Working with the Walkthrough Assistant

Instead of manually manipulating the camera, you can make animating much easier by using the Walkthrough Assistant. The Walkthrough Assistant allows you to “fly” your camera to explore your virtual designs. Although the tool's name implies interior usage, the Walkthrough Assistant is actually suitable for both interior and exterior scenes.

In essence, it simplifies the tasks of creating a camera, constraining that camera to a path of your choice, and then makes it easy to edit and animate various aspects of the camera such as tilt, pan and lens values. All manipulation is centralized in the same dialog so you do not have to browse through various panels to make changes to camera parameters.

In this tutorial, you will learn how to:

- Create a target camera
- Adjust camera head tilt and angle
- Use Set Key to animate a camera
- Render an animation to a sequence of still image files
- Create a movie file of your animation

Skill level: Beginner

Time to complete: 1+ hours (includes rendering time to create an animation.)

Camera Setup with Walkthrough Assistant

In this lesson, you'll use the Walkthrough Assistant to animate a camera, simulating a walk or run along the Great Wall of China. The scene contains a camera path ready for constraining the camera, but you will first need to create a sufficient number of frames to hold your animation.

Set up for this lesson:

-  On the Quick Access toolbar, click the Open File button and from the *\animation\walkthrough_asst* folder, open *great_wall_start.max*.

TIP If the Units Mismatch dialog displays, choose Adopt The File's Unit Scale and then click OK.

Calculate the number of frames:

1. In the right viewport, select the blue spline that represents the camera path. Alternatively, press H to open the Select From Scene dialog, and double-click Camera Path.

2.  On the Utility panel, click the Measure tool.

   This tool reports the length of the camera path is roughly 900 feet.

   NOTE For a comfortable walking pace, which is useful in architectural walkthroughs, you'll need about a second for every 3 feet of distance. For a jog or a fast run, you can go as far as 9 feet for a second. In NTSC format, that translates into 30 frames for every 9 feet of distance traveled, or 3000 frames for 900 feet.

3.  Click the Time Configuration button next to the Current Frame Field.

4. In the Animation group in the Time Configuration dialog, change Start Time to **1**. Change End Time to **3000** to increase the number for frames in the animation, and then click OK.

   This will provide sufficient frames for your walkthrough animation.

   The time slider frame indicator now displays 3000 frames.

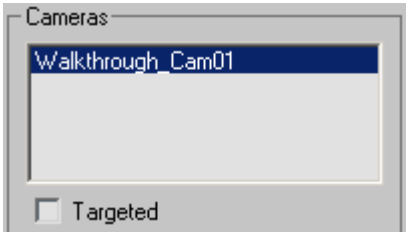
Creating a basic setup using Walkthrough Assistant:

1. From the Animation menu, choose Walkthrough Assistant.

   A modeless dialog displays.

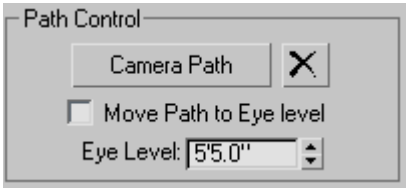
2. In the Camera Creation group in the Main Controls rollout, ensure the Free Camera option is chosen, and then click Create New Camera.

   A new camera is created in the scene. The camera name, *Walkthrough_Cam01,* displays in the Cameras group.

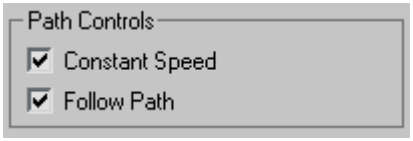


3 In the Path Control group, click Pick Path and then in the Right viewport, click the blue spline named *Camera Path*.

The Pick Path button label changes to reflect the name of the selected spline. This constrains the Camera Position to the path. It also aligns it to follow the direction of the path.



NOTE By default, the camera will travel at a constant speed and will always point in the direction of travel. This is shown in the Advanced Controls rollout at the bottom of the dialog where both these options are enabled.



