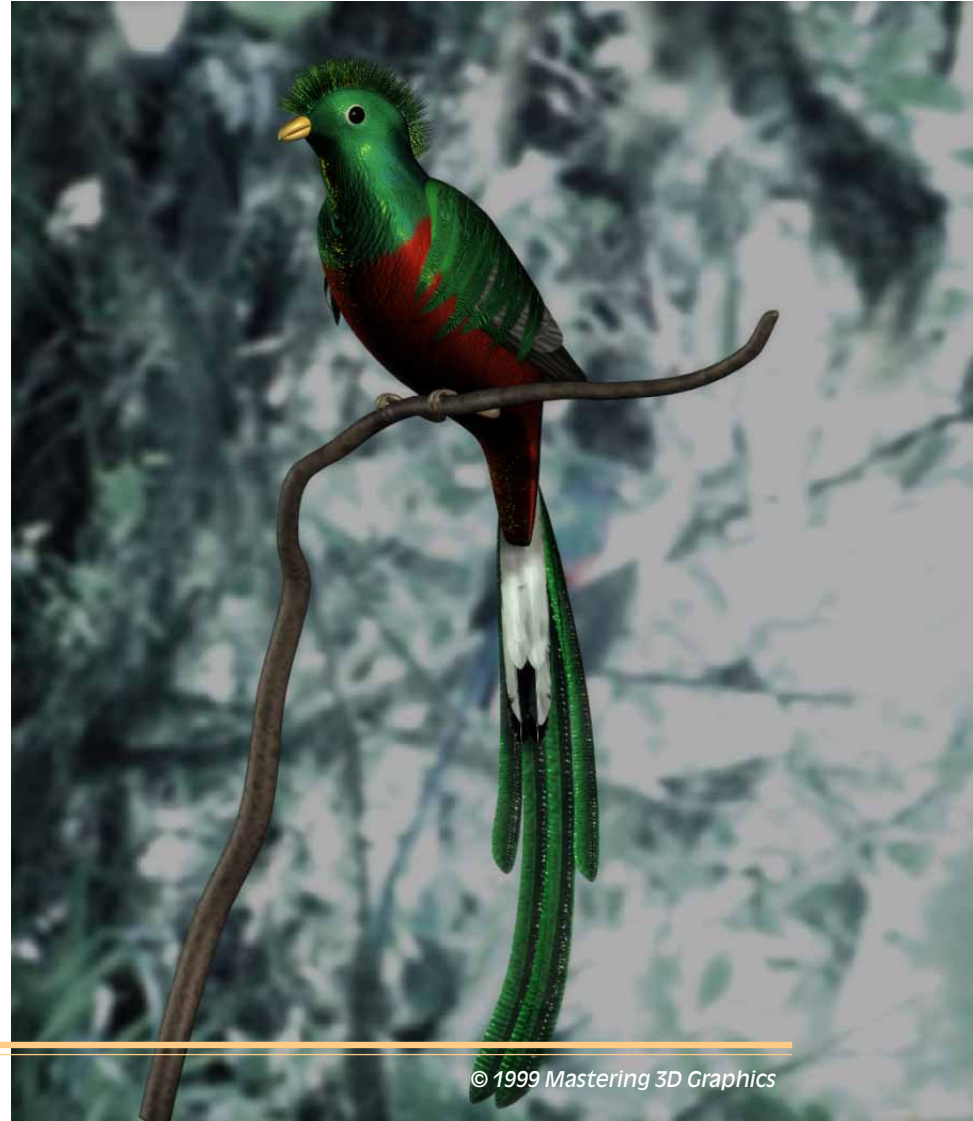


Modeling an exotic bird

Mastering 3D Graphics ~ issue #2

Animation: Master ~ Michael Hough

While this is a tutorial on making an exotic bird, the modeling aspects of it can be applied to almost any bird alive today. I am quite partial to colorful images though, so I felt inclined to choose a more colorful subject than say a sparrow. There is no shortage of tropical bird species to choose from, but one that has fascinated me more than any other is the quetzal. I had first seen one depicted in a 19th century painting, and a few times in magazines and on TV.



Not many people I know have even heard of a quetzal. They inhabit a small range in Central America, including Guatemala, where it is the national bird and is also paid homage to in the name of the currency. The ancient Mayans revered the quetzal and the feathers of the bird were valued more than gold. The birds were caught and their long tail feathers were plucked before being released to grow new ones. To kill the bird was punishable by death.

Some things I will discuss in this tutorial are specific to A:M '99, the most important feature of which is 5-point patches. If you are using an older version you will need to improvise with 4-point patches. Another feature I mention often is lock control points, which is just a productivity tool. You don't need it, but it is a nice feature to have.

Distinguishing features of a quetzal

It is always helpful to acquire a variety of reference materials when attempting to model something you have never seen in real life. Finding photographs of quetzals is difficult, which is understandable considering the rarity of these

birds, but I was able to find enough on the internet and in old national geographic magazines to get a very good idea of what they look like. They are basically regular birds with fancy feathers, so most of the modeling can be based on the general anatomy of a bird, making proportional adjustments to coincide with the reference material.

There are four major features that distinguish a quetzal from other birds. These are the head crest, the highly elongated tail feathers, the elongated nape feathers and, of course, the iridescent feathers. The unique properties

of the iridescence are easily observed in peacock feathers, which are not too difficult to find. Peacock swords are especially brilliant and you would notice from looking at one that the feather appears to be black with highlights that reflect a very small portion of the spectrum; mostly blues and greens. A quetzal has a combination of these blue-green feathers and ruby-colored ones. Some bird!



Figure 1: Painting of a quetzal by the author.

Figure 1 is a painting I did of one a few years ago. It should give you an idea of what a quetzal looks like.

Building the head and body

We will be using a simple sketch as a rotoSCOPE to start the model. This will make it easier to get the shape of the head and body roughed in. Create a new model, switch to a right viewport and zoom out a little bit. Right-click on the name of the model and choose new->rotoSCOPE and select the image that contains the side sketch of the bird.

It should be easy now to draw splines to follow the contours of the head using the rotoSCOPE as a reference. We will be building half of the head by first drawing splines in one direction and then laying splines on top of these in the other direction to create valid patches. I find doing it this way to be helpful to get just the right amount of detail with the minimum number of patches.

A little pre-planning goes a long way towards reducing the modeling time. We need enough splines going through the eye to build detail there. Two at the edges and one in the middle will be perfect for creating the hole for the eyelid, so three splines in this region will be ideal. We are also going to be adding some fur to the head later – this will be

pointing straight up, so there needs to be enough patches on the top of the head to apply a fur material to it. Therefore we will have an extra spline drawn close to the top of the head to help form a good flat top. Additional splines will be added to make shaping the head easier.

Starting the head

Draw 7 splines going from the front of the head to the neck, making them follow the contours of the head in the rotoSCOPE. You want to make 3 points on the splines in the area of the eye and, as I explained before, three splines passing through this area, so there should be a total of 9 points around the eye. Remember to make two splines close together near the top of the head as well.

All the splines should contain the same number of points

so that we can connect them with additional splines going in the other direction. The result should look similar to [Figure 2](#).

Now we will be creating valid patches so the surface will render. Draw new splines crossing all the splines already drawn so that when the points are welded, a grid will be formed. It will be helpful to draw two extra points at

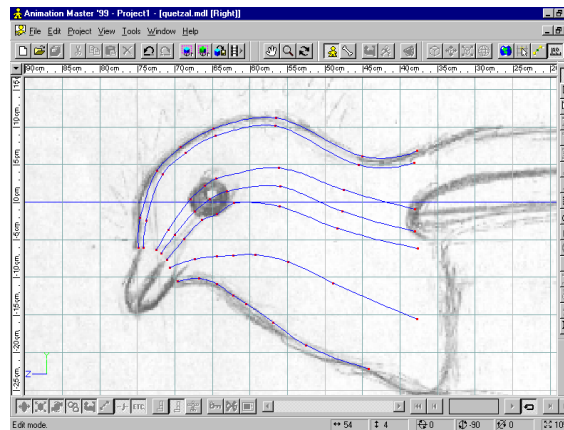


Figure 2: Splines following the contour of the head.

the ends of the ones going on the front and back so that they don't become continuous with the other splines when you weld them. Once you have them all drawn, weld them to the other points; you should have something that looks like [Figure 3](#). If you switch to shaded mode, you should now see a solid surface. If there are any holes, then you probably missed welding a few points.

Next we'll shape this half of the head. Start by grouping the points around the eye and rotating the view a little. Move them right along the x-axis until they are just short of being the same distance from the center as the head is high, since the head should be a little flatter on the sides. The rest is just a matter of pulling the points out to create the rounded shape of the head ([Figure 4](#)).

Forming the eyelids

You might be thinking at this point that it would have been easier to create a lathed surface and deform the points to form the head. However, this would mean

doing the eyelids twice. By creating only half of the head, we only have to worry about doing a detailed eyelid once. Then we can copy and weld the two halves together. You'll find this concept of doing one side at a time repeated throughout this tutorial.

Break the edges of the spline connecting the point in the center of the eye to the outside, then delete the center point. Next, draw a closed four-point spline in the center of this area. You will need to group the points in the spline and drag them right along the x-axis so it lines up with the rest of the head. In order to make this spline into a nice circle, turn on the bias handle button and adjust the bias of the points until the spline looks as round as possible.

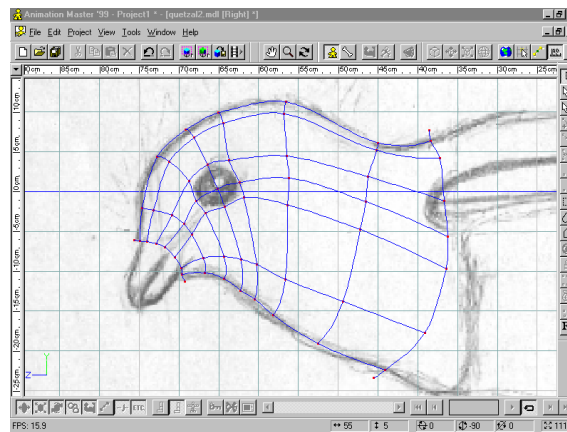


Figure 3: The completed grid for the head.

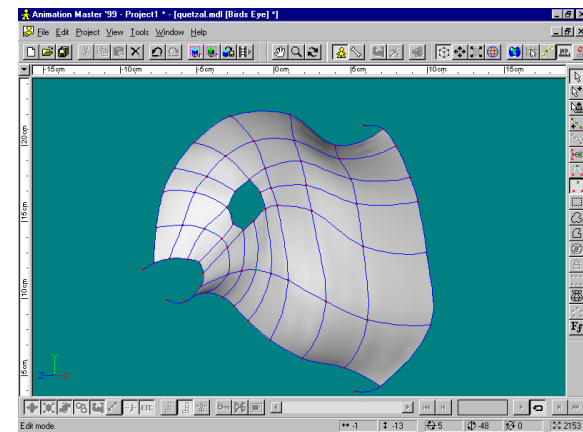


Figure 4: Shaping half of the head.

Now draw some splines to connect the outside to this new spline. This will leave 4 areas that are surrounded by 5 points. Make these into 5-point patches by selecting them into groups and hitting the make 5-point patch button. The result is shown in [Figure 5](#). Notice how we avoid creating creases to this area by not connecting any splines to the outside corners.

Select all the points on the circle in the center and extrude them, then scale the newly created group just a little and move it a small amount away from the surface. Extrude again and scale by another small amount. Extrude one more time and scale a little smaller, then move this last part back into the head so it's just below the surface. You should have a circular ridge surrounding the eye at this point ([Figure 6](#)).

Finishing the head

Now you can select everything and copy it. Flip the copy on the x-axis, then use the translate manipulator to move this half to the other side, far enough so that none

of the points overlap. You don't want it to move on any other axis, in order to keep perfect alignment. Then you want to break all edge splines on one side so you can attach it to the other ([Figure 7](#)).

Weld the two halves and move them so they are equally spaced from the center. You will need to move the center splines separately so they are at 0 on the x-axis. Go back to the right view and zoom in very close to the eye. Use the lasso drawing tool to select all the points inside the first 4-point circle. Complement all, then hit the hide key. Select all the visible points and name this new group Body. We will add more points to this group later.

Show all the points and select all of them inside the 4-point circle again, but this time include the first circle as

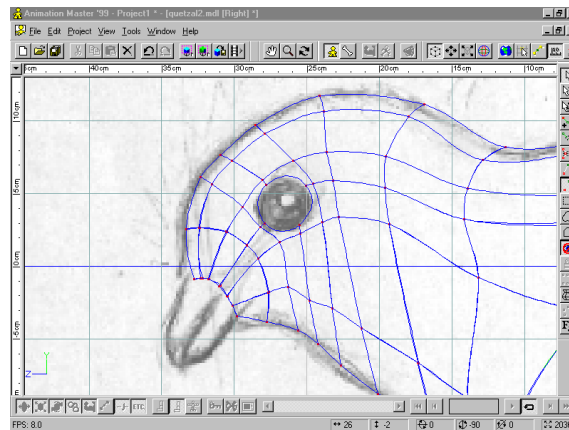


Figure 5: The circle for the eyelid.

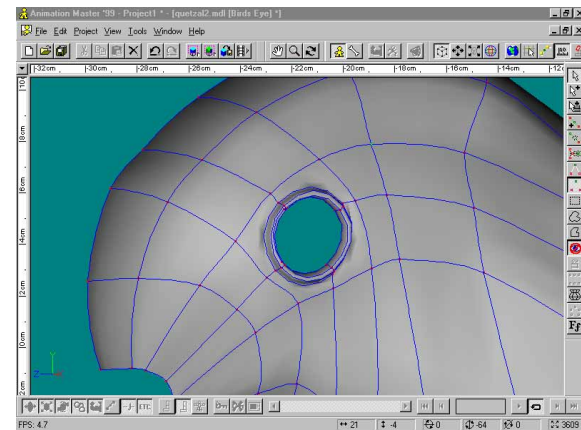


Figure 6: Extruding the eyelid.

well. Hit the hide button again and select all the remaining visible points. Name this group Eyelid. **Figure 8** shows a perspective view of the head with temporary colors added to the named groups we have so far.

Creating the eyes

Make a half-circle with a new spline in a right view. Create it away from the rest of the model and make it so that it extends to the side of the y-axis and the two end points lie on the y-axis. Lathe the spline to create a sphere. If the result doesn't look quite round enough, you can select rows of points and move them so that it is. Group the points on the sphere and name it Eye.

Move the eye near the eyelid. You want to scale it so it's about twice the radius of the eyelid and position it so the left side of it fits just inside the left eyelid. Hit the hide button and create a copy of the eye. Slide the copy along the x-axis

only, so it's away from the original. Now select the Eye group in the properties panel and select the points in the copy, while holding the shift key to add them to the group. Select the copy, unhide all the points, then slide it along the x-axis over to the right side and position it as you did with the left side. Check the group has color in the group's properties, give it a black color and a white specular highlight. Make the specular size about 20 and the intensity 100. You should now have some adorable black eyes (**Figure 9**).

Creating the two halves of the beak

You could just extrude the spline on the front of the head to create the beak, but we will be making a more detailed

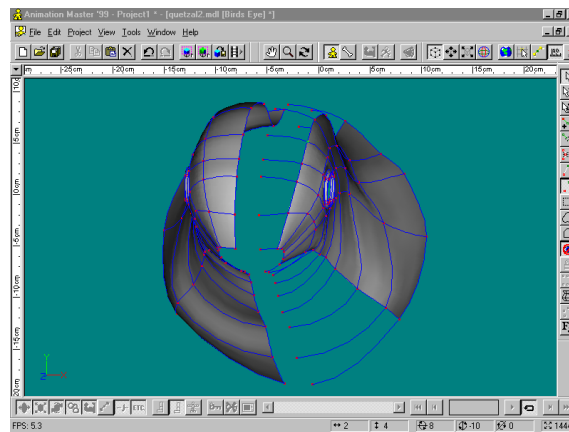


Figure 7: Breaking the splines on one side of the head.

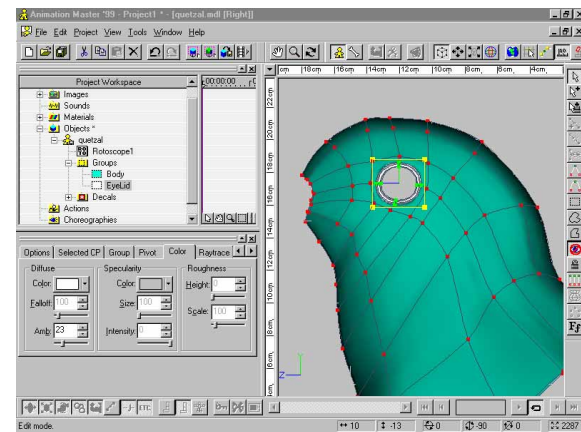


Figure 8: Finished head with color groups.

one here. We will accomplish this by modeling it as two separate surfaces that will start inside the head.

Make a new spline as we did for the eye, but make this one more like half of a cone that is slightly rounded near the top. Lathe this spline, rotate it, then move it to the front of the head. In version 7.0 of A:M there is a new tool on the right menu that lets you lock unselected points so they can't be moved. This can be very useful for doing this part. Select the new lathed surface and hit the lock CP button. Now you can move points around without affecting the rest of the head.

This bird's beak is wider in the middle than on the top or bottom. It is also concave on the bottom. Go to a front view of the beak and zoom in, then move the bottom row of points on the beak upward. You want the points to go higher than the two adjacent rows. Widen the bias handles a little on the center points to sharpen the edges of the beak as well. Rotate the view slightly as you do this to get the best angle (Figure 10).

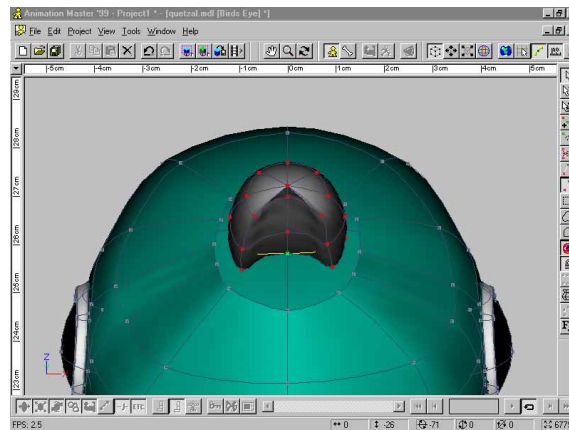


Figure 10: Making the beak concave.

Looking at the beak from the right, adjust the control points to match the shape of the top of the beak in the rotochrome. The tip should curve down a little and the base should narrow slightly as it meets the head.

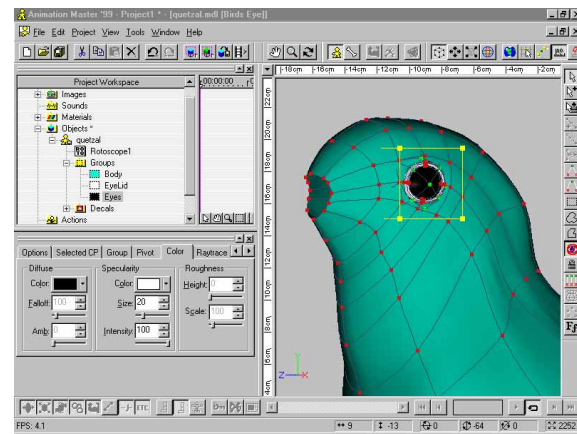


Figure 9: Eyes positioned inside eyelid.

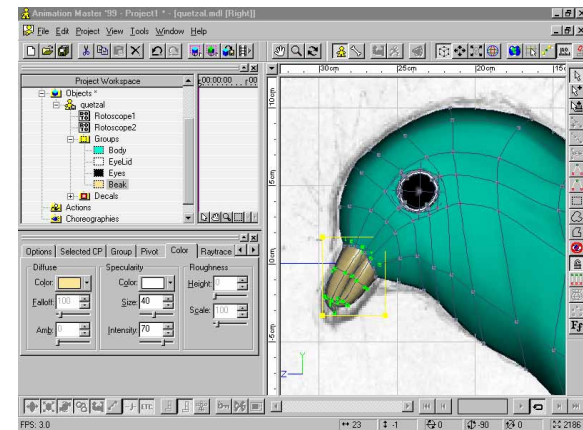


Figure 11: The two halves of the beak.

Make a copy of the top half and flip it on the y-axis to start the bottom half. Scale it a little smaller than the top. The last step is to move the points on both parts to make them meet in the center. Group both parts and name it Beak. Give it a pastel yellow-orange color and a white specular color. Use a specular size of about 40 and an intensity of about 70 (Figure 11).

Extruding the rough body shape and closing it off

Turn off lock CPs. Now we're ready to create the main part of the body. Select the last spline in the direction of the neck and extrude it 6 or 7 times towards the tail. Scale each extrusion as you go along so the edges match the contour of the body in the rotochrome and space them fairly evenly (Figure 12).

Next we want to close the tail section. Zoom in on that area and select all the control points, then rotate the view to get a good look at the opening in the surface. Look for the two splines on the

sides of the body that would form a horizontal line if they were connected by a spline, since that is exactly what we are going to do. Use the add mode to draw the spline and weld the two ends to these points. Since there are 5 points above and below this spline, we will add the same number to this spline.

Select one of the two points it is connected to by clicking on the line between them. Hit the insert button 5 times, then adjust the new points so they are spaced evenly. Now close the surface by drawing splines from the surface above through these points and connect them to the adjacent points on the bottom. This will create two 3-point patches on either side; but that's OK, as they are small (Figure 13). Note that what we did here is a great technique for closing off lathed and extruded surfaces.

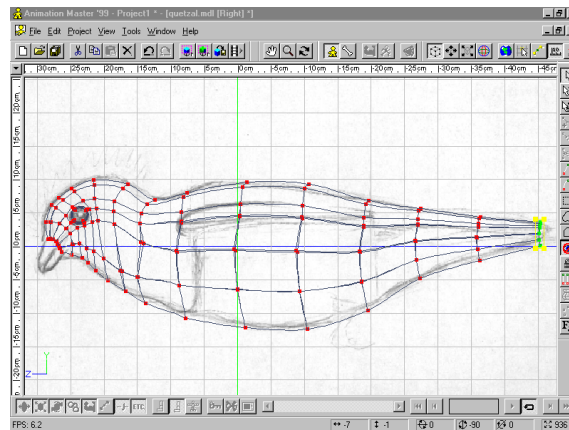


Figure 12: Extrude rough body shape.

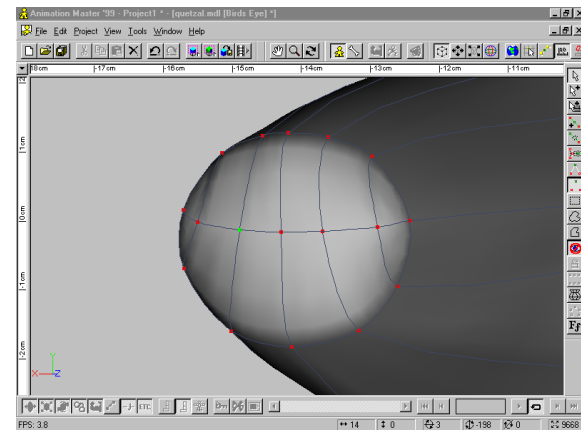


Figure 13: Closing the end of body.

