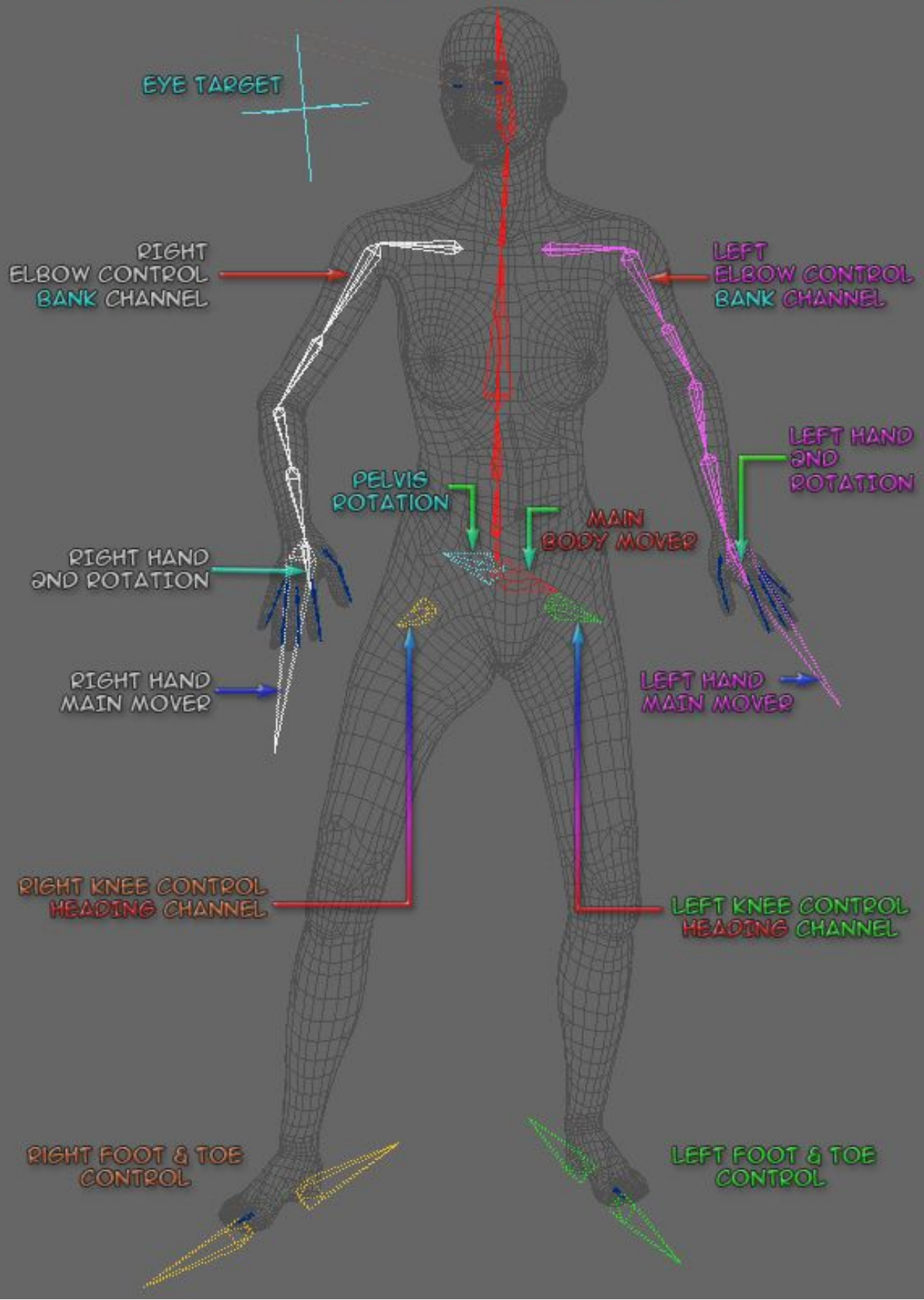


Thomas4D Rigging Tools Manual Version 3. 01

www.thomas4d.com

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**RED BONES
CONTROL SPINE NECK AND HEAD**



EYE TARGET

RIGHT ELBOW CONTROL BANK CHANNEL

LEFT ELBOW CONTROL BANK CHANNEL

LEFT HAND 2ND ROTATION

PELVIS ROTATION

MAIN BODY MOVED

RIGHT HAND 2ND ROTATION

RIGHT HAND MAIN MOVER

LEFT HAND MAIN MOVER

RIGHT KNEE CONTROL HEADING CHANNEL

LEFT KNEE CONTROL HEADING CHANNEL

RIGHT FOOT & TOE CONTROL

LEFT FOOT & TOE CONTROL

THIS MANUAL IS IN 3 SECTIONS

1/ QUICK START GUIDE

FOR THOSE WHO KNOW LIGHTWAVE
AND WANT TO GET STARTED AS FAST AS YOU CAN.

2/ COMPLETE STEP BY STEP GUIDE

DETAILED STEP BY STEP PROCESS OF USING THE RIGGING TOOLS IN
LIGHTWAVE.

3/ TUTORIAL ON RIGGING "WITHOUT" THE PLUGINS.

- F.A.Q AND MOST COMMON RIGGING MISTAKES

QUICK START GUIDE

Thomas4d Rigging tools simply converts the template skelegons into a Character rig. What mesh you put around that skelegon template is up to you. If your character does not fit the template you will have to edit the skelegons to fit your mesh shape.

The main advantage using the Plugins is you can quickly test a rig & work on weight maps, change bone placement, add bones or use the Plugin to create different versions of the same basic rig very quickly. One rig cannot do every scene, so the Plugin builds a very open rig ready for nearly anything you can throw at it. When changes are needed you can quickly edit/recreate a rig to suit the Animator's needs for each scene.

This manual in the Tips and tricks section, details the many changes you can make to a rig to fit more closely with the scene's needs.

Enjoy the Plugins and the manual, hope it helps ⇒)

Most Joy =)

Peter Thomas

< TIPS ON EDITING SKELEGONS >

Never rename or delete a skelegons from the template files. The Plugin needs all the template skelegons to be there to run correctly. You can add or split bones as long as any new bones have their own special name.

For Knees and Elbows always pre-bend the joints, 5 to 10 deg. should do it. The reason for this is Lightwave IK system uses this starting placement of the bones to work it's future IK calculations. Edit your mesh to get this bend correct.

As you edit bone placements, only use the projection view ports (TOP LEFT RIGHT BOTTOM ETC), not prospective, it helps keep all the Bone's rotation axis straight and correct.

Use Bone Rename to find out the name of the bone your moving around. The shoulder area is important, make sure the upper arm bone is the highest bone in the arm. Sometimes users pull down the shoulder bone into the arm. This is incorrect, the IK set-up works from the bone names, so the IK settings will be wrong once in Layout if you do this.

◀ TIPS ON EDITING SKELEGONS ▶

Legs and arms; keep the skelegon chains vertically straight (up and down), or in the case of the arms, horizontal. You can rotate them, but keep in mind you are also rotating the Axis of the skelegons in the chain. So your effecting how the rotation channels are created for the bones when they are converted in layouts later.

Once the rig has been completed by the Plugins, and your happy with the rig, delete any hold bones you don't need. Also if your character doesn't need some bones.

for example; extra fingers - delete the extra fingers

Hide all the hold bones and any bones that you don't want to select when animating.

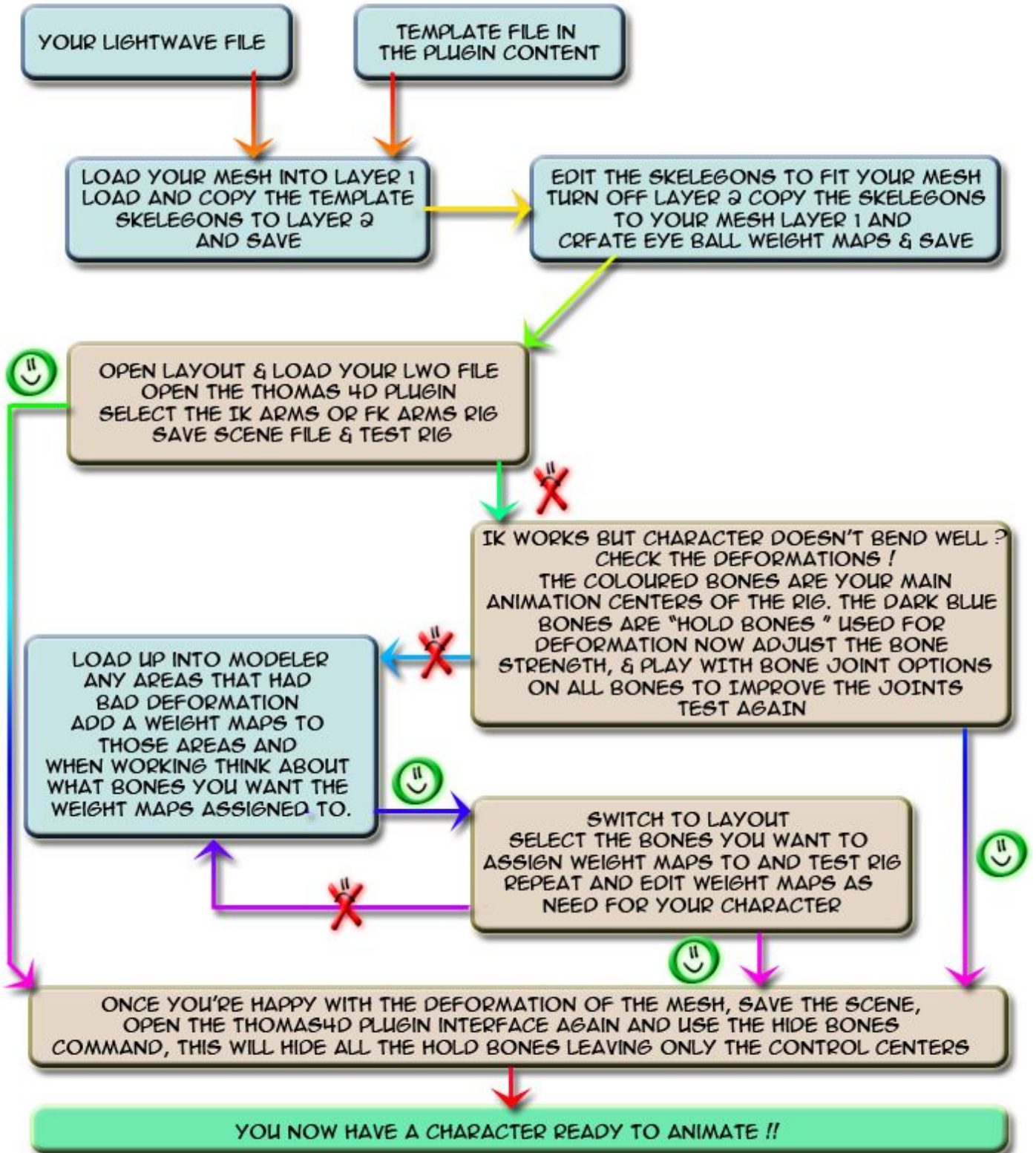
SETUP LIGHTWAVE FOR RIGGING

Setup your keyboard and menus, put commands in places you'll find them. A few commands to look out for are

Rename Skelegon, Create Weight Maps, Clear Maps and Split Bone

Download the Plugin Blur Weight Map from www.flay.com

BASIC WORK FLOW USING THE PLUGIN

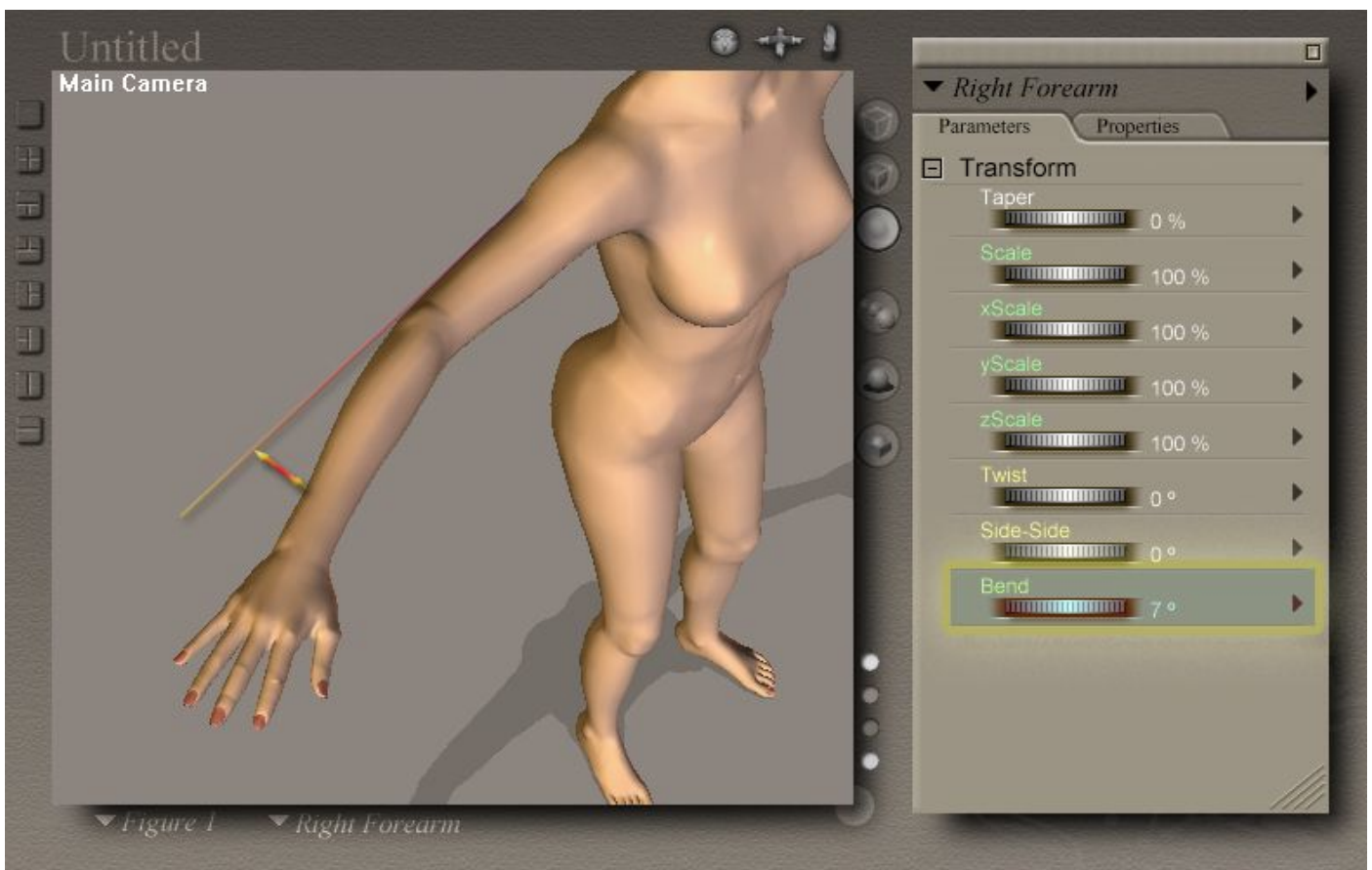


COMPLETE STEP BY STEP GUIDE

STARTING IN POSER 5

FIRST THING BEFORE WE EXPORT, CHECK THE MODEL !

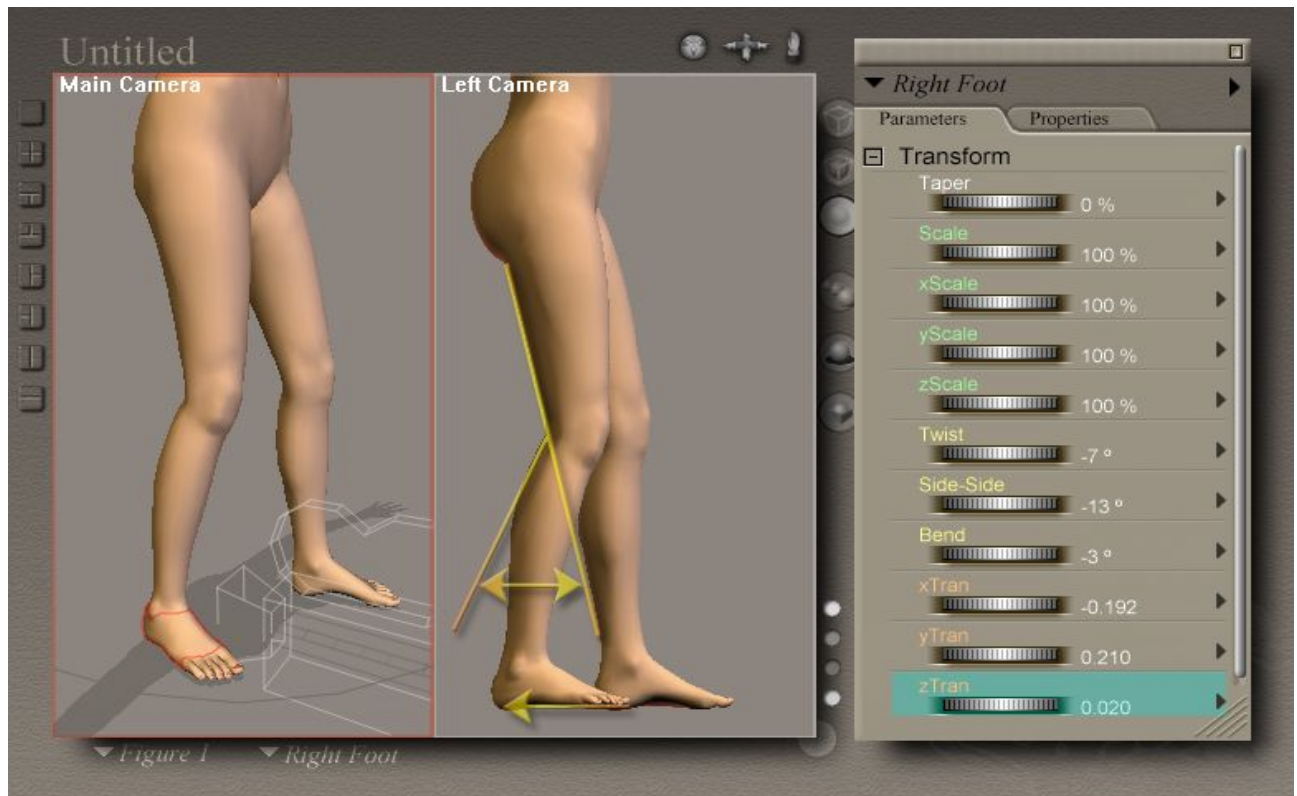
We have 4 major IK joints in a biped Character rig. To get the best performance from Lightwave we need to pre-bend the IK Bones at these joints. So it's best to think about this at the modeling stage or in this case, exporting stage, then editing the model later.



Now the arms look good at the default pose, there's enough bend in the arm for the IK to know which way to bend.