4 Right-click the lower-right Perspective viewport to activate it. In the Main Controls rollout, click the Set Viewport To Camera button to switch the viewport to the Camera view.

5 Click the Play Animation button to view the results in the Camera view.

The camera travels along the path but the motion seems unnatural, almost robotic. This is because the aim or target of the camera is controlled by the path constraint. It is far better to control the target manually, and choose the direction you want to look at any given time. As an analogy, as you walk in a straight line down a museum hallway, you would turn

your head to look at the paintings on the wall instead of keeping your head pointed in the direction of your feet as you walk.

In the next lesson, you learn how to animate the camera using the Walkthrough Assistant.

Animating Camera Rotation

Now that the camera is constrained to the path, you'll animate the camera rotation so that it is aimed in a more natural position at points of interest in the scene.

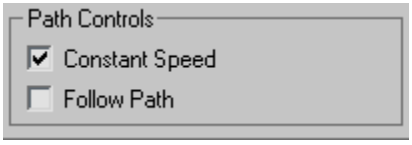
Set up the lesson:

- Continue from the previous lesson or on the Quick Access toolbar, click the Open File button and from the *\animation\walkthrough_asst* folder, open *great_wall_head.max*.

TIP If the Units Mismatch dialog displays, choose Adopt The File's Unit Scale and then click OK.
This is the same scene from the previous lesson. The camera is now in place but you will use Walkthrough Assistant to animate the Turn Head parameters.

Turning off Follow Path:

1. If the Walkthrough Assistant dialog is not visible, go to the Animation menu and choose Walkthrough Assistant.
2. In the Advanced Controls rollout, in the Path Controls group, disable the Follow Path option. You will not need it because you will control the head rotation manually.

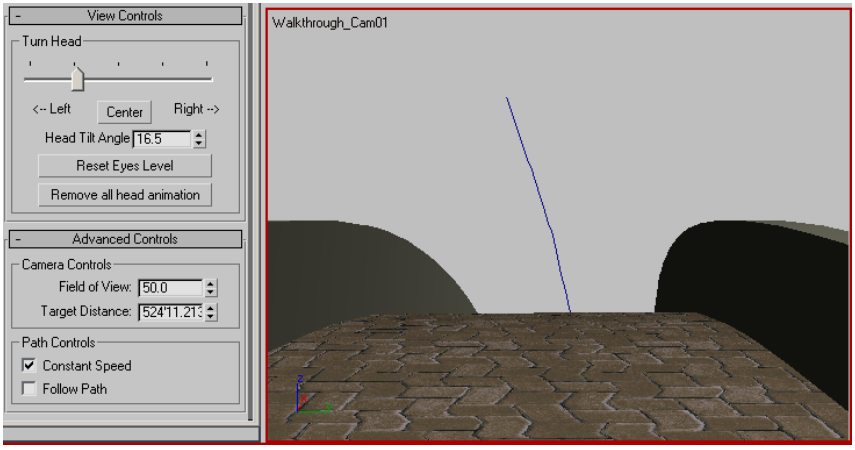


NOTE Disabling the Follow Path option resets the camera orientation to its default value (positive Y). You will fix that as you start animating the head rotation from the Walkthrough Assistant dialog.

3 

Make sure you are at frame 1, then turn on the Auto Key button.

4 In the View Controls rollout, move the turn head slider to the left and adjust the Head Tilt Angle to **16.4** in order get a better viewing angle of the brick path in the Camera viewport.



