please plan accordingly.

56. Click on the render button to begin rendering your final animation.
57. Save your final .max file in your exercise 12 folder as “yourname-animation.max”
58. Verify that your final .AVI rendering is saved in your exercise 12 folder as “yourname-animation.avi”
59. End of Part A. You may exit this file after saving.

PART B: CREATING A SHADOW STUDY

60. Open the file located in your directory named “animation-start.max”
61. From the main menu bar select **File, Save As**, and save the file in your project 12 folder as “**yourname-shadow.max**” Be sure to complete this step because you will need the animation-start file in its original state again later in this exercise.
62. Create a new target camera in the interior of the Farnsworth House that matches the view shown in figure 12.17. Set the perspective viewport to be this new view.

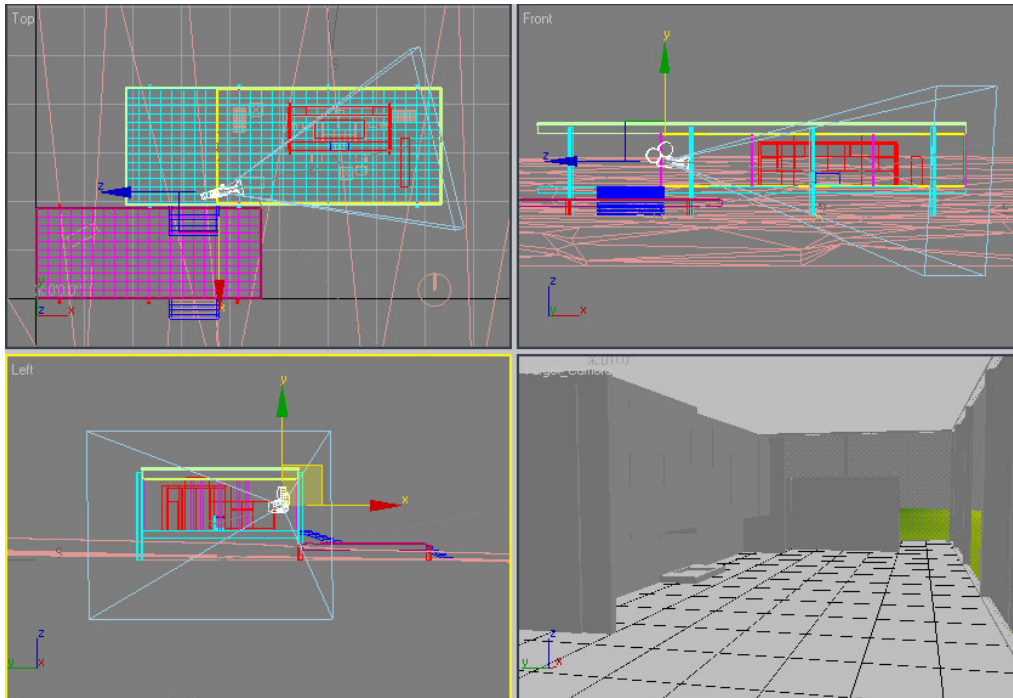


Figure 12.17

For this exercise, we will animate the sun to create a shadow study for the interior of the house. This can be an easy and helpful tool to be able to fully understand the effects of sunlight on your designs.

63. Use the select by name tool to select the sun01 object.
64. In the command panel, select the motion tab.
65. Adjust the control parameters so that the time is 9am, and verify that the location is Chicago, as shown in figure 12.18.
66. Select the time configuration button located in the animation tools.
67. Change the end time to 300 and click OK. For this rendering we will create a shorter 10 second animation of the sunlight as it changes throughout the day.

