ANIMATING MAPS
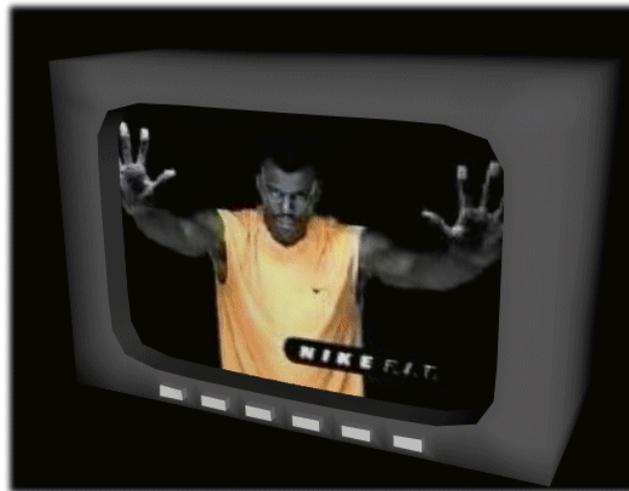
This tutorial will teach you how to animate a map by loading a sequence of images over time.

## ESTIMATED TIME REQUIRED

20 Minutes

LEARNING GOALS

In this tutorial, you will learn a technique for:
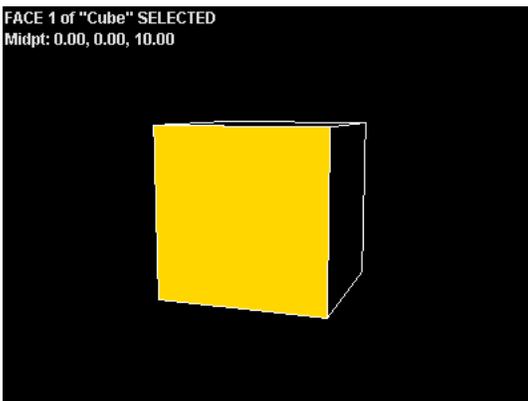
• Modeling a television

• Animating a map

MODELING THE BOX
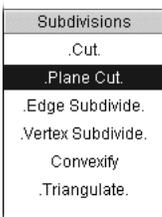
Let's get started on modeling the television:

1 Use the *File>Scene* command to create a new scene.

2 Press F5 to add a cube to the scene. The New Element dialog box appears. Select *Cube* as the type of element that you want to add, with the default parameters.
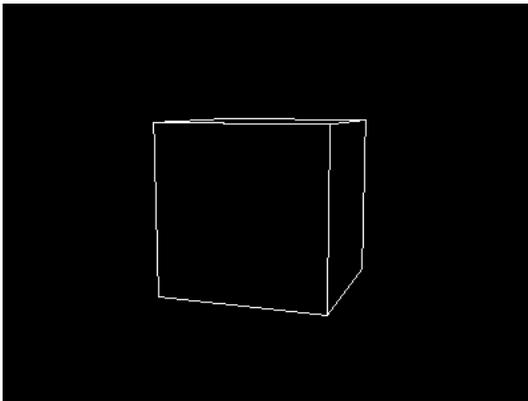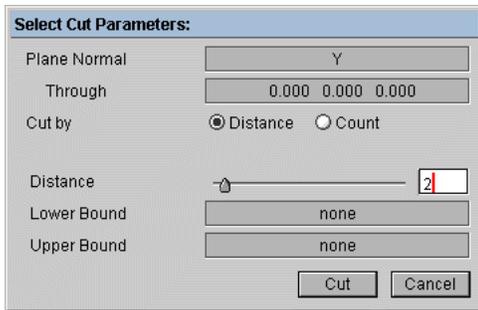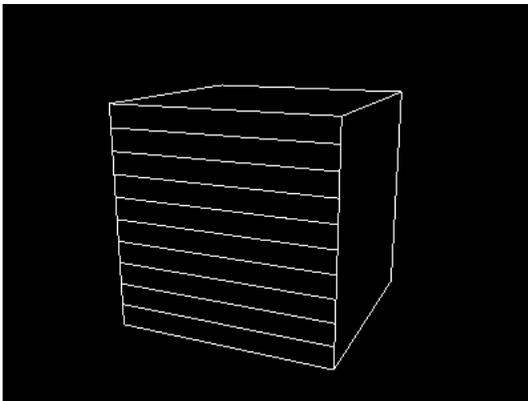
3 [R] on the front face of the cube.