The body still needs a little shaping to make it rounder because of the flatter head shape from which we extruded it. You can do this by looking at the model from the top and selecting rows of splines, then scaling them on the x-axis only. Now you can move a few more points around to get it just right.

Go back into the right view and select the Body group in the Project Workspace. Hold the shift key while dragging the lasso tool around all the points we created in this part to add them to the body group. We're now done with the body, beak and head; aside from some decaling that we will do later (Figure 14).

The Wings

All the parts of the wing will be constructed separate from the main part of the body. This will make it easier to surface them and it also mimics the way feathers drape over an actual bird. We will make most surfaces only one patch thick and use transparency and bump decals to give them a detailed look.

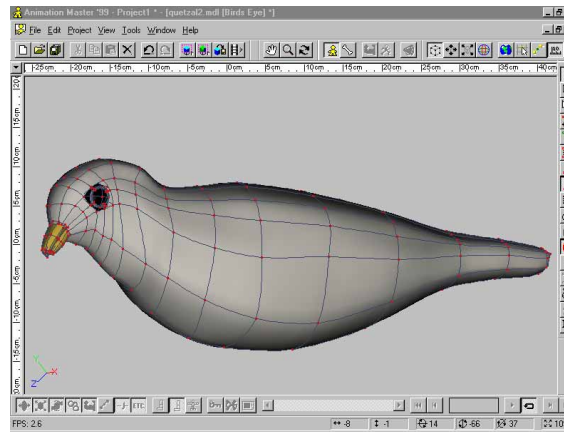


Figure 14: Completed body shape.

You will find it helpful at this point to rotate everything to give the bird a more typical posture, since from now on we'll be departing from using the rotoscope as a reference. A more familiar pose like this will make it easier to model the rest.

Creating the bend of the wing

We could try to work the wing shape out of the body, but this could be very time consuming. Instead, we will make a new surface to make this part from. Draw a new spline with about 6 points and orient it perpendicular with the back of the bird. Select all the points on the spline and then hit the lock CP button so we won't have to worry about messing up the body. Extrude this new spline about

6 times so as to create a new surface that goes about halfway down the body. The first spline will be connected to the sides in an awkward way, so select it and delete it to leave 6 to work with.

Now form the unique shape of the bird's wrist as it meets the body. There is a sharp bump that starts near the neck, is flatter on top and curves down towards the

belly. We will make the part near the tail flat and add additional shapes coming out of it for the flight feathers. Blend the bottom into the body above the belly and at the top. Then you want to make the side of the wing flatter. Look at [Figure 15](#) for a better idea of what I mean.

An important aspect of the part that we are modeling is how it blends into the back. There should be a slight ridge and it should be closer to the center (nearer the tail than the neck) forming a v-shape when both sides are in place. A top view of this is shown in [Figure 16](#).

Make a copy for the other side and then group all the points and name it Wing.

Making the three folded parts of the wing

This will be composed of three parts, which are (starting from top to bottom) the secondary coverts, the secondaries and the primaries. We'll start from the top with the secondary coverts using an extruded spline as we did with the wing.

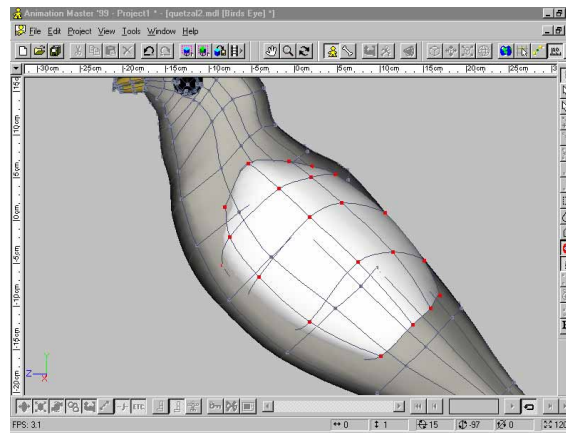


Figure 15: Side view of wing.

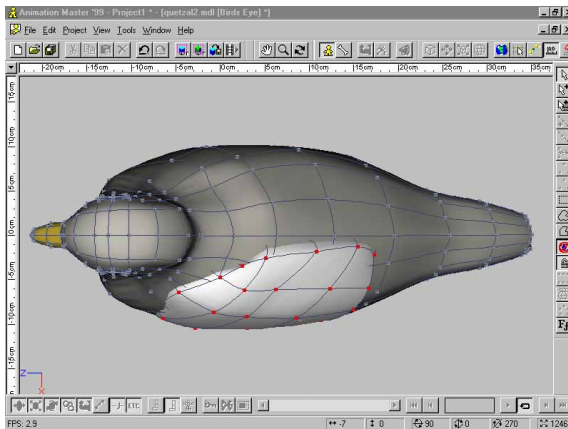


Figure 16: Top of wing showing V-shape on back.

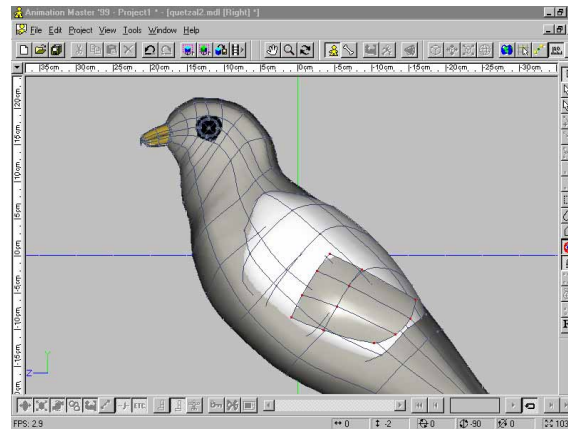


Figure 17: Extruded spline makes the secondarycoverts.

Make the spline with 4 points, select them and use the lock CP button again. Position the spline perpendicular to the length of the body and about halfway down the wing. Position the view so you are looking down the body and adjust the points on the spline so they follow

the curve of the wing. Then look at it from the right and extrude the spline 4 times. Adjust the points so that the new surface appears to come out of the wing and follow the shape of the body (Figure 17).

Group the points and name it SecondaryCoverts. Make a copy and name this Secondaries. Position it a little closer to the body and shape it from the side so it looks like Figure 18.

The last one is the primaries, we'll make this one as a solid shape because it extends well beyond the body. Draw a new spline with

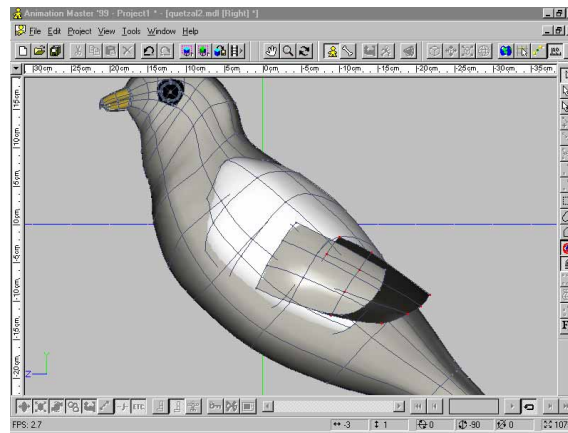


Figure 18: The secondary feathers.

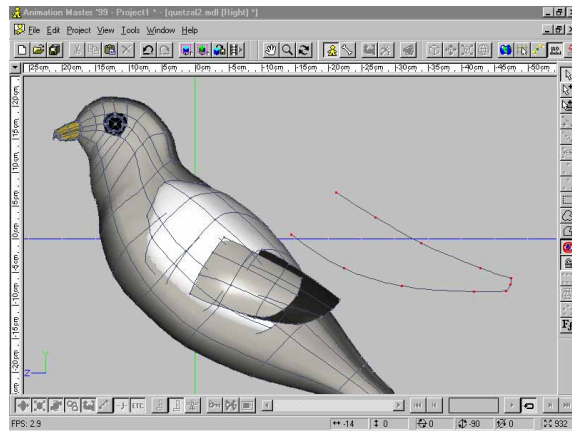


Figure 19: Spline outlining primary feathers.

10 points as shown in Figure 19 and then extrude it by a small amount along the x-axis. This will make a thin ribbon on the outside. Close the surface off by connecting splines between the points on the front and back, then

use the insert tool to add a point to the center of each of the new splines. Then you can draw a new spline to go through these center points to finish modeling the surface. Move it near the body and underneath the other two wing sections, then bend it a little so the tip goes in over the rump (Figure 20).

Creating the enlarged nape feathers

These are the elongated feathers that extend from the back out over the wing and breast.

Start this part by extruding a spline as we did for the wing and flight feathers. In order to have enough points to create

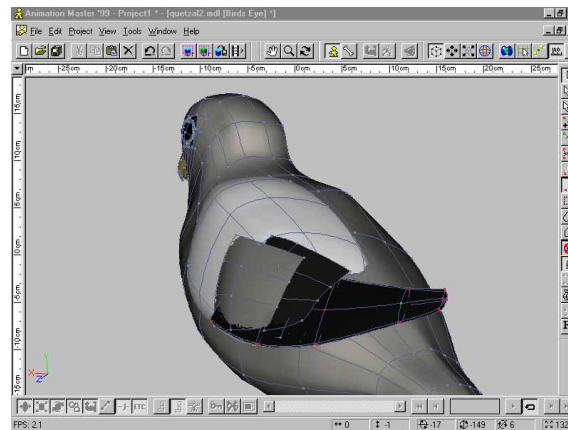


Figure 20: Primaries extending across back.

6 simple feathers, we will use 7 points in the initial spline. Extrude this spline 5 times to create a new grid. Break the vertical splines from the bottom to 3 points up. We will create a new feather using two splines at a time. Only one side of each feather uses a spline that is continuous with the rest of the surface; the other side will be made with a new spline that is connected to the point at the base of the feather. This probably sounds more complicated than it is. Examine [Figure 21](#) for a better idea of what I mean.

Molding the surface around the body is simple as long as the other

control points are locked. Just blend the top into the top of the wing and drape it around the body so the tips of the feathers curve around the belly ([Figure 22](#)).

The Tail

We'll separate the tail into two different parts. There will be 8 rounded feathers and 4 very long pointed ones. It is quickest to model them flat in a top viewport and then position them with the body after surfacing. Let's tackle the rounded ones first.

Shorter tail feathers

Although the actual bird has twelve of these feathers, there is only about 8 visible when at rest (because the center ones overlap) so we'll make the 8 that would be visible. Go into a top viewport and draw a single feather using

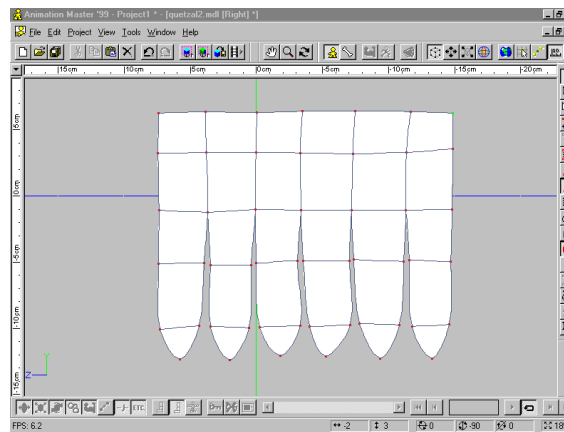


Figure 21: Patches that form the nape feathers.

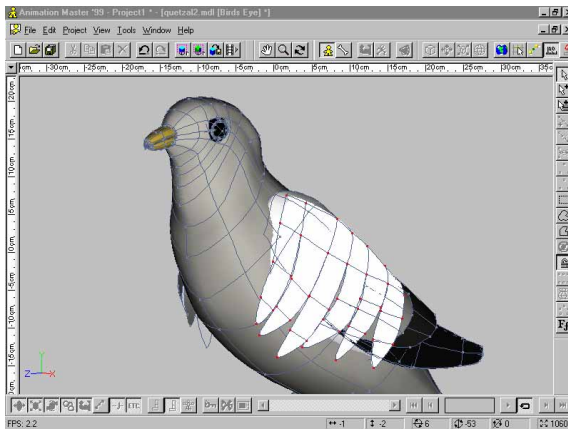


Figure 22: Forming nape feathers around body.

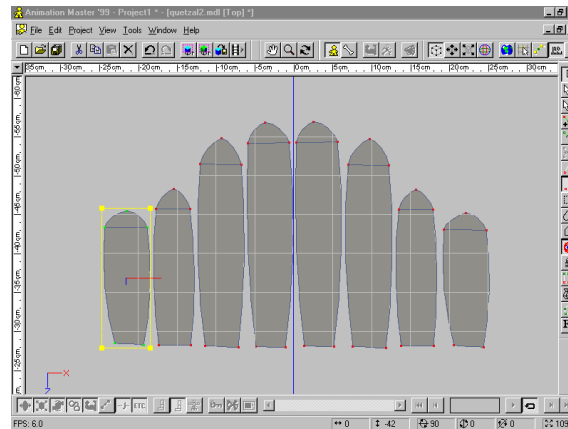


Figure 23: Short tail feathers.

three patches so that the last one is rounded off. Make 7 copies of this feather, adjust and arrange them as shown in [Figure 23](#). The last step is to offset the feathers by about 0.1cm on the y-axis – starting from the outside moving inward – incrementing the amount by 0.1cm for each. This is best done manually in the properties panel. We do this so the outer feathers will be visible under the inner ones. Now take a screenshot of the feathers from the top as a reference for making the decals. It will be easier to decal now while these parts are separate and flat, than to have to separate them later.

All the decaling for this area can be handled efficiently with a single cookie cutter map. Start by making a copy of the image to be used later in the alpha channel, then paint the colors into the image. The outer feathers are white, then the next two are half-white and half-black, and then the center ones are all black. They all have a light grey stripe running down the middle. Load the previously saved image into the alpha channel

and make the feathers white, the remainder being black. Make a few parts of the bottom of the white feathers a pale grey to simulate slight transparency and then draw some jagged edges to the feathers ([Figure 24](#)).

Apply the decal to the tail feathers and then rotate the feathers so that they overlap. Before you do this, you might want to apply a bone to each feather in case you ever want to make them unfold again, since it would be easier to assign the points to the bones while they are still separated. Group all the points we've created for the tail and call it Tail. All that's left is to move and rotate the whole group so that it appears to be coming out of the rump ([Figure 25](#)).

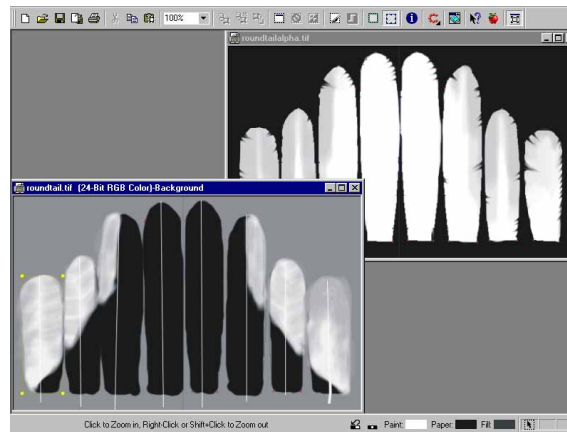


Figure 24: Maps for short tail feathers.

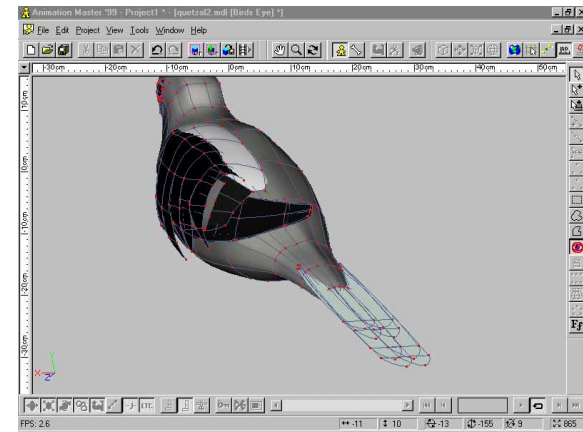


Figure 25: Short tail positioned on body.

Elongated tail feathers

The long tail feathers have a bit of a v-shape to them, so model these with 3 points across and about 6 running down the length. You can do this using the extrusion trick we have used before and then select the centerline of points and move them upward a little to create a slight V-shape to the feathers. Start by making only one and draw it away from the body in a top viewport. Take a screenshot for making the decals. Make a copy the same length of the first and then make two more copies scaled to about half the length of the first two. Arrange them close together and make the two outside feathers shorter (Figure 26).

Make bump and transparency decals to apply to the long tail feathers using the screenshot as a reference. Those shown in Figure 27 were made by doing the transparency first and then making the bump maps based on that. The transparency maps should just include some jagged edges and a few nicks, then the bump maps can use any kind of regular pattern radiat-

ing from the center stem. Contrast filters can help in getting the tonality right.

Apply the maps to one feather at a time, which will create multiple stamps for both decals. Name the group LongTailFeathers and then move the feathers into place on top of the rounded tail feathers. You might want to add some bones here to make it easier to bend them when creating a pose later on.

Modeling the legs and feet

Extrude an 8-point circle a small amount towards back of body. Continue extruding toward the front to create the bend in the knee, making this section a little narrower than the first. Extrude again forward to create the ankle

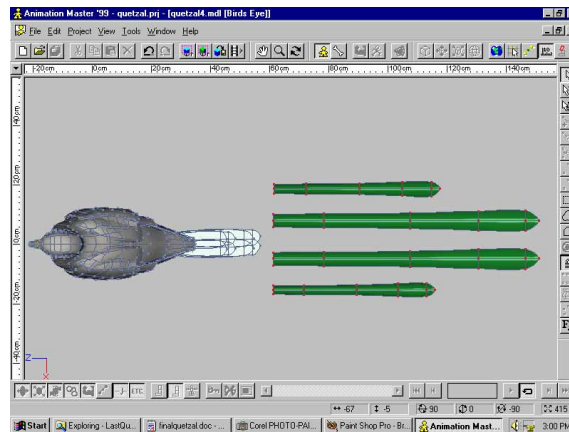


Figure 26: Long tail feathers.

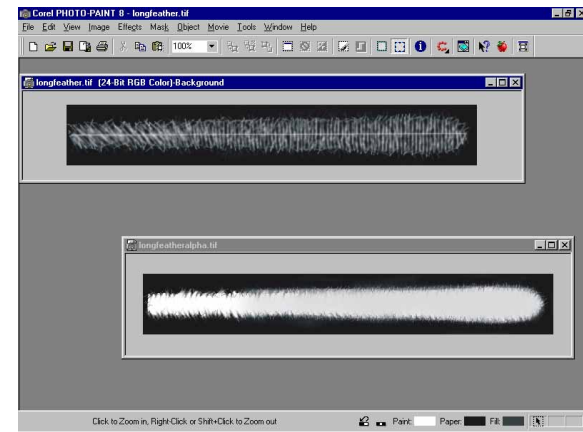


Figure 27: Maps for long tail feathers.

and foot. Group the points and call it Legs, then drag to left side of body. Position the leg as shown in [Figure 28](#). Notice that the legs are rather short. Quetzals cling to trees most of the time, so their legs are adapted for climbing.

The toes

Because they are creepers, a quetzal's toes are arranged with two in the front and two on the back. Perching birds have three in front and one near the back. Build one using a closed 4-point spline by extruding it. Narrow the end points of the extrusion to create the toenails ([Figure 29](#)).

Create a copy of the first toe and attach them both to each foot as shown in [Figure 30](#). Notice that the points on the toes were connected to the nearest points on the foot except for the inside points on the toes, which were con-

nected together. Then a new point was added between them and a spline drawn from the top middle point on the foot through this point and connected to the bottom of the foot. Notice the 5-point patches that have been created in this area.

Now make a copy of the patches that make up the toes and flip them on the z-axis, then position them farther back on the foot. You have two options here: 1) just position them so they appear to be connected to the back of the foot, or 2) connect them directly to the foot as you did for the ones on the front of the foot.

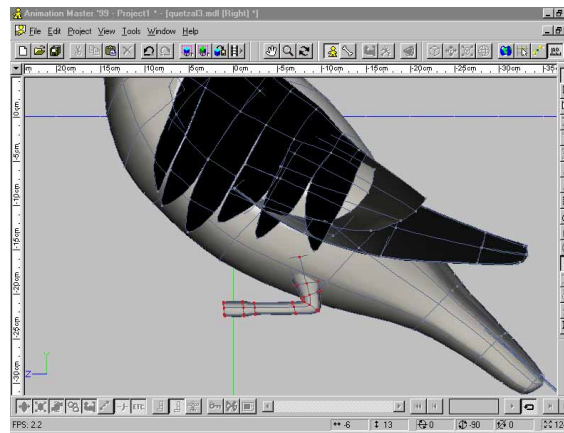


Figure 28: Extruding the leg and foot.

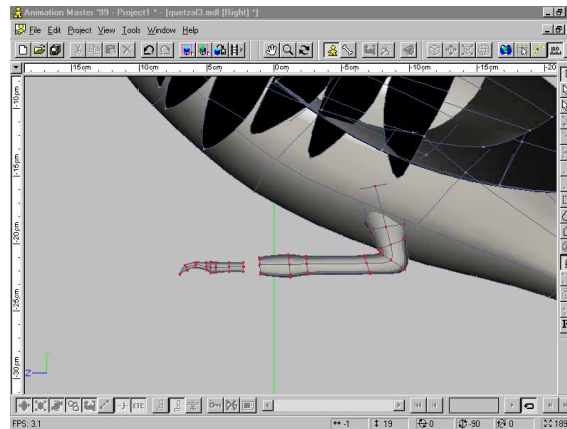


Figure 29: Extruding a toe.

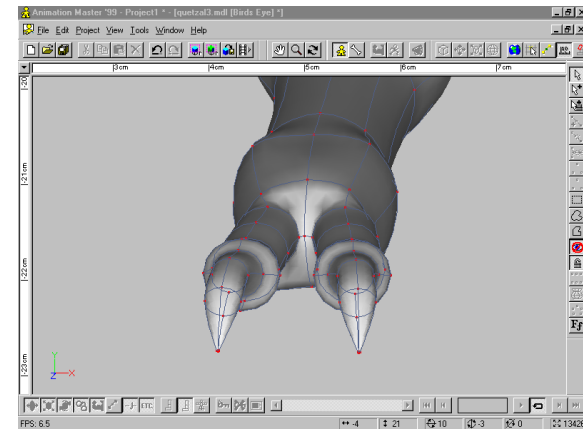


Figure 30: Attaching front toes to foot.

If you opt for the second one, add a row of points on the front of the foot. Now you can find an area on the side towards the front where you have three splines crossing in both directions, just like we had for the eye. Break the center spline here. The backward facing toe on the right side of the left foot actually starts at the front and is bent back. Since we created the toe with a 4-point circle, again like the eye, you can connect the center points to the toe and fill the rest with 5-point patches. Connect the other toes in a similar fashion, but one spline further back on the foot. Tweak the points to make it look like [Figure 31](#). You will notice the foot had to be deformed a little to make this new arrangement symmetrical.