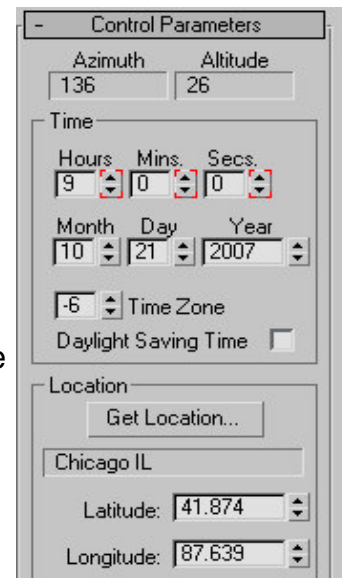


Figure 12.18

68. Verify that the sun01 object is still selected.
69. Activate the Auto Key button.
70. Move the time slider to frame 300.
71. In the motion tab, change the sun01 time parameters to be 16 hours, 0 mins, 0 secs. We have now animated the sun path from 9am till 4pm across the 300 frames in our animation.
72. Deactivate the Auto Key button, and move the time slider back to frame 0.
73. Click on the render scene dialog toggle to open the render scene dialog box.
74. Under the time output parameters select the active time segment radio button.
75. In the output size, select 320 x 240.
76. Scroll down to the render output dialog box and click on the files button.
77. The render output file dialog box will open.
78. Select AVI file (*.avi) in the save as type parameters.
79. Name the file "yourname-shadow" in the file name box, and save the file in your project directory for exercise 12. Click Save.
80. In the AVI file compression dialog box select OK.

Note: The next step can take as much as 30 minutes to render. Please plan accordingly.

81. Click on the render button to begin rendering your final animation.
82. Save your final .max file in your exercise 12 folder as "yourname-shadow.max"
83. Verify that your final .AVI rendering is saved in your exercise 12 folder as "yourname-shadow.avi" After viewing the AVI file you can see how this is an effective tool to visualize the effects of sunlight in a space throughout the day.
84. End of Part B. You may exit this file after saving.

PART C: CREATING WALKTHROUGH

Another option for creating an animation is to draw a path, and have a camera follow that path. This portion of the exercise will create a quick walkthrough animation to give you the idea.

85. Open the file located in your directory named "animation-start.max"
86. From the main menu bar select **File, Save As**, and save the file in your project 12 folder as "**yourname-walkthrough.max**"
87. In the top viewport create a line shape similar to the one shown in figure 12.18 by starting in the upper left corner of the interior space. Remember to click hold and drag to create curved line shapes.
88. Use the select and move tool, working in either the front or left viewports, to move the line shape up in the Z axis until it is approximately at eye level within the space.
89. Use the time configuration button as shown in the previous section to make the animation 200 frames long.
90. In the left viewport, create a free camera (not a target camera) anywhere in the scene., as shown in figure 12.19.