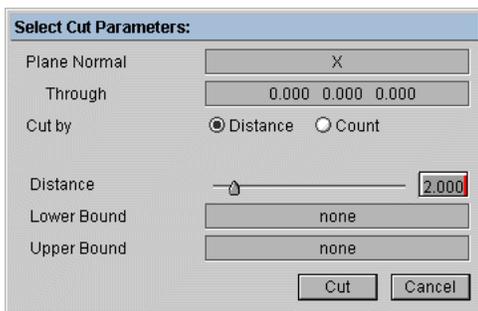**4** [R] on the *Plane Cut* command.

5 In the dialog box that appears, enter the parameters as follows:

Select Cut Parameters:

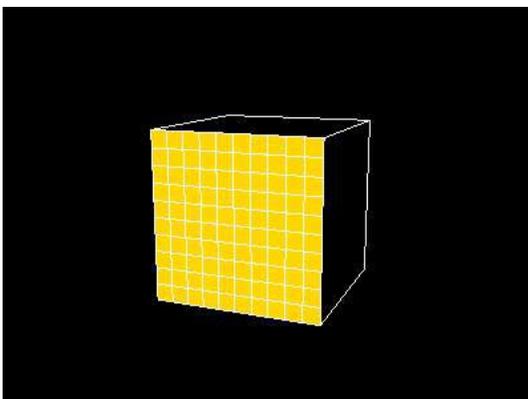|	
Plane Normal	Y
Through	0.000 0.000 0.000
Cut by	⦿ Distance ○ Count
Distance	⟶ 2
Lower Bound	none
Upper Bound	none
	Cut Cancel

6 [L] on the *Cut* button to multi-cut the face.

**7** Now, collect the 10 newly created faces on the front of the cube and Plane Cut [R] again, this time cutting along the X axis:

Select Cut Parameters:

|	
Plane Normal	X
Through	0.000 0.000 0.000
Cut by	⦿ Distance ○ Count
Distance	⟶ 2.000
Lower Bound	none
Upper Bound	none
	Cut Cancel

**8** [L] on the *Cut* button to multi-cut the face horizontally.

9 Select bodies on the element sensitivity menu, then [R] on the cube and *Free Scale* [L]. Scale the box until it has the rough dimensions of a television.
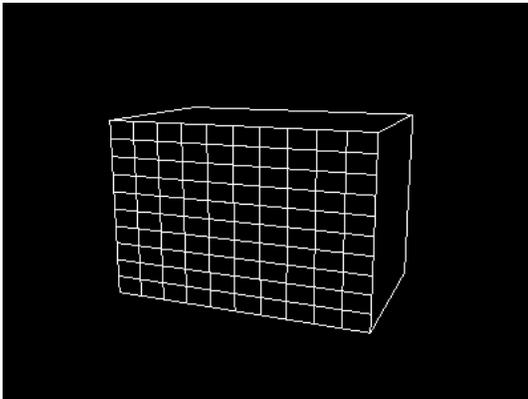

10 Select edges on the element sensitivity menu, then select the edges that define the first "loop" inside the front of the screen, as shown below:
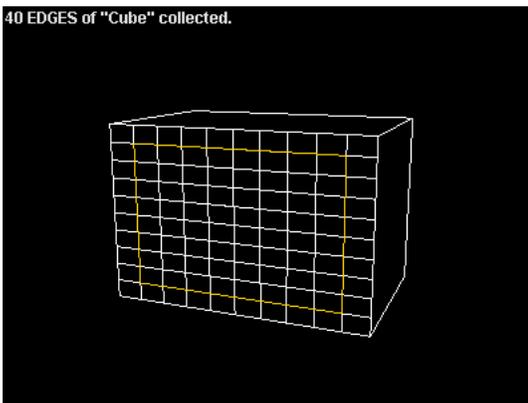