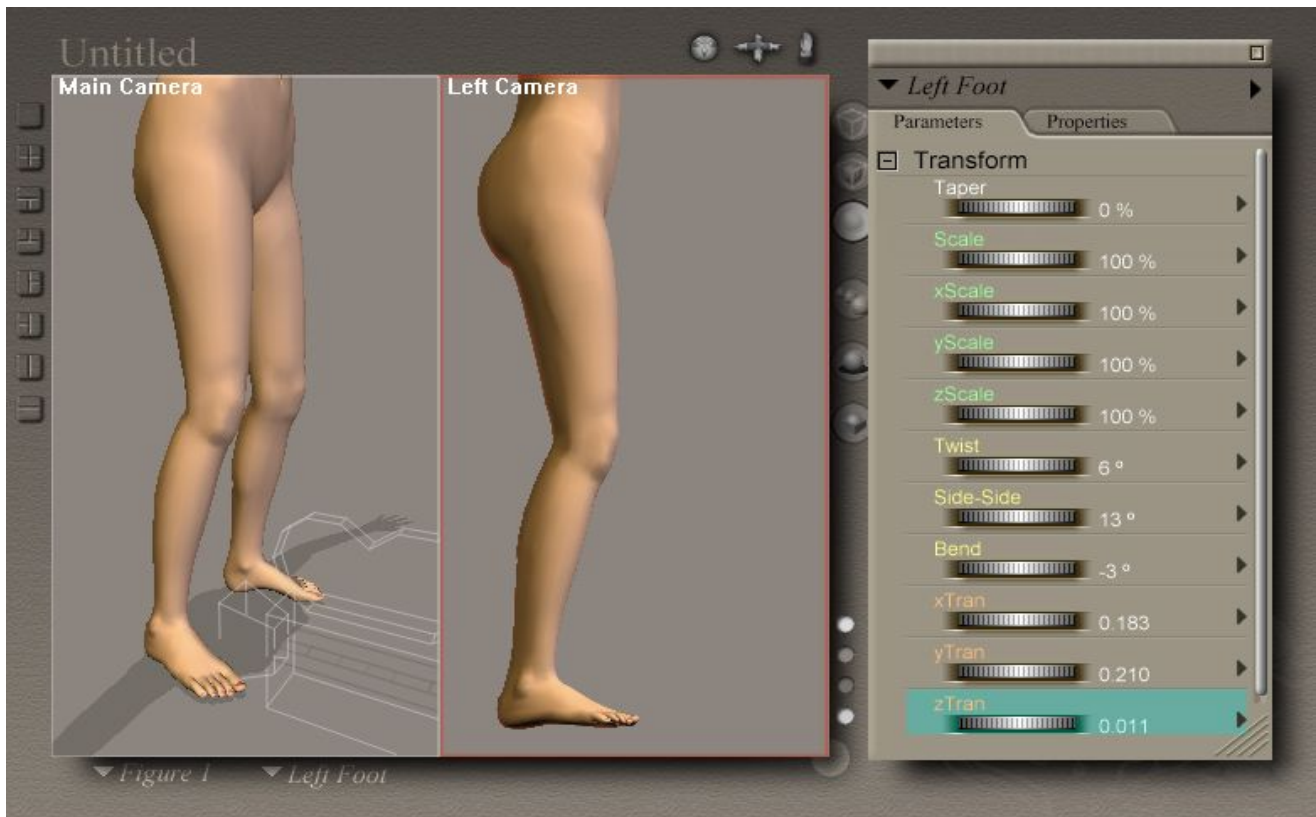


But the legs need work ..



Use the IK and just move the foot back so it's more under the body

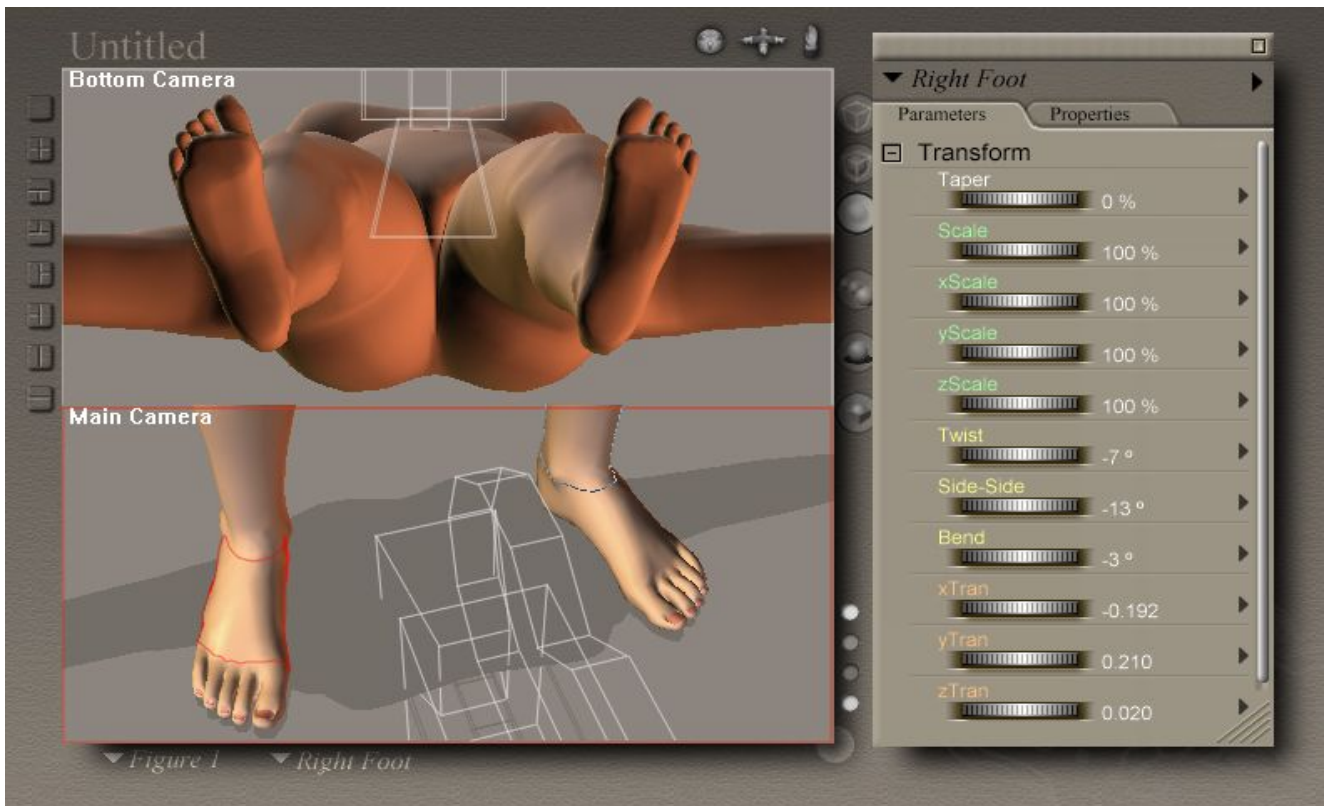
You'll get a nice bend at the knee, just like the elbow.
And do the same for the other leg.



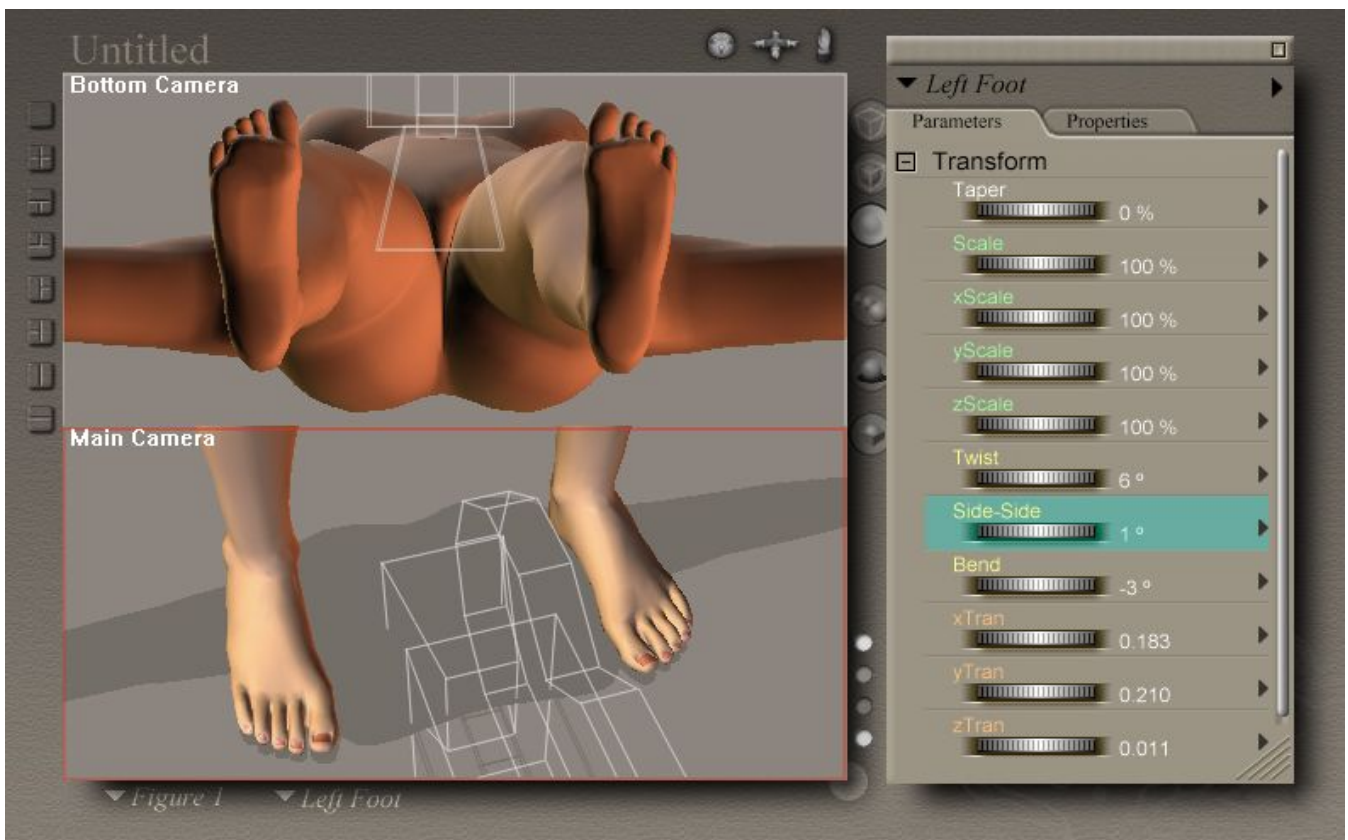
< TIPS ON MODELING FOR ANIMATION >

Remember if your modeling characters in Lightwave or any other 3D modeler, that it is to be rigged in Lightwave. Bend the IK joints like this. Sometimes it takes a lot of work to edit a model at rigging time, but bending the knee correctly helps reduce any IK wobble.

Now the feet are pointing outwards, we need the bones to point to the front, So the poser feet need to point to the front as well.

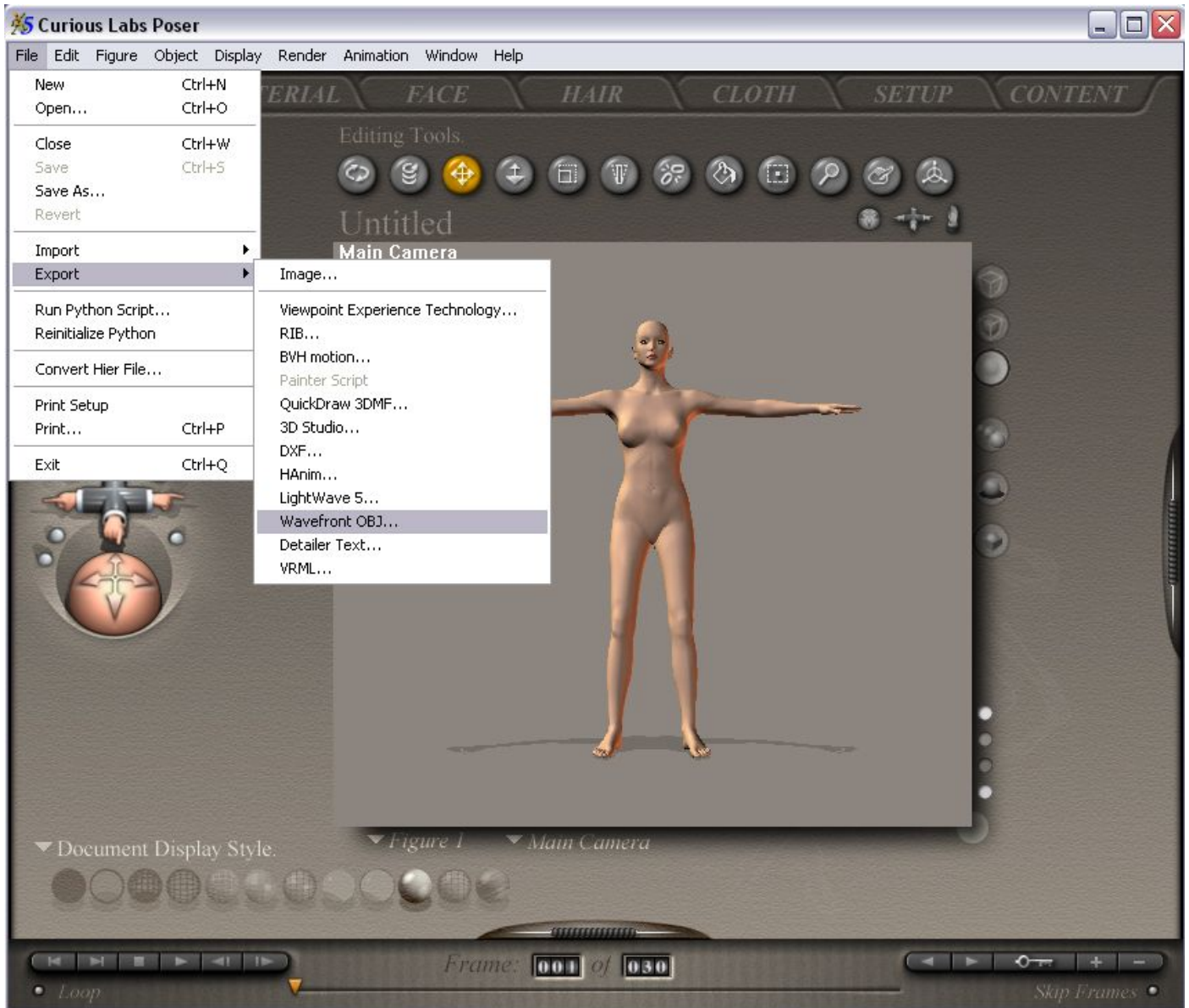


Something like this



Now that's it ! We'll export the model making it ready to rig in Lightwave.

Go to File-> Export -> Wavefront OBJ...



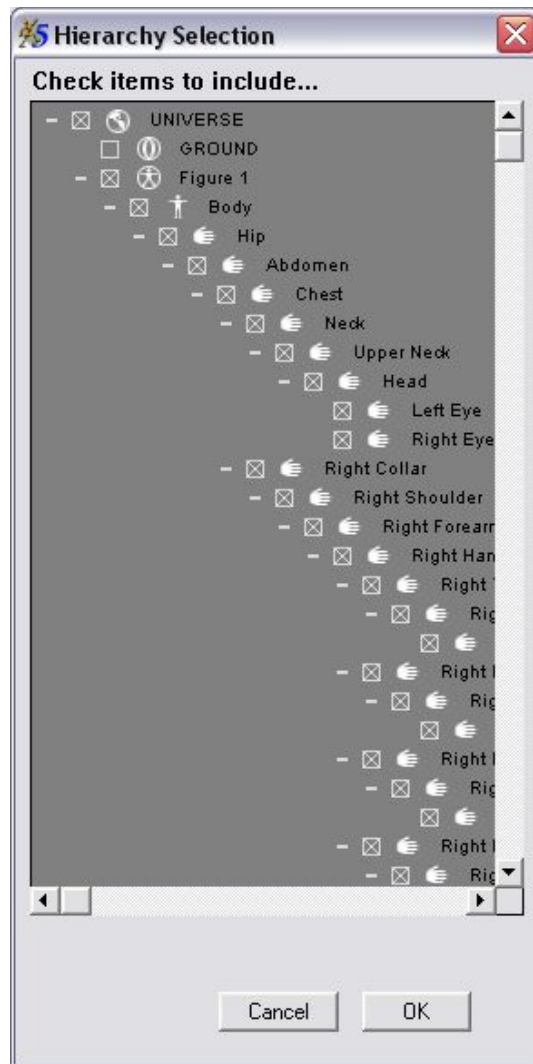
< EXPORTING 3D TIPS >

OBJ is one of the most useful 3D Model Formats. Due to being able to export Model Data, UV Map Data, and nearly all 3D software reads and writes OBJ correctly. Also if you want to export morphs from poser, export all the morph as separate obj files and combine them in Lightwave later.

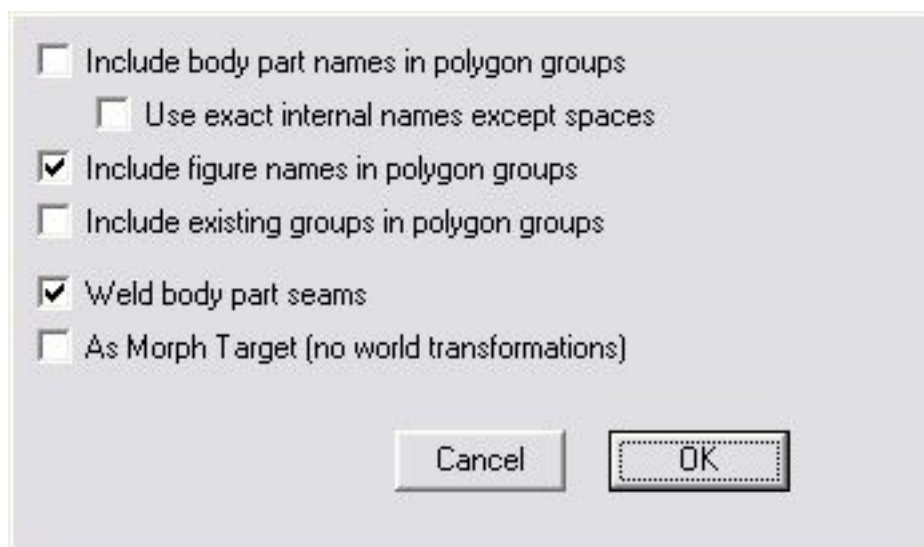
Now we leave this as default, leaving Single Frame selected.