Figure 32: Bump map used for feet.

Make a copy of the finished leg and flip it on the x-axis, then position it on the other side of the body. Next, you want to group the points on the legs and the claws (the tips of the toes) and make different groups of them. The

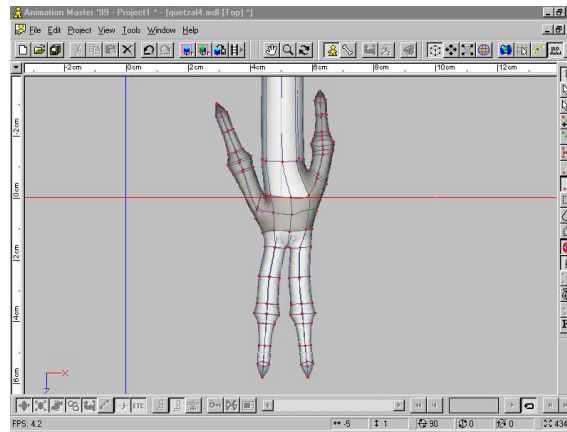


Figure 31: Back toes attached to foot.

easiest way to do this is to hide everything but the legs, then select the claws, and make them into a group. Then select the claws again except for the bottom spline on all of them, then compliment all to select the rest. Add a small image like that shown in [Figure 32](#), to the Leg group (a bump map for ridges on leg). Rotate the image if it appears to be going in wrong direction.

The completed legs with different colors for the claws are shown in [Figure 33](#). The left foot in the screen shot is shown rendered with the bump image applied to the Leg group and a little bit of roughness added to the color as well.

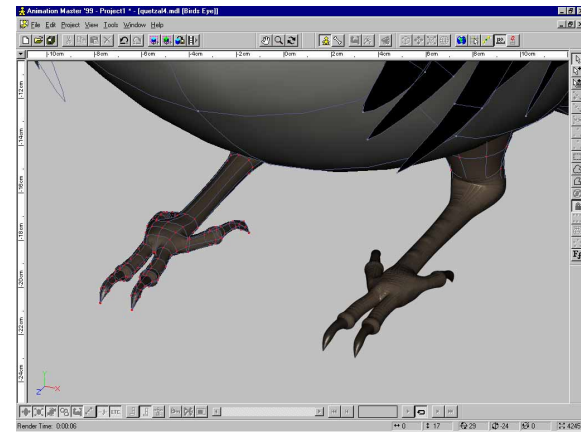


Figure 33: Completed feet with color groups.

Final surfacing

This section will cover decaling any parts that we have not done yet, plus tweaking the color settings on the named groups.

Decaling the body and head

It would be optimal to be able to flatten the entire body and head in order to get the decals applied seamlessly, but unfortunately flatten isn't all that easy to use. It is much easier to use the same map on both sides and since the results are nearly as good, we will take that route. Create a new pose and then select the body group and hide the rest. Scale the body on the x-axis so it's nearly flat when viewed from the front, then take a screen shot as a reference for the decals.

The color maps are easy to make. Just fill in the head and back with green and the belly with Red. Use a sharp smear brush to 'feather' the green above the belly into the red. Start the bump map by paint-

ing the area dark grey, then work lighter colors over it using a fine speckled brush to get a fur-like effect. The idea here is to radiate the strokes outward from the eye and then forward to back when you get to the body. **Figure 34** shows the completed color and bump images used on the model. Apply them to the body and head by separating it into two halves and creating a new stamp for each side. Doing it this way helps ensure they meet somewhat seamlessly in the front and back.

Decals for the folded wings

You can create the decals for these three sections by taking a screen shot and drawing on top of that. Since they are all essentially monochromatic, the group colors can be set to a pale brown and then a diffuse map created to

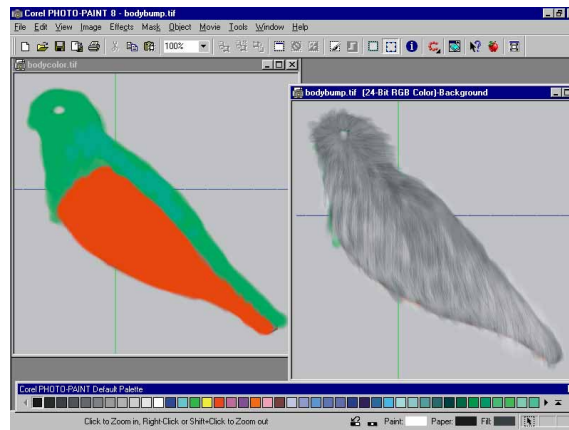


Figure 34: Bump and color maps for body.

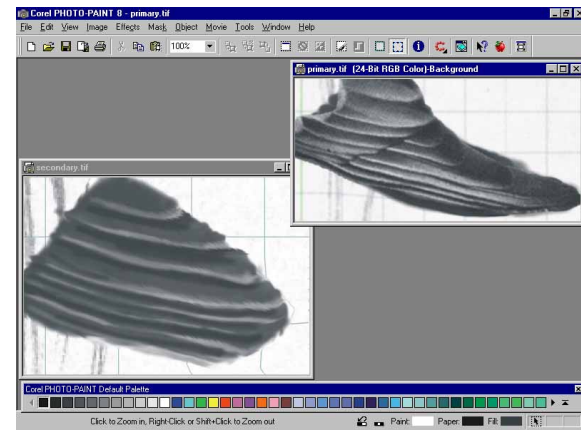


Figure 35: Diffuse maps for folded wings.

reduce the brightness for most of the areas. The only light part should be the center quill of the feather. **Figure 35** shows the diffuse maps used. I used the same image for both the secondaries and secondarycoverts, then another for the primaries. Apply them individually and change the decal type to diffuse.

Decaling the nape feathers

Create a new pose, hide all but the nape feathers, then select them one at a time and flatten them by scaling on the x-axis. Reposition the points so the tips are evenly spaced. The decals for this part require the most complicated maps because we are trying to create the very distinctive look of long feathers. Take a screen capture of the surface or do a render of it and use this as the reference for painting the maps.

It is best to start with the transparency map to create the jagged edges of the feathers. Change the colors in the image so that the background is black and the feathers are white. Contrast filters are the easiest way to do this.

Shrink the feathers a little bit by painting black around the tips and edges, then use a pointy smear brush to pull the white into the background to create a distinct jagged pattern.

Now create a new image based on the original screen shot to use as a bump decal. This part is important because color and diffuse variation don't play so much of a role in the final look of the surface. I used PhotoPaint to create the maps shown in **Figure 36**. It was a lot easier to create than it looks; it just takes some time. I drew a grey line down the center of each feather, then created a flat brush rotated by about 10 degrees. Using a large step size to create a good spacing, all that is needed is to paint in a straight line down both sides of the feathers. Make a

copy of one feather using the lasso tool, paste as a new image and adjust the brightness upward a little. Then use a copy of this new feather in it's own mask channel. Copying and pasting the new feather like this will create a transparent selection that you can position higher up. Do this multiple times to build up the bump map.

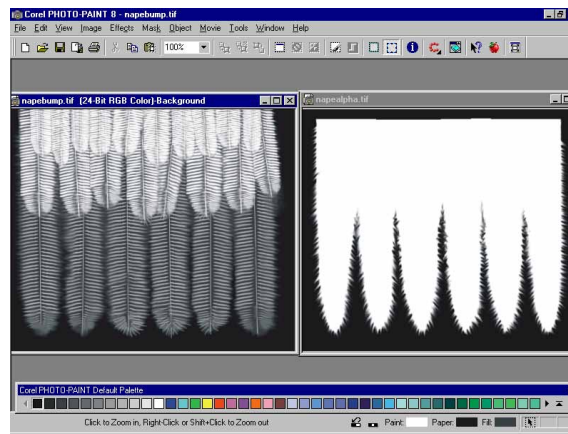


Figure 36: Bump and transparency maps for nape feathers.

Remaining color settings

The specular size in A:M has a set limit, which unfortunately isn't large enough to get that iridescence look. We will still use specularity to add a little extra glitter to the model, but will also adjust the diffuse channel to act similarly to a specular highlight. By setting the diffuse falloff to be a large amount, it will make the surface look like it is black with a wide highlight. This works extremely well at simulating the metallic look of a quetzal's feathers.

Change the color settings for the wings, nape and long tail feathers to something like the following:

Diffuse Color - 53, 172, 74
 Diffuse Falloff - 500
 Specular Color - 255, 255, 0
 Specular Size - 21
 Specular Intensity - 100

The head crest

Create a new material and change the type to fur. Change the color settings so they are similar to those used for the green

parts of the body and wings. Next, group points on top of head from the beak to near the neck and name this Crest. Drag the fur material to this new group and adjust fur settings so that it looks like [Figure 37](#). You may need to flip the normals for the group if the fur is pointing inward. The main thing is to get the thickness and density to look like it's made of dense fur. The settings I used are:

Length - 3cm
 Density - 7
 Thickness - 0.1
 Stiffness - 100

The last step is to create some bones to aid in posing the model. You can create ones for the head, body, tail and a few to move the legs and toes. I recommend not attaching the bones except maybe the legs to the body. [Figure 38](#) shows the finished quetzal standing on a branch lit by a key light and one fill light. It is important to use filter for the final render or all the bump maps will show strong aliasing.

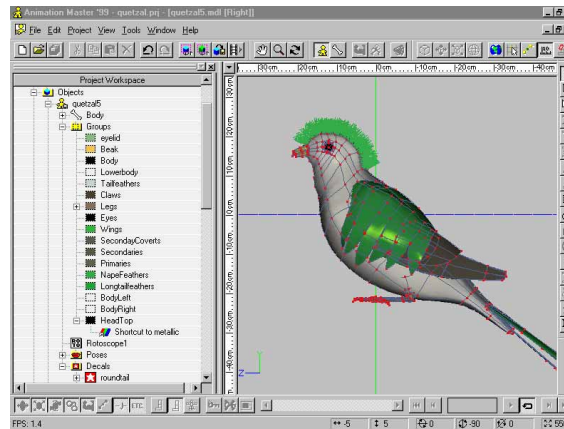


Figure 37: Fur material crest on head.

Biography

I am a freelance artist residing in Lindenhurst, IL. I was a painter prior to getting into 3D, and my artwork has been the focus of several exhibitions in southern New York, one of which was funded by a state grant. I switched to digital art shortly after receiving an Associate Degree in Fine Arts. I am a past winner of the Internet Ray Tracing Competition and currently a 3D rendering specialist for AOL's 3D SIG. I keep a small gallery of my 3D artwork at:

<http://users.aol.com/pcrmikeh>

and I can be reached at:

AmaltheaJ5@aol.com.

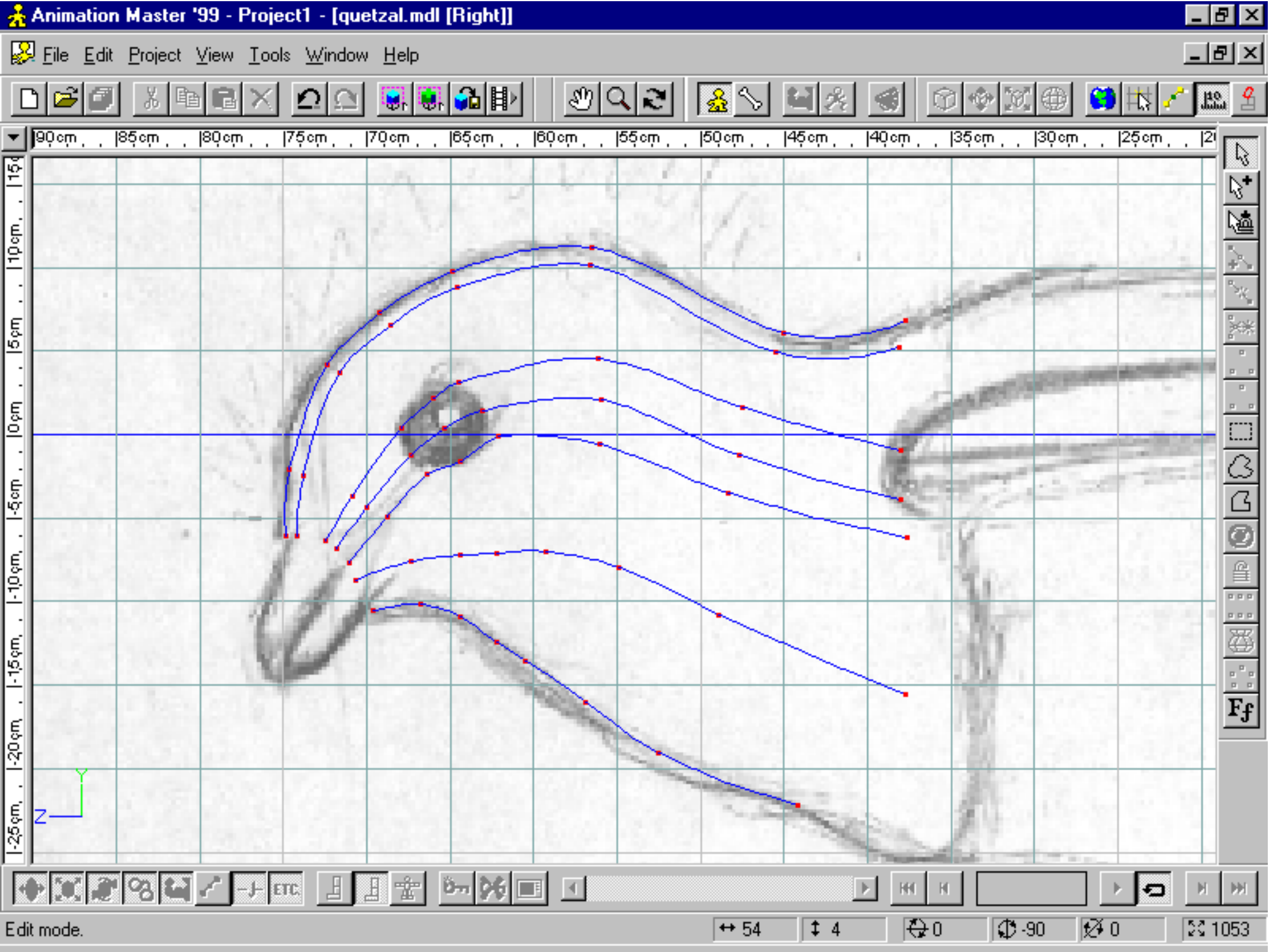


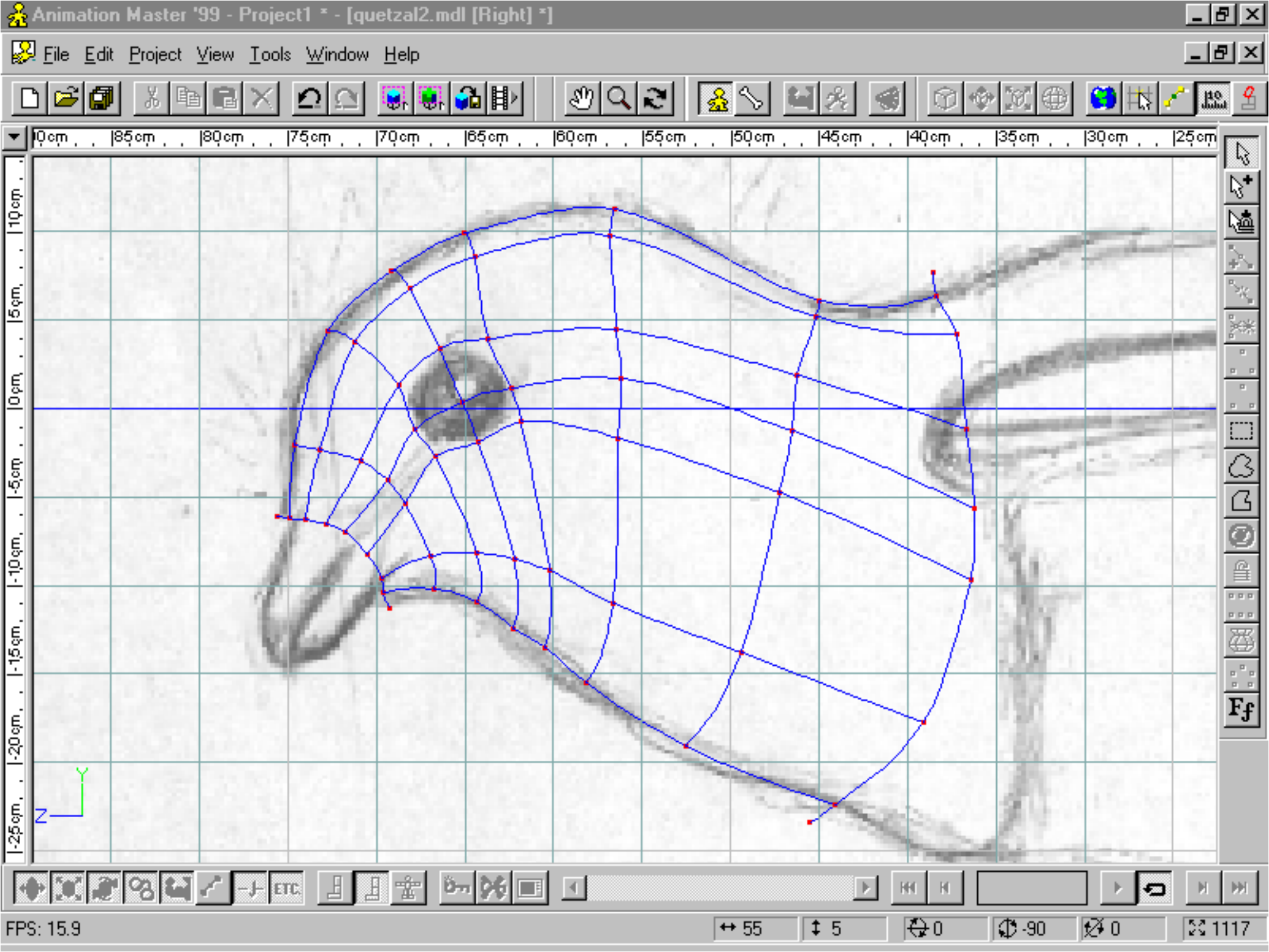
Figure 38: Completed model.