11 [R] on the collection and choose *Scale*. This scales the edges uniformly, creating a nice rounded effect at the corners of the collection.
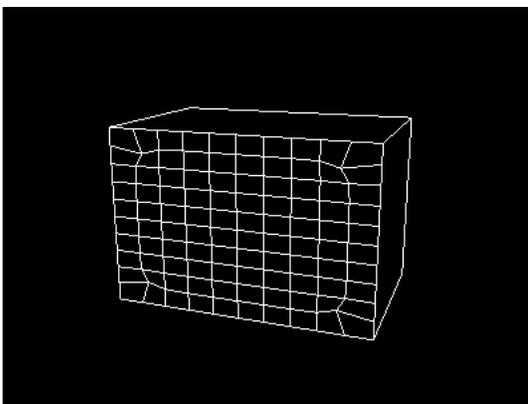
12 Select faces on the element sensitivity menu, then collect all but the outer row of faces on the front of the box. [R] on the collection, then choose *Add to Part>Make New Part*. Name the part "screen."
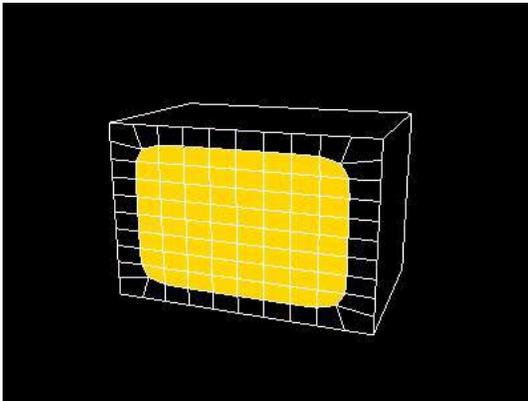

13 With the faces still collected, [R] and choose *Extrude Region*. Move the faces inward slightly.
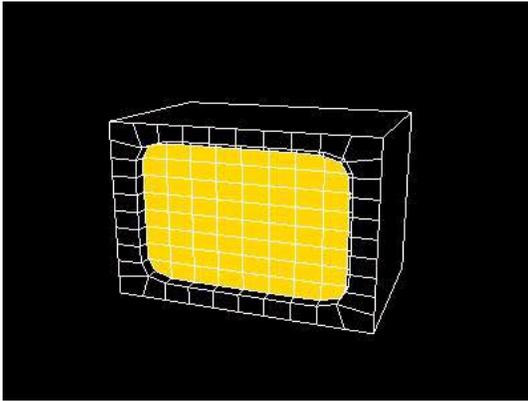