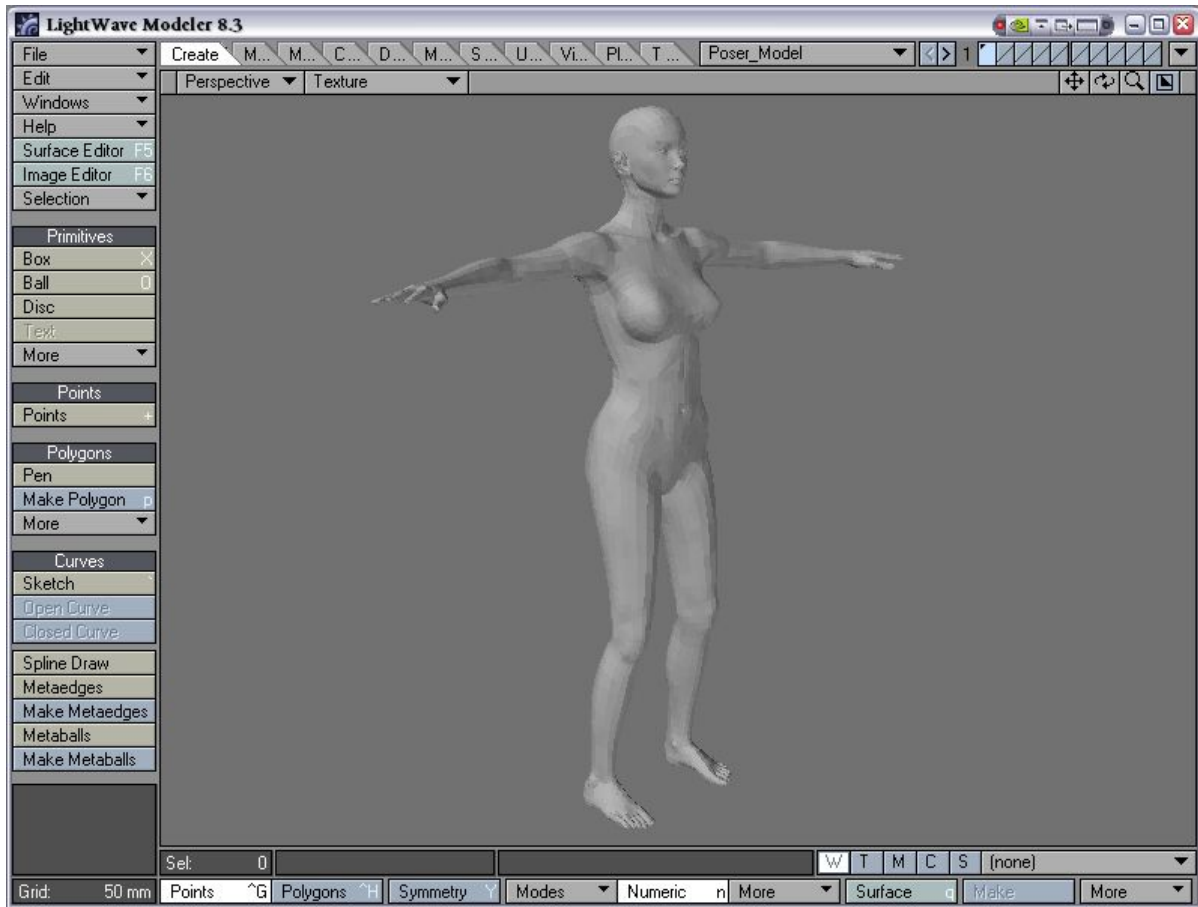
Leave Hierarchy Selection as default, it should only have the character mesh objects shown.



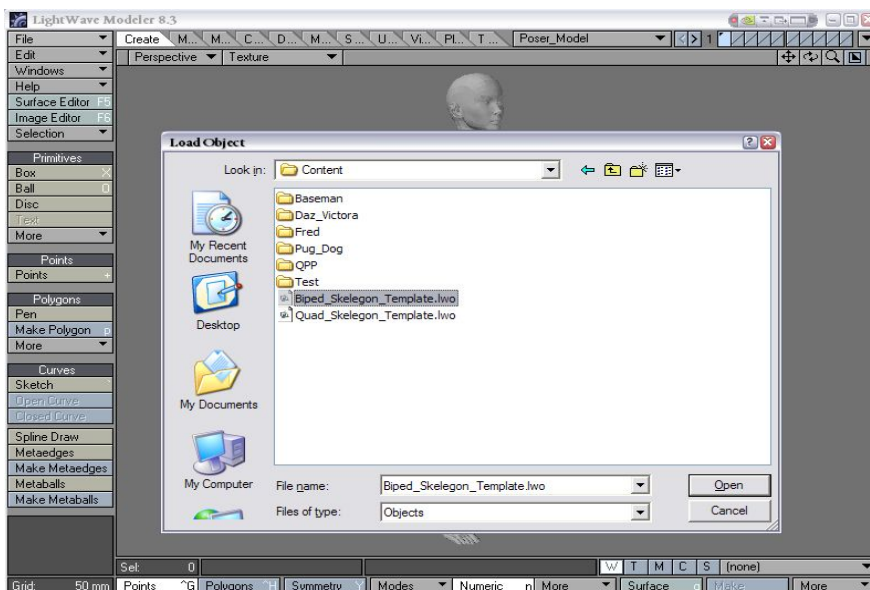
Next you'll be asked for a file name and a directory to save. Again without touching any settings click OK for next panel.



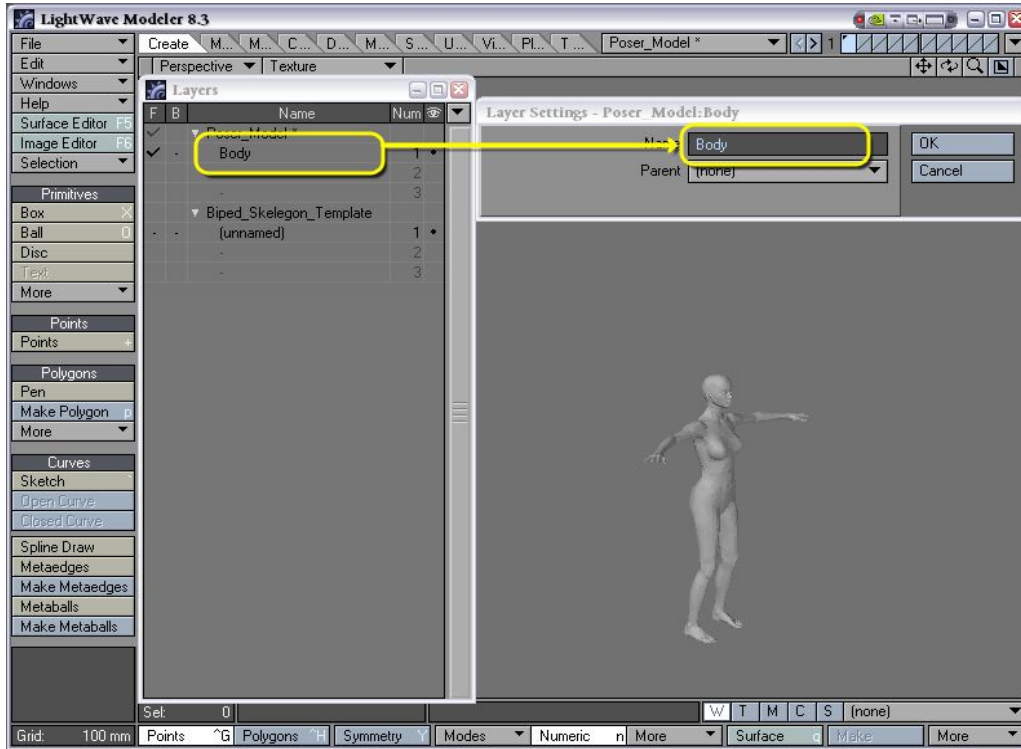
Now you have exported a character model from Poser in Obj file format
You are now ready to load in Lightwave Modeler and load the obj file.



Now load the *Biped_Skelegon_Template.lwo* file in the content directory.

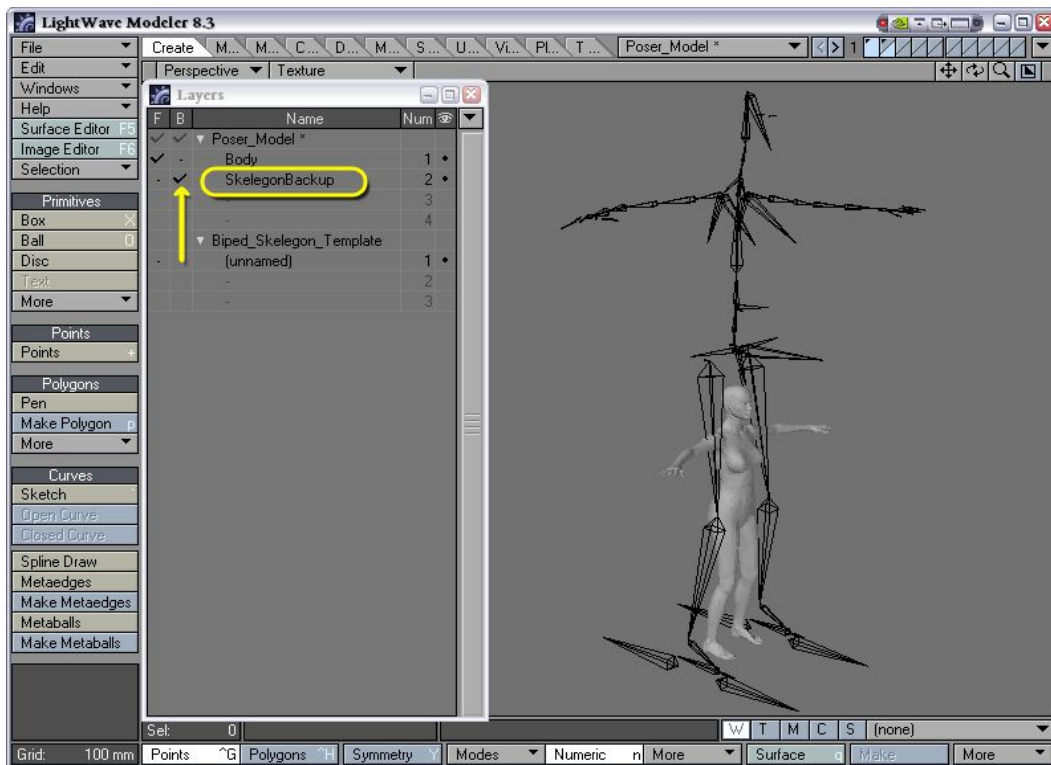


Rename the first layer on your Character Object. Call it body or something, it's not important for the Plugin, so it can be called anything.

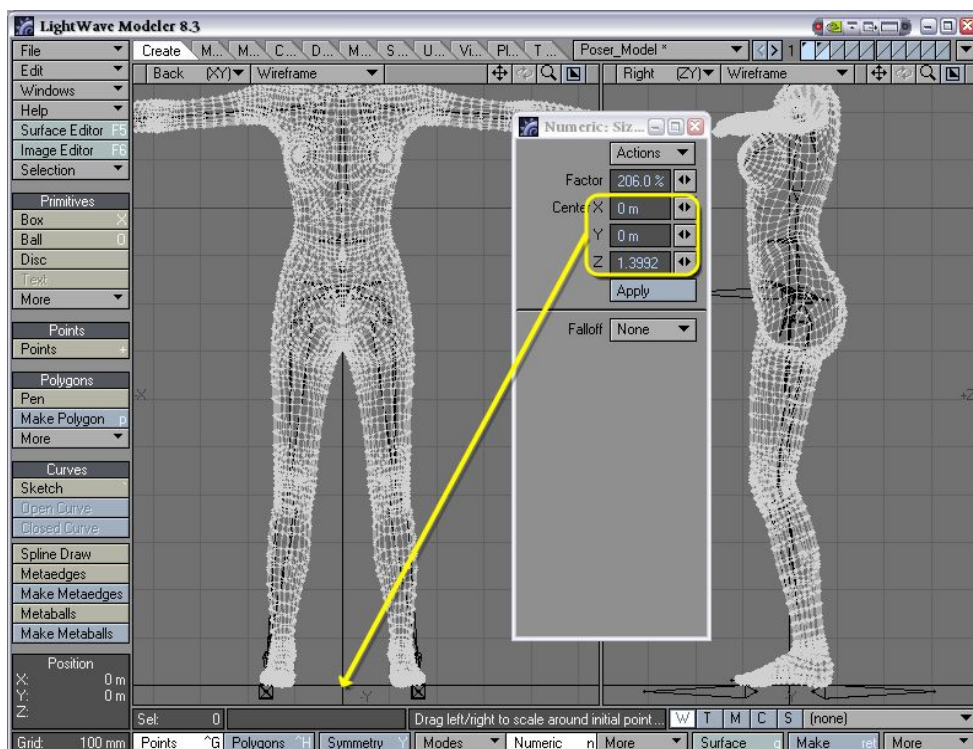


Copy the skelegons from the template and paste them to the second layer of your character object, now rename this layer something useful like SkelegonBackup.

Notice:- the Skelegon Template is much larger then the Character. The Template is real world scale in Lightwave (around 1.8 meters tall) so it's best to scale the model up to proper scale then down to ?? scale.



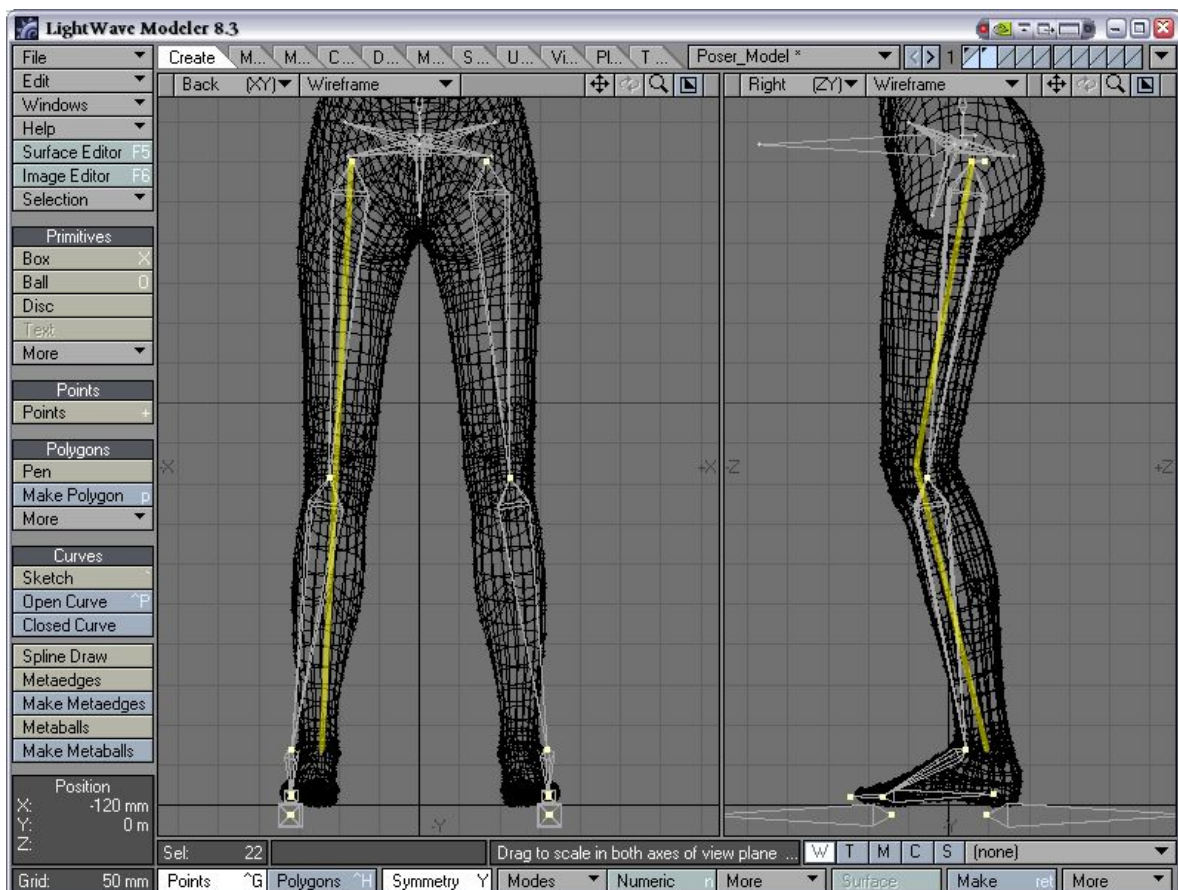
Now make sure you're in the back or front view port and use the scale tool to get your character around the scale of the skelegons. Use the hips as a guide and press the mouse down right at the center of the modeling world, check your at the center by having the numeric panel open. Seeing we're using the front view port, X,Y need to be at Zero,



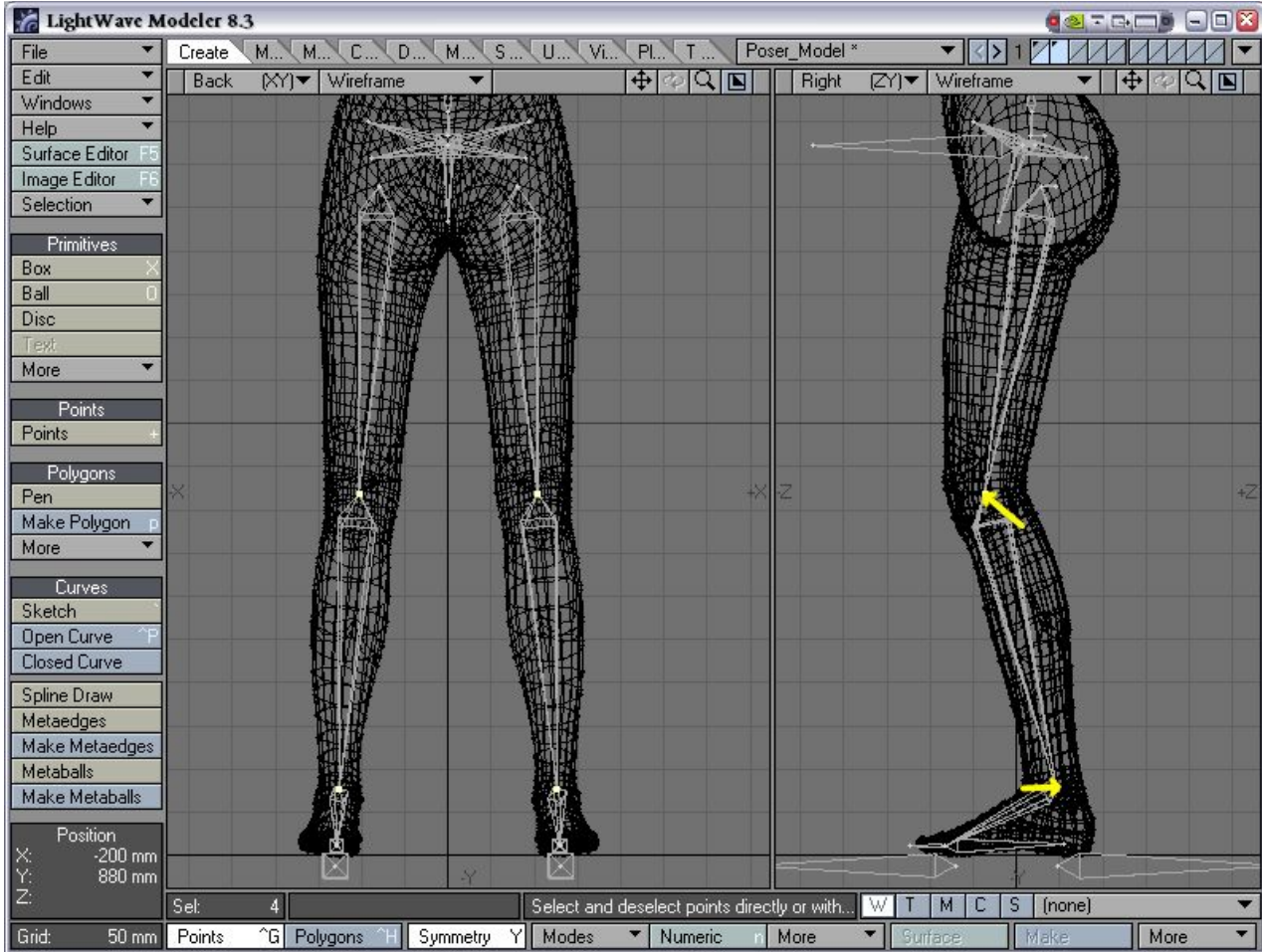
< GENERAL 3D TIPS >
ALWAYS KEEP YOUR CONTENT TO A REAL WORLD SCALE, THEN YOU CAN EASILY USE ALL YOUR OLD CONTENT ON NEW JOBS. SAVE TIME AND \$\$\$!