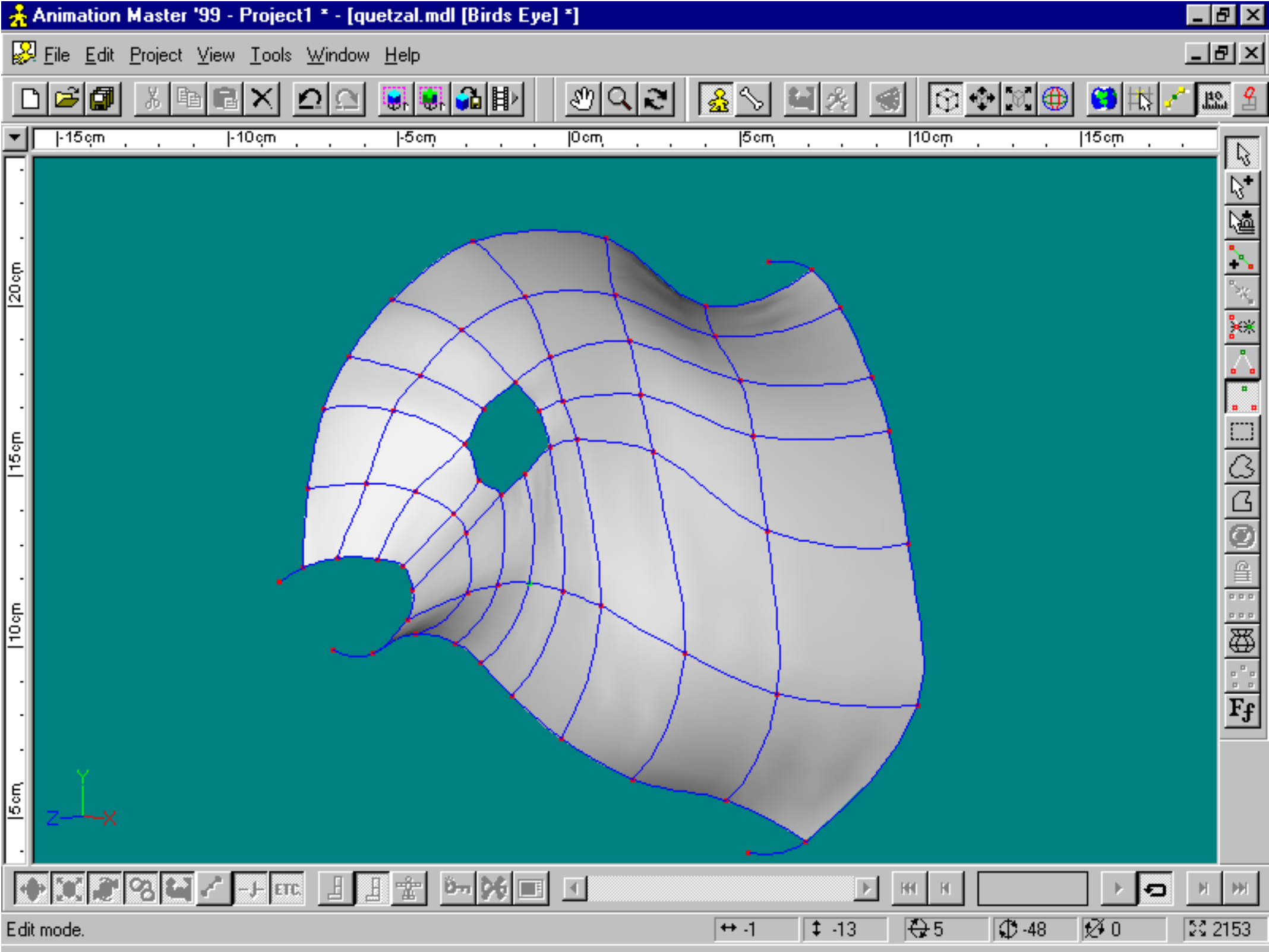


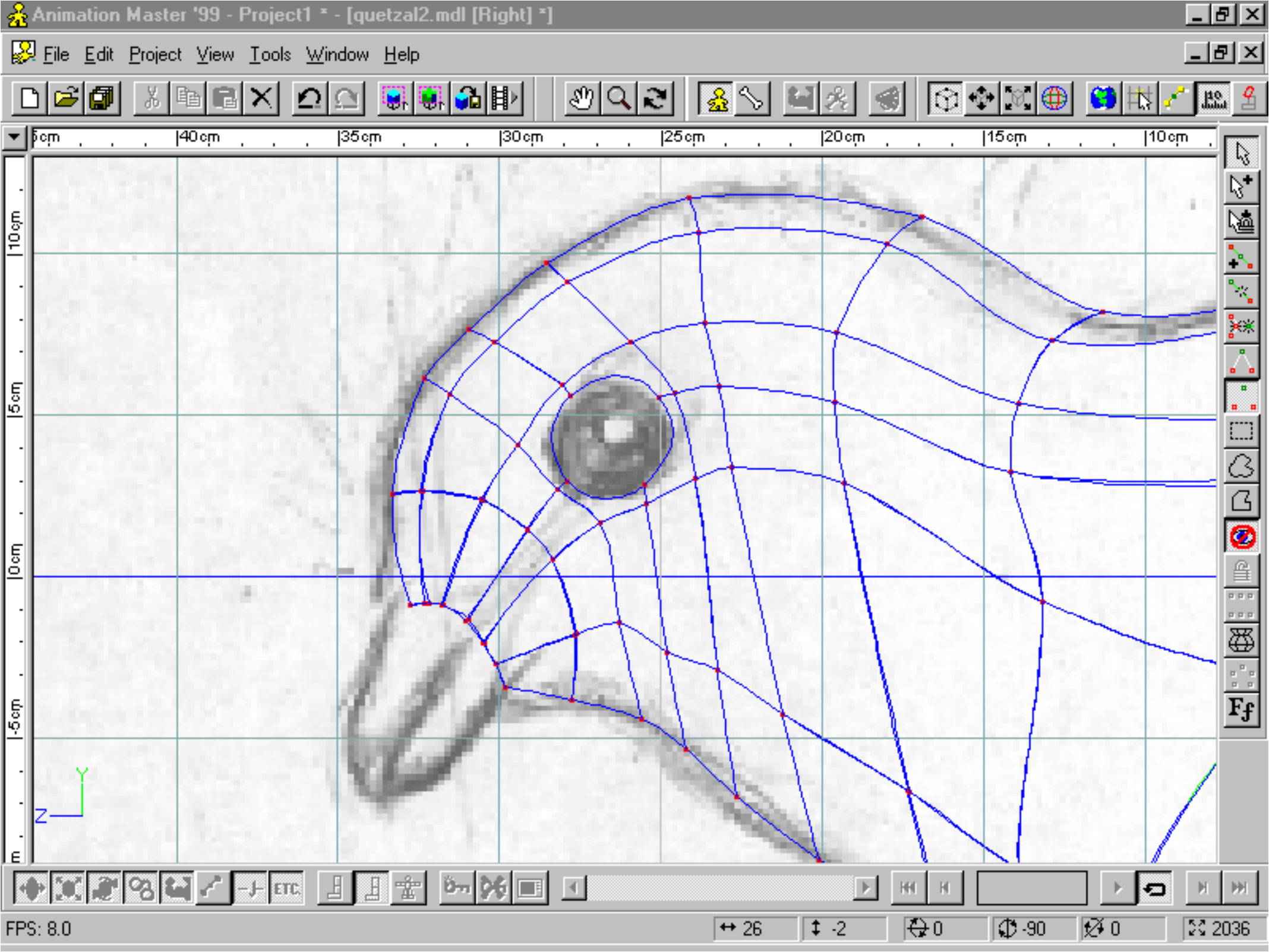


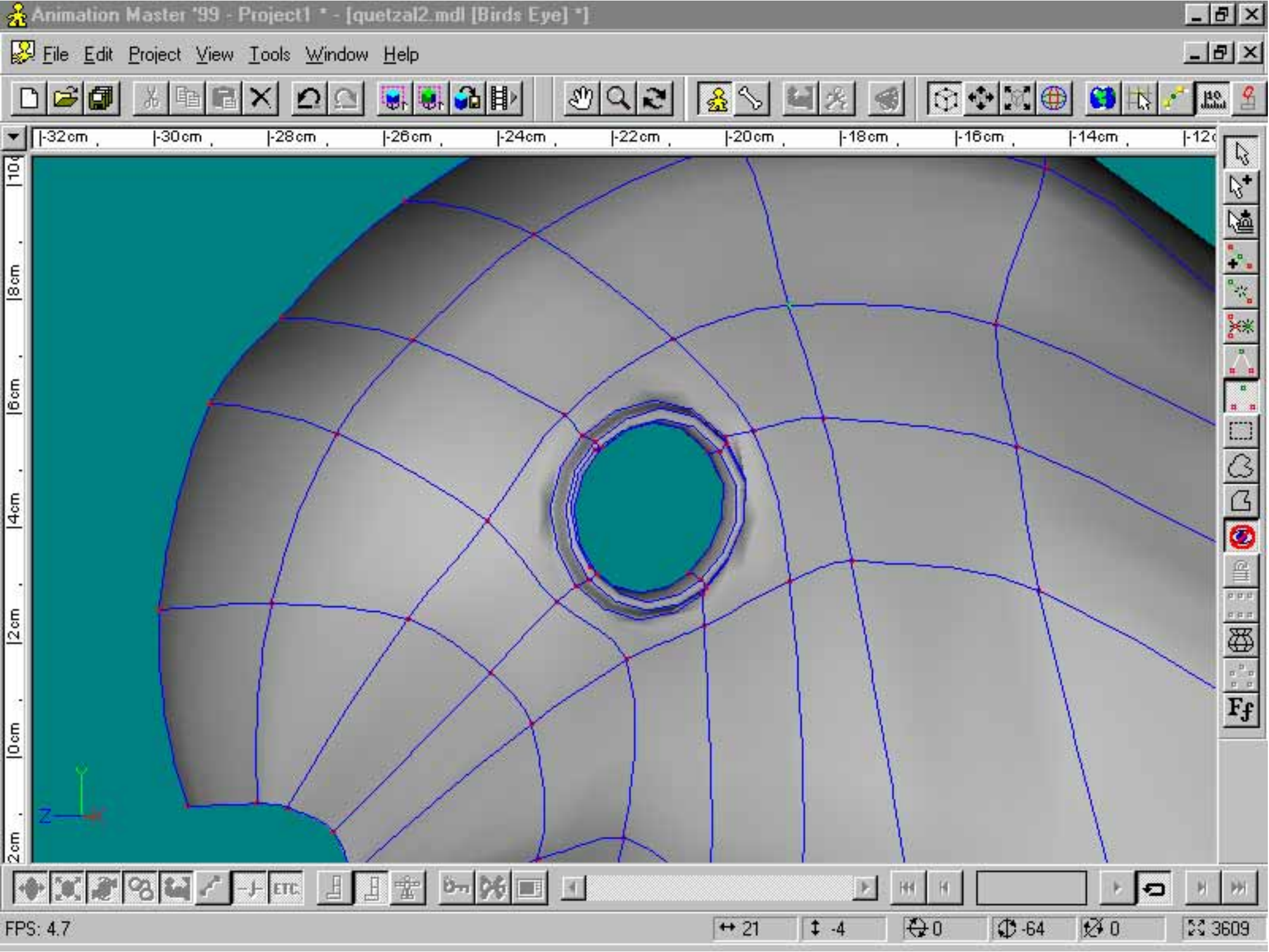
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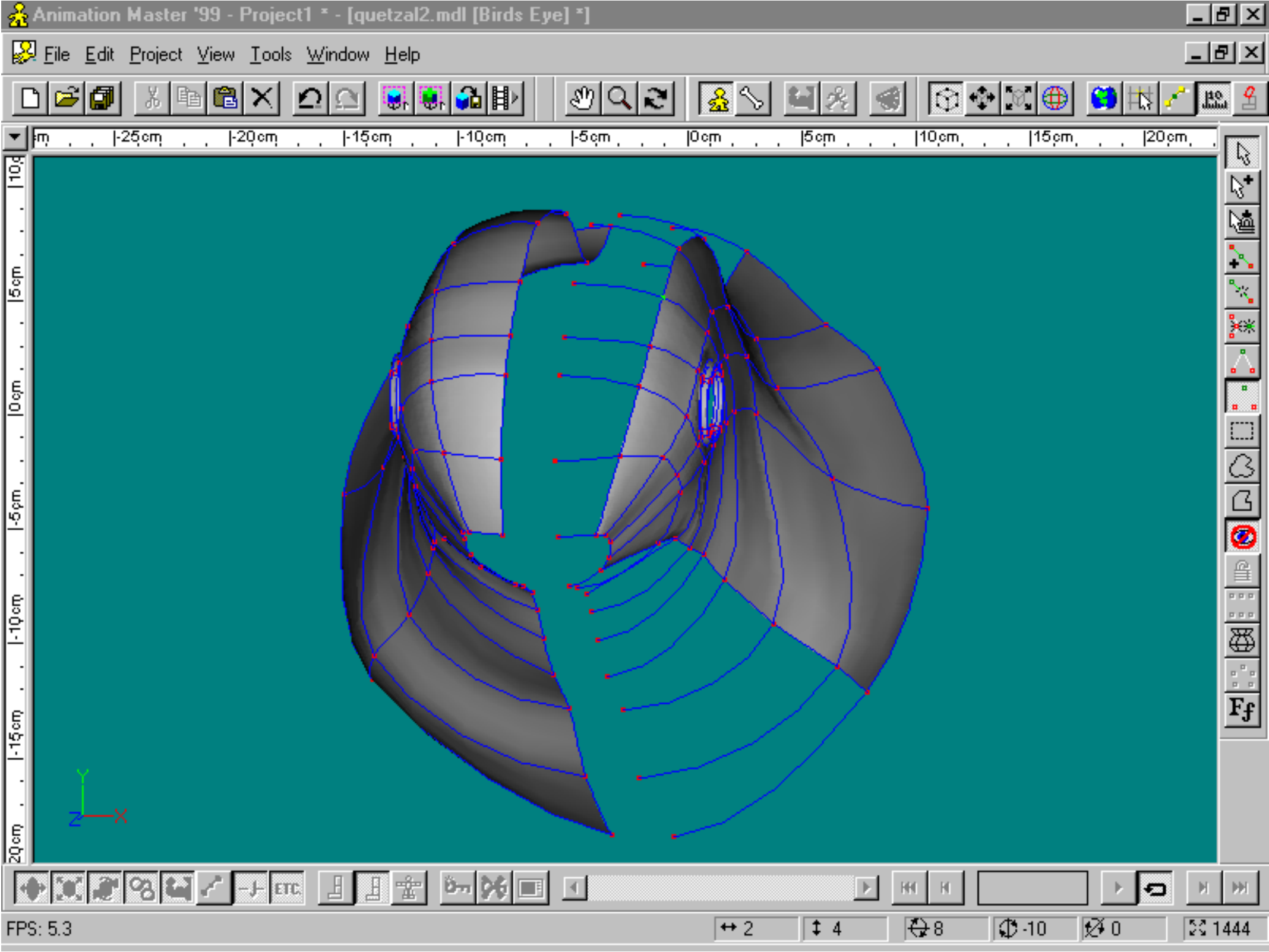


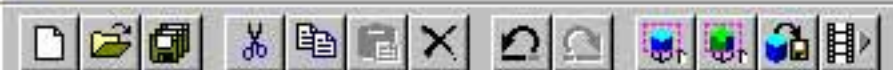












Project Workspace

- Images
- Sounds
- Materials
- Objects *
 - quetzal
 - Rotoscope1
 - Groups
 - Body
 - EyeLid
- Decals
- Actions
- Choreographies

Options Selected CP Group Pivot Color Raytrace

Diffuse

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Falloff: 100

Amb: 23

Specularity

Color: [Color Picker]

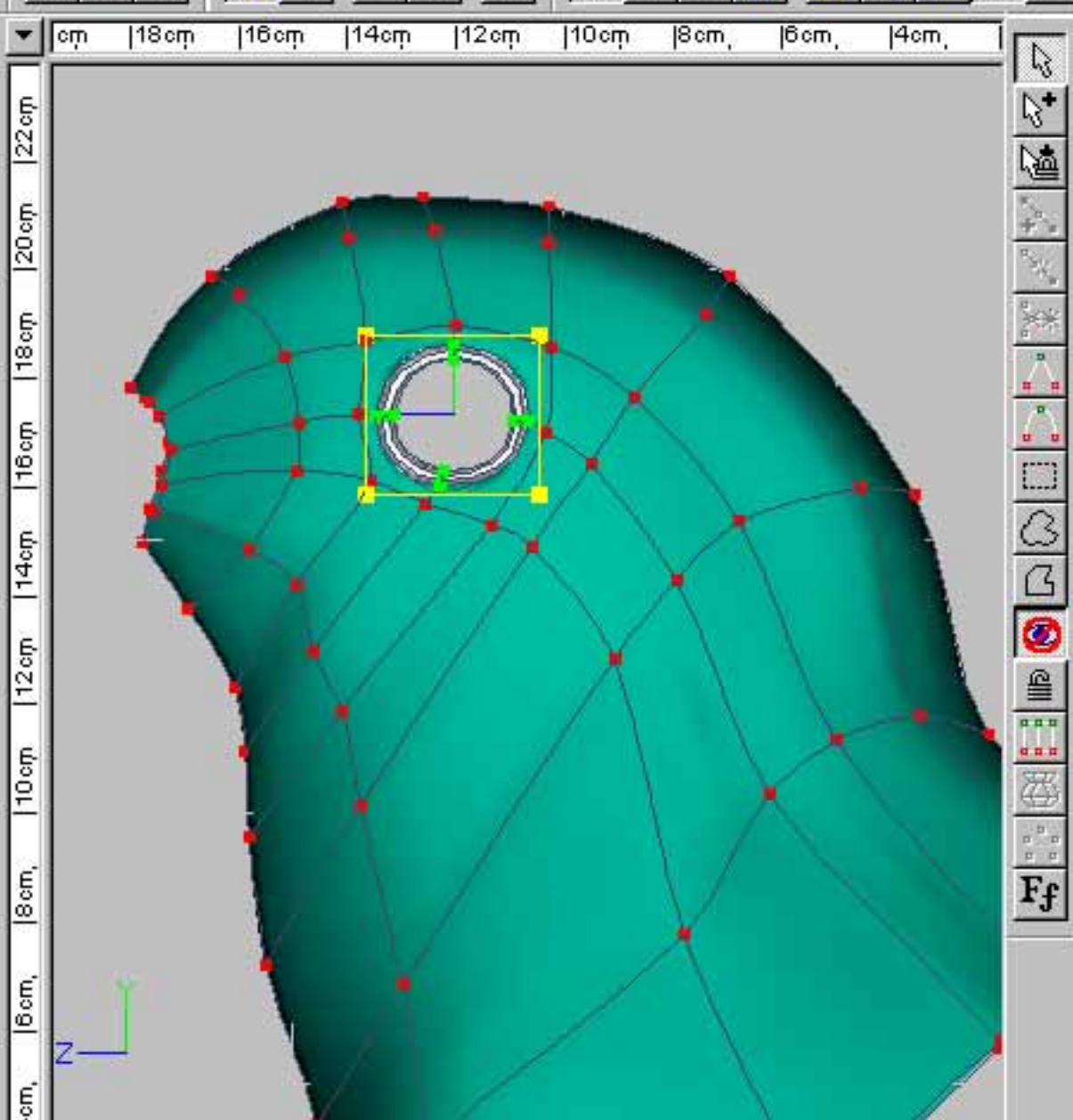
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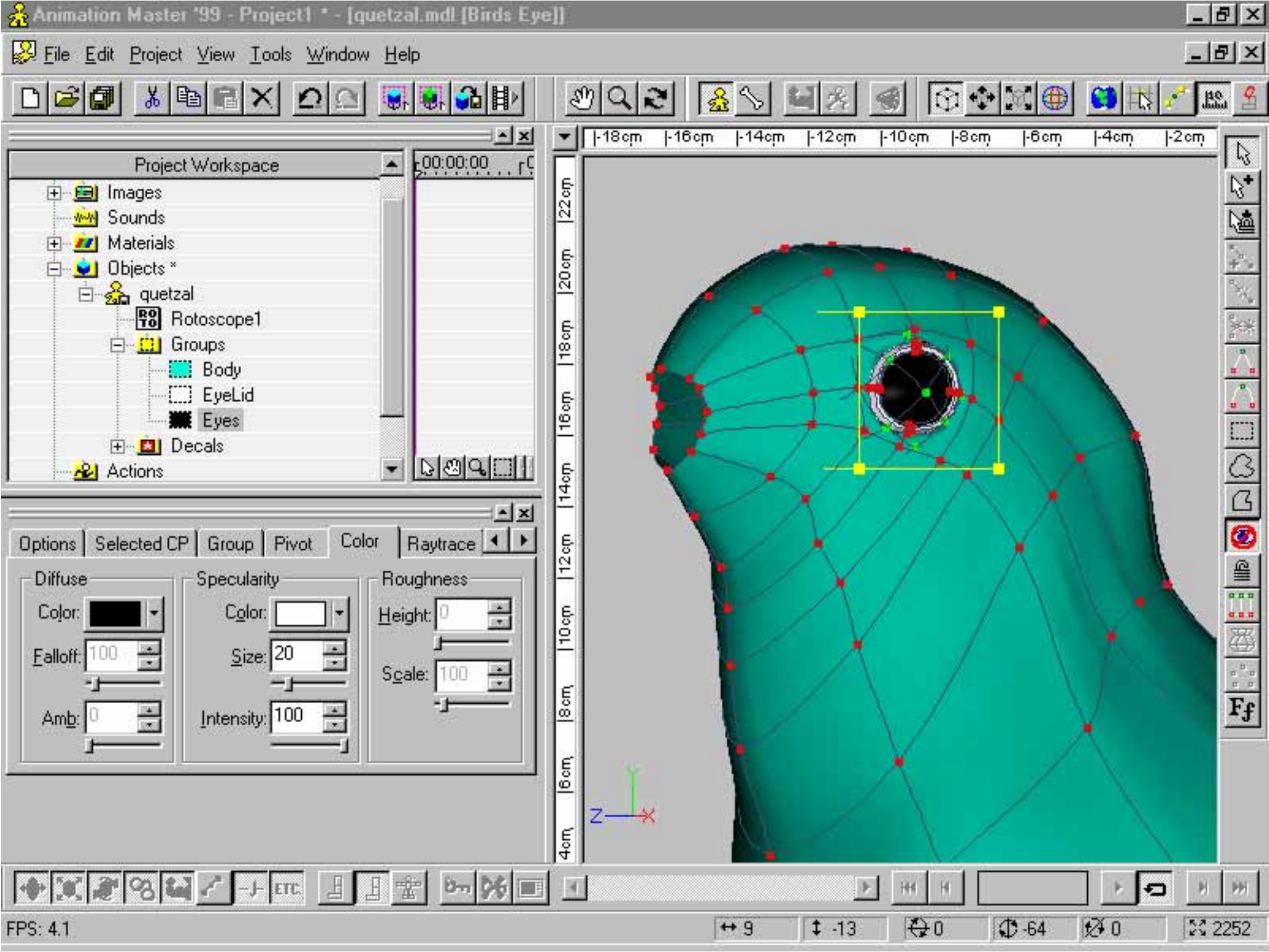
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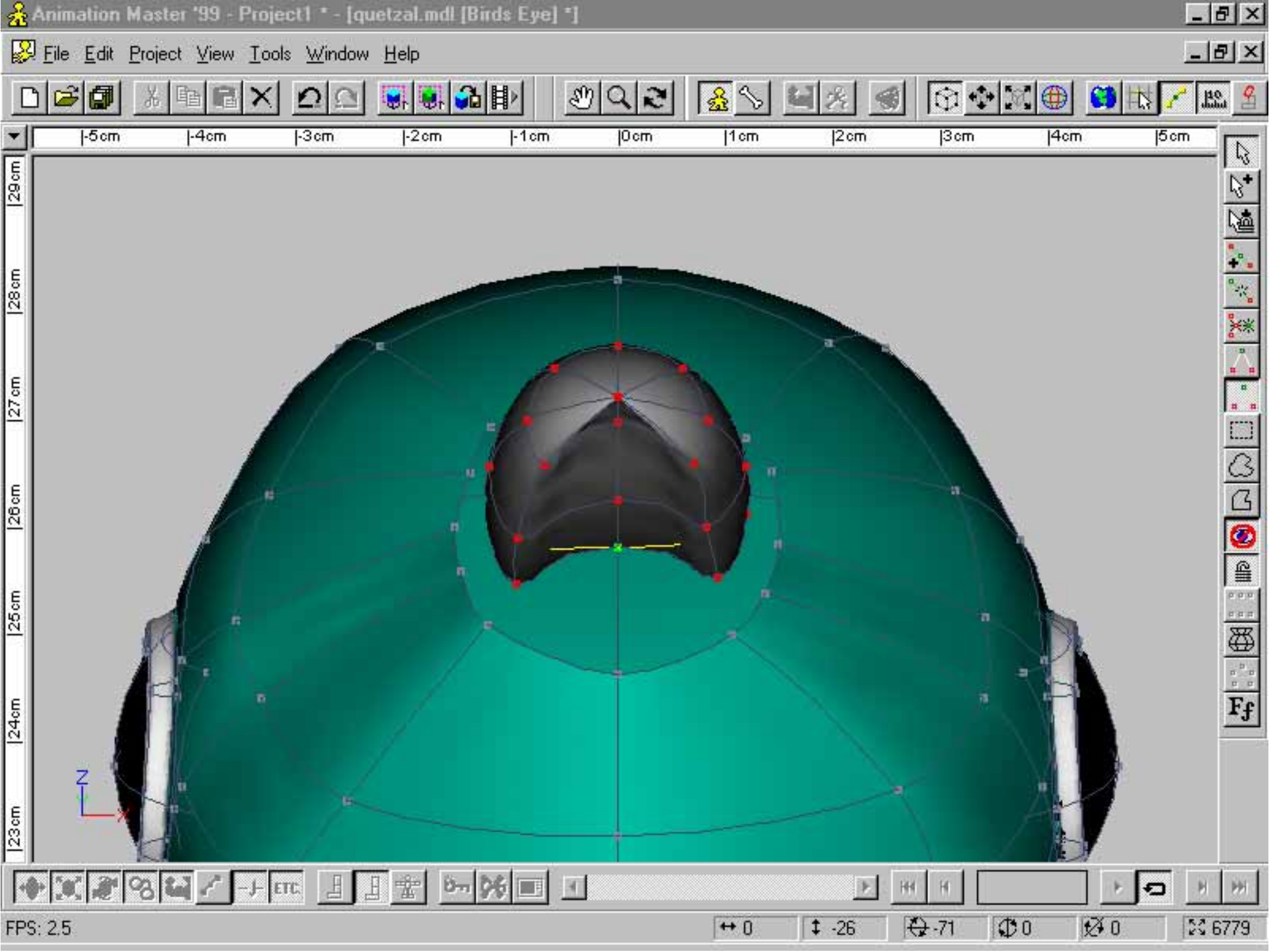
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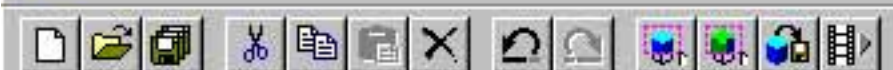
Height: 0