14 To make the surface of the screen slightly convex, you can use one of Mirai's magnet operations. [R] on the vertex at the center of the screen.
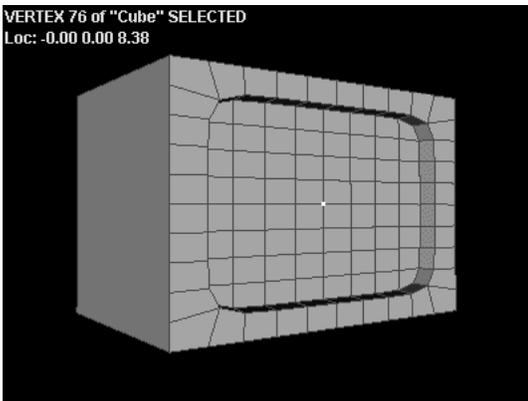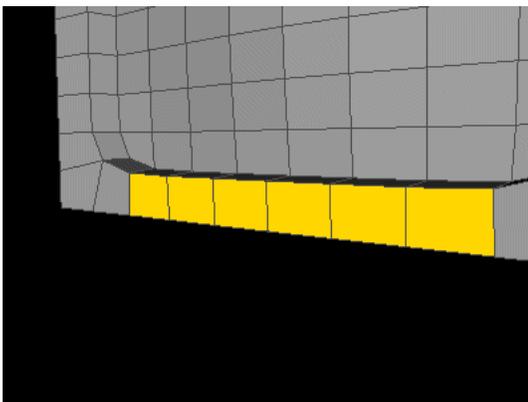
15 Hold down the *Alt* modifier key, then *Axis Move* [L]. Geometry goes into point selection mode. Select a point at the perimeter of the screen to define the area of falloff for the magnet operation.
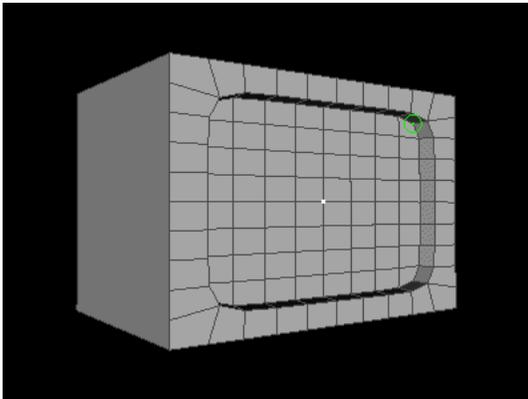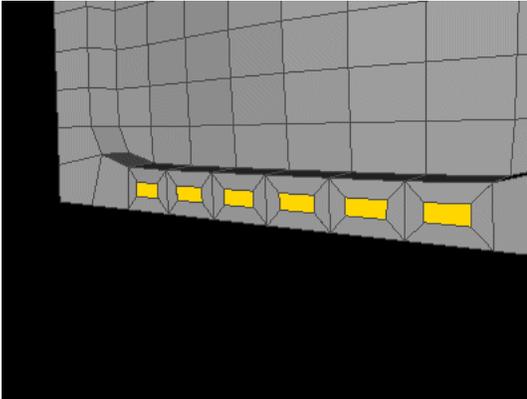

**16** Axis Move the vertex until you get a nice curvature to the screen:
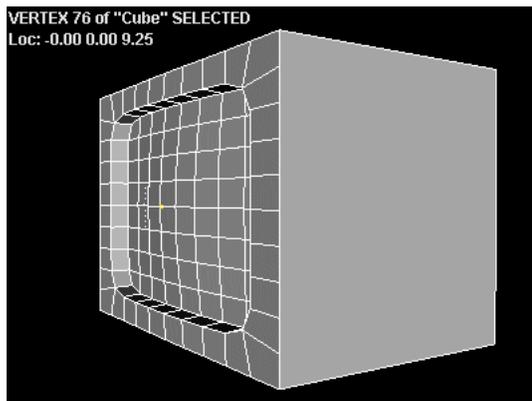
**17** Select the six faces along the bottom of the box.

18 [R] on the collection and choose *Inset*. Use the default settings that appear in the dialog to inset the faces.

19 With the faces still selected, [R] on the collection and *Extrude* [L]. Create the buttons for the television by extruding the faces along their individual normals.
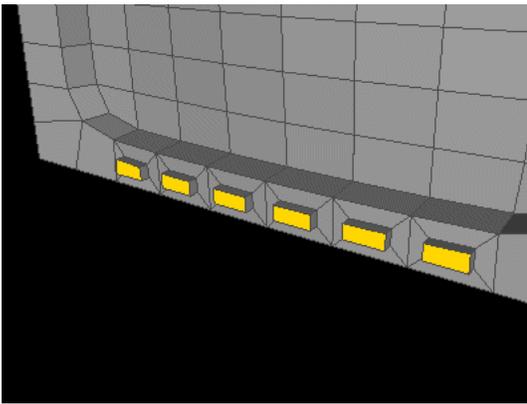

20 Press the "+" key to grow the collection. This selects all the faces that are touching the currently selected faces. [R] on the collection, then choose *Add to Part>Make New Part*. Name the part "buttons."
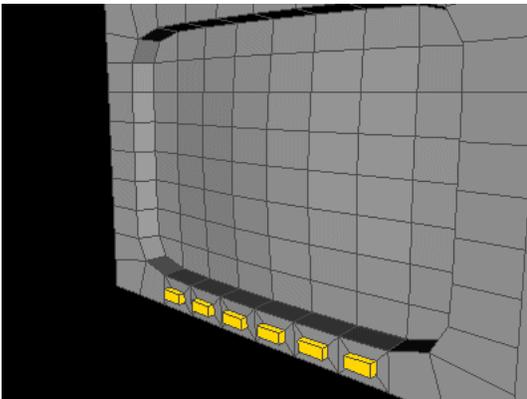