Now switch the layer views, and have the skelegon layer as your working layer. Have your character model in the background. We need to edit the skelegon positions and get more natural joint placements. As you see the legs need to be edited. Turn Symmetry on, and use the front view. Select all the leg points on the bones, and use the stretch tool by placing the mouse just under the foot. Pull the points of the bones in line with the joints. Once stretched, you may need to rotate a little, again place the mouse under the foot and rotate from there.

(below; use the yellow line as a guide for joints)

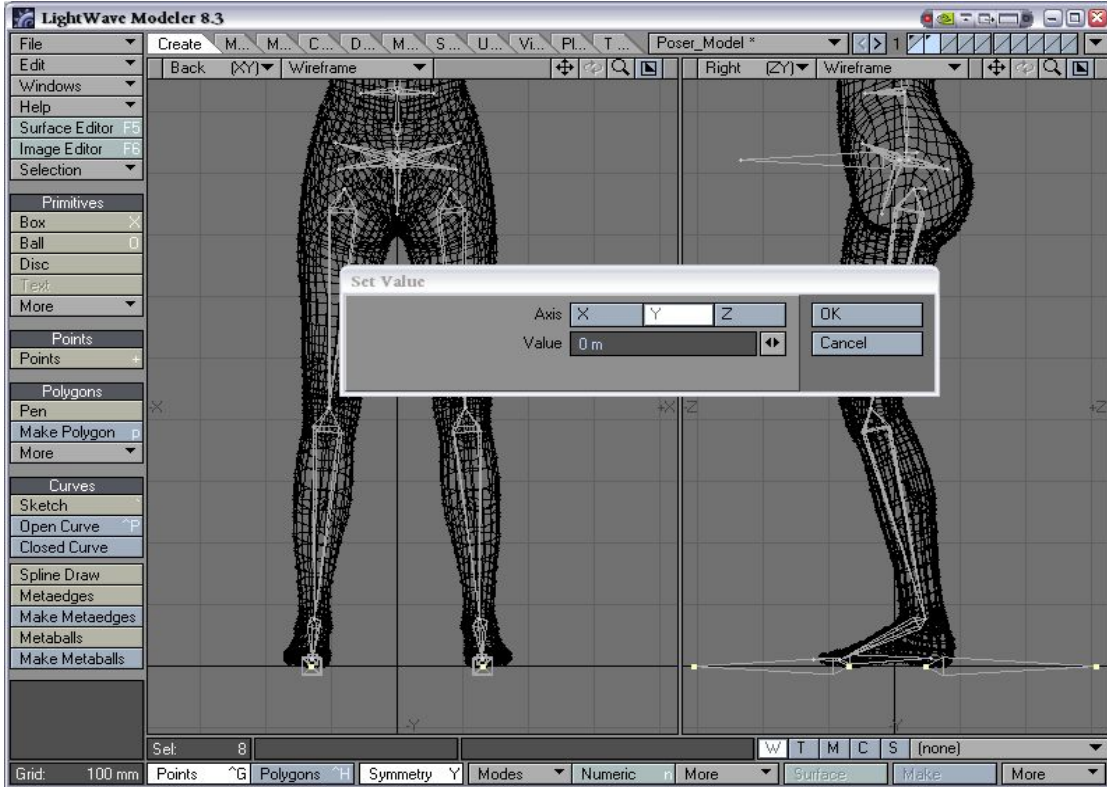


The right view shows the knee and ankle need some more work. Using the right view, select the ankle point and move into a position, do the same for the knee.

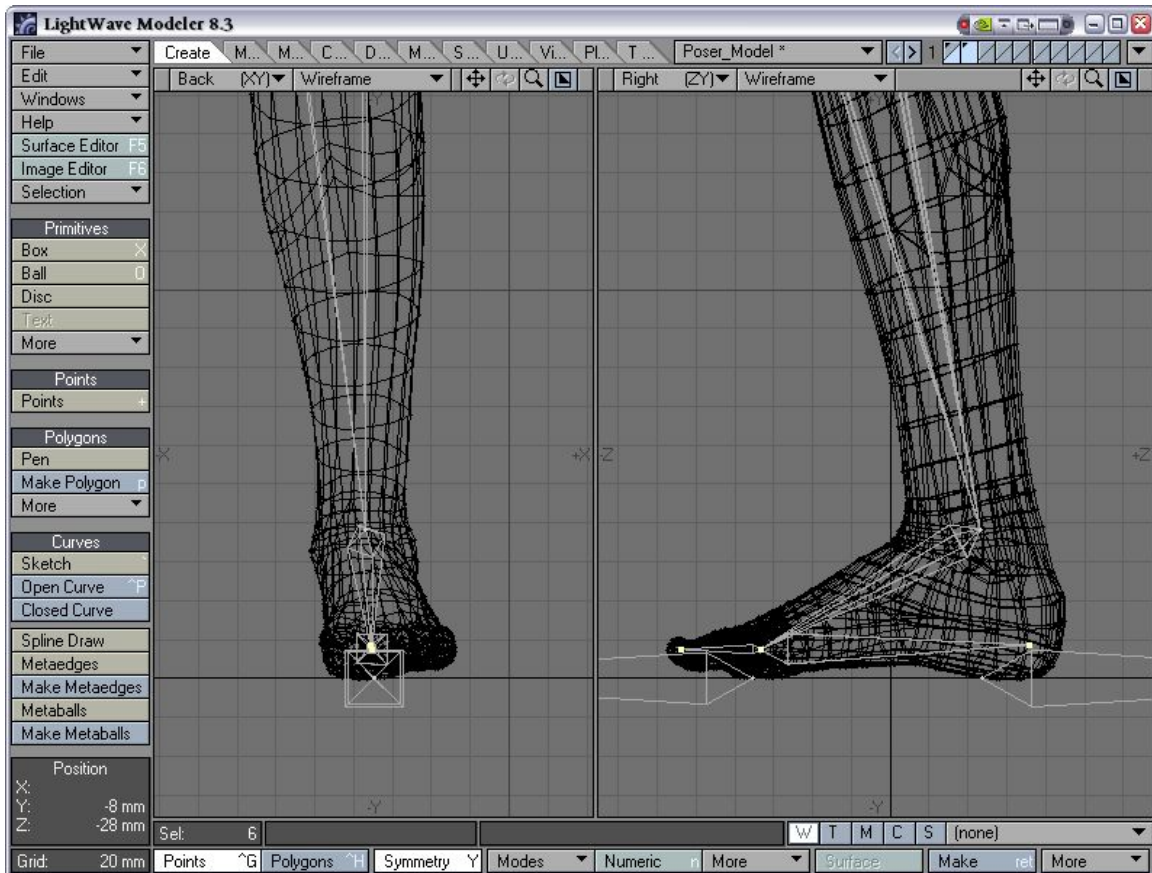


Now to the four big bones below the feet. These are the main controls for the feet in the layout. It really helps if these are set to zero on the Y Axis. Use the value command to set the points on the big feet bones to zero.

< RIGGING / ANIMATION TIP >
POINTS SET TO ZERO IN MODELER ARE THE SAME IN LAYOUT, SO IF YOU WANT TO ADD AN EXPRESSION TO KEEP THE FEET ABOVE GROUND IT'S SIMPLE, KEEP THIS IDEA FOR OTHER THINGS.

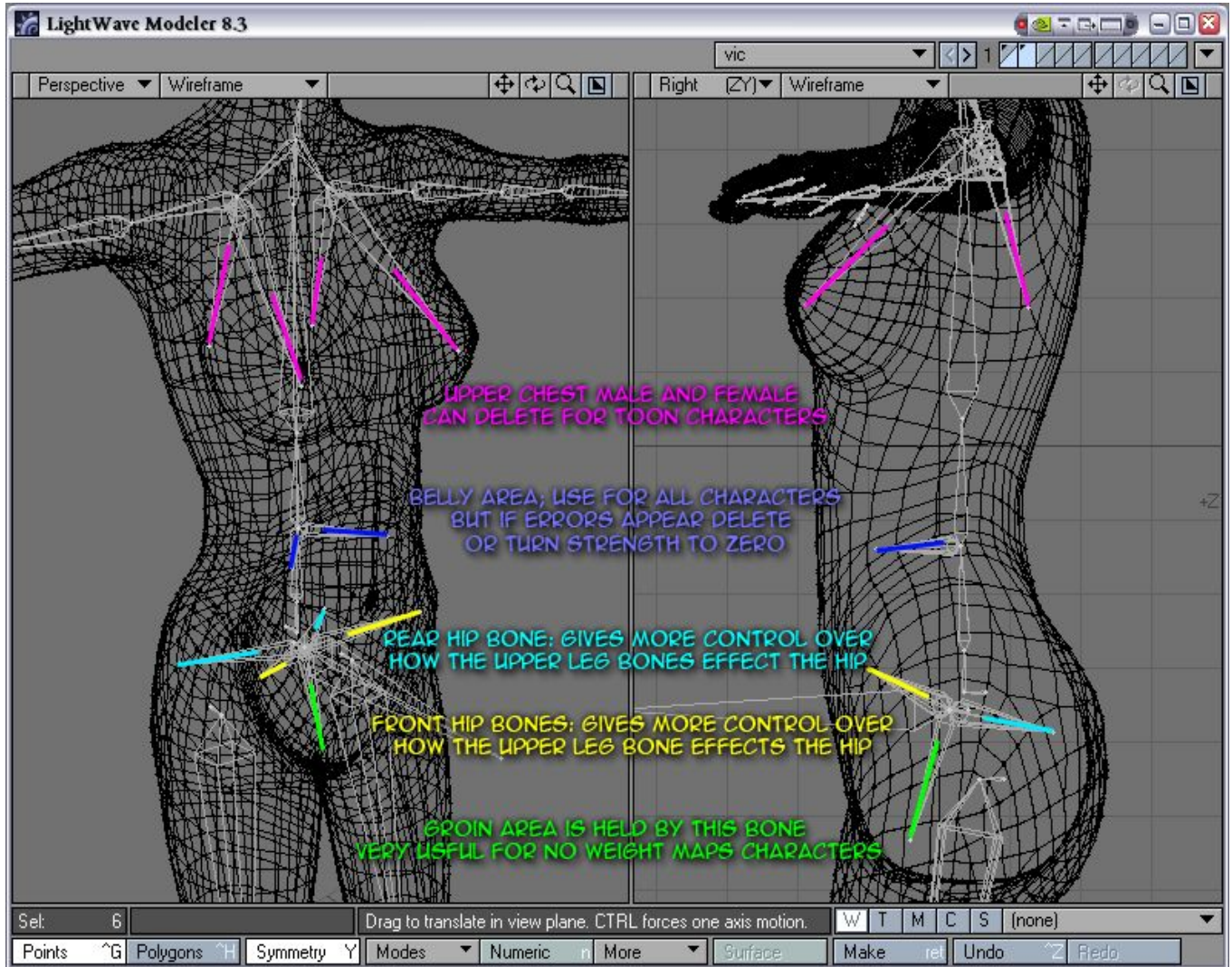


To finish the legs, edit the points around the foot from side view.

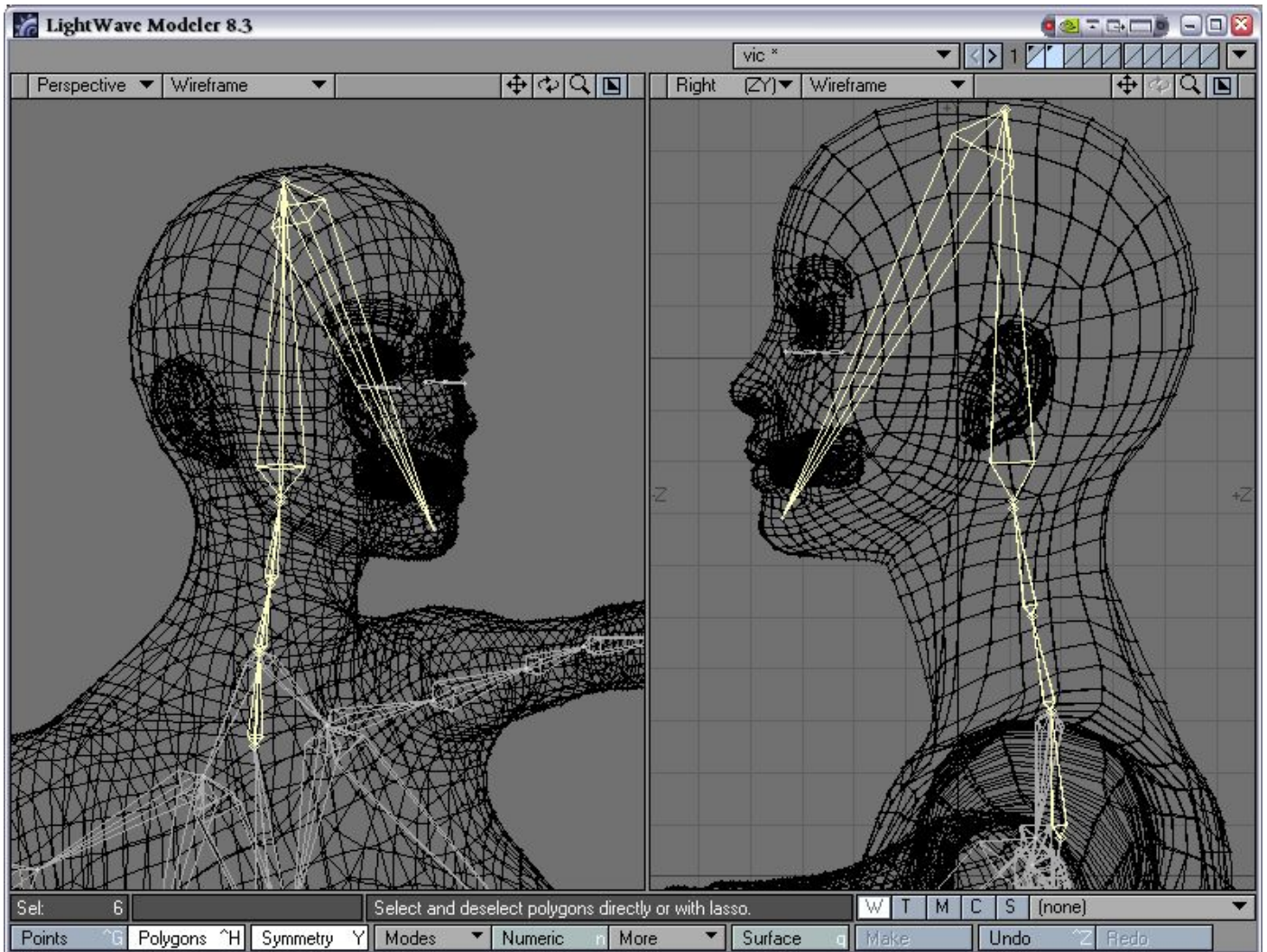


Now we'll move on to the body, for placement of the spine. Use the

right view, and place bones into position moving up the body. The template skelegons were designed to fit poser models. There's not much needed here, but when you do other characters, keep this reference map of the hold bones in mind for good placement.



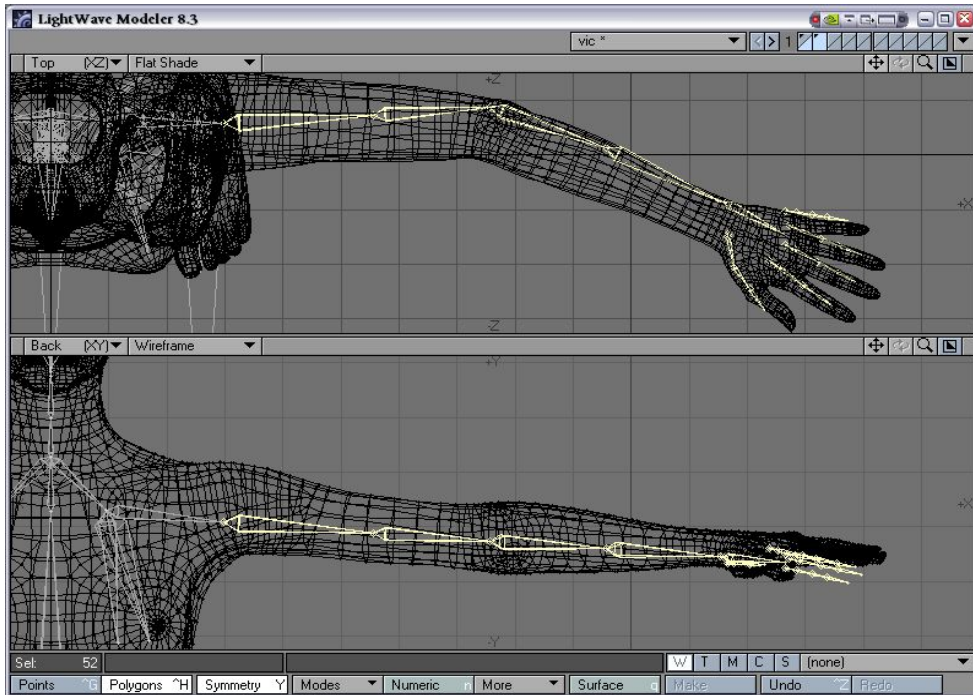
Now let's move to the head using the right side view again. Select the bones (as shown below), and move into position.



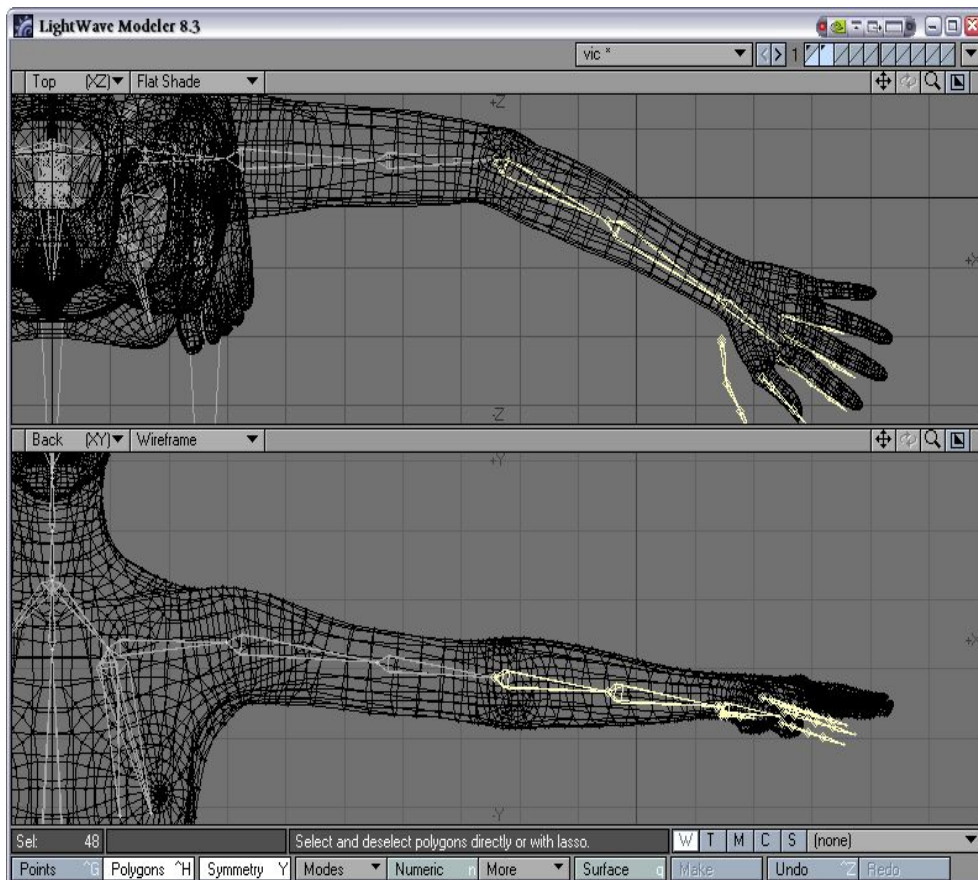
< T4D RIGGING TOOL TIP >

THE BIG BONE IN THE FACE IS NOT FOR WEIGHT MAP RIGS. IF YOU'RE USING WEIGHT MAPS, YOU CAN SCALE THIS BONE DOWN TO NOTHING OR MOVE IT OUT OF THE WAY. DON'T DELETE UNTIL AFTER YOU RUN THE RIGGING PLUGIN.