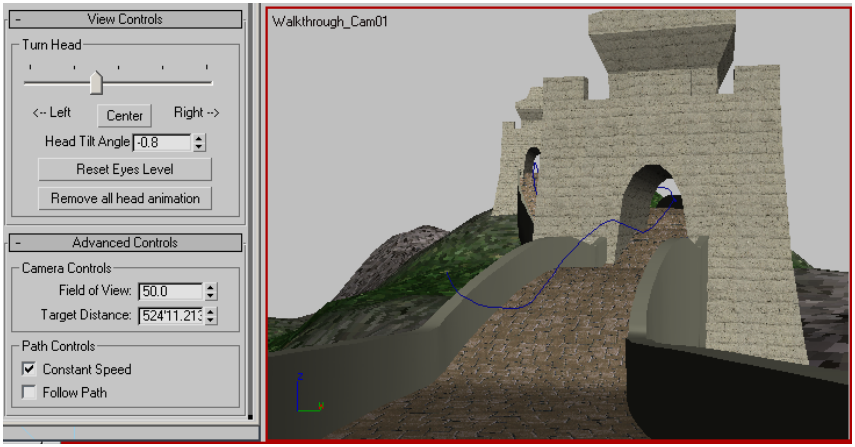
5 Scrub the time slider to frame 206. You are now at the other side of the hilltop. Adjust the Head Tilt Angle to approximately **-3.3** to level the camera head, then slide the Turn Head slider to the left to adjust the rotation.

The goal is to adjust the camera head rotation so that it looks towards the tower as if it has suddenly caught your attention.

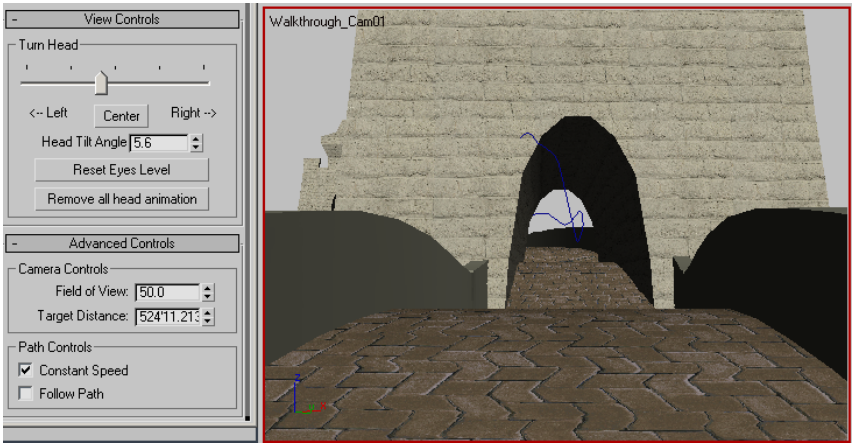
6 Scrub the time slider ahead to frame 408. Adjust the Head Tilt Angle to **–13.5** so that you are looking at the pavers in front of you.

Although it's nice to look at the scenery, it's also important to create a walkthrough that “feels' comfortable; in other words, to make it so that the viewer doesn't feel off balance while doing the a virtual walkthrough of your scene.

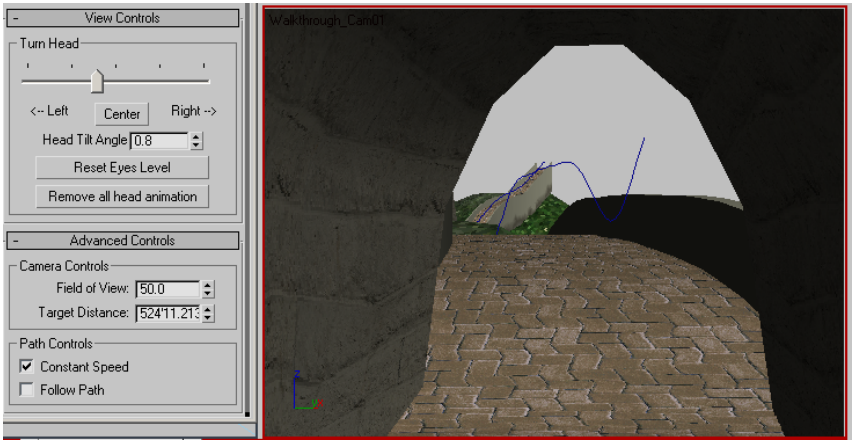
7 Scrub the time slider to frame 615. Change the Head Tilt Angle to **–0.8** and turn the Turn Head slider a little to the right until the camera is looking at the tower again.