Scale: 100







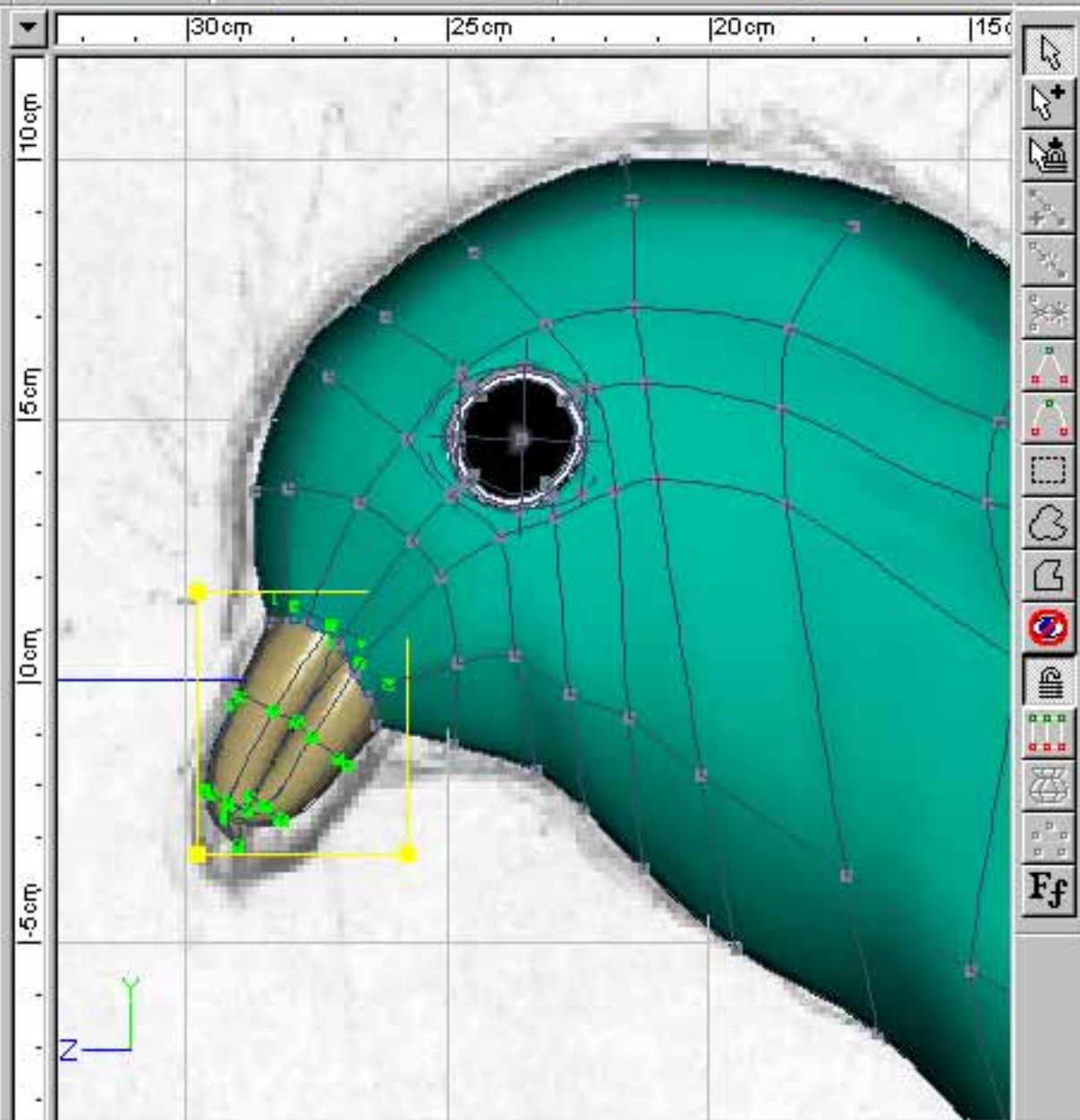


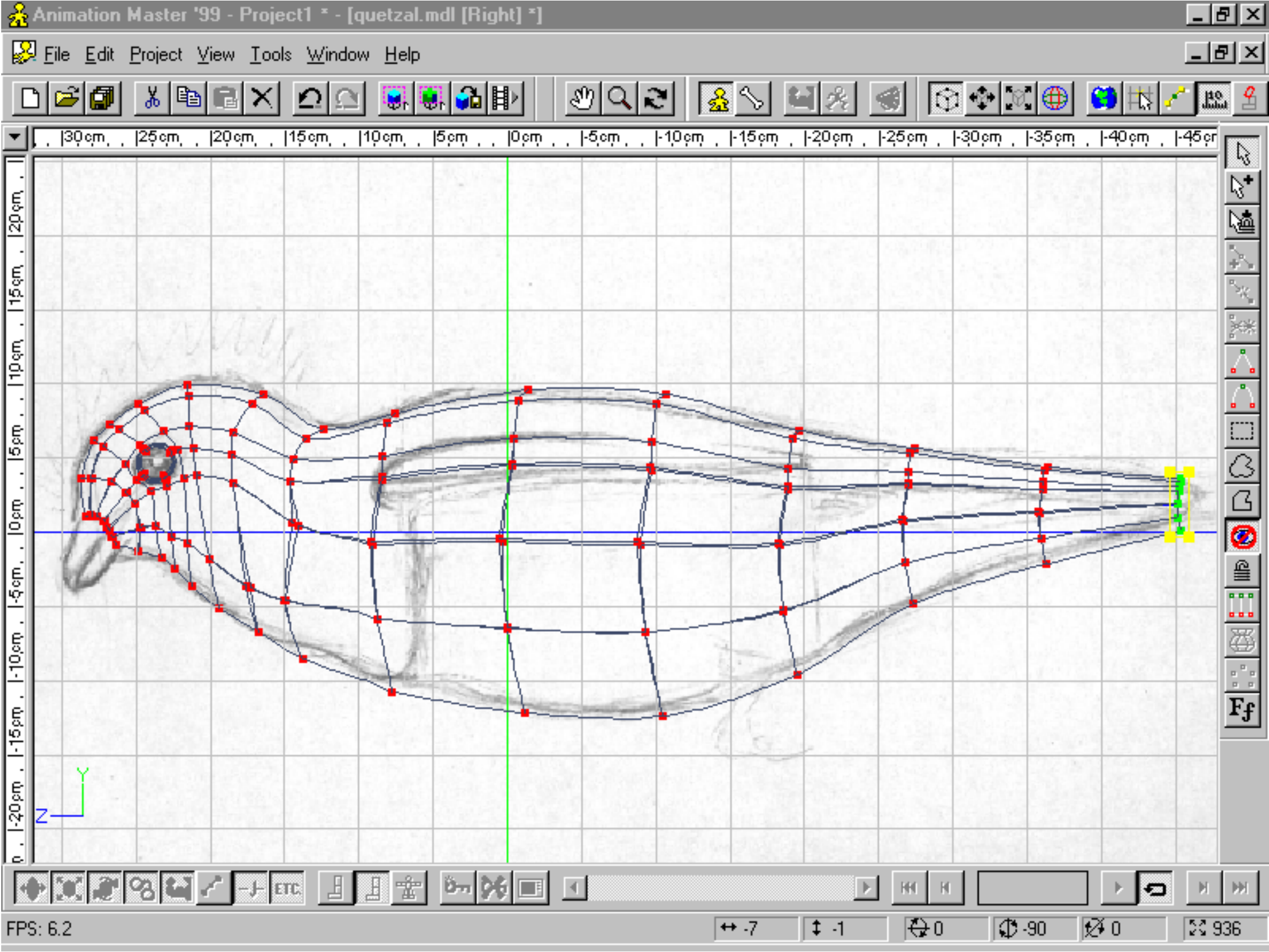
Project Workspace

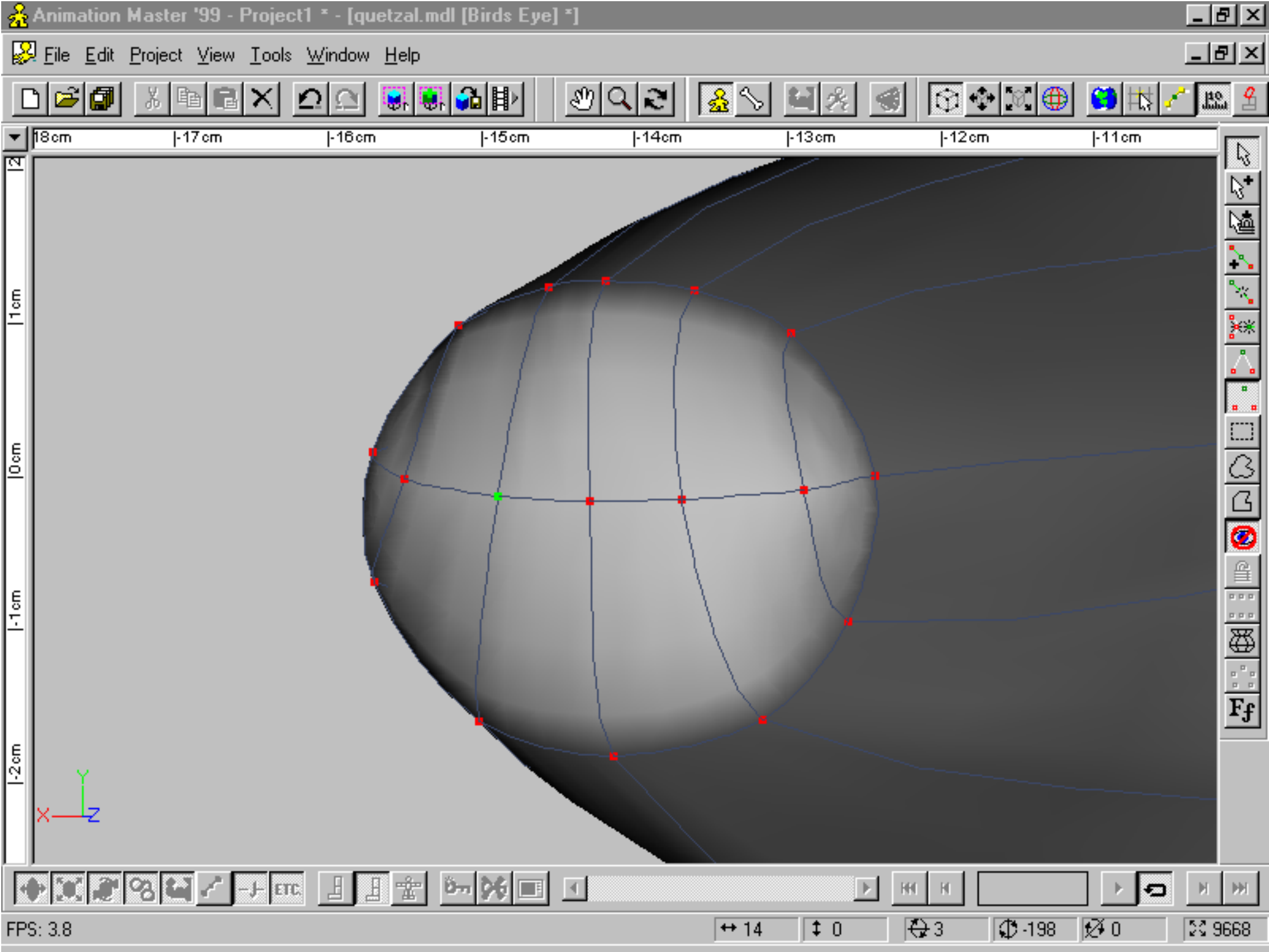
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 - Rotoscope1
 - Rotoscope2
 - Groups
 - Body
 - EyeLid
 - Eyes
 - Beak
 - Decals
 - Actions
 - Choreographies

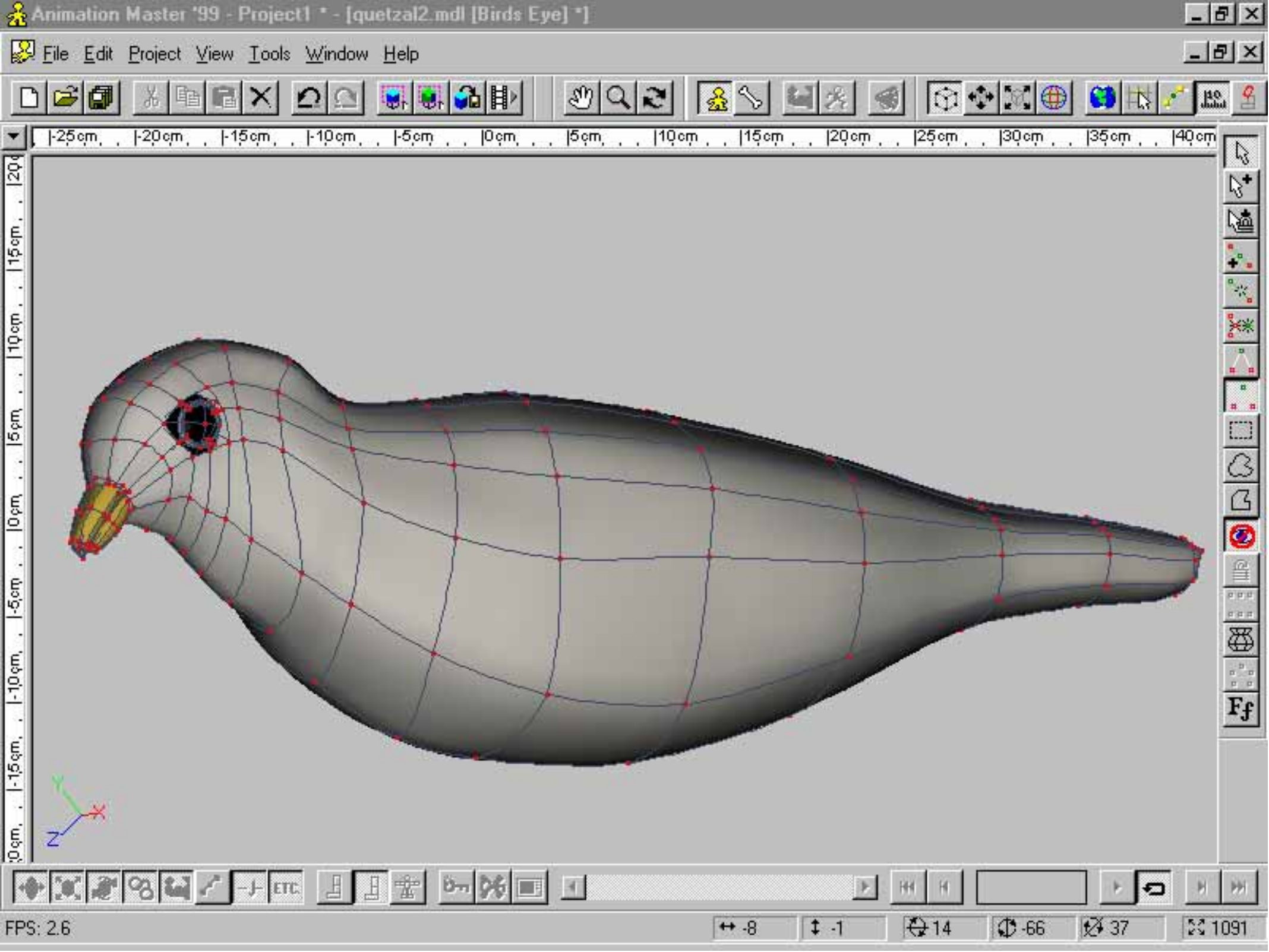
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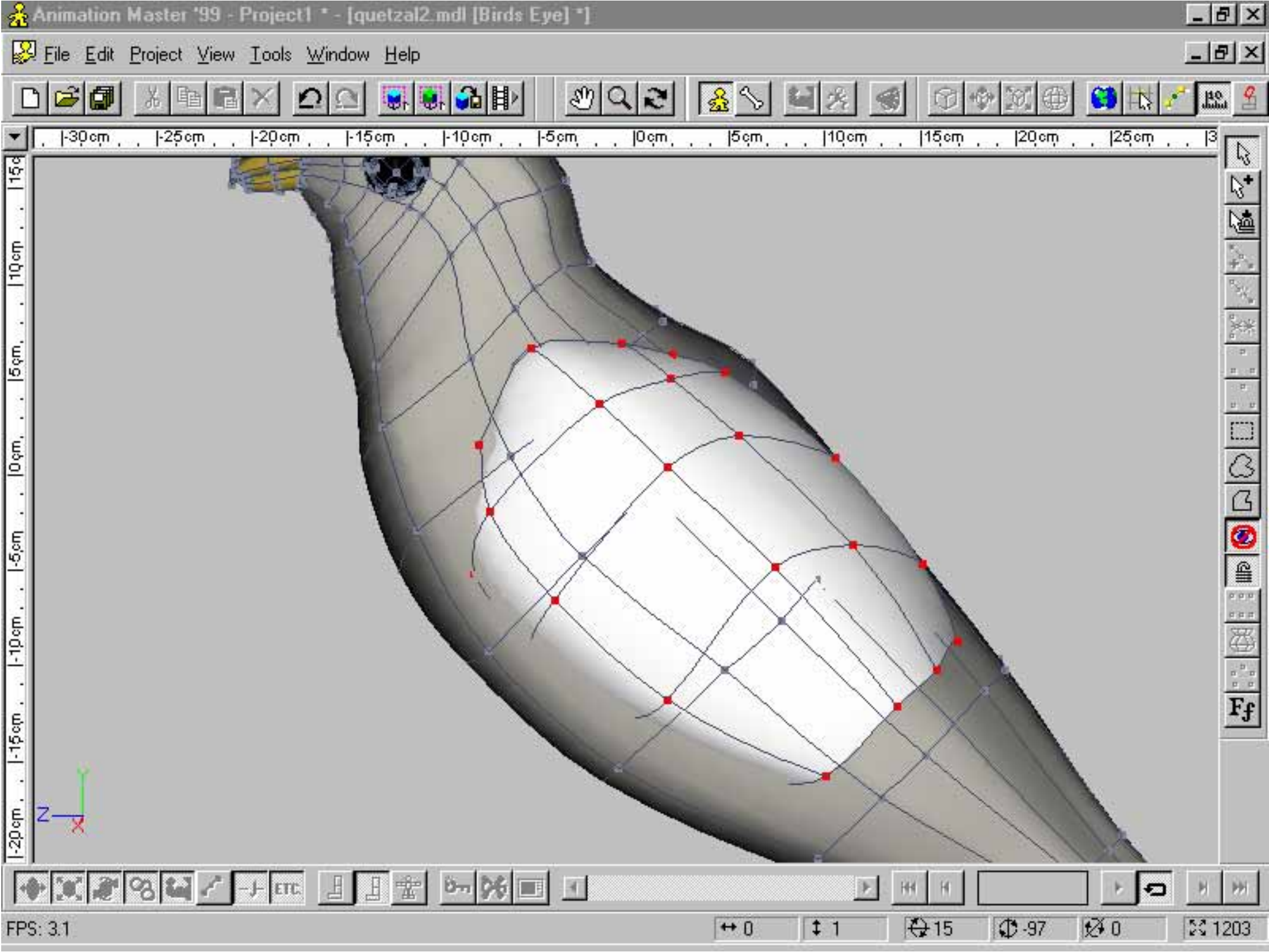
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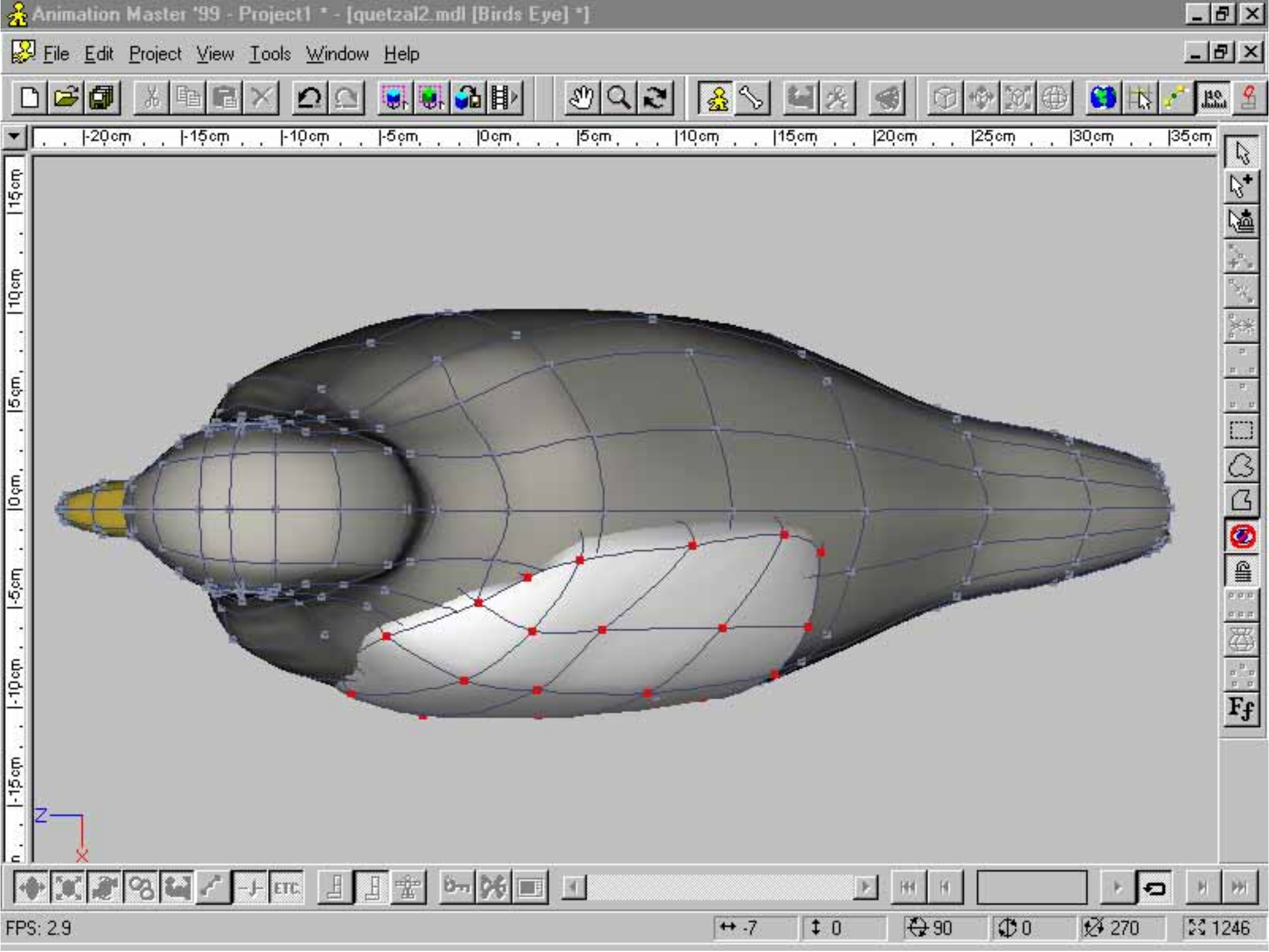