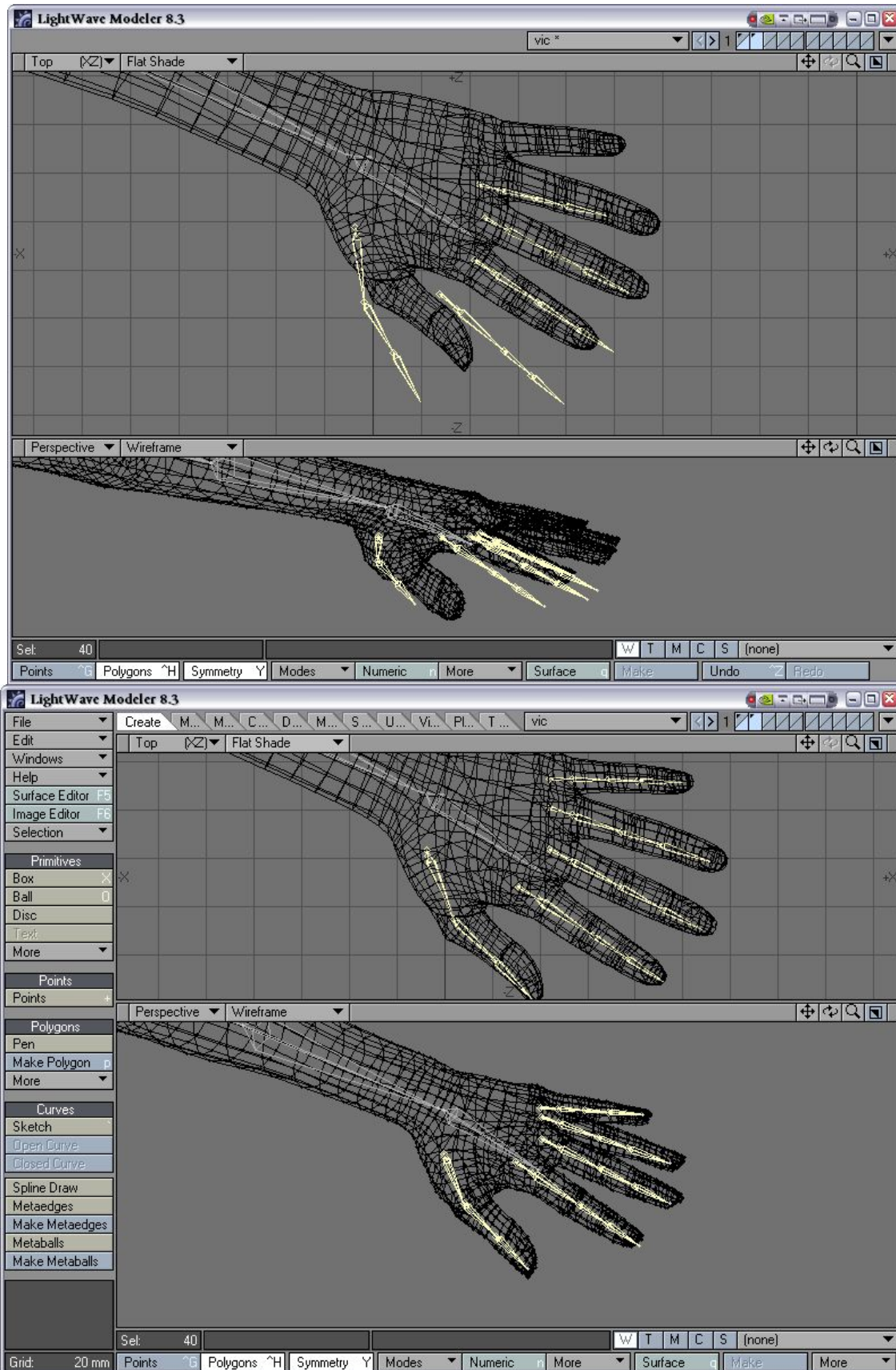
The Arms and Hands:



Select all the bones again with symmetry on and move them all into position. De-select them as you place them into position.

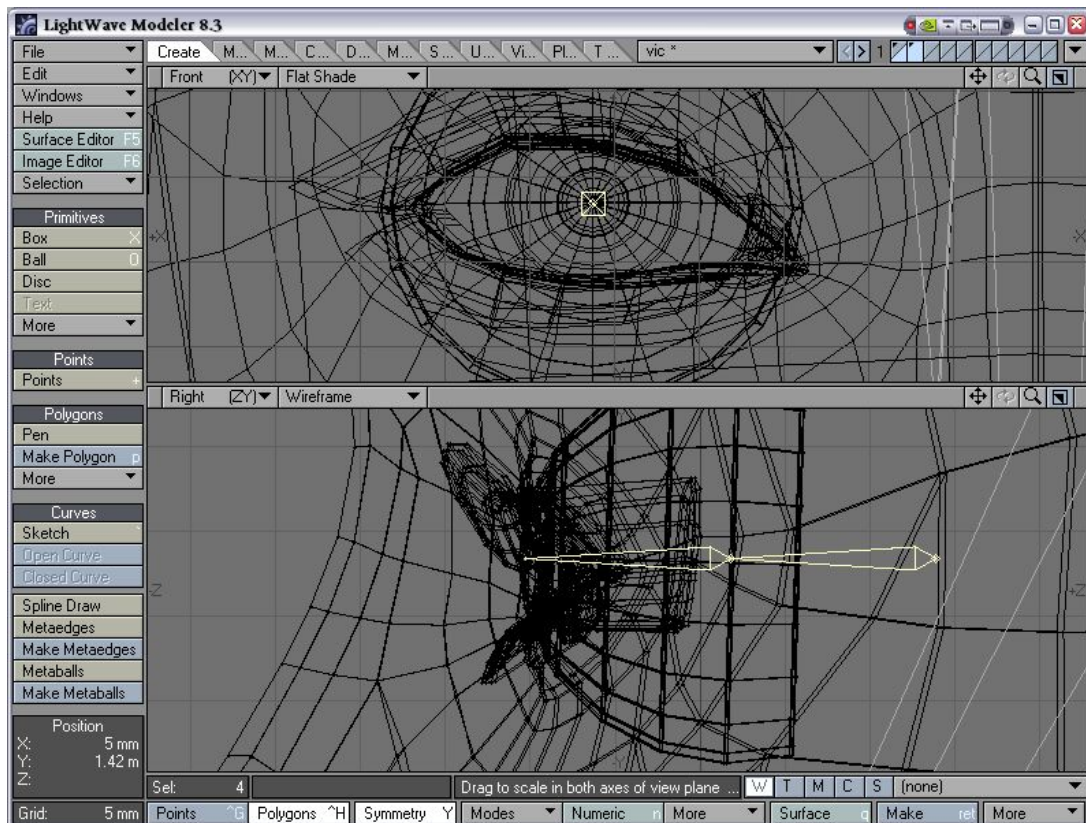
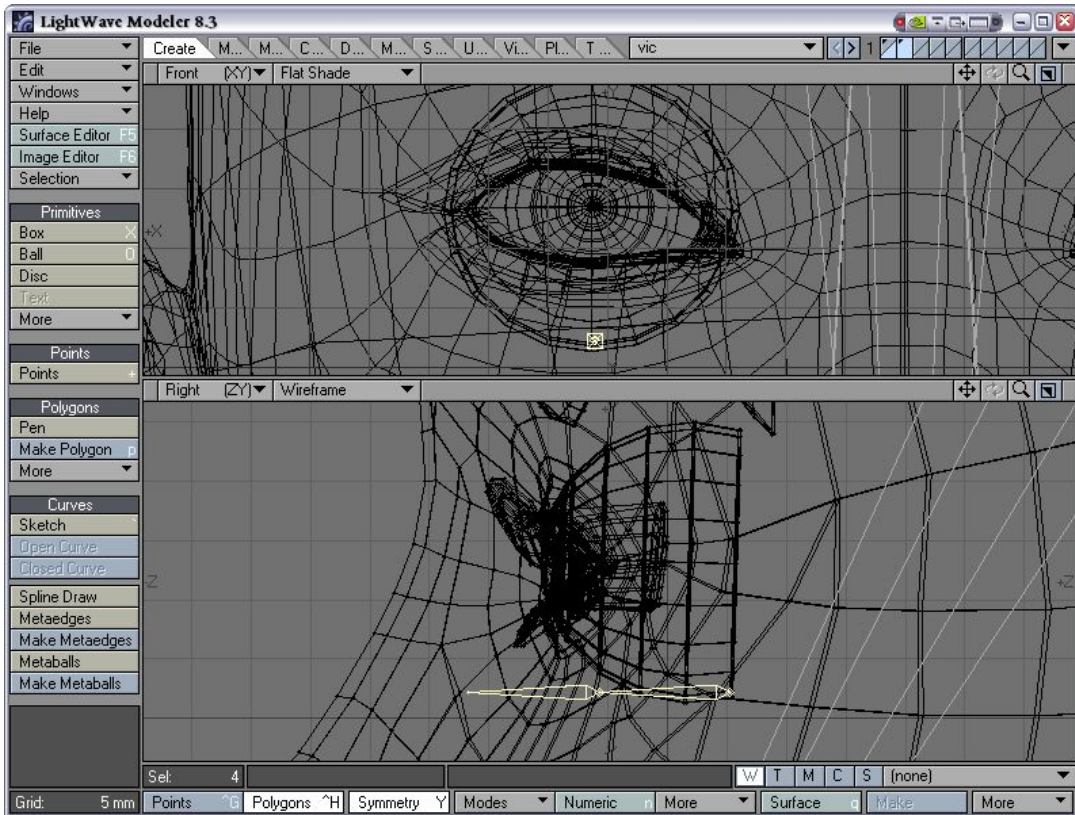


Once you get to the hands, zoom in and place finger bones.



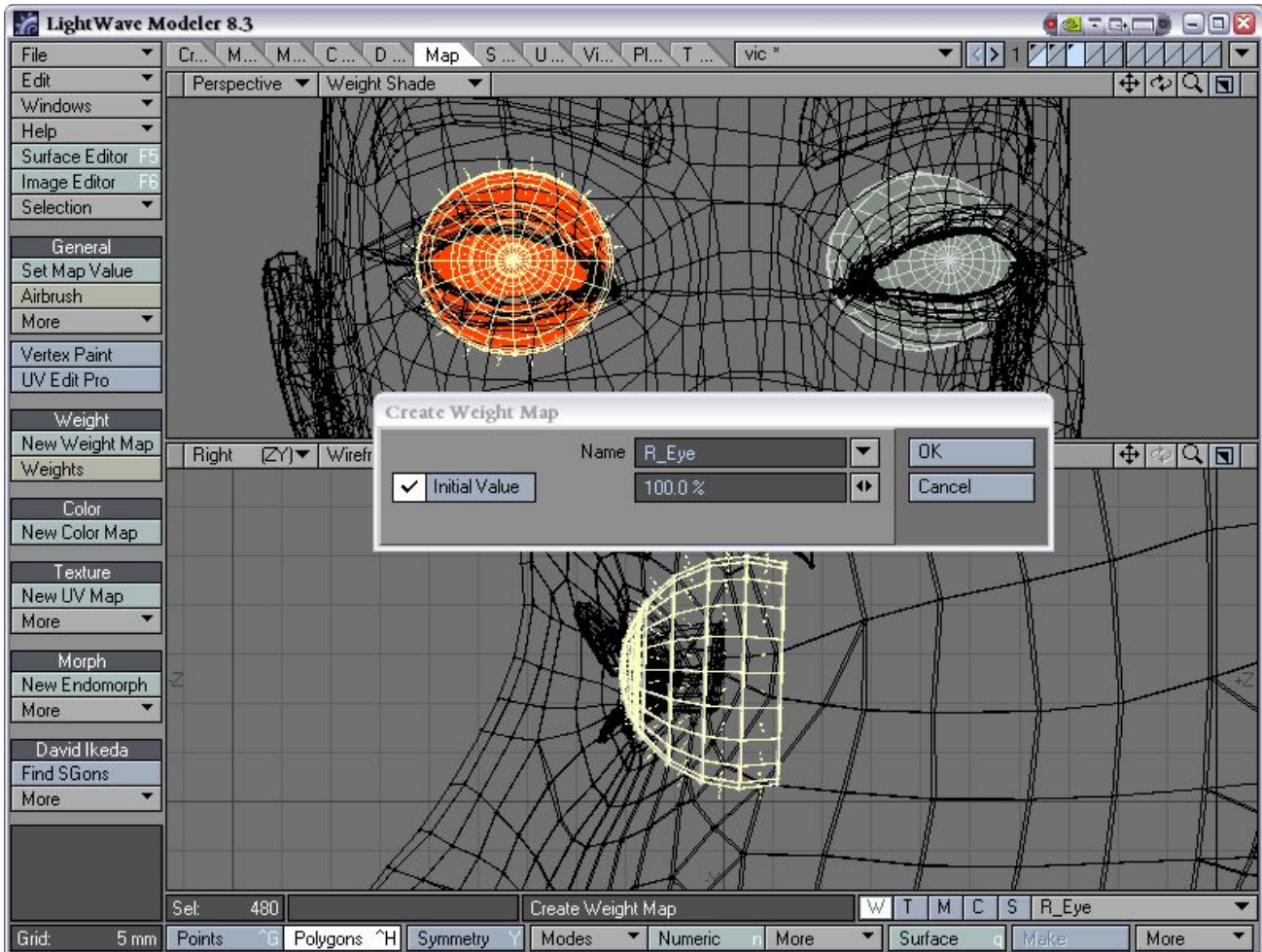
THE EYES,

Zoom into the eyes and move the bones to the center of the eye ball

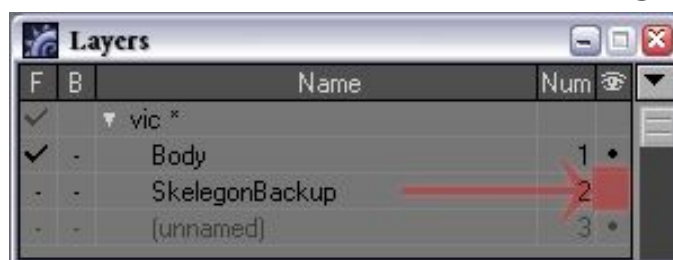


We also need to give each eye it's own weight map.

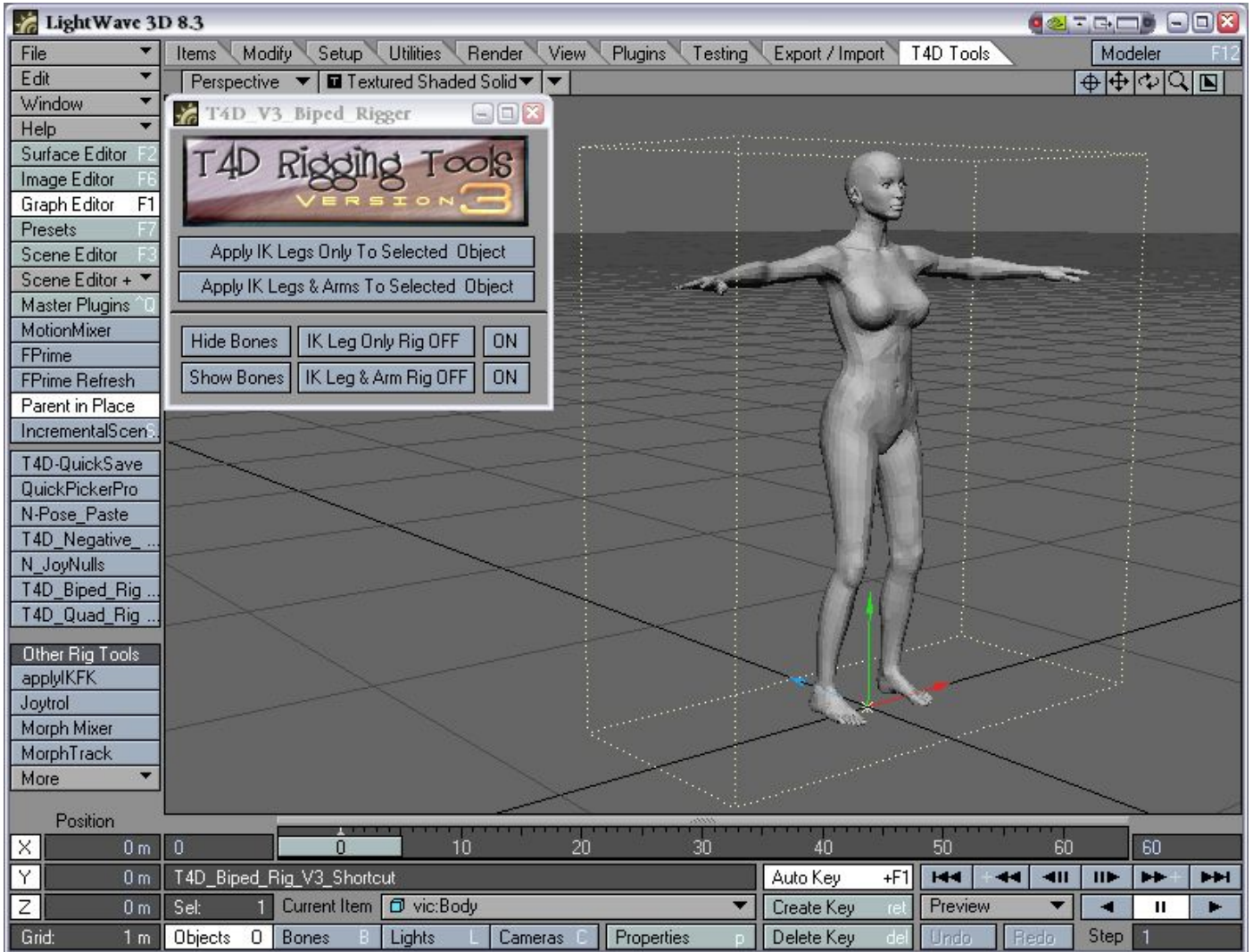
Copy the eyes to another layer (just makes it easier). Turn Symmetry off and select one eye ball and give it a weight map. Call it something like L_Eye, and do the same for the right eye.