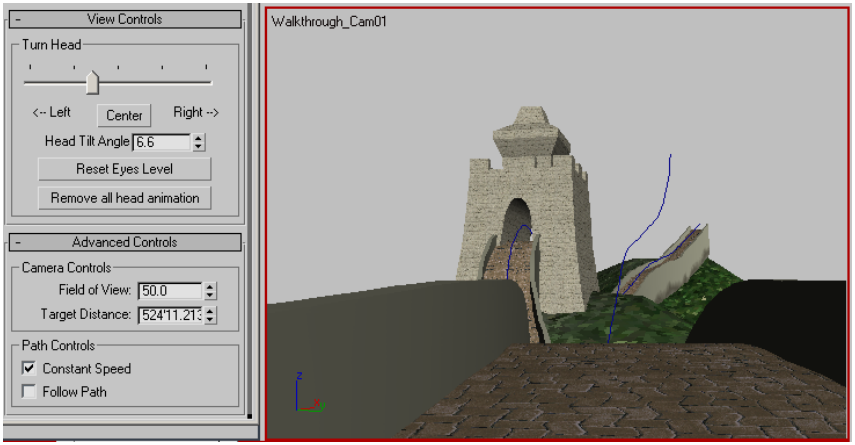
8 Scrub the time slider to frame 800. Change the Head Tilt Angle to about **5.6**. Move the Turn Head slider to the right until the tower opening is centered in the camera view.



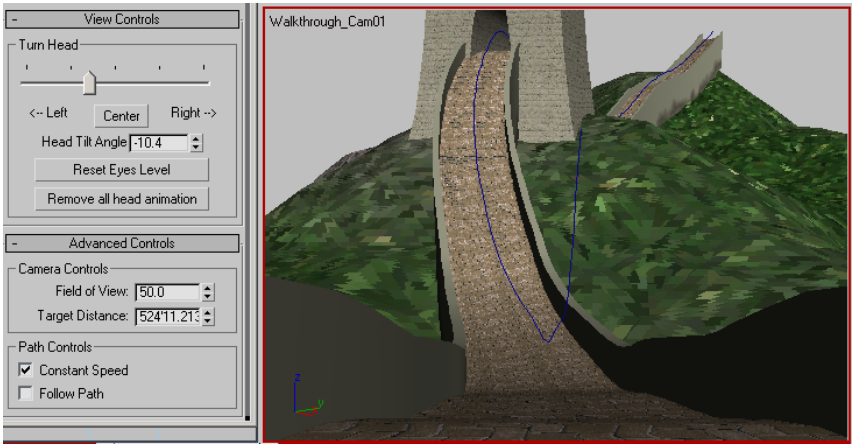
9 Scrub the time slider to frame 1050. Change the Head Tilt Angle to about **–0.8**. Move the Turn Head slider a little to the left so that the camera is tilted in anticipation of turning left after exiting the tower.



10 Scrub the time slider to frame 1150. Change the Head Tilt Angle to about **6.6**. Move the Turn Head slider slightly to the left so that you're looking the second tower in the distance.