21 To project an image onto the surface of an object, you need to create a mapper. Press *F5* and choose *Mapper*. [L] on the *Bounds Source* field and choose the "screen" face part you created earlier. Set the

Front Orientation to Z and *Type* to Planar. When your parameters look like those shown below, then click the *Ok* button.
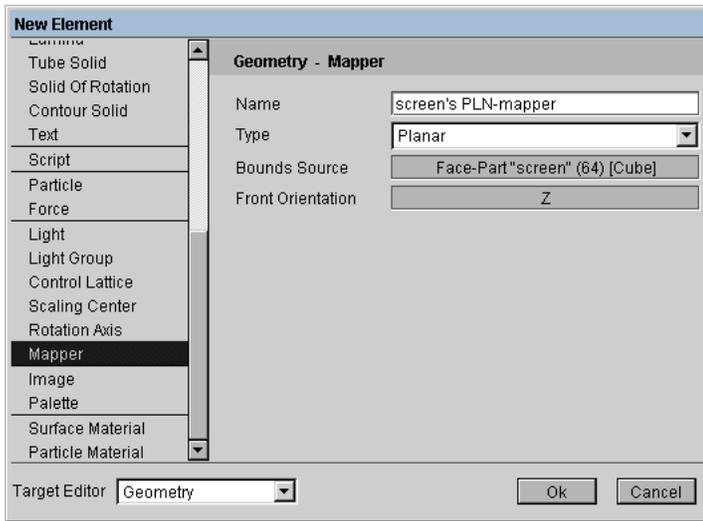

22 Ctrl [R] on the Geometry window and *Modes* [R]. Make sure *Visible Attachments* are enabled (this is required if you want to see the mapper), then click the *Ok* button.
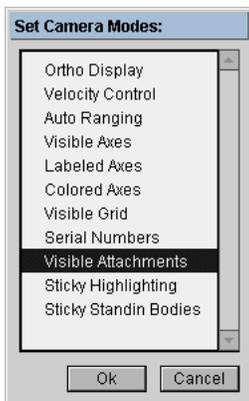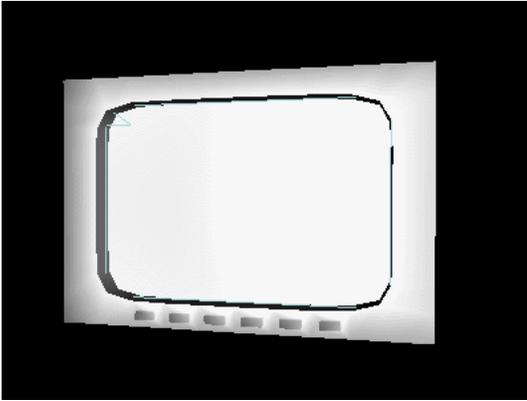
23 The mapper appears in the Geometry window, aligned with the +Z axis, with the dimensions of the specified face part (in this case, the screen).
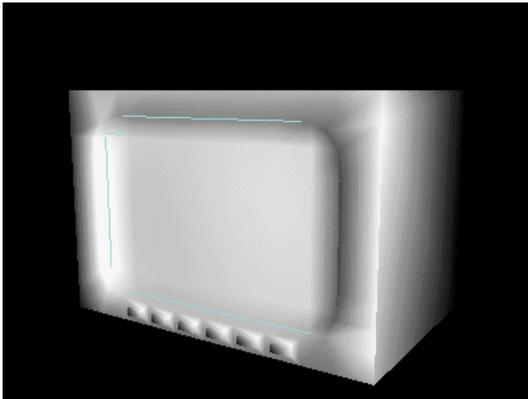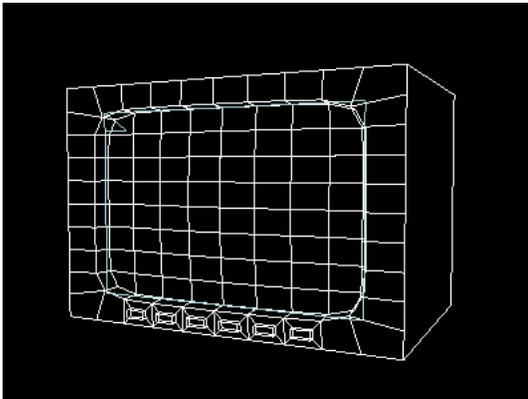
24 Ctrl [R] on the Geometry window and Render a test image of the screen.