Copy both eyes back to your character layer (layer 1). Have a check over the rig to make sure all bones are in a correct position. Copy your skelegon layer (layer 2) to your character layer (layer 1). Turn off the skelegon layer and save. You are ready to go to Layout..



LOAD YOUR CHARACTER OBJECT AND OPEN THE T4D RIGGING TOOLS DISPLAY

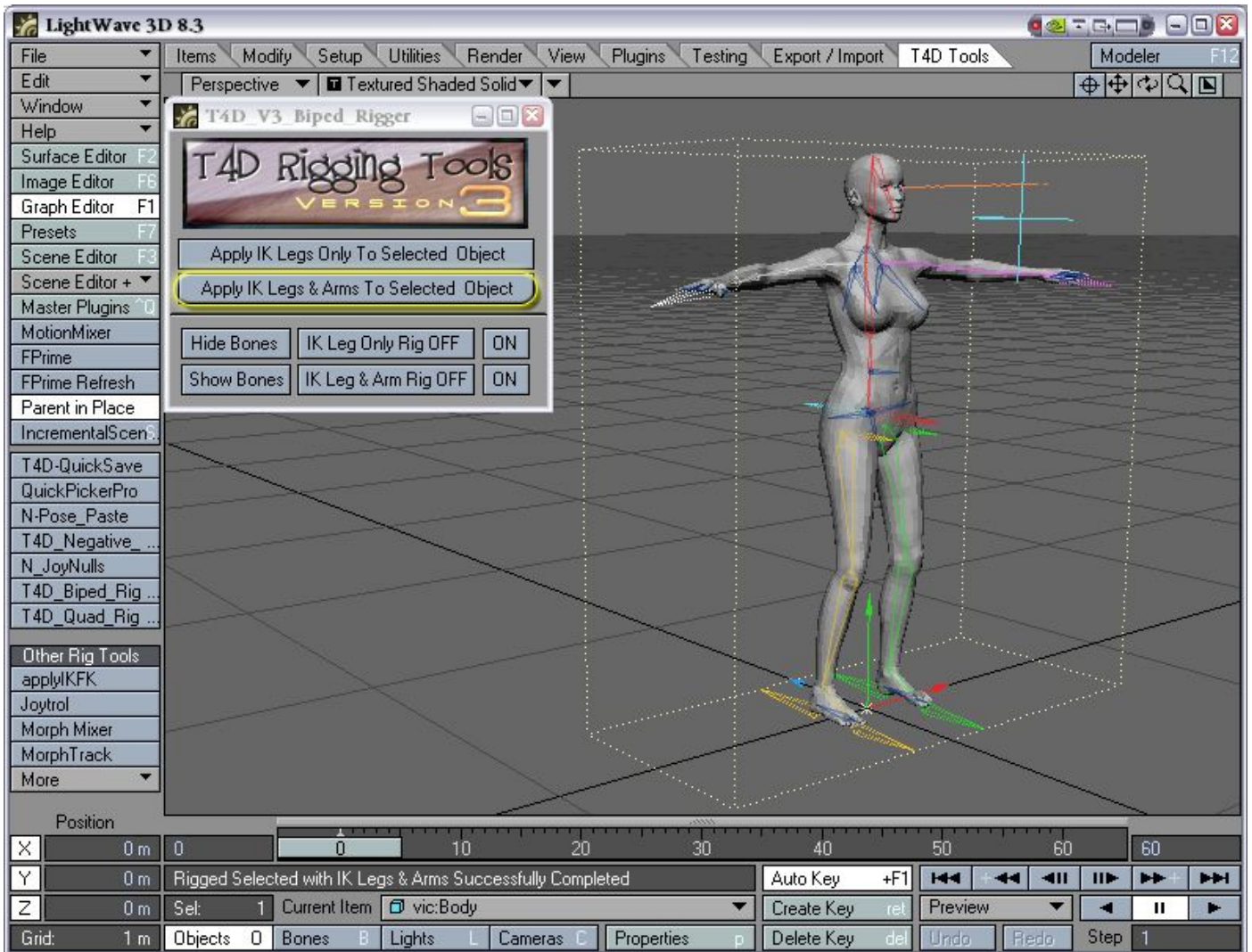


Now select the rig you want created

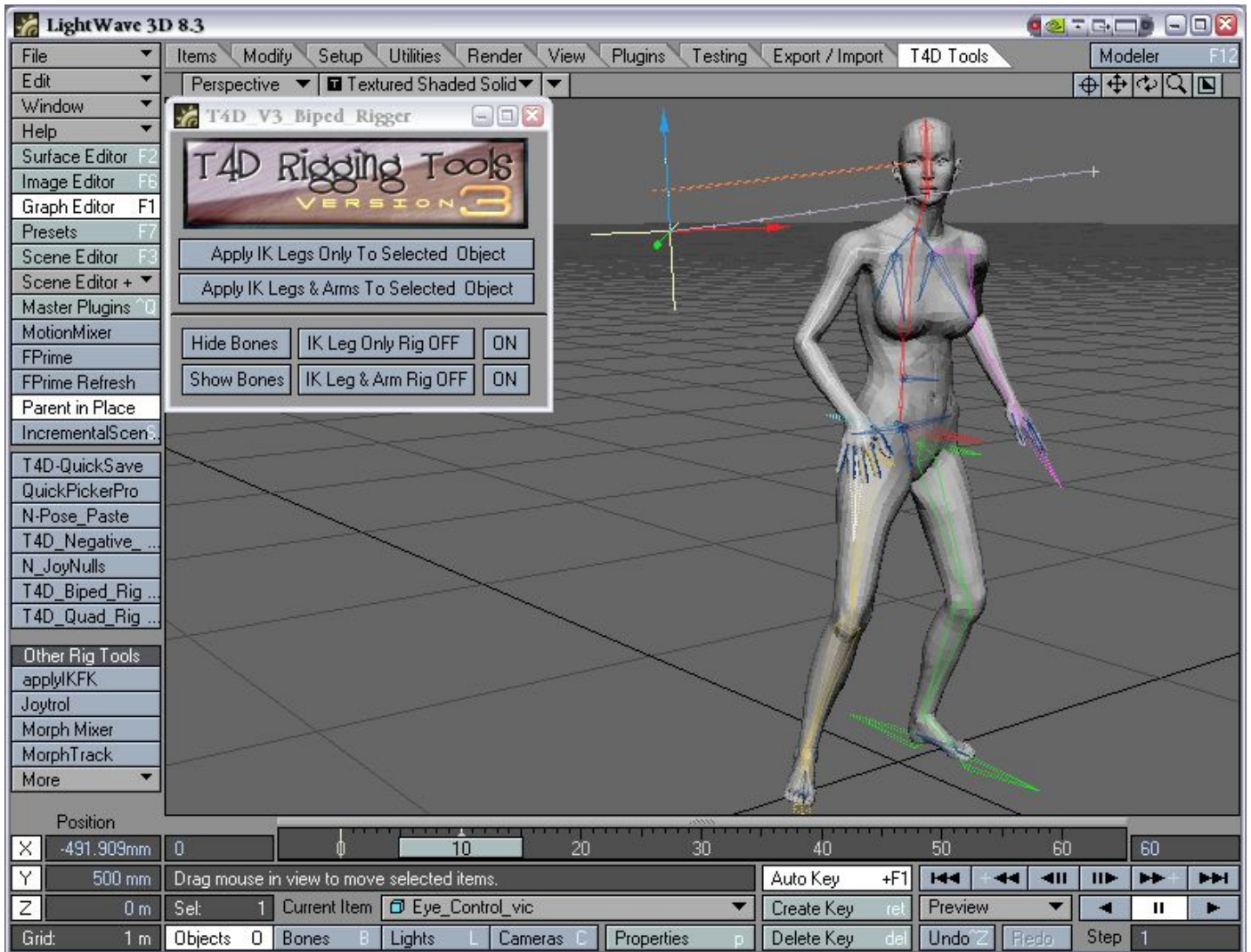
IK Legs FK arms

or

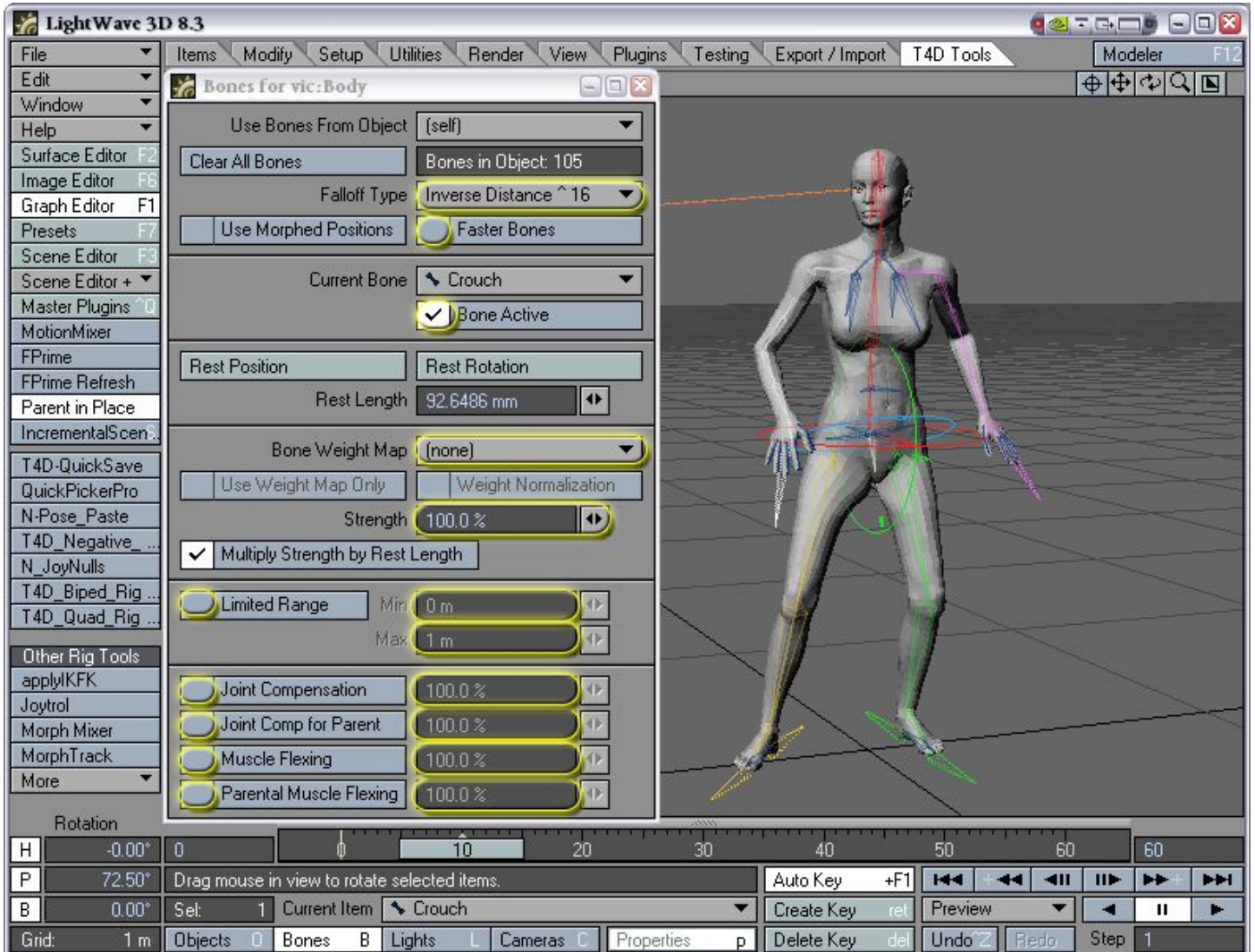
IK arms AND legs



Go to frame 10 and test the rig by creating a test pose.



Now If your character has deformation problems (bad joints), you have many options open to you. First explore the bone options & select one bone in the problem area.



Best place to start if the whole character isn't right, is to change the very top tab highlighted in picture above

Falloff type - Inverse Distance level, then if that setting doesn't correct things, try the faster bones button. If most things are moving well and it's a small area that needs work, make sure you have a bone selected in that area and change the bone Strength level. Also see what turning the bone off does, by clicking the Bone Active Button off.

If it's more of a joint bending issue, check you have the bone joint in a good position. In the case of Cartoon Characters, maybe move the joint to an odd location to help the mesh deform better.

If using Lightwave 8, you can use the new bone editing tool Joint Move. I still find going back in modeler and editing the skelegon there, and redoing the Plugin steps is easier. This method works also for Lightwave 7.5.

Now, if you still have areas that don't move well, go back to modeler and add weight maps to those areas, but think about what bone or bones you're going to assign the weight map too.

In the case of poser, or any model that gives you trouble, I would start with a basic weight map setup.

- one weight map for the whole upper body including arms & hands
- one weight map for the neck, and another for the head
- one weight map for each finger
- one weight map for each leg including foot & toes

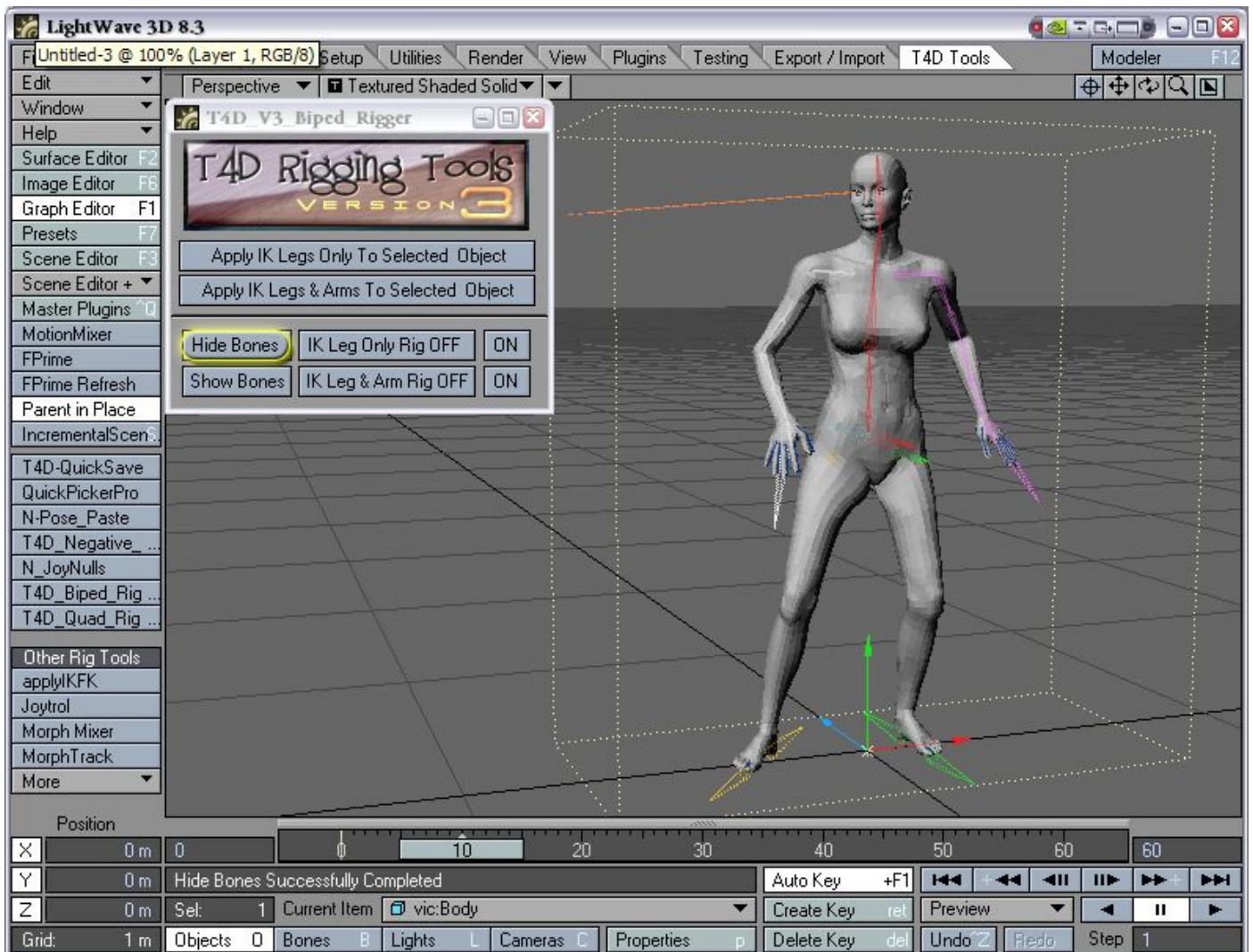
When in Layout assign them to groups of bones in layout.

If you see any areas that deform in any unwanted way, add a weight map on a per bone level. Add them one at a time to see the effect. Though there's not many characters you would have to go to this level with, it will come up sometimes.

If you followed the steps to correct any mesh problem, you can now move to the last stage.

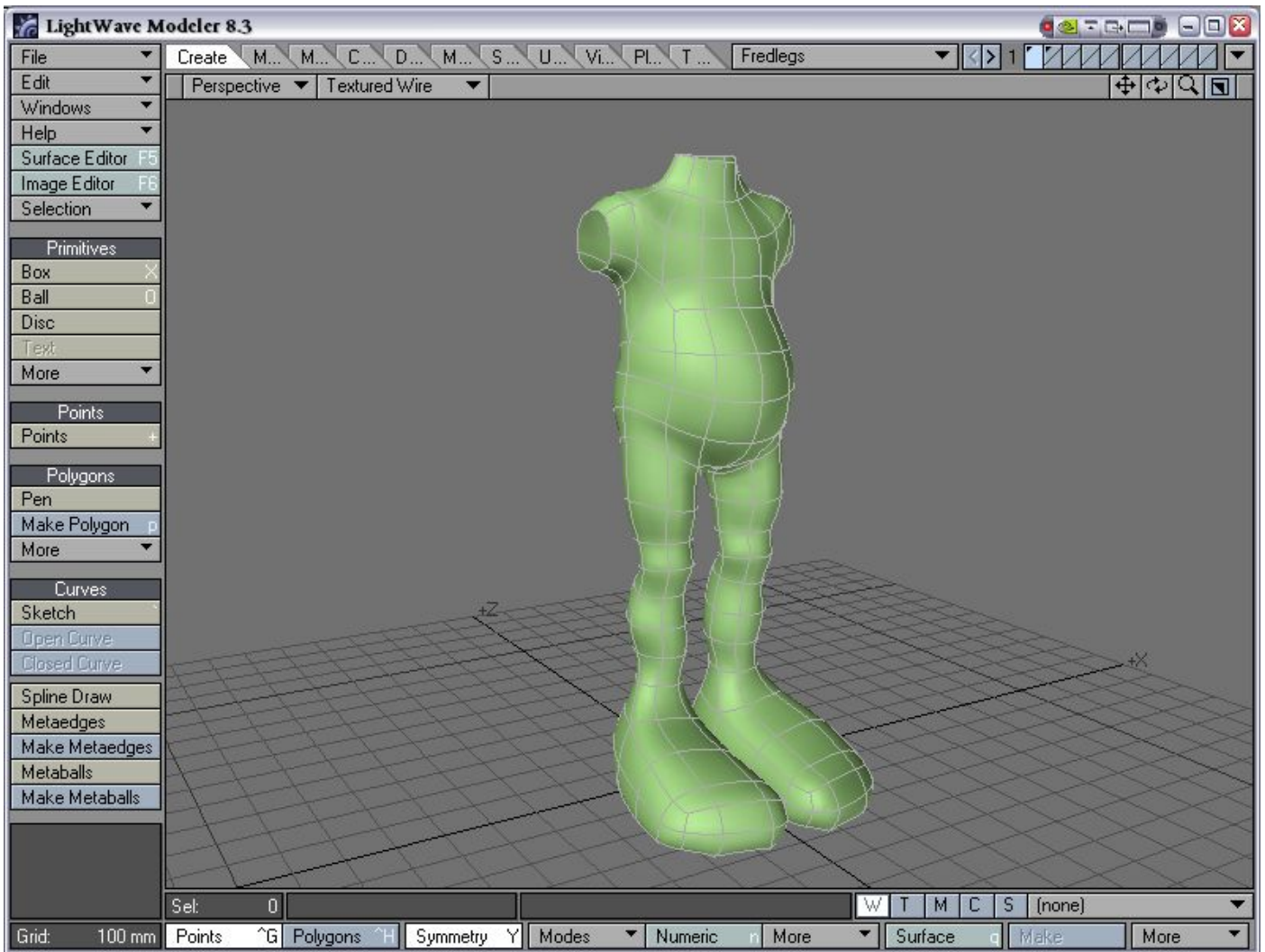
With the T4D rigging tools panel open, select the main character model and press the Hide Bones button. The character rig controls are still showing.