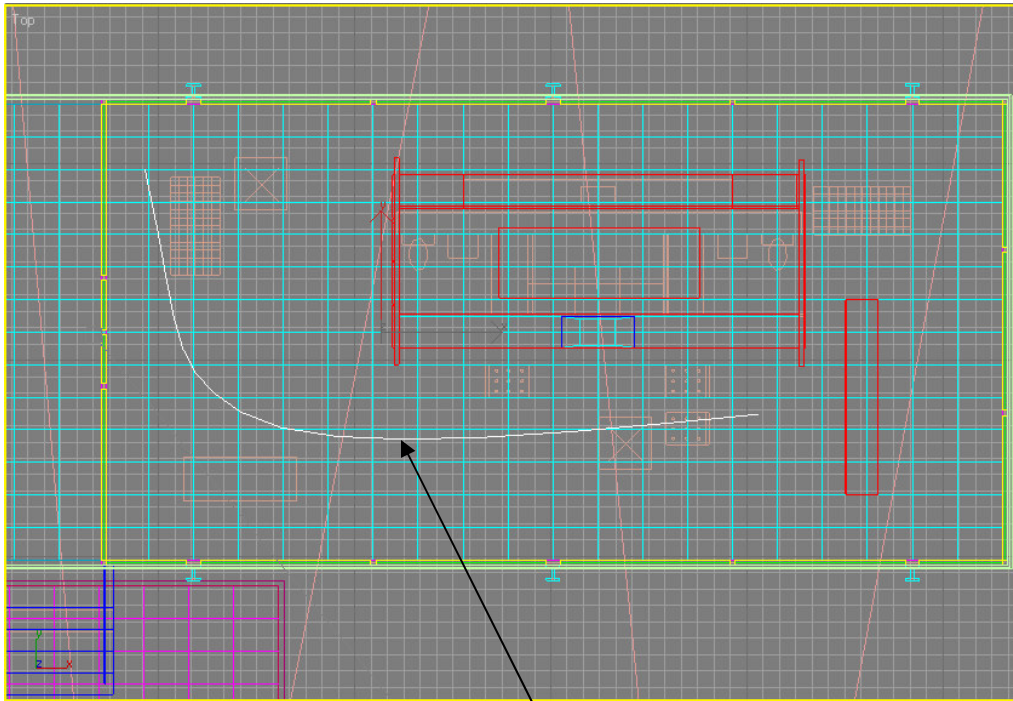


Figure 12.18

Create this curved line shape

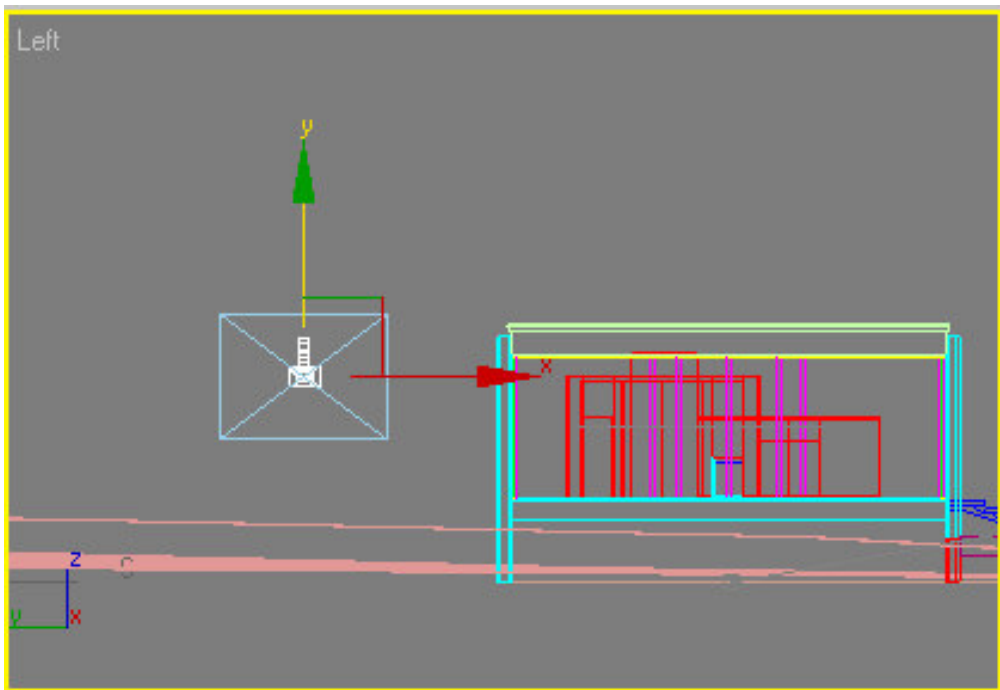


Figure 12.19

91. With the free camera still selected, go to the animation pulldown menu in the main menu bar, select constraints, path constraint.
92. Hover over the curved line you created in any viewport and select it. A crosshairs will appear when you are hovering over an acceptable object. The free camera should move and attaché itself to the end of the line that you began drawing first, as shown in figure 12.20