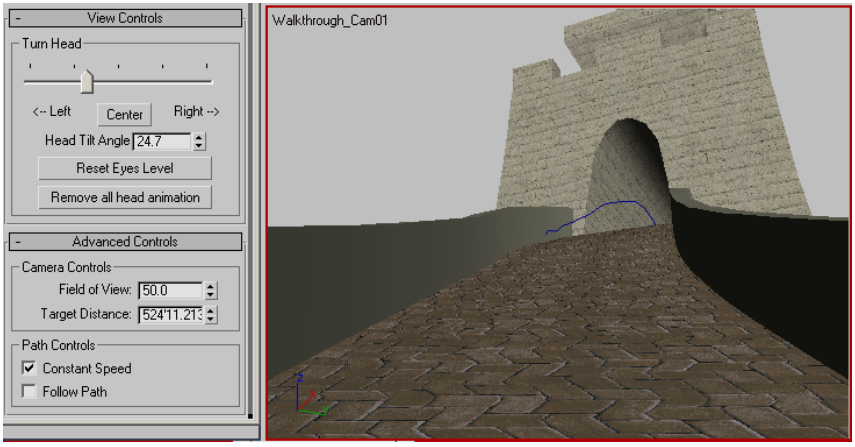


11 Scrub the time slider to frame 1280. This time change the Head Tilt Angle to about **–10.4** so that the camera head is tilted downwards to match the path's slope.



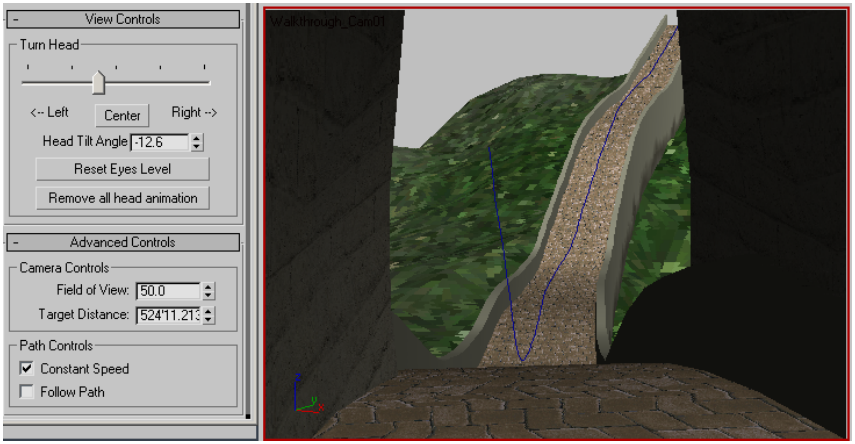
12 Scrub the time slider to frame 1420. Change the Head Tilt Angle to about **–11.9** to tilt the camera head further down.

13 Scrub the time slider to frame 1680. You're now looking up again towards the tower ahead of you. Adjust the Head Tilt Angle to about **24.7**. Slide the Turn Head slider a little to the left so that is aimed at the second tower.

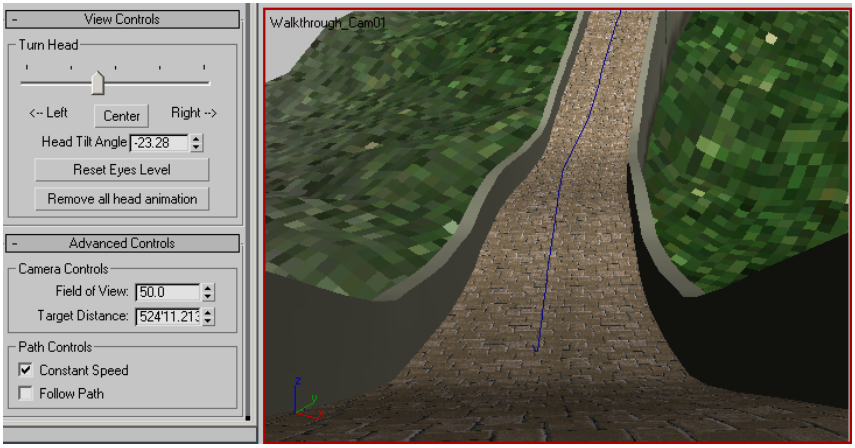


14 Scrub the time slider to frame 1860. Change the Head Tilt Angle to about **29.4**. Move the Turn Head slider slightly to the right so until you're looking at the second tower opening.