That's it, Enjoy Animating the rig =)

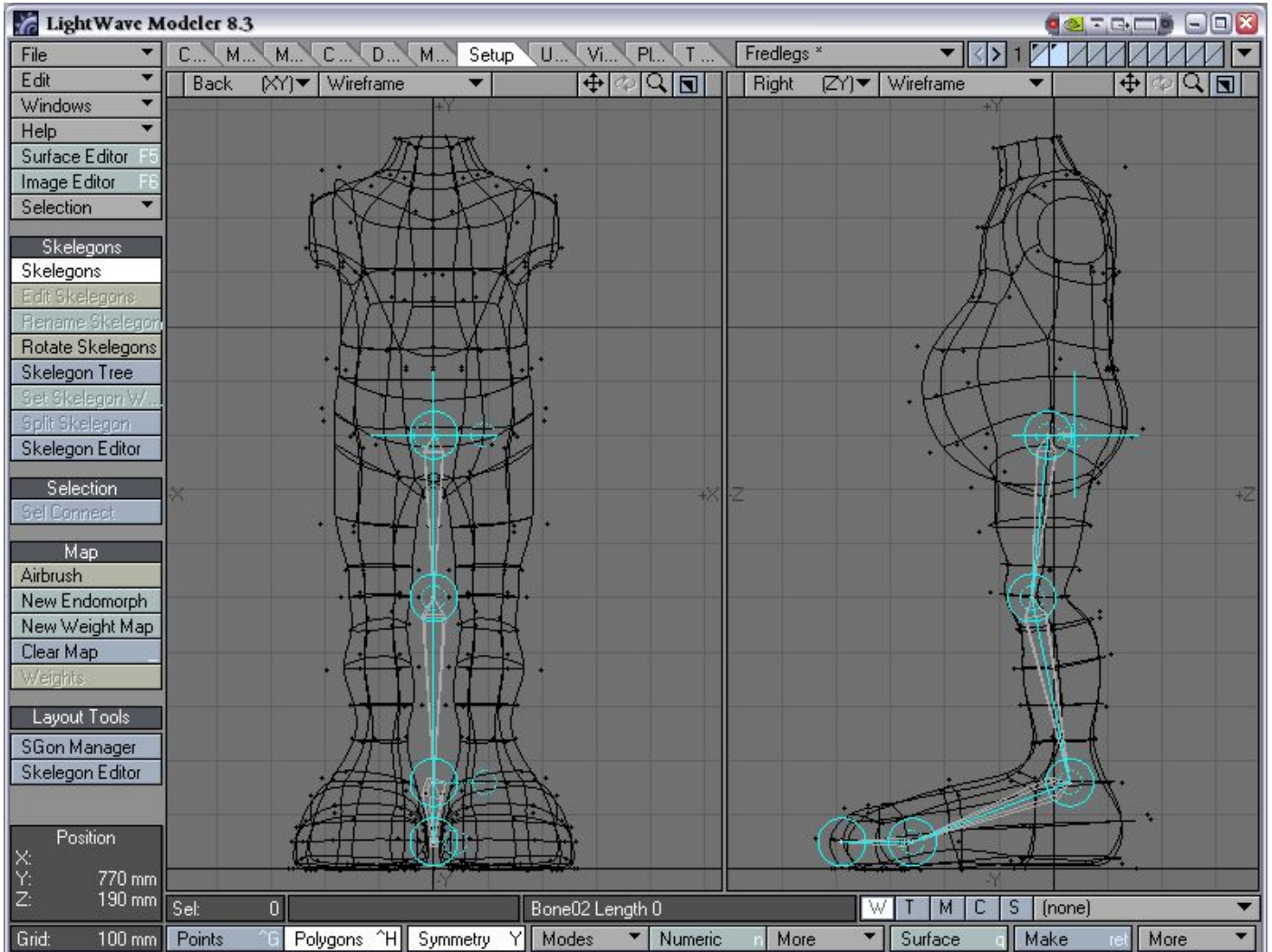


IK LEGS WITHOUT THE PLUGINS

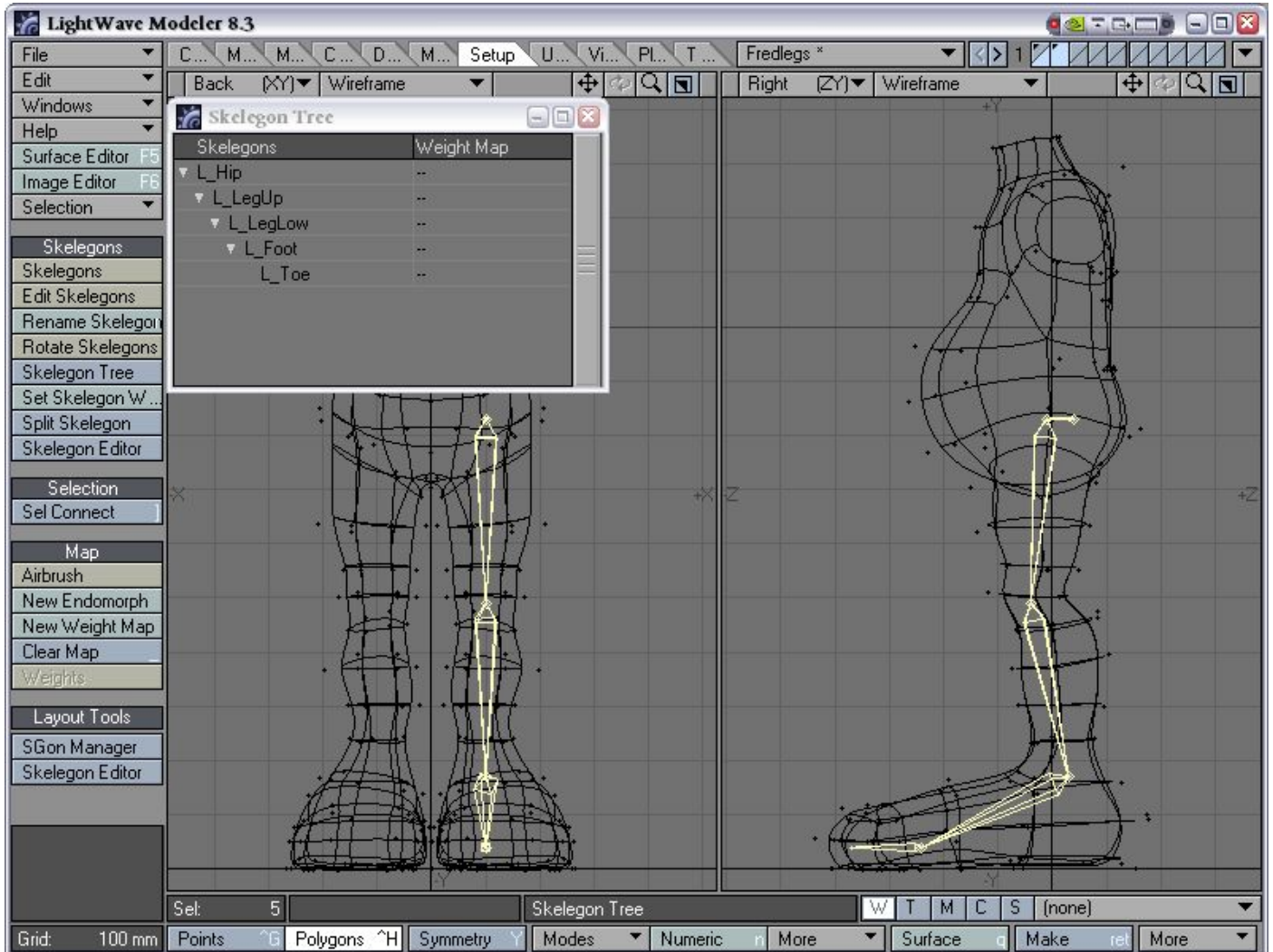
To better understand what the Plugin does and to edit the rig, you need some understanding of the basic rigging methods in Lightwave. This IK Leg Rig Tutorial should cover all of it. We're using a basic set of legs here in Modeler as an example.



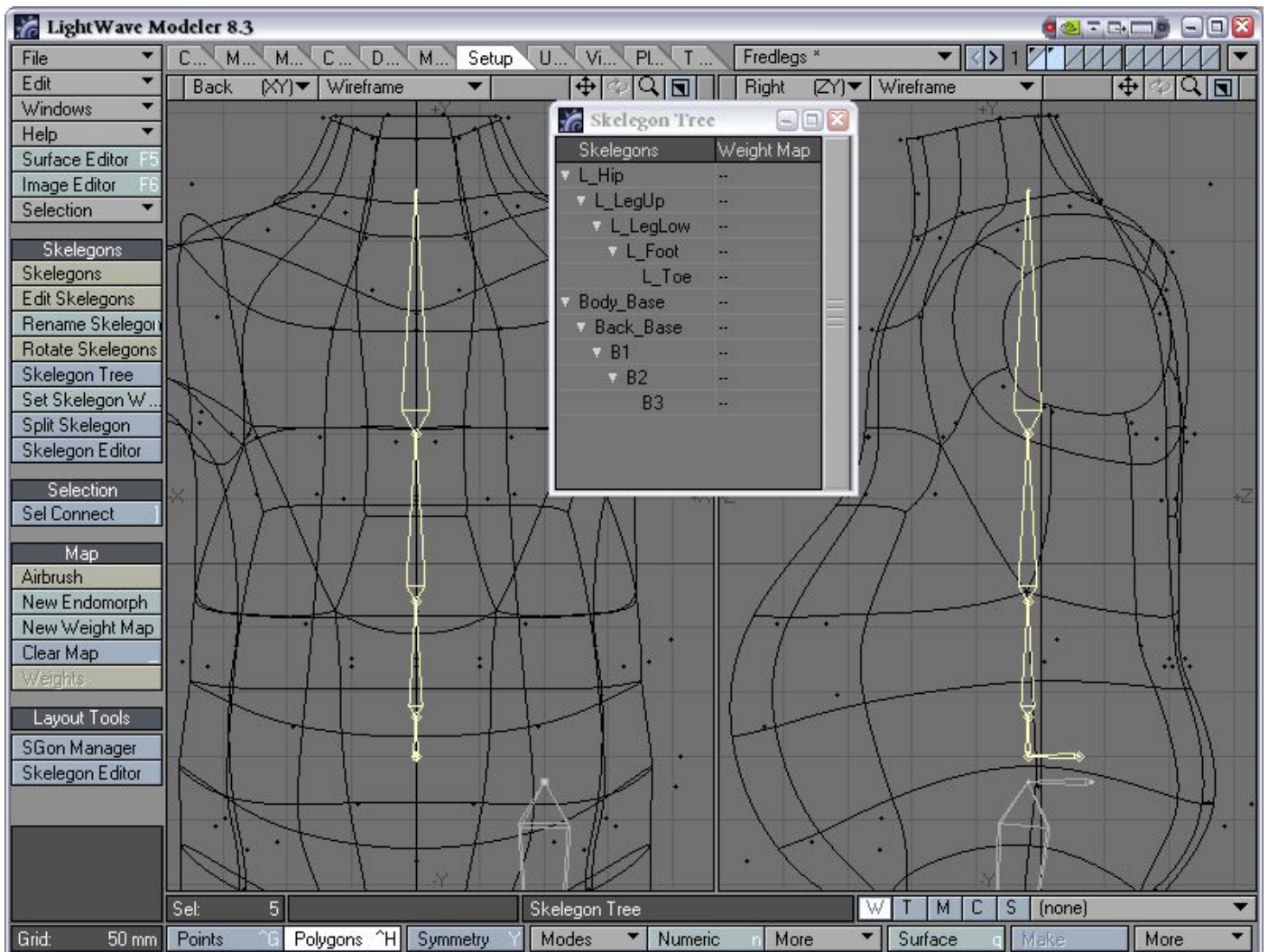
Go to layer 2 and put your mesh in the background layer. Set your View Port to Right Side View and draw a hip, upper leg, lower leg, foot and toe bones.



Now with Symmetry Off, move the bones to the left side of the body and rename the skelegons (give proper names).

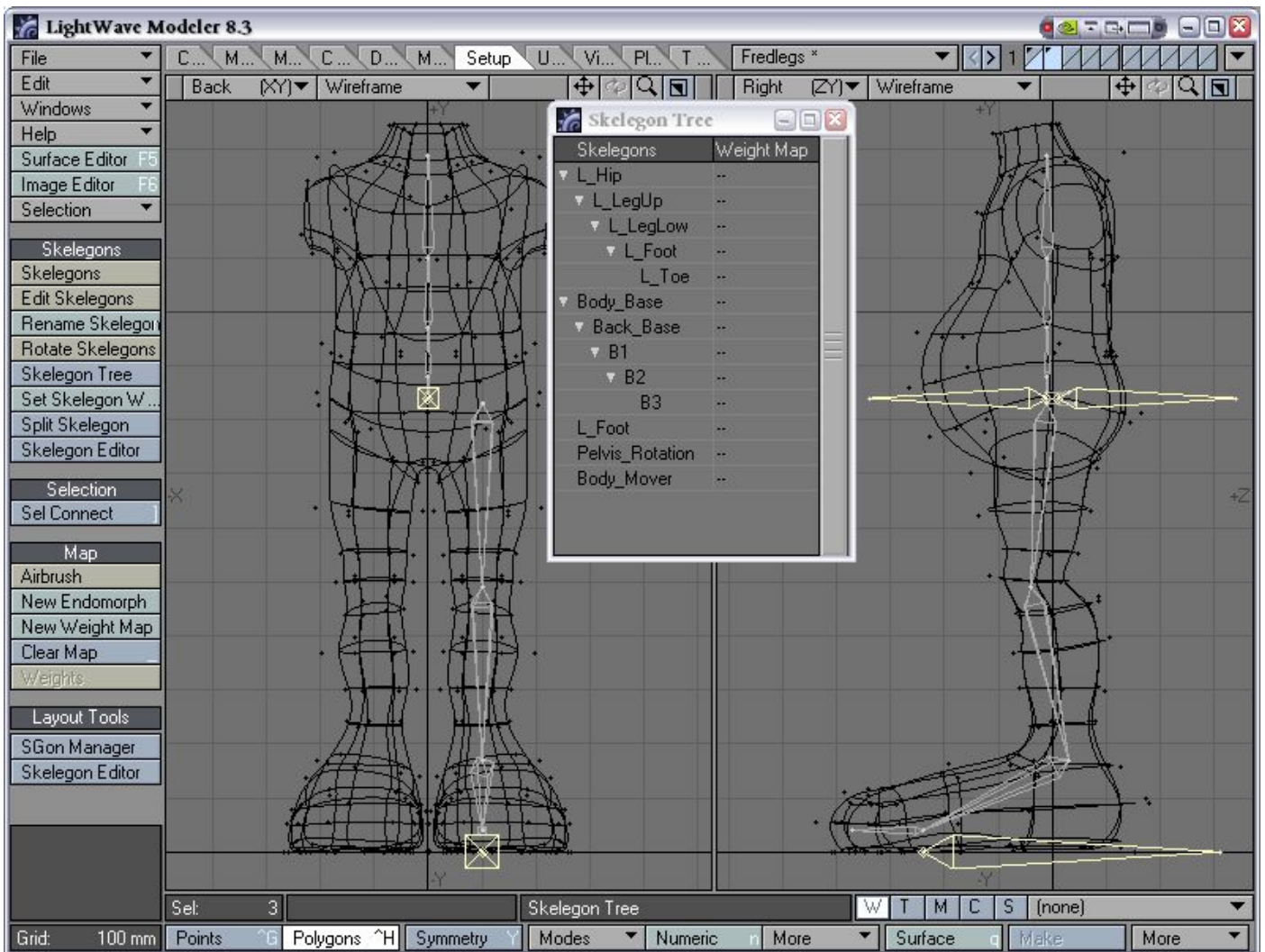


Before drawing the spine in, a few little bones have to be put in first for later on. Draw a small bone for the Body Base, then draw another small bone as the Back Base, then draw your main spine. Bones (B1,B2,B3). You can have more, but 3 back bones works fine for most characters.