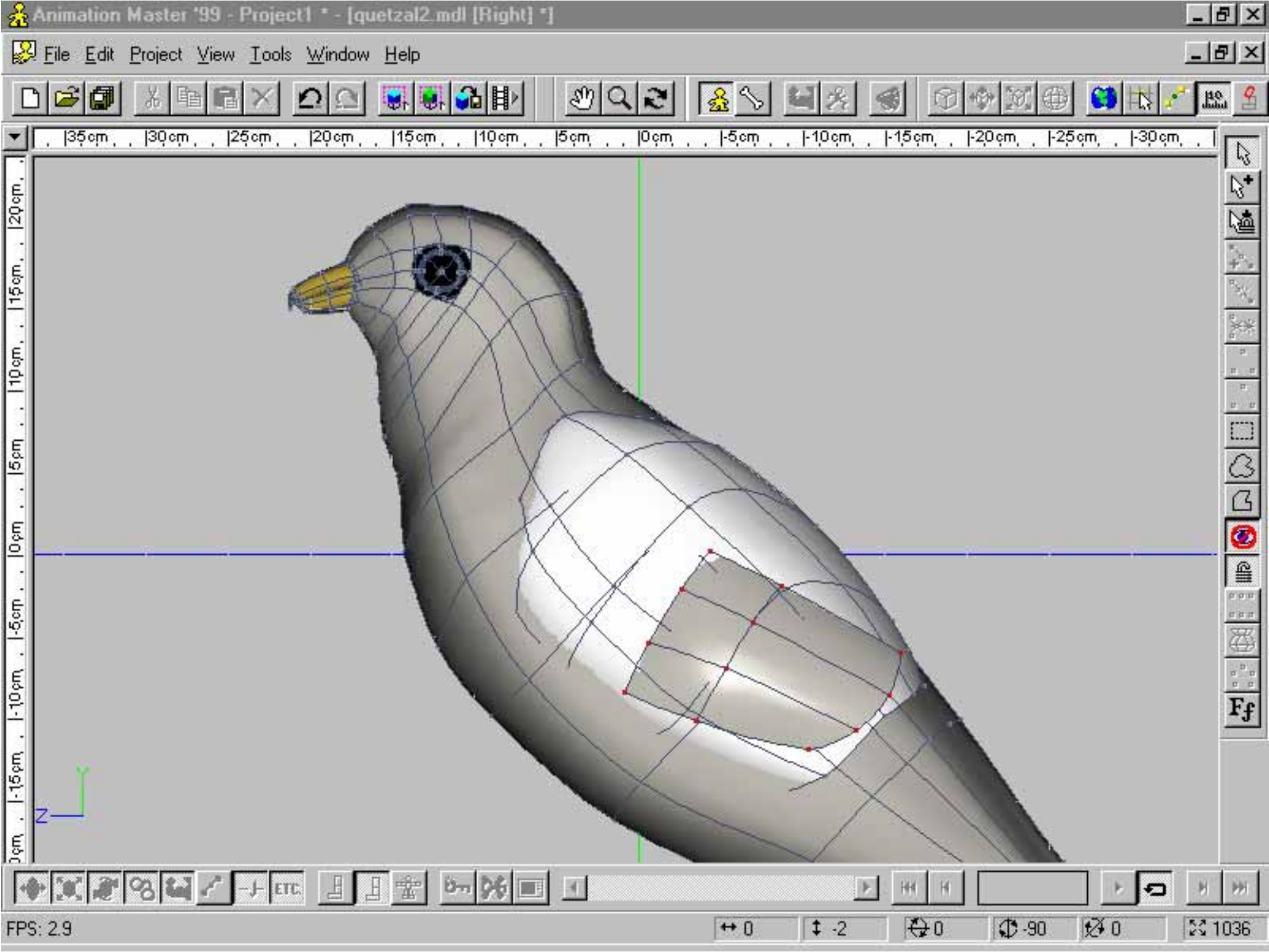


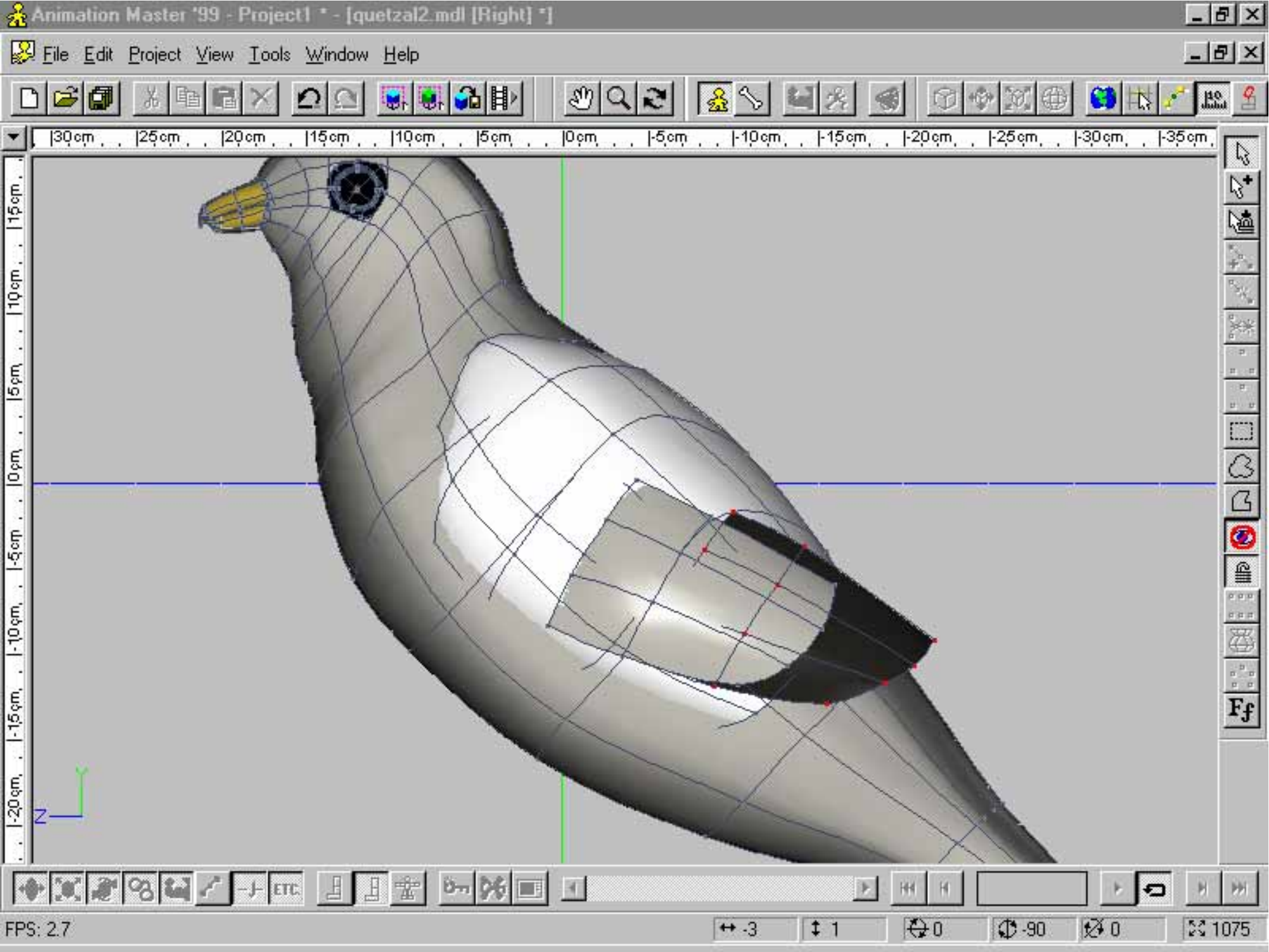


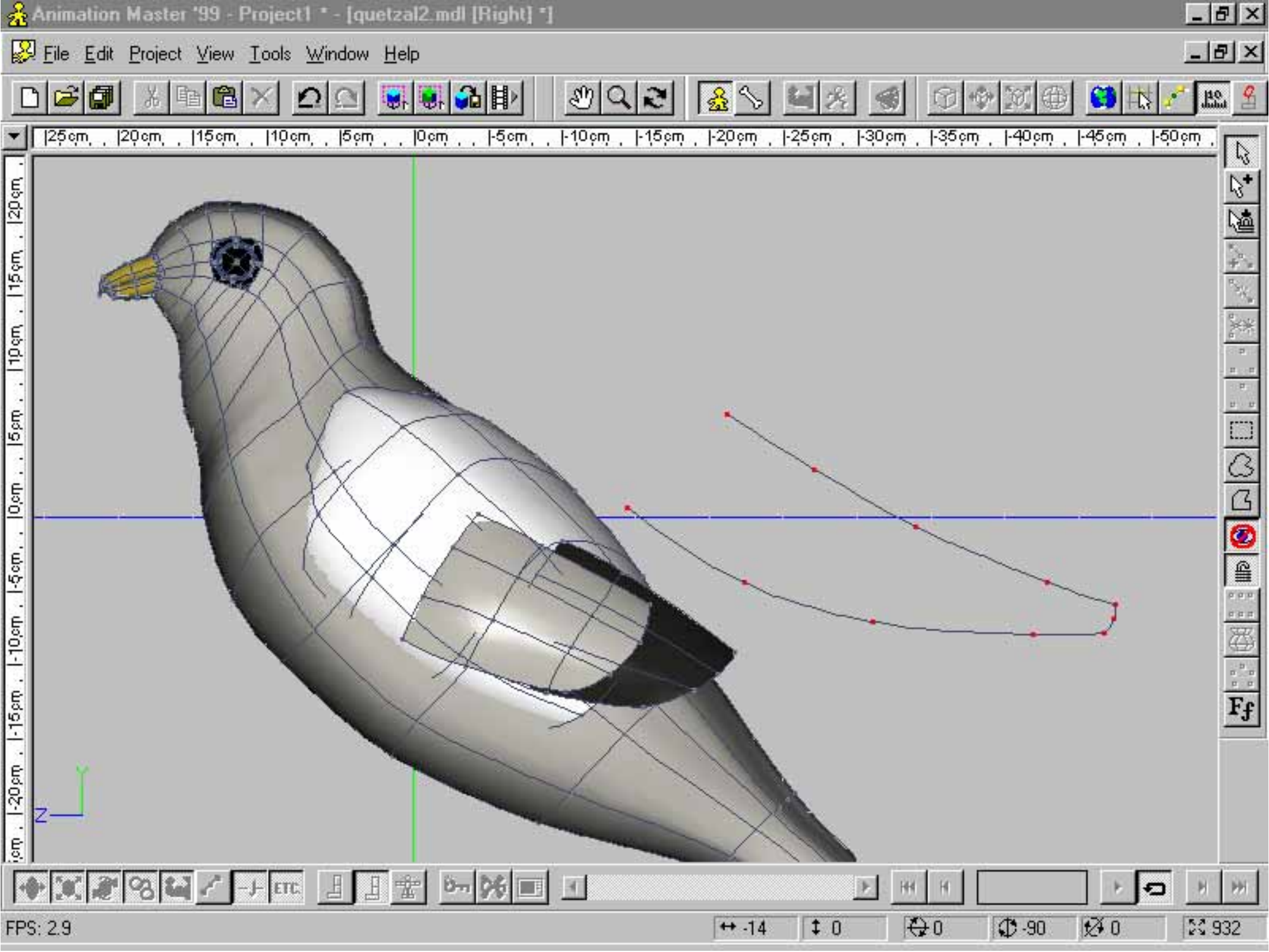


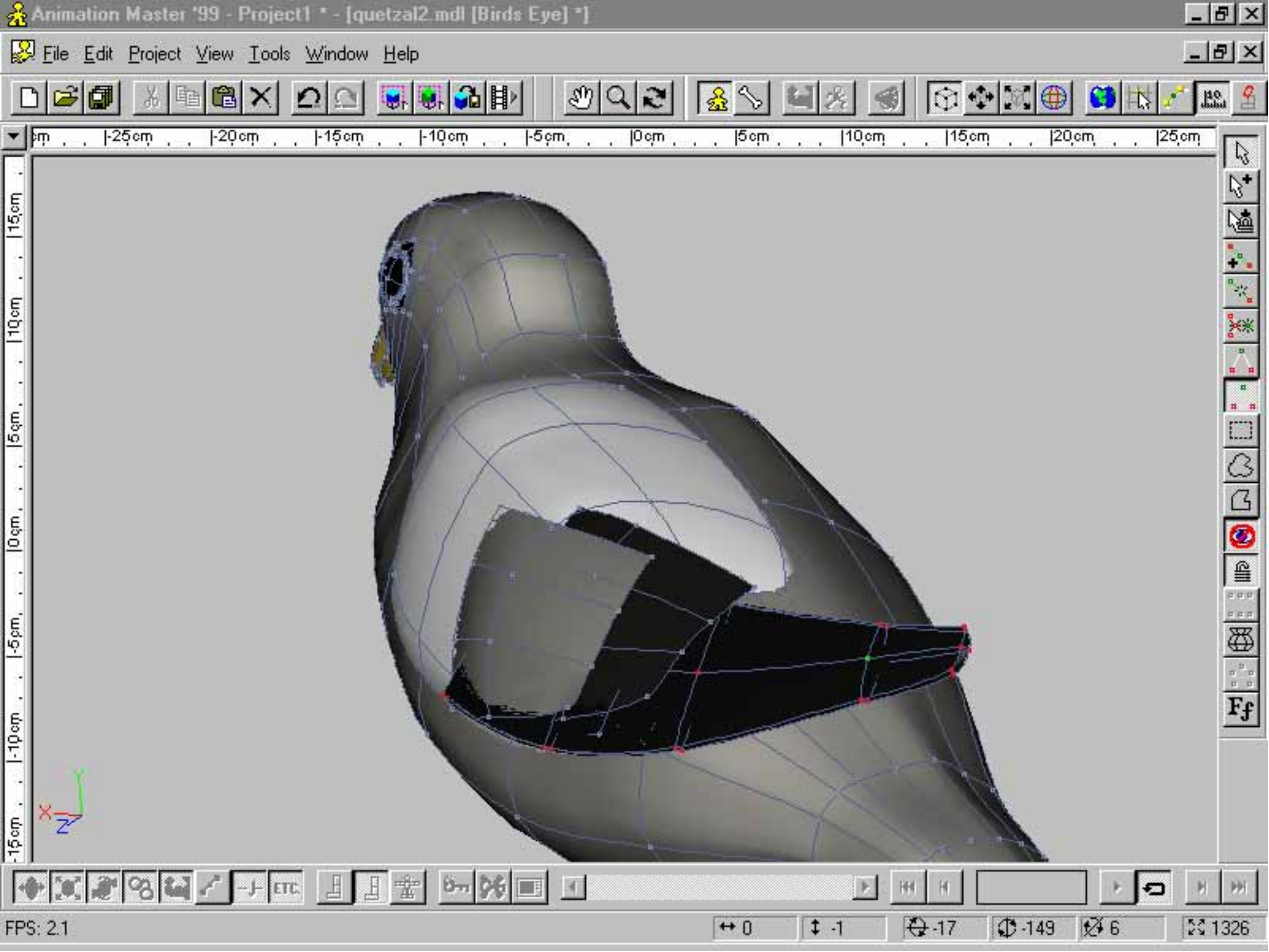






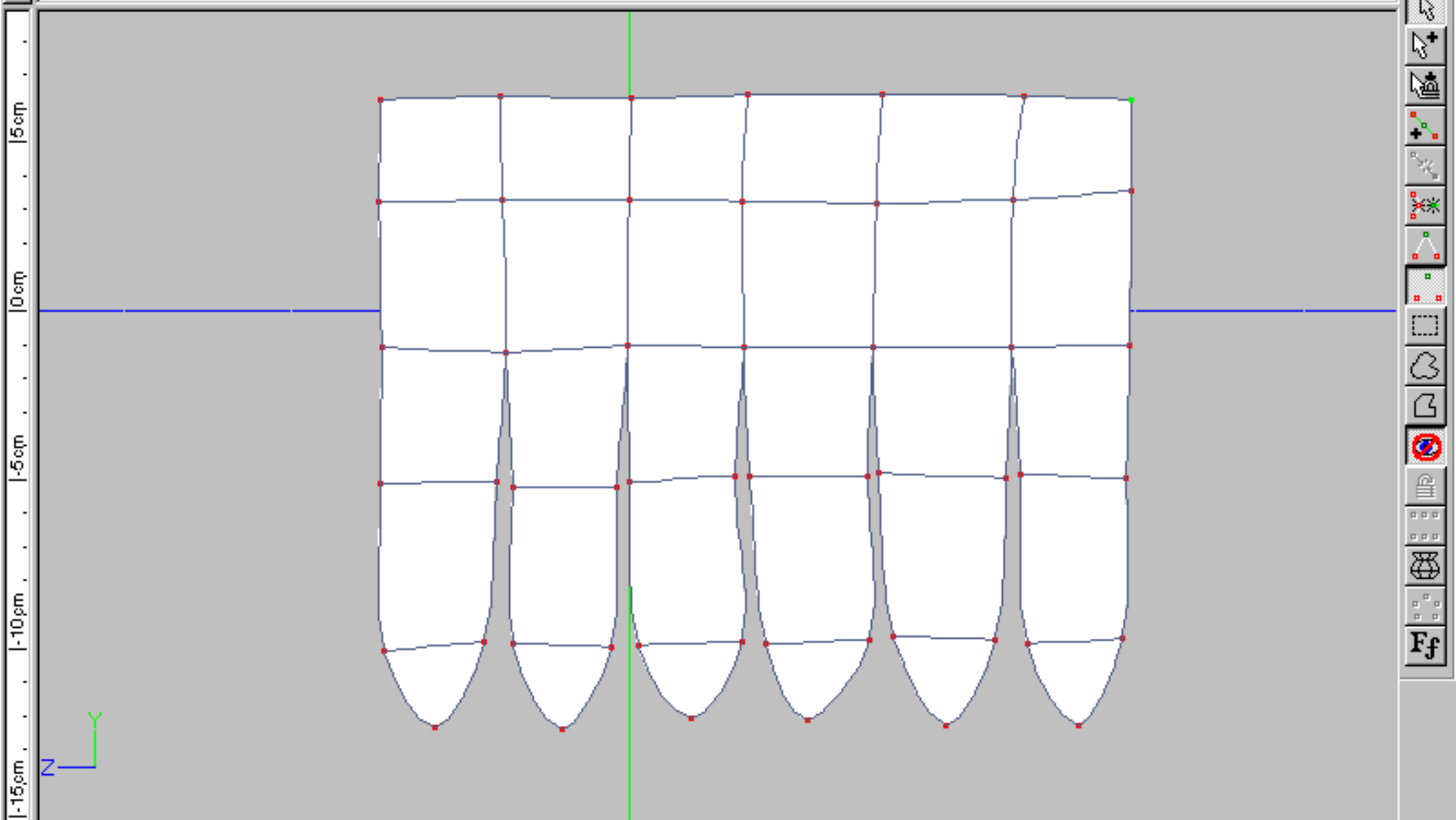


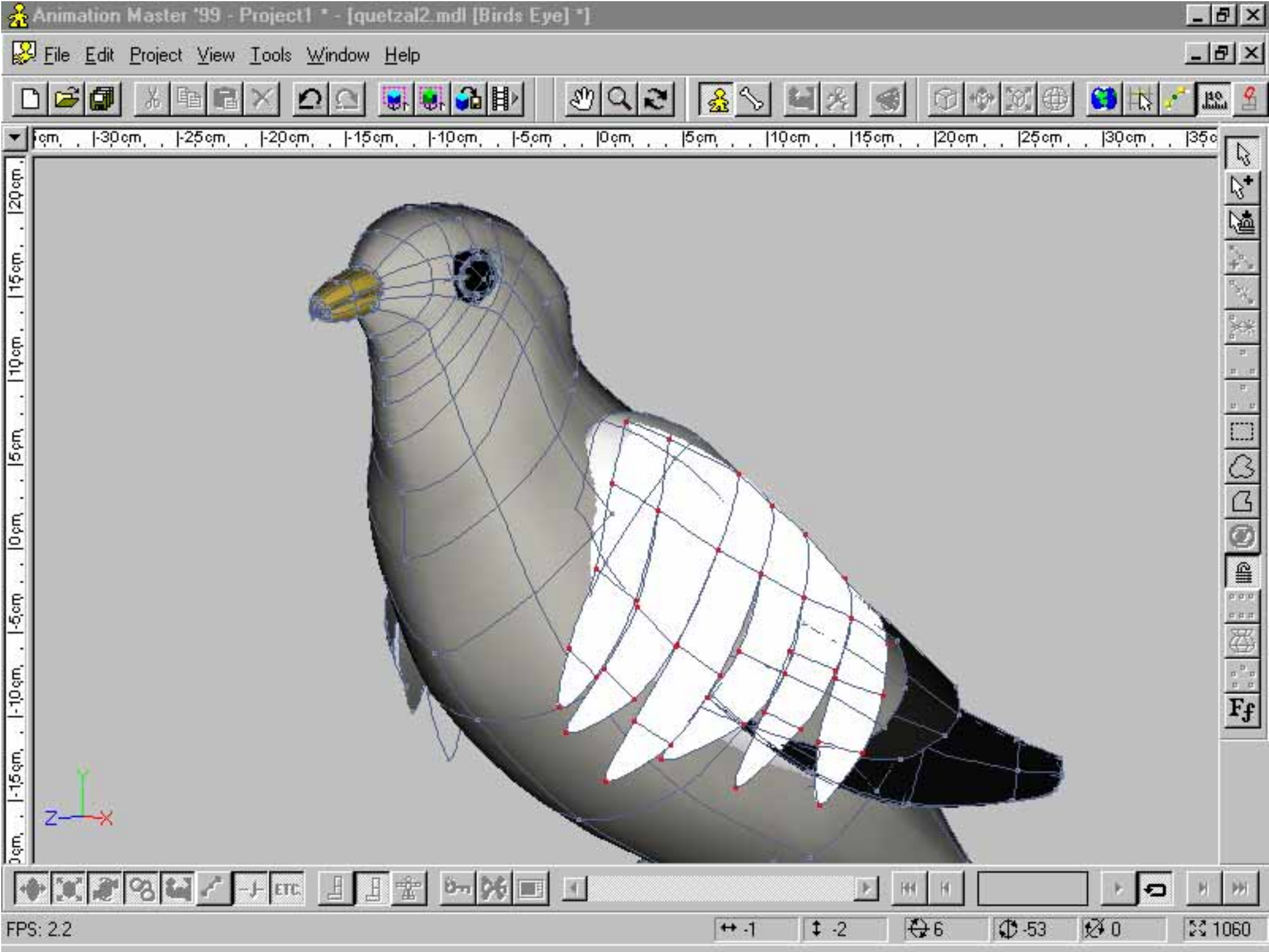