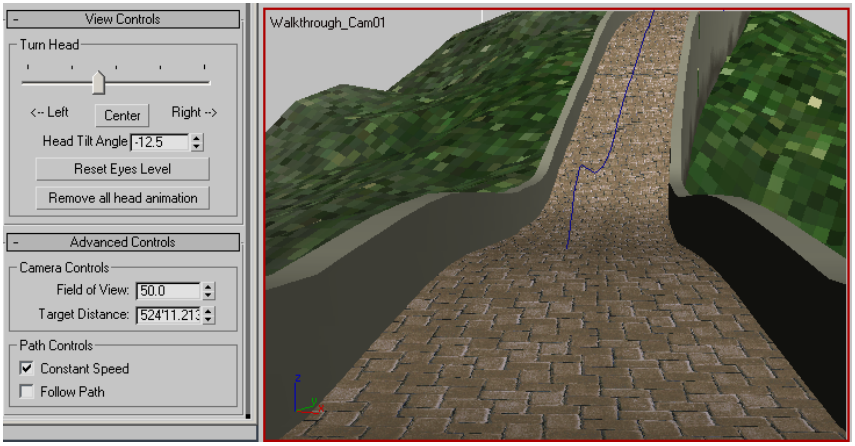
15 Scrub the time slider to frame 2030. Change the Head Tilt Angle to about **–12.6**.



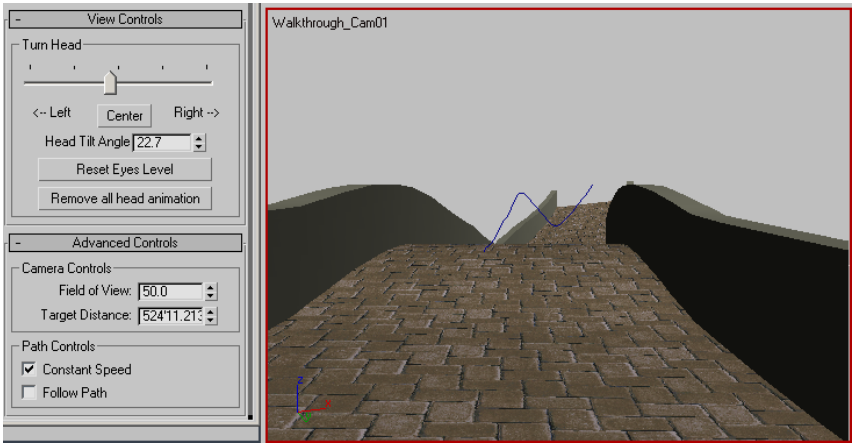
16 Scrub the time slider to frame 2125. At this point in the walkthrough, you are going down the hill again. Change the Head Tilt Angle to about **–23.3**. You want the camera head tilted downwards toward the path instead of the scenery because you want to feel as if you're watching your step.



17 Scrub the time slider to frame 2250. You are still looking at the path in front of you. Change the Head Tilt Angle to about **–12.5**. Adjust the Head turn and tilt to that purpose.



18 Scrub the time slider to frame 2550. You are now going up the path. Change the Head Tilt Angle to about **22.7**, and move the Turn Head slider slightly to the right so that you're looking towards the end of the pathway.



19 Turn off Auto Key mode.

20 Play the animation in the camera view to see the results. Notice that the camera motion is far more natural than it was in the previous lesson.

NOTE The camera path will not be visible when rendered.

21 Save your file as **great_wall_finish.max**.

Summary

In this lesson, you have created a camera walkthrough animation using the Walkthrough Assistant. You have learned to calculate the number of frames needed for the animation and you have learned to automate the creation of the camera and how to constrain it to a path. Finally, you have learned how to manually animate the head turn and tilt of the camera to create realistic camera motion.