25 Select the two vertex loops just inside the parameter of the front of the box.
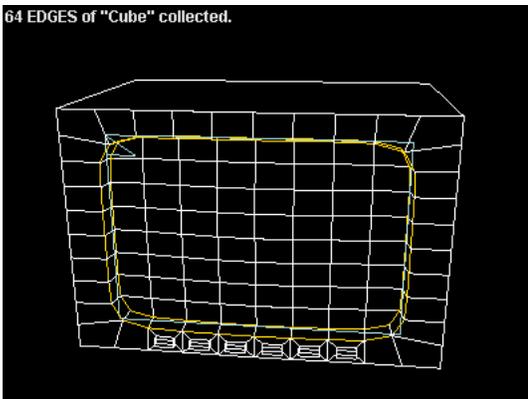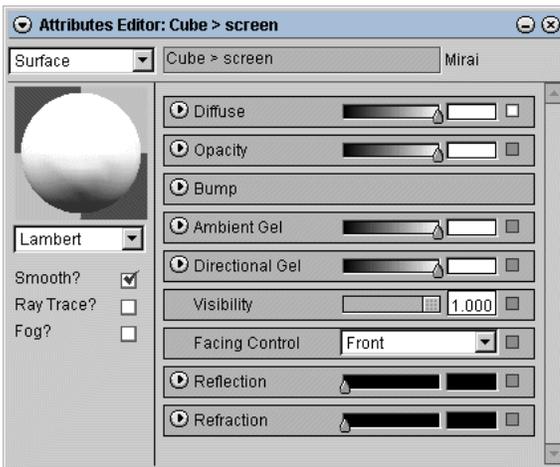
26 [R] on the collection and *Crease* [L] to make the crease angle harder.

27 [L] on the *Materials* tab on the configuration bar.

28 *Alt+Drag* [M] the "screen" part into the attributes editor.

29 [L] on the *Diffuse* field. [L] on the layer bar which appears, then [L] on the *Image* field.

30 [L] on the *Image* field, then choose *New*. Create a new "placeholder" image named "tv image". (We used the SMPTE color bars for our example.)

NOTE: *Make sure the placeholder image you specify has the same dimensions as the series of images you wish to project onto the surface of your model.*
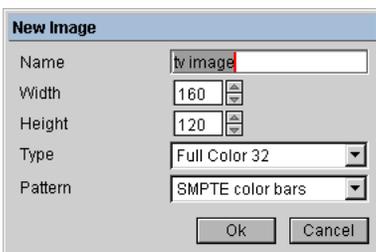
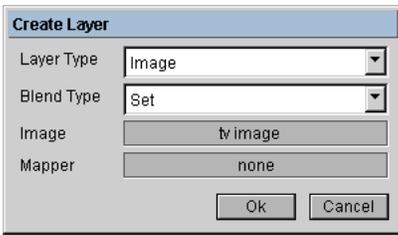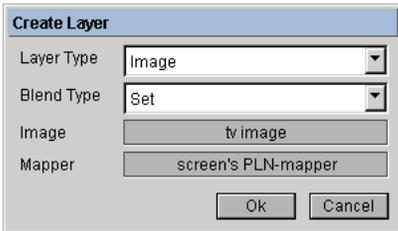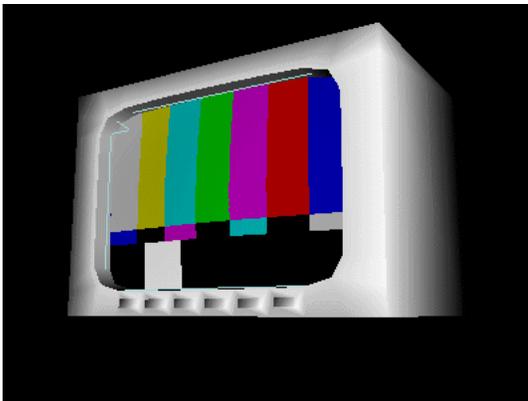**31** Click Ok, to see the image added to the local attributes.