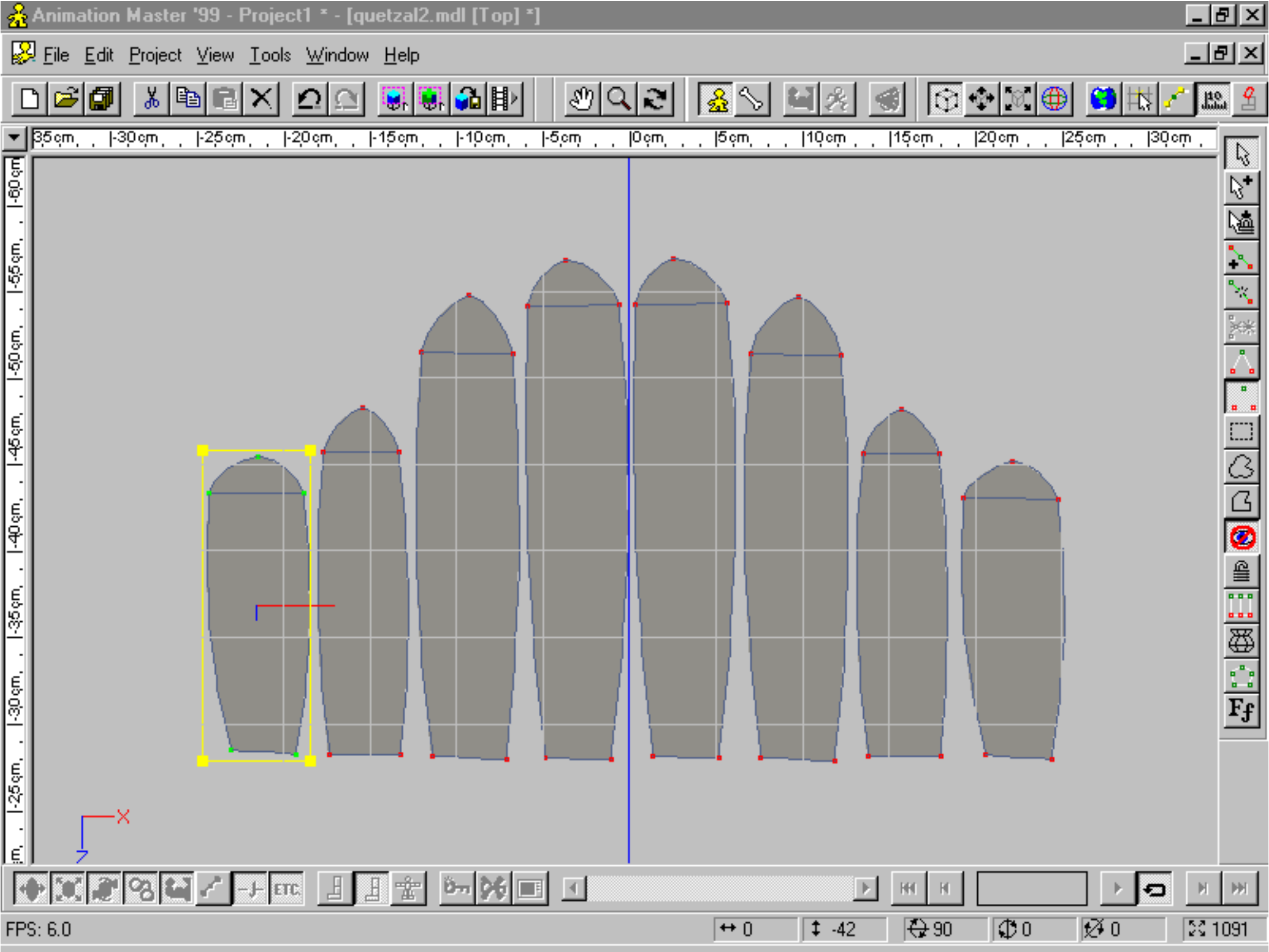


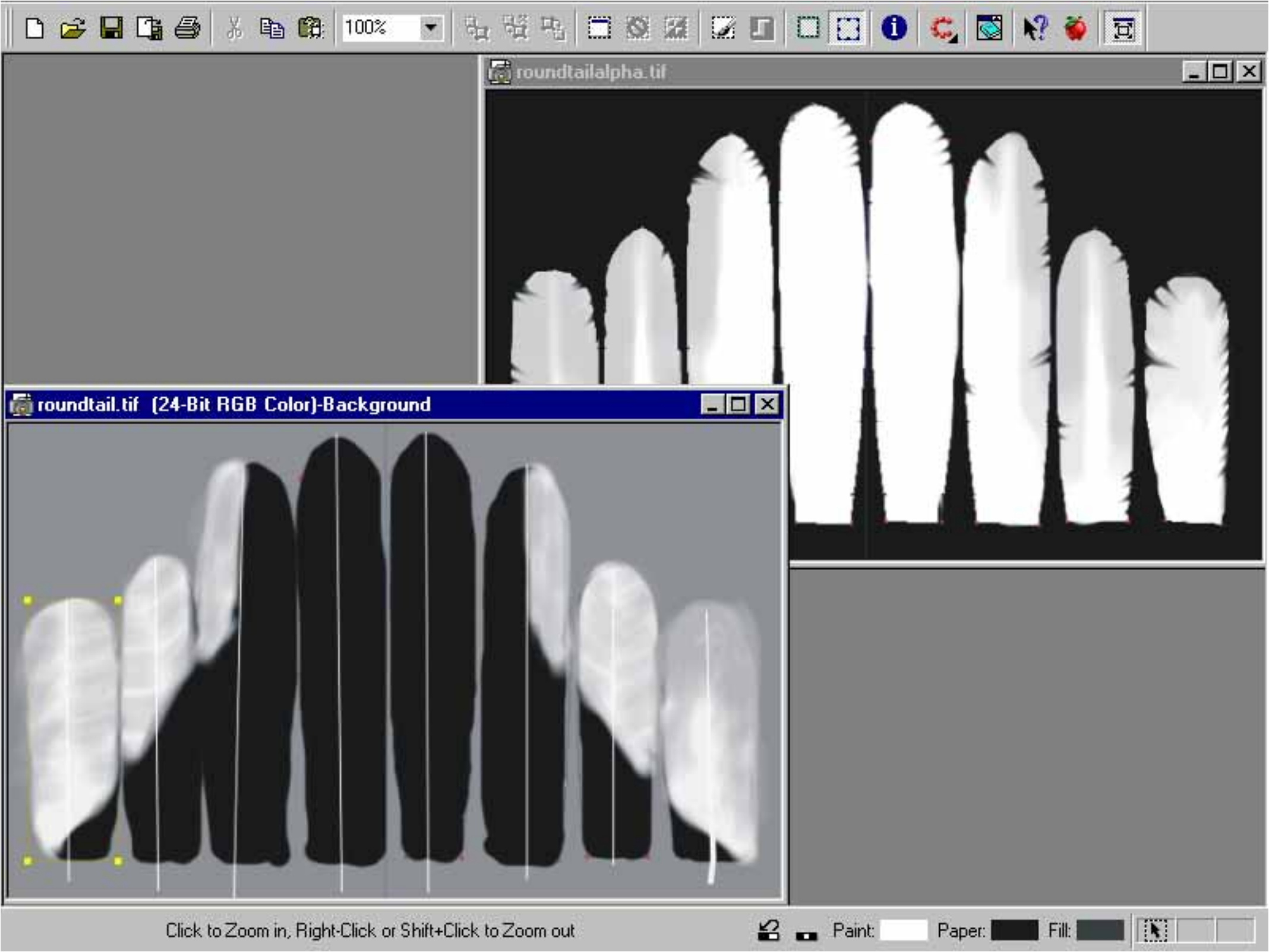


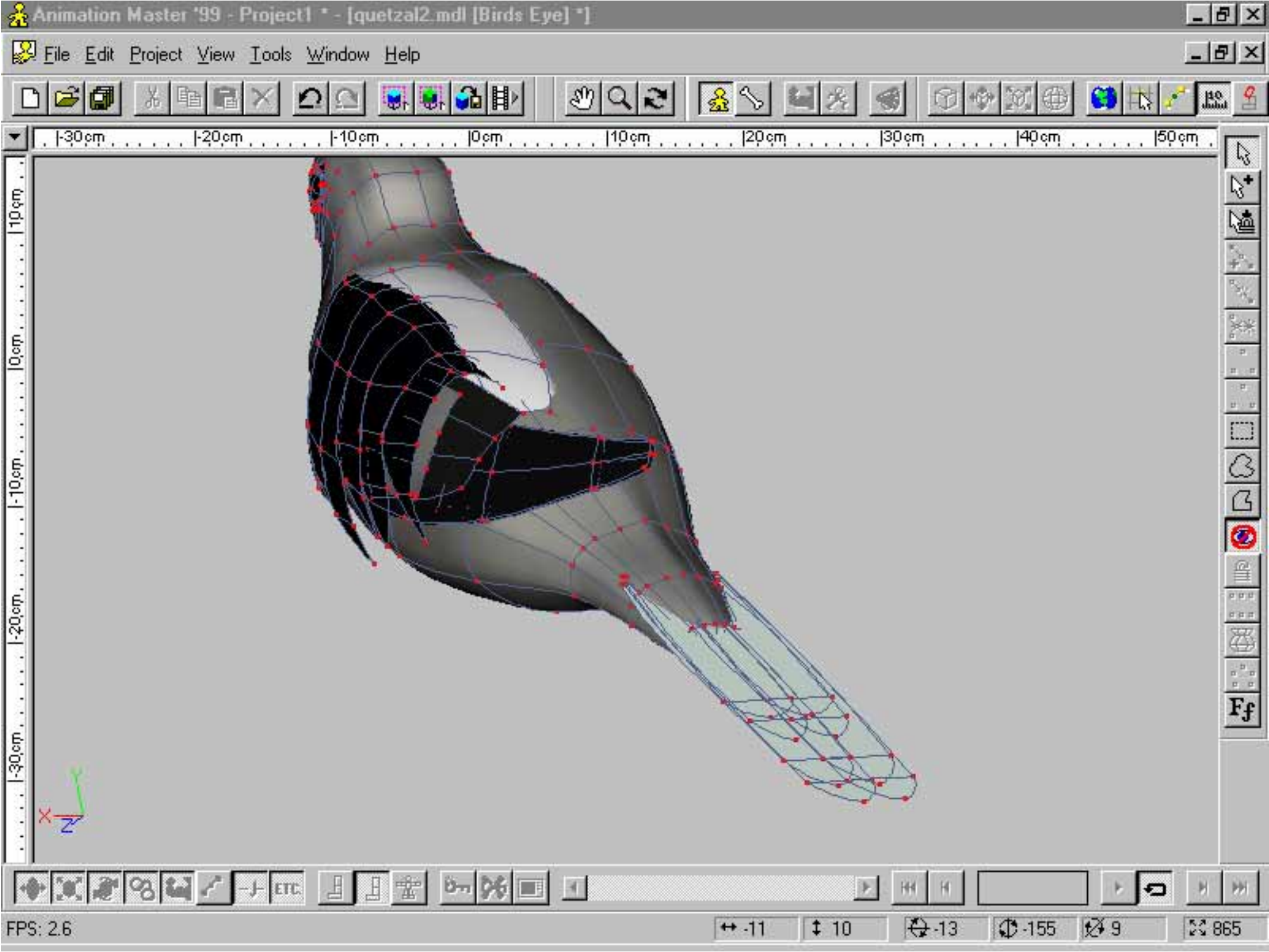
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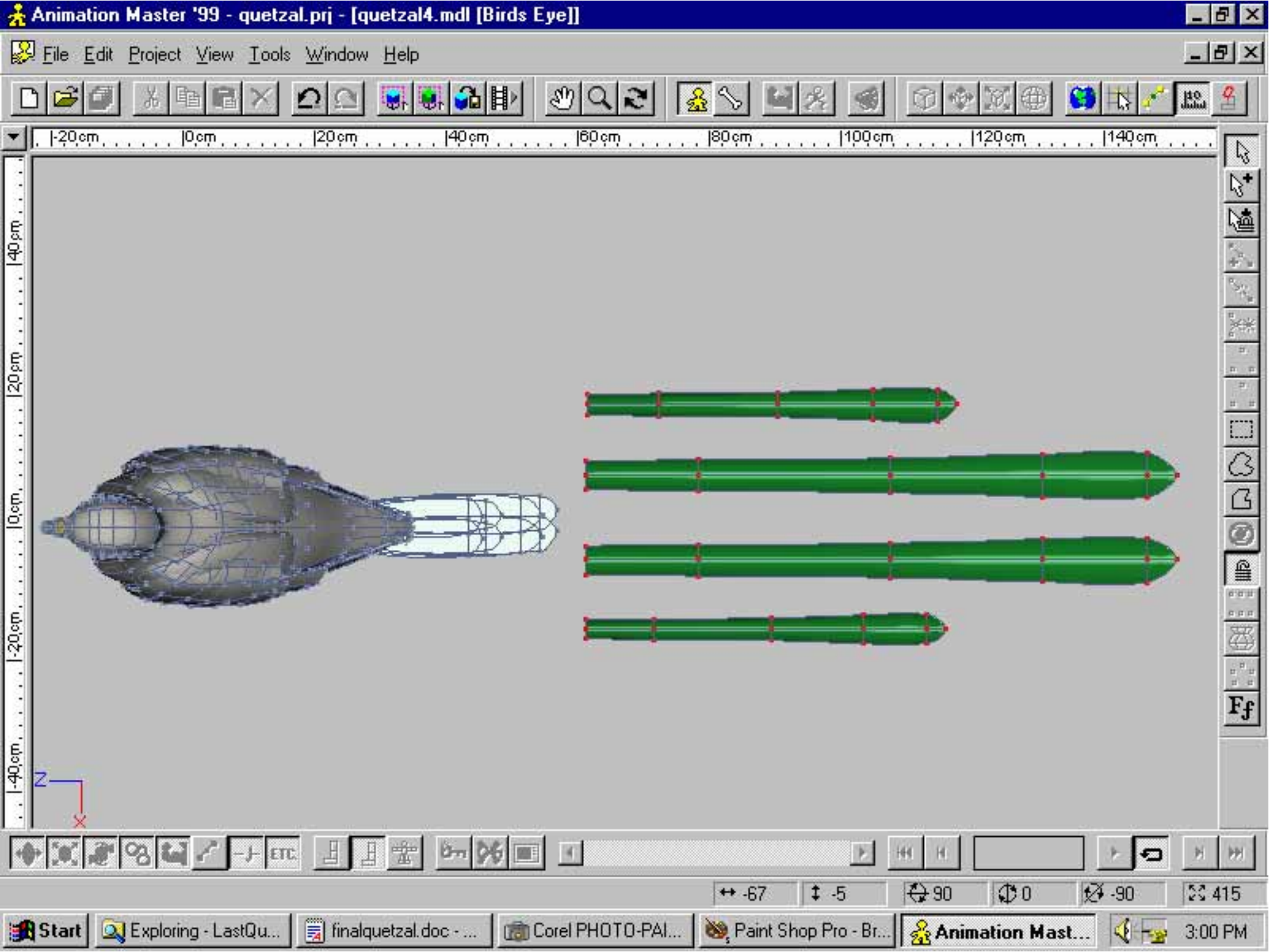