Rendering Your Walkthrough Animation

There are some specific techniques to learn for rendering your animation into a movie file. You can render directly to a movie format such as AVI, or you can render a sequence of still image files to file formats such as TGA and then use the RAM Player to save them into a movie. The latter method is the recommended choice. It requires doing a few more steps than rendering directly to a movie format, but it gives you more control over the file size and quality of the output. In addition, if you have frames that artifacts or other errors, you can repair or remove them.

The next lesson will take some time to render. Depending on the speed of your computer, the rendering may take a few minutes to several hours.

Set up the lesson:

- From the *\animation\walkthrough_asst* folder, open *great_wall_render.max*.

  TIP If the Units Mismatch dialog displays, choose Adopt The File's Unit Scale and then click OK.

  This file is similar to the one created in the previous lesson. A bobbing motion has been added to the camera to simulate the up-and-down effect of someone jogging along the path. Two omni lights have been added to create additional lighting but there are no settings for Global Illumination in order to decrease rendering time.

Rendering an image sequence:

1. If the Camera viewport isn't active, right-click in it to activate it.
2. From the Rendering menu, choose Render Setup.
   Next, you'll define the animation range and output size.

3 On the Common tab of the Render Setup dialog, in the Time Output group, choose Range. Set the range of frames from **1** to **3000**.

4 In the Output Size group, change the output resolution to 320x240.

5 In the Render Output group, click the Files button.

The Render Output File dialog opens.

6 Navigate to a directory where there is enough disk space to save the rendered files. You can use the Create New Folder button to establish a new location, if necessary.

Next you'll define the type of still image file to render.

7 In the Save As Type field, click the drop-down arrow and choose JPEG File (*.jpg).

NOTE In a production environment, you may want to use a high-quality, lossless format such as TGA or TIF, but for the purposes of this tutorial, you will use the JPG format to keep the size of the output files small.

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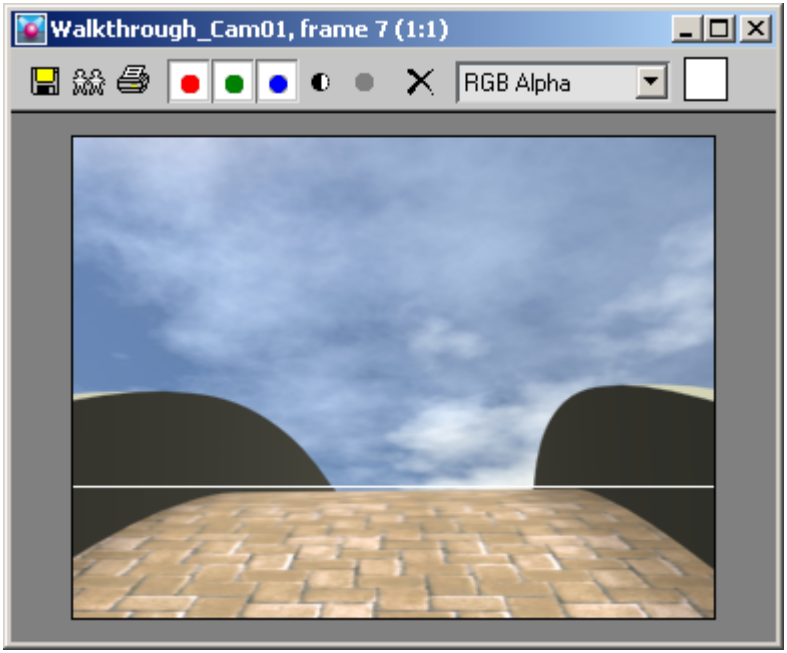
8 In the File name field, type **my_jog.jpg**, then click Save.

After you click Save, a format-specific dialog asks you to specify attribute and information settings. Accept the default values, and then click OK.