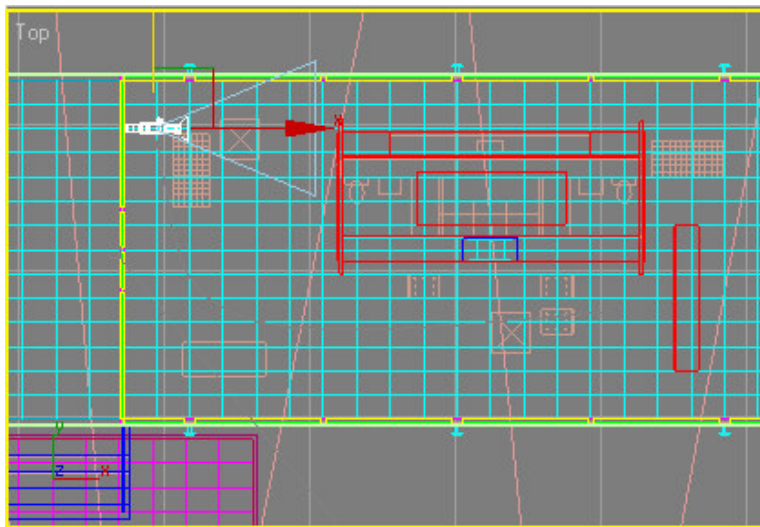
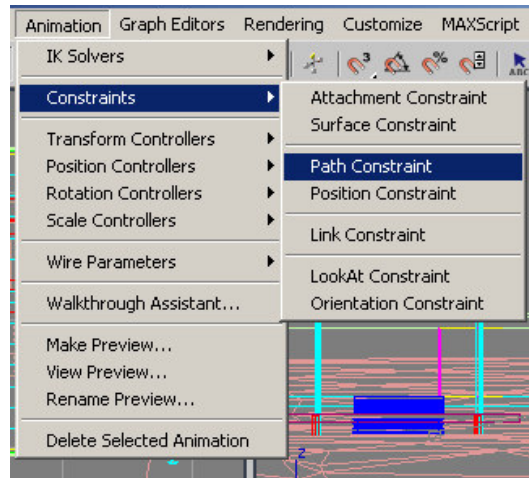
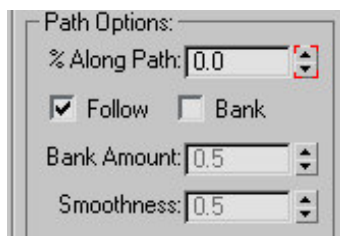


Figure 12.20

93. In the motion tab, scroll down to the path options parameters and check the box labeled follow. The camera should now align with the path.



94. Set the perspective viewport to view free_camera01.
95. Use the play animation button to preview the animation view you just created. You will notice that the view is a bit awkward because the camera literally follows the path. In reality, our head is free to turn as our body moves. We will add another path for the camera target in the next steps to address this.

96. Select the free camera and switch to the modify tab in the command panel.
97. Change the Type setting to be Target Camera as shown in figure 12.21
98. In the top viewport, draw a line shape as shown in figure 12.22
99. Move this shape upwards in the front viewport about halfway up the inside space.
99. Select the “free-camera-target” object.
100. Go to the animation pulldown menu in the main menu bar, select constraints, path constraint.
101. Hover over this new curved line you created in any viewport and select it. A crosshairs will appear when you are hovering over an acceptable object. The free camera target will now follow this new line, while the camera follows the original path. The animation should look smoother and more realistic.
102. Use the play animation button to preview the animation view you just created.