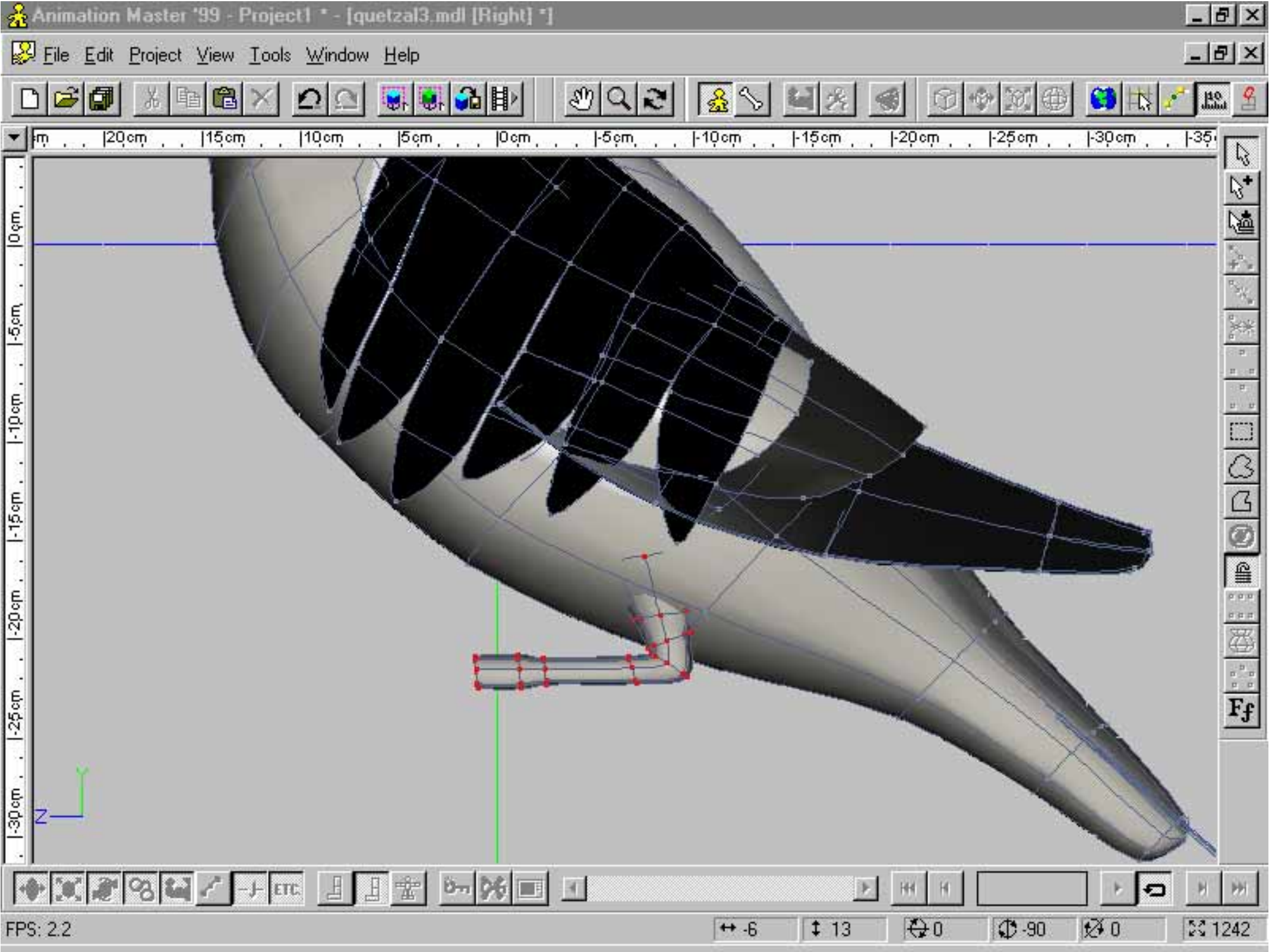


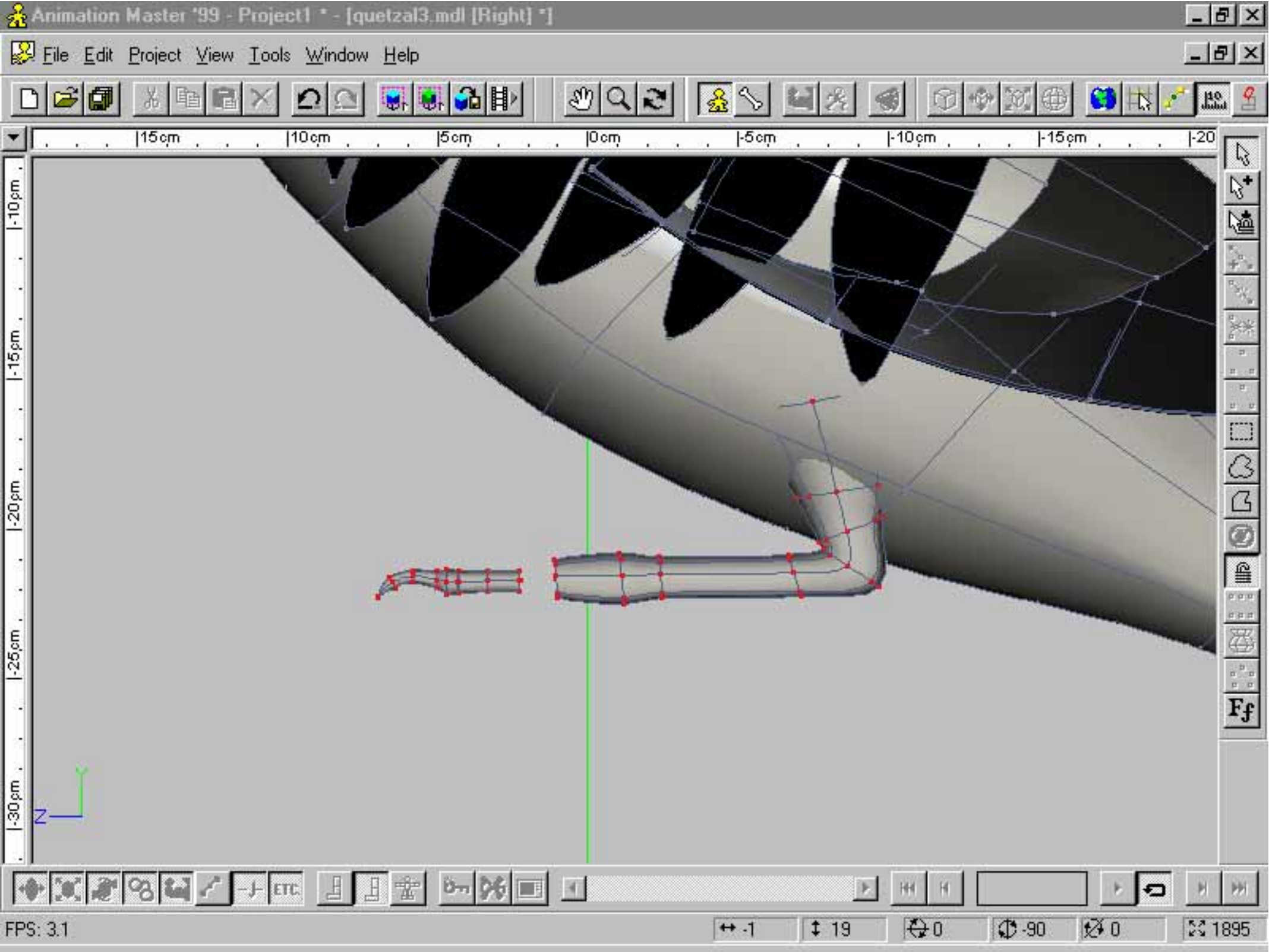


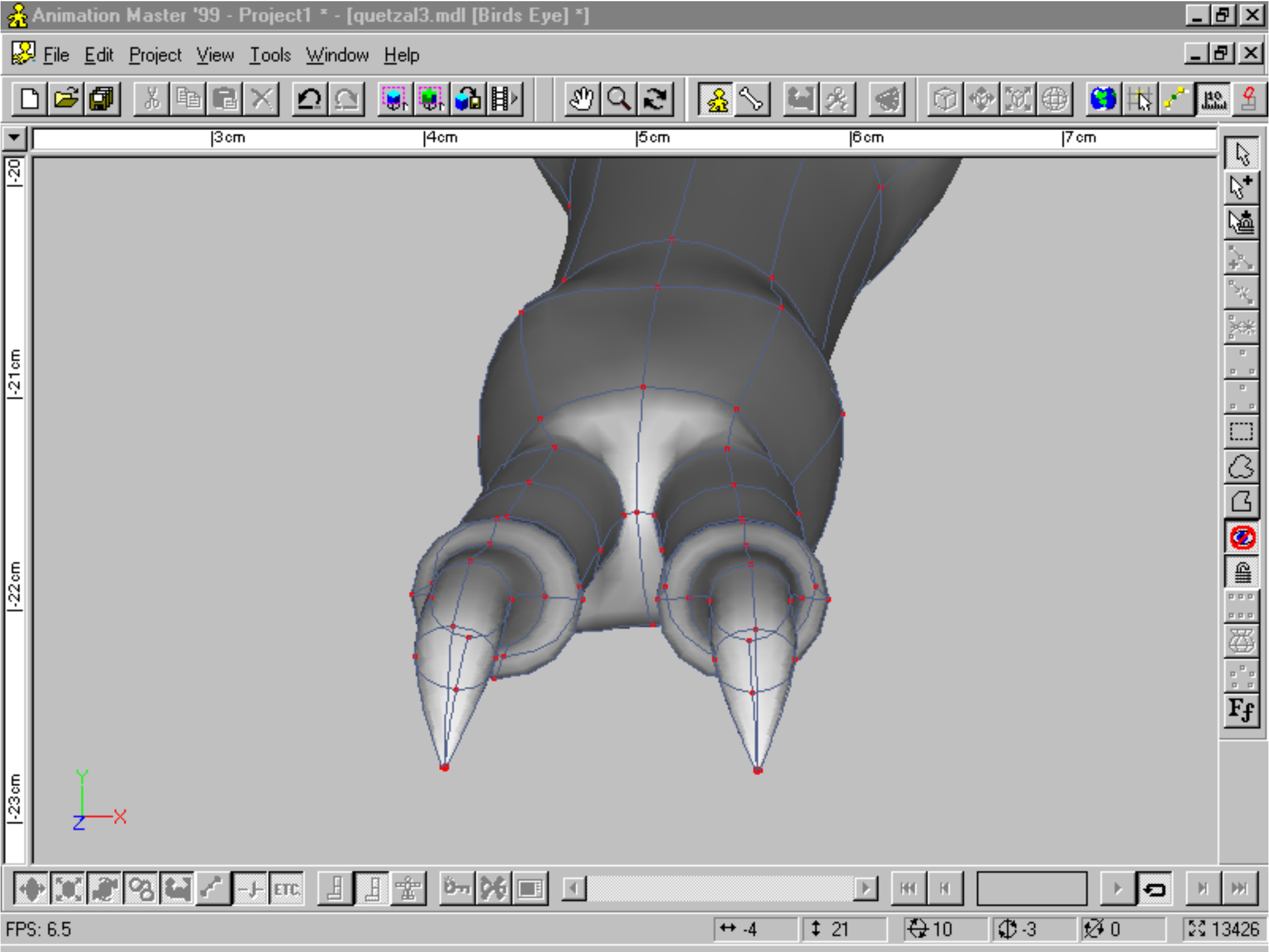


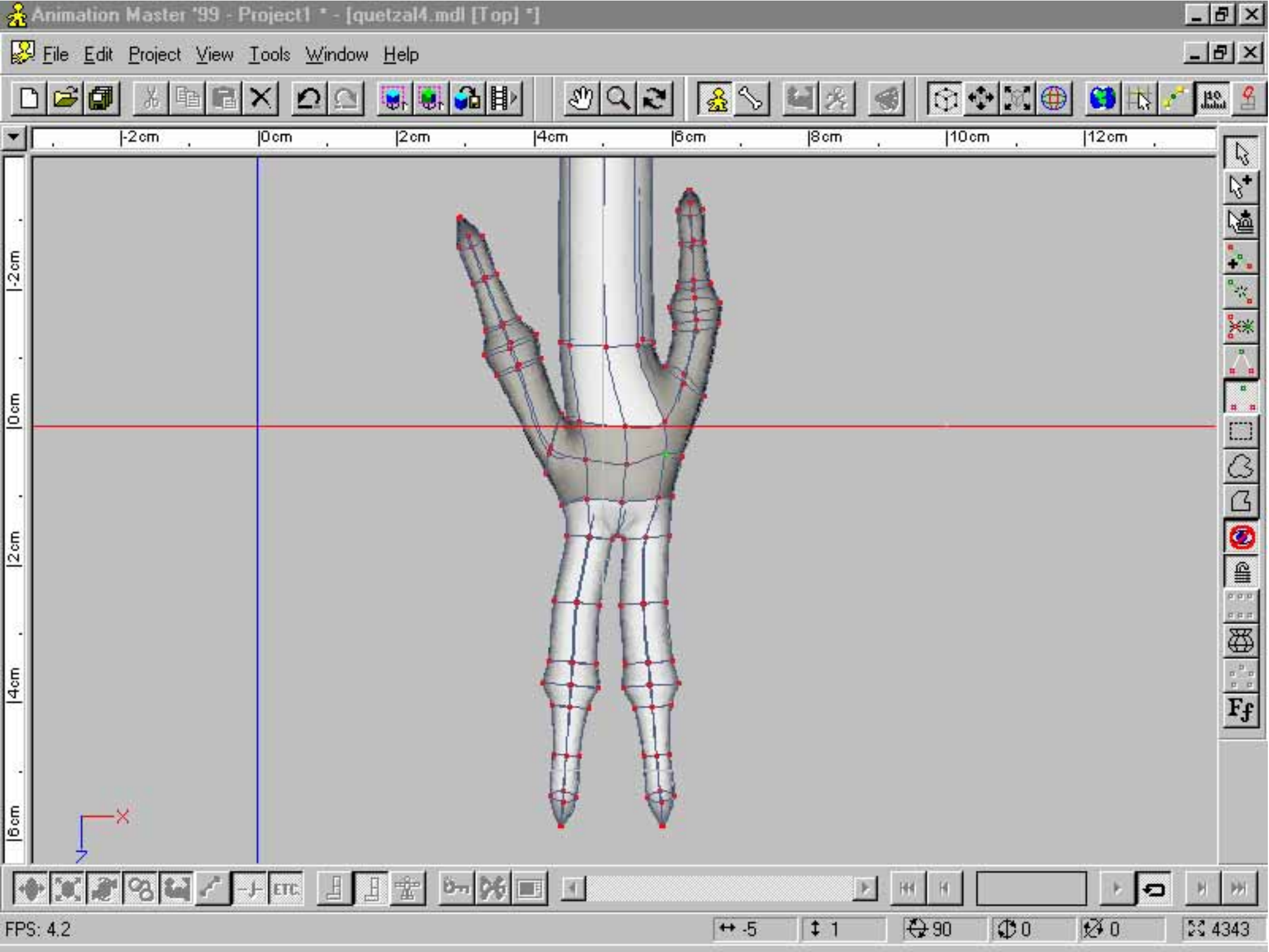








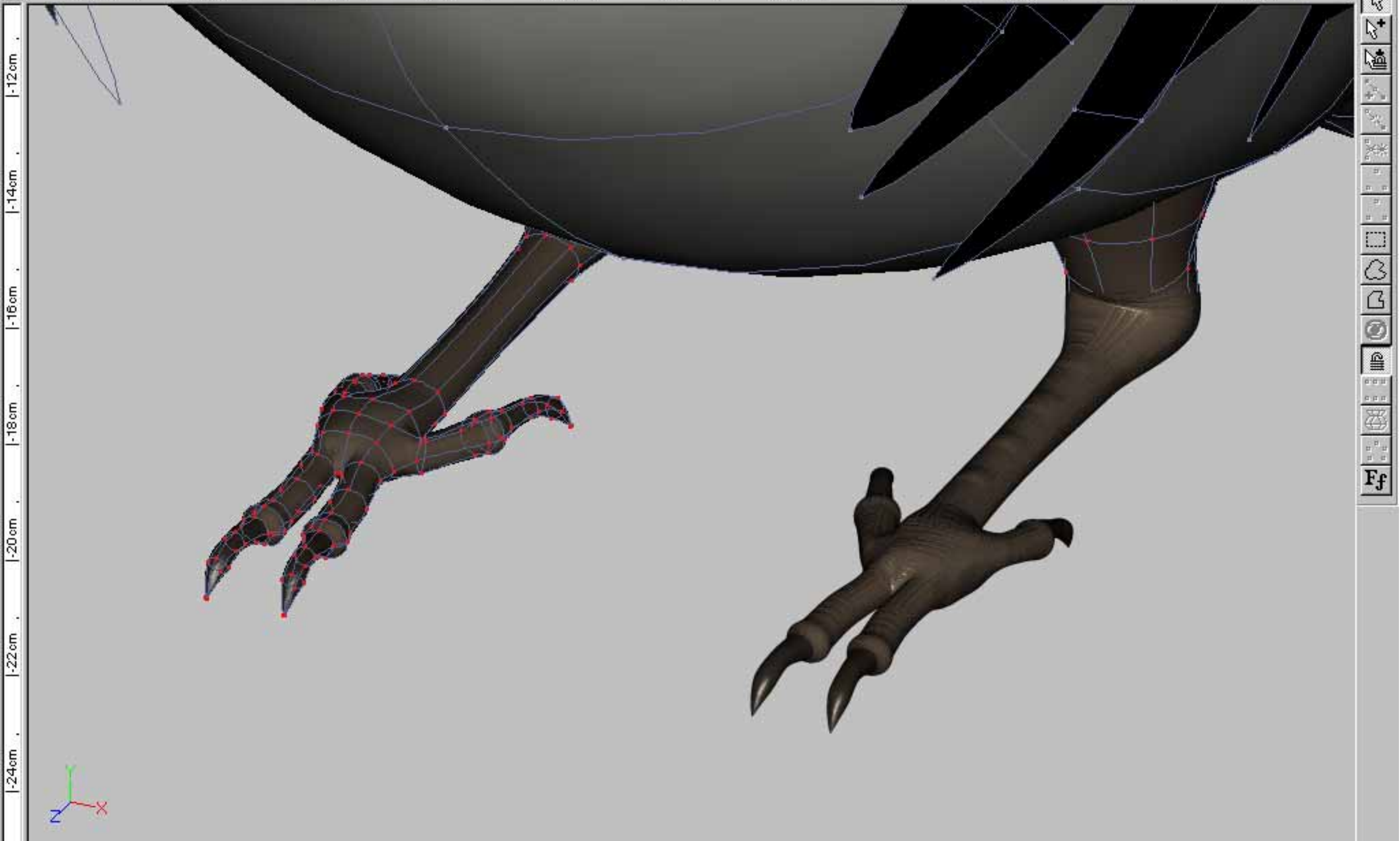






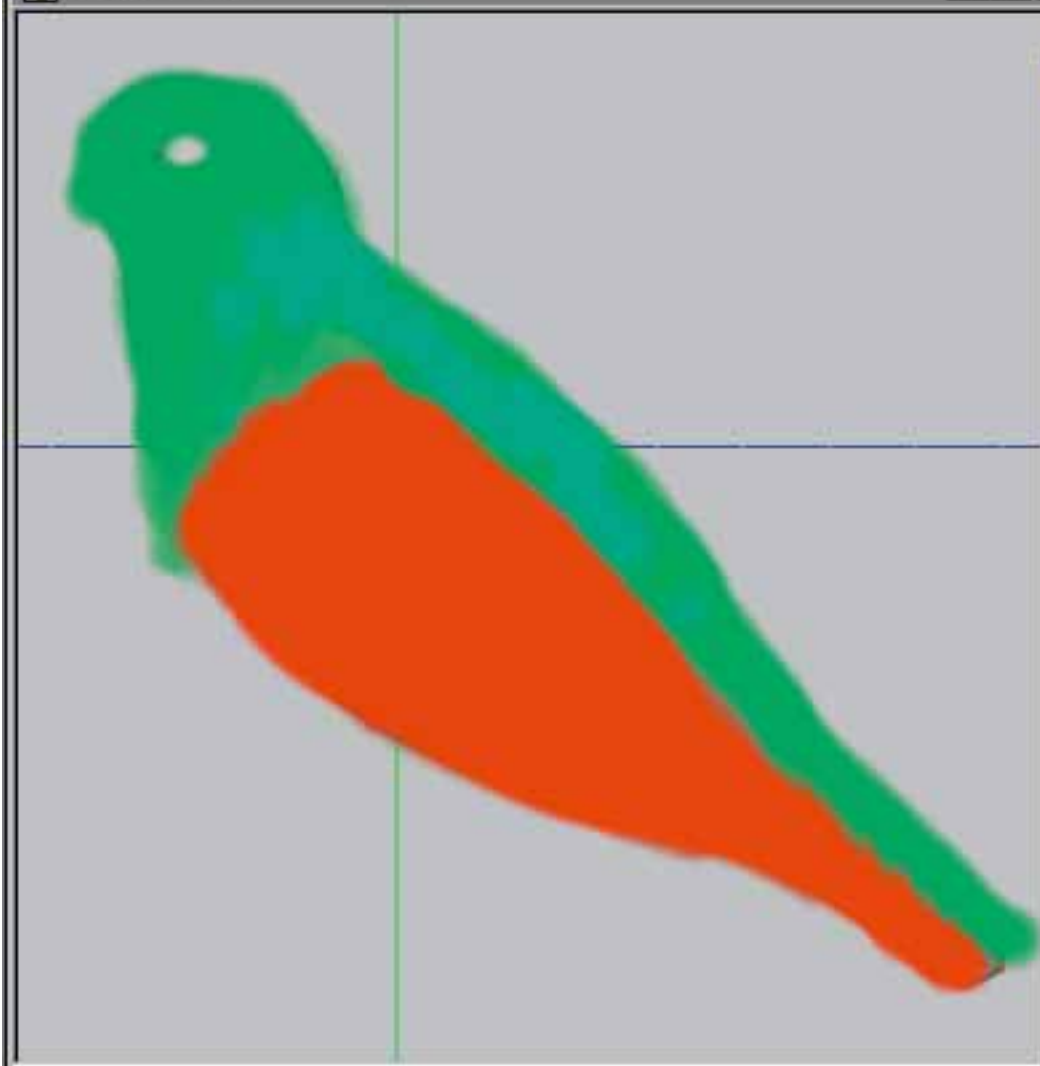


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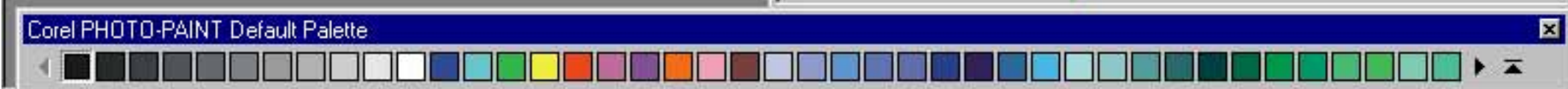
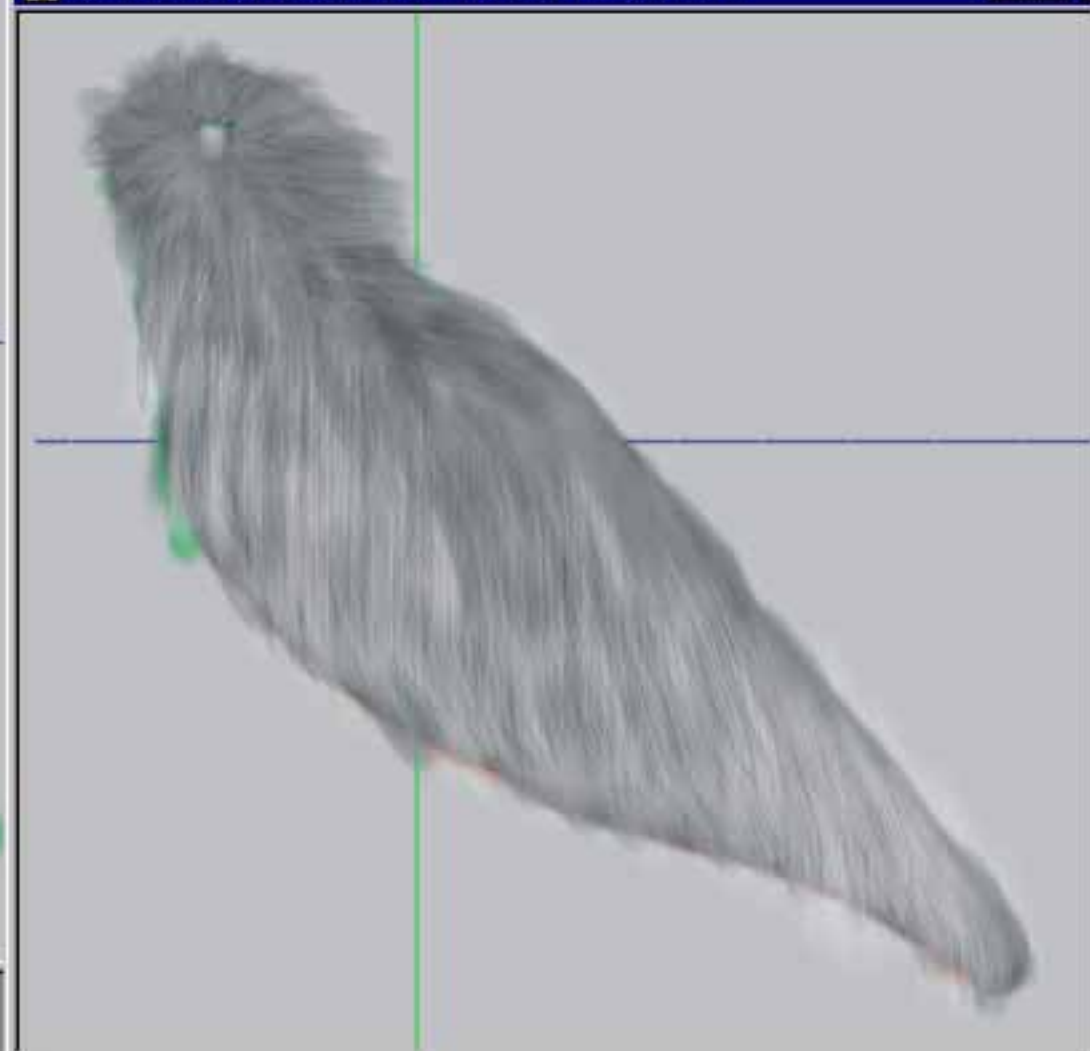




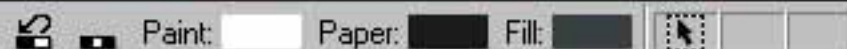
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bodybump.tif (24-Bit RGB Color)-Background

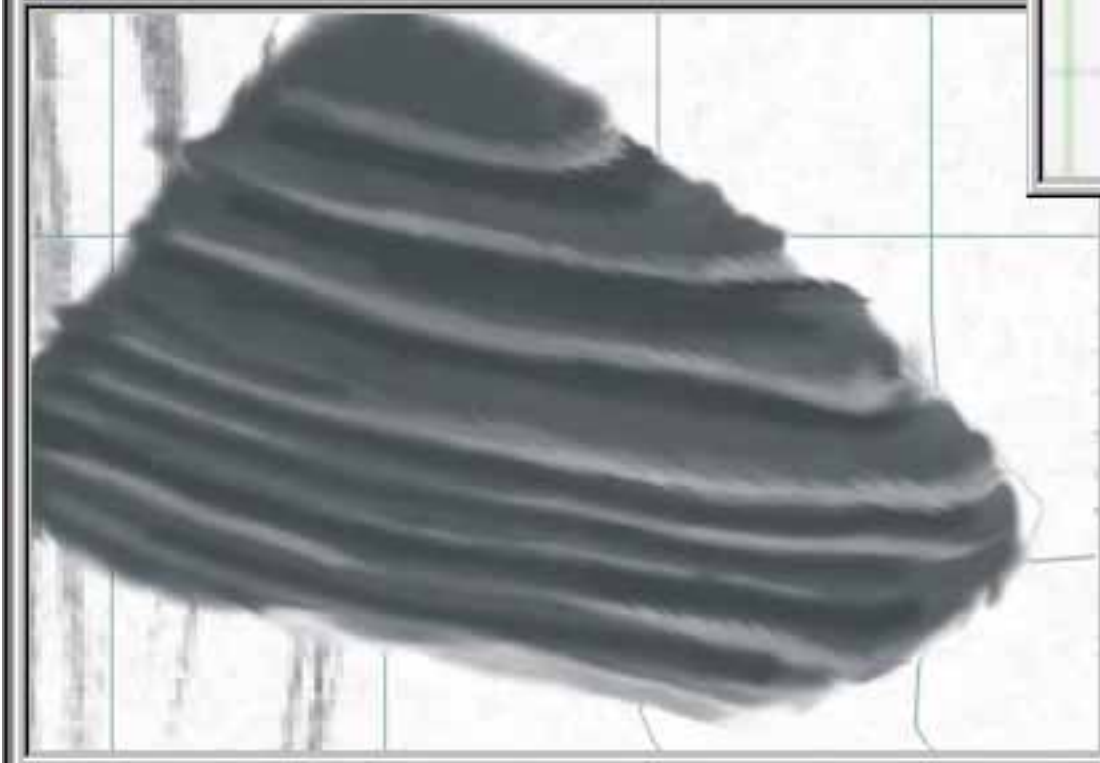


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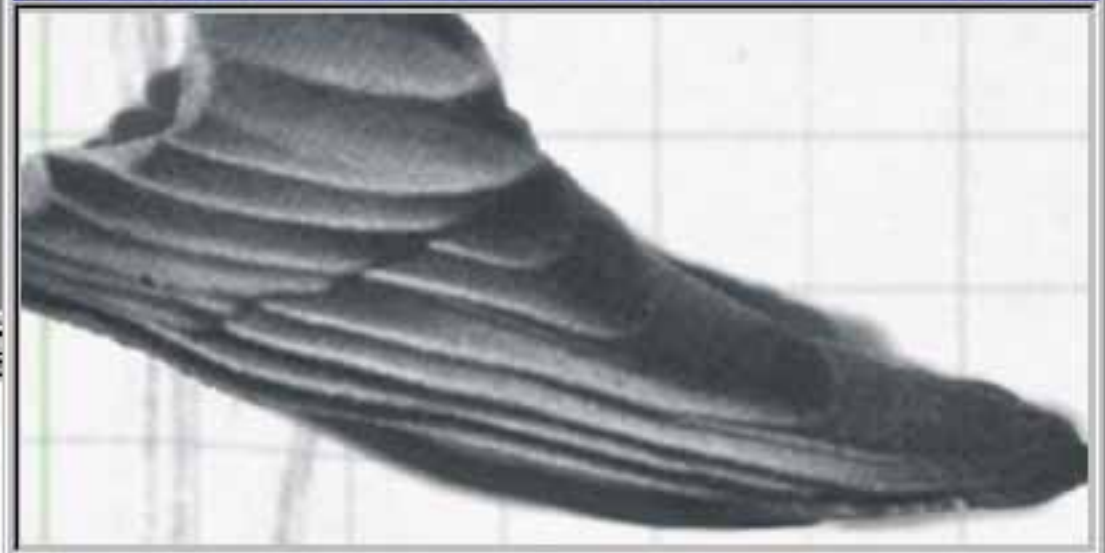




secondary.tif



primary.tif (24-Bit RGB Color)-Background



Click to Zoom in, Right-Click or Shift+Click to Zoom out