When you render a still-image sequence, as in this case, the software automatically appends the first part of the file name with a four-digit frame number. So the first frame will be *my_jog0000.jpg*, the second is named *my_jog0001.jpg*, and so on.

9  Make sure Save File is turned on in the Render Output group. Also check that the Viewport field at the bottom of the Render Scene dialog is set to Walkthrough_Cam01 (not Top, Front, or Left), then click Render Production.



NOTE A sky background is rendered. The dome representing the sky is an object that is hidden in the scene. However, the renderer is set to take hidden geometry into account.

10 The Rendering Progress dialog displays. Wait for a short while as the first frame is rendered. You will see the Last Frame Time, Elapsed Time, and Time Remaining values change after the first frame finishes.

Allow at least four frames to render.

At this point, you can work on something else while your animation is rendered.

TIP You can also watch the rendering for errors or observe to see where you want to make changes. This is generally a good practice so that you can study the scene as it is rendered.

After the rendering has completed, you will have 3000 JPG files in the folder you specified.

Convert an image sequence into a movie:

The RAM Player loads still image sequences into memory and plays them so you can watch them as a movie. It actually lets you load two different sequences and then compare them visually, but you won't use that functionality here. You'll simply use the RAM Player to save the files into an AVI file.

1. From the Rendering menu, choose RAM Player.
2. 

On the RAM Player toolbar, click Open Channel A.
3. In the Open File Channel A dialog, navigate to the sequence of JPG image files. Highlight the name of the first file in the sequence and then ensure the Sequence option is turned on. Click Open.

   The RAM Player will now load the image files in sequential order starting with the first file you selected. The Image File List dialog appears. Here you can use the Every Nth and Multiplier fields if you need to speed up or slow down your animation. If your animation is too slow, change Every Nth to 2 or 3. If your animation is too fast, increase the Multiplier.
4. Click OK.

   The RAM Player Configuration dialog appears. Here you can observe and adjust your memory usage. There are also tools here to resize your animation, specify a range of frames to use, and split the alpha (transparency) information into a separate file.

   NOTE In order to use transparency, the image file specified has to be able to process an alpha channel. JPG files do not contain any transparency information the way TGA, TIF and PNG images often do.
5. Increase the Memory Usage to its maximum for your system, and then click OK

   The RAM Player loads the rendered files into memory. In the Loading dialog, observe how much memory is being used and remains available.

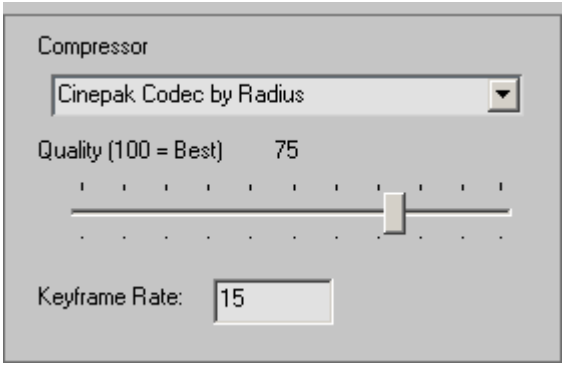
   If it looks like you are about to run out memory, click Stop Loading. If you have a low-memory system, reduce the number of frames to load and try again.
6. 
On the RAM Player toolbar, click the Play button and watch the movie play.

7  On the RAM Player toolbar, click the Save Channel A button.

The Save File dialog appears.

8 Choose AVI as the file type, and name the animation **my_jog.avi**. Click Save.

The AVI File Compression Setup dialog appears. Here you can choose a codec (compression/decompression type) and adjust the quality of the file. Choose the default Cinepak Codec. To reduce file size, lower the quality to 75%.



9 Click OK to continue.

Summary

You have learned how to render your animation to a sequence of still image files. This allows you better control for later correction of your animation. You also learned how to assemble a still image sequence into a movie file, such as AVI or QuickTime using the RAM Player.