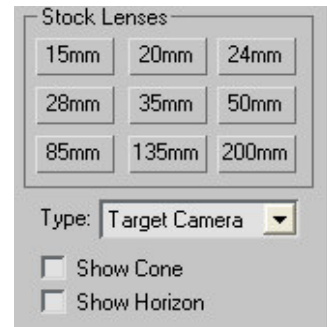


Figure 12.21

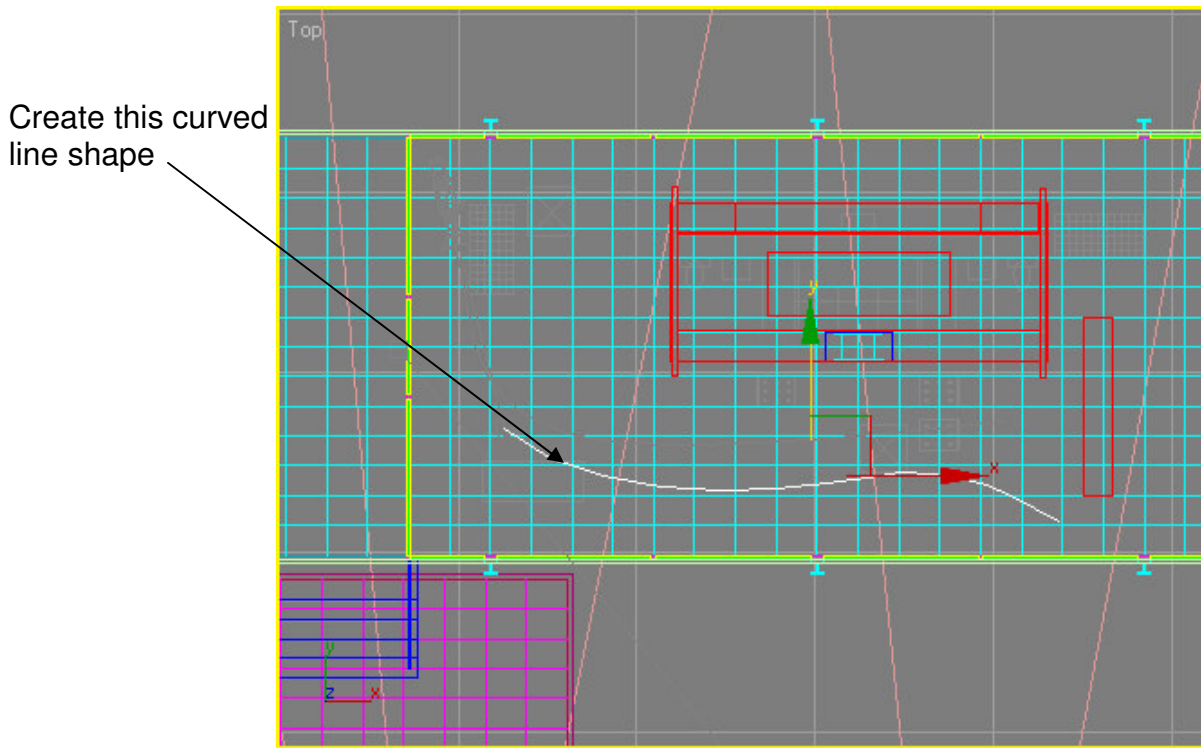


Figure 12.22

103. Click on the render scene dialog toggle to open the render scene dialog box.
104. Under the time output parameters select the active time segment radio button.
105. In the output size, select 320 x 240.
106. Scroll down to the render output dialog box and click on the files button.
107. The render output file dialog box will open.
108. Select AVI file (*.avi) in the save as type parameters.
109. Name the file "yourname-walkthrough" in the file name box, and save the file in your project directory for exercise 12. Click Save.
110. In the AVI file compression dialog box select OK.

Note: The next step will take a few minutes to render.

111. Click on the render button to begin rendering your final animation.
112. Save your final .max file in your exercise 12 folder as "yourname-walkthrough.max"
113. Verify that your final .AVI rendering is saved in your exercise 12 folder as "yourname-walkthrough.avi" View the final walkthrough AVI file.
114. End of Part C. End of exercise.

For this exercise you should have completed and submitted 3 .max files and 3.AVI files in your project 12 folder.