32 [L] on the *Mapper* field and choose "screen's PLN-mapper."

33 Click *Ok.* You should see the image appear on the front of the TV.

You've now assigned created a mapping relationship between the mapper and the face part "screen." You've now ready to animate the map.

NOTE: *If you plan on animating the television, you should either restructure the mapper under the television (creating a group), or freeze the mapper using the* Make Frozen Mapper *command.*

ANIMATING THE MAP

To create an animated map you must have a sequence of images. At each frame, another image in the sequence is (temporarily) loaded into the scene then copied over the "placeholder" map that you've already projected onto the surface of the object.

34 Press *F5* and create a new script.

35   Add a *Canvas>Load from File* operation to the script. [L] on the pathname field to select the first map in the sequence.
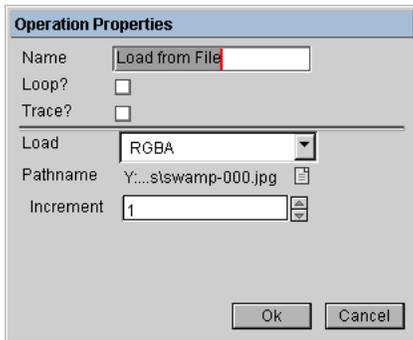
36   Next, add a *Canvas>Save Canvas to Image* operation. [L] on the Image field, then choose the image you want to overwrite (in this case, we want to overwrite the "tv image" map we created earlier).
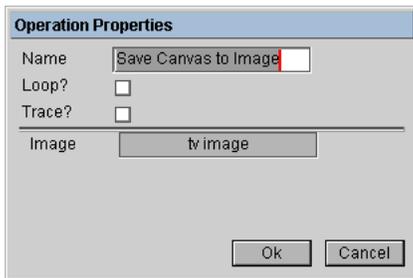
37   Finally, add a *Visibility>Make Visible* channel and choose the tv object you created.

38   Press the rewind button on the Timeline. If you haven't created a canvas, you'll be prompted to do so. The Animation Canvas should have the same dimensions as the "tv image" map and the images in the sequence you're loading. If you have an animation canvas already open, close it and open a new one, or add a *Canvas>Canvas Size* operation to your script to set it to the right size.

39   Press the play button. You'll see the sequence of images appear on the screen, just as if you were watching a television.
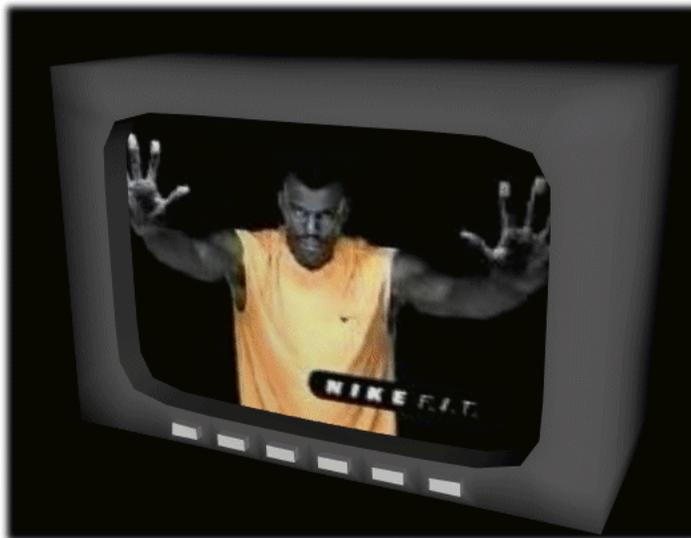
OTHER CONSIDERATIONS

• Make sure the frame rate of the images you're loading is the same as your output, otherwise the animated maps will appear to be animating too slow or too fast.

• Adjust the diffuse color for the cube object and the "buttons" part to get a better look for your TV.