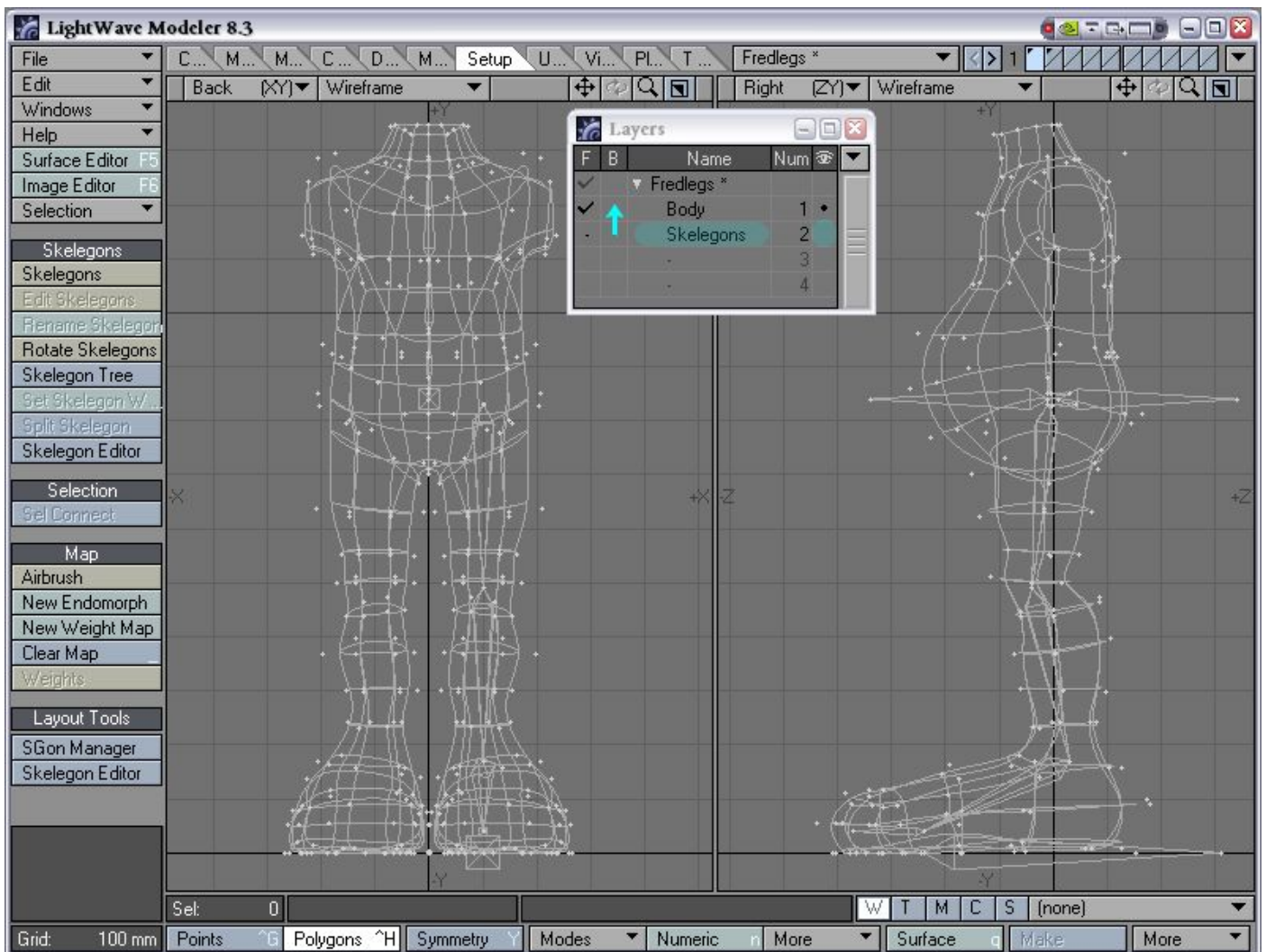


Now we will draw some bones that will be used as control bones in layout.

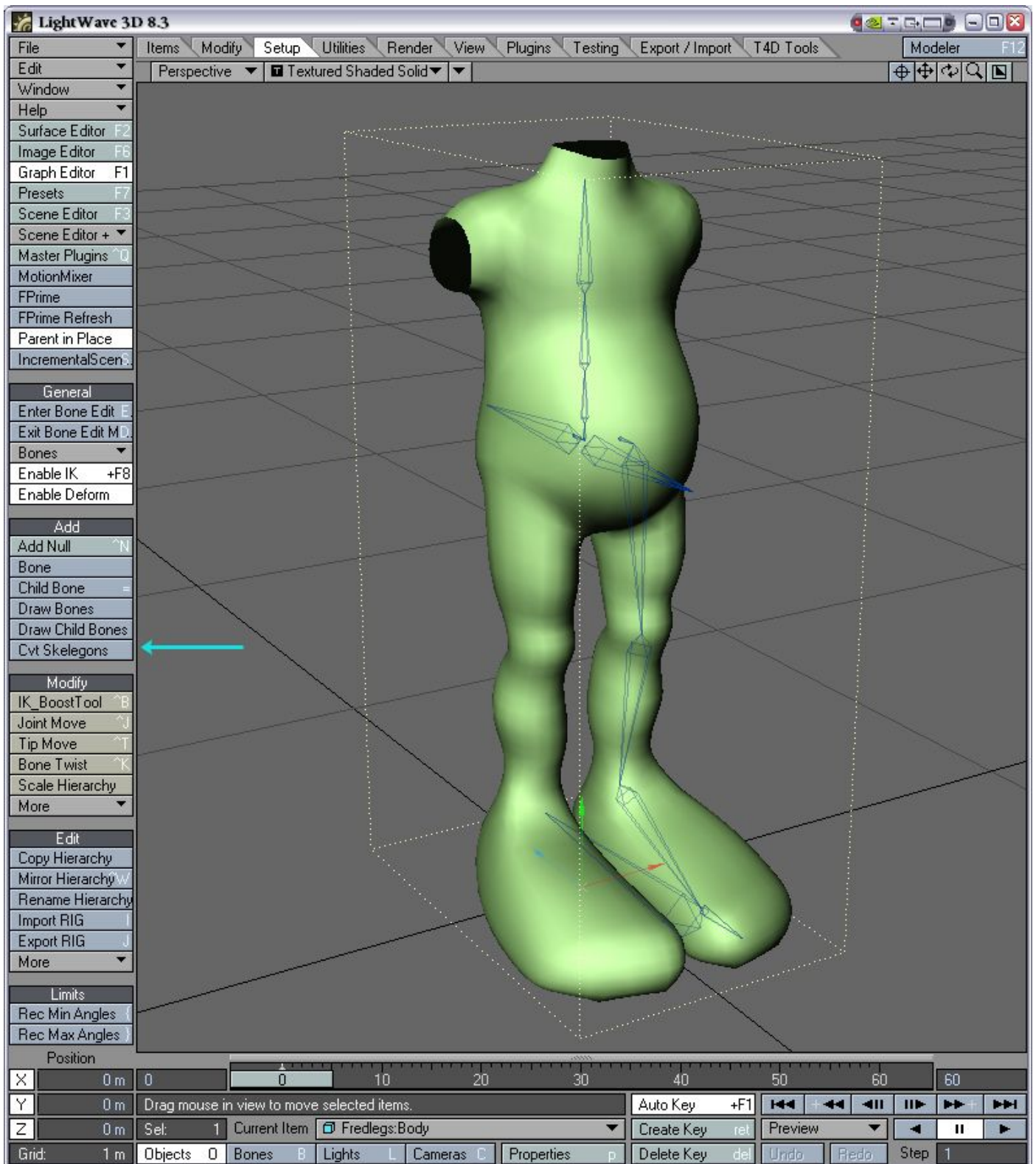
Draw a Body_Mover pointing forward. Pelvis_Rotation pointing to the rear. One L_Foot will be the main foot controller. Move the L_foot across into position under the rest of the left leg.



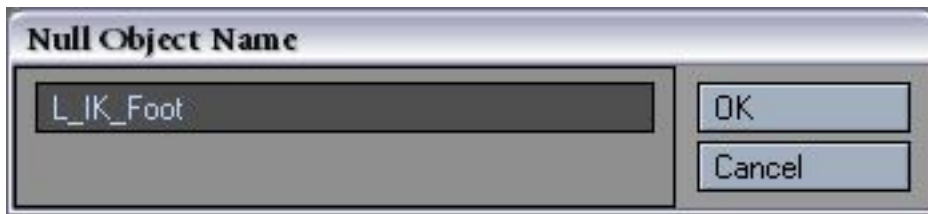
Now copy the skelegons from layer 2 to your Mesh Layer (layer 1). Turn off the second layer so it doesn't load into Layout. Rename it, ex. Skelegon Backup. This is your working skelegon layer. Save and send to layout.



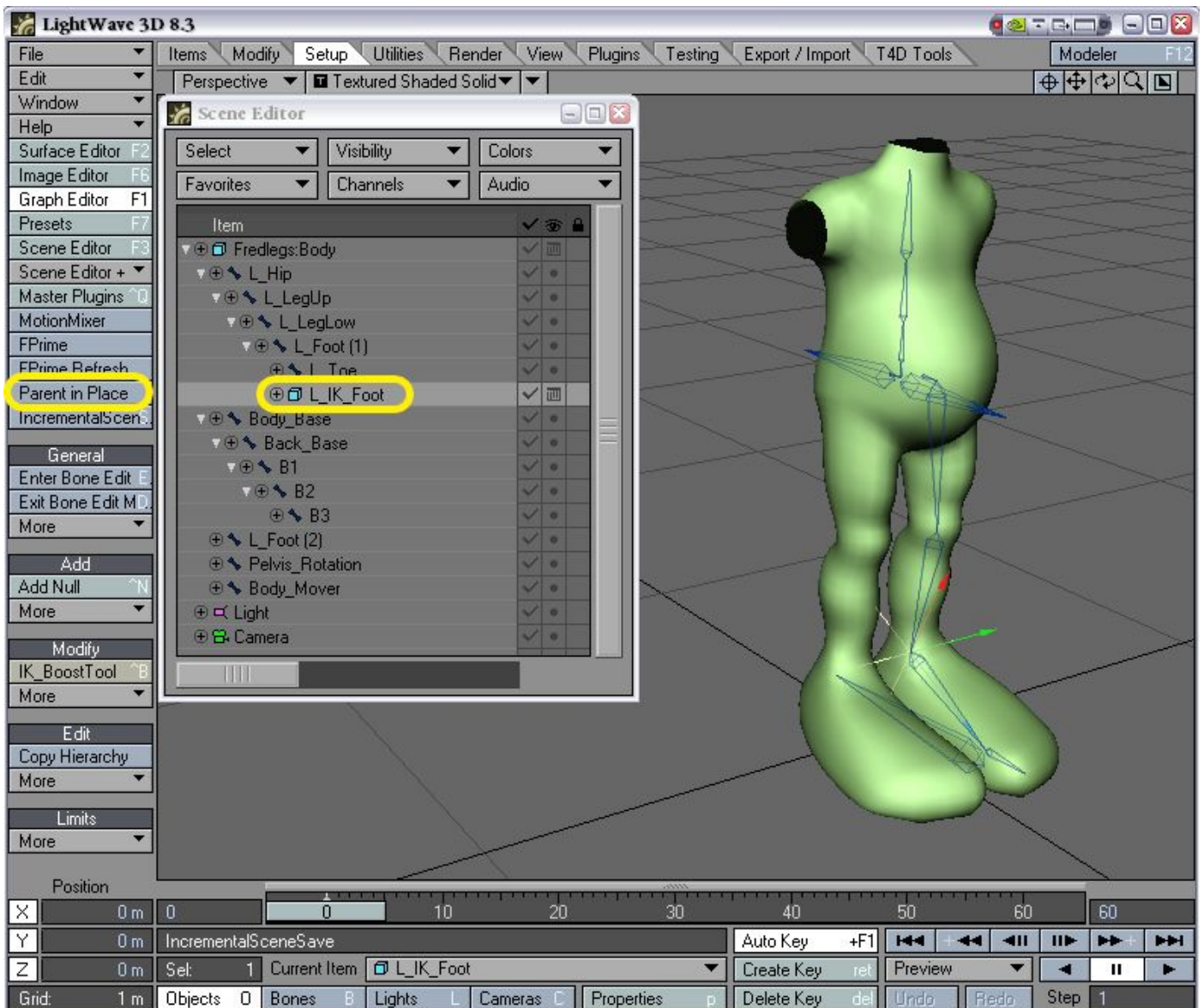
Convert the skelegon to bones and turn X-ray Bone on in the View Port. Display Options.



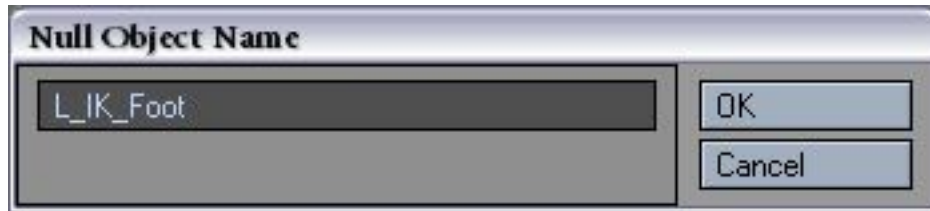
Create a Null, call it L_IK_Foot



Turn Parent in Place off, and Parent the Null to the L_Foot Bone



Now I see an error here. There are 2 L_foot bones shown by the (1) & (2) on the ends.



Let's rename the Control Bone by putting an X on the end.

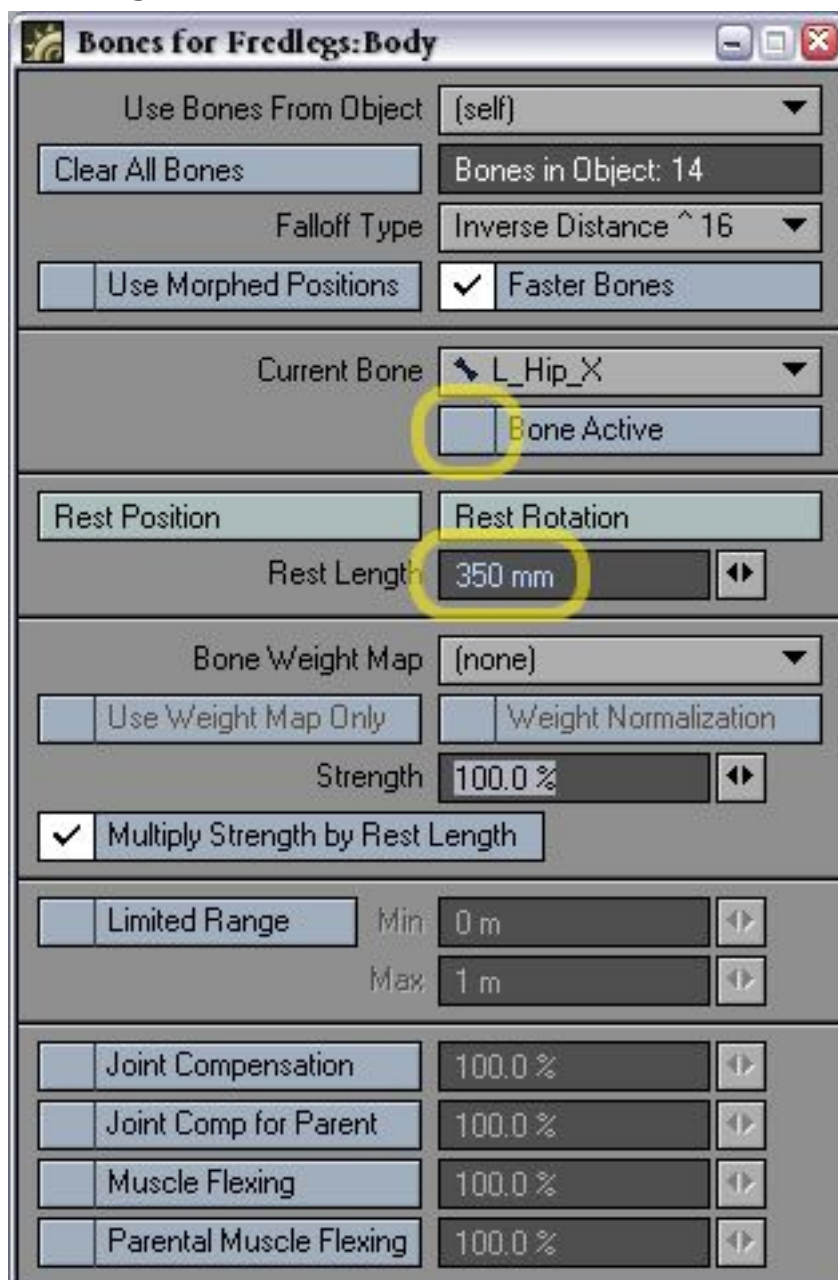


It'll look something like this.

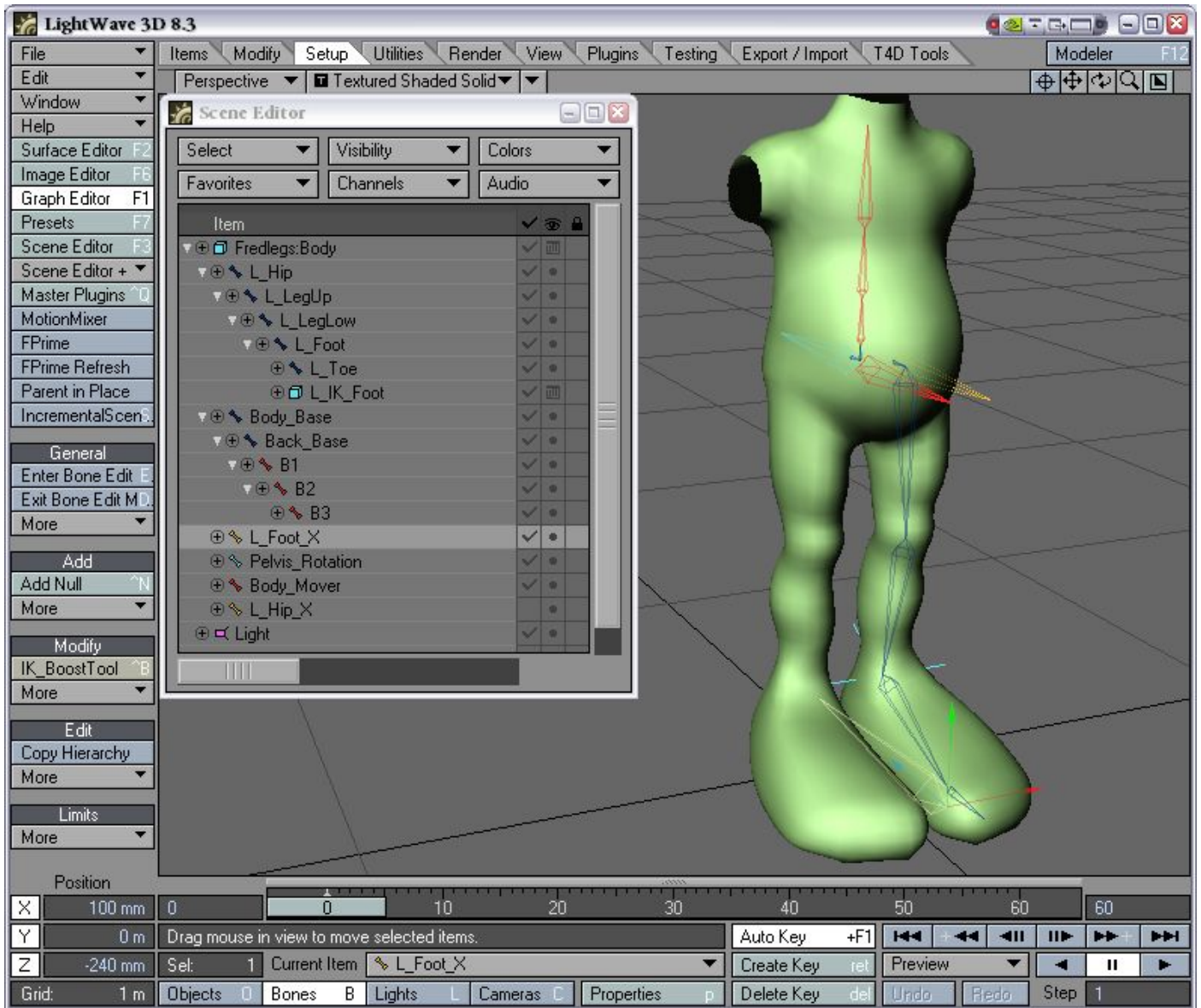
Now we need a Knee Control so clone the L_hip and rename the clone by putting an X on the end.



Now with L_Hip_X selected, open the Bone Panel and turn Bone Active off. Set the Rest Length to 350mm, make it big so the bone is easy to select while animating.



Now colour all the Control Bones for easy selection and work flow as shown below



Now we'll set up the Parenting, for the rig with Parent in Place On.

Parent the **Body_Base** to the **Body_mover**.

Parent the **Pelvis_Rotation** to the **Body_Mover**.

L_Hip_X to the **Pelvis Rotation** and Parent **L_Hip** to the **L_Hip_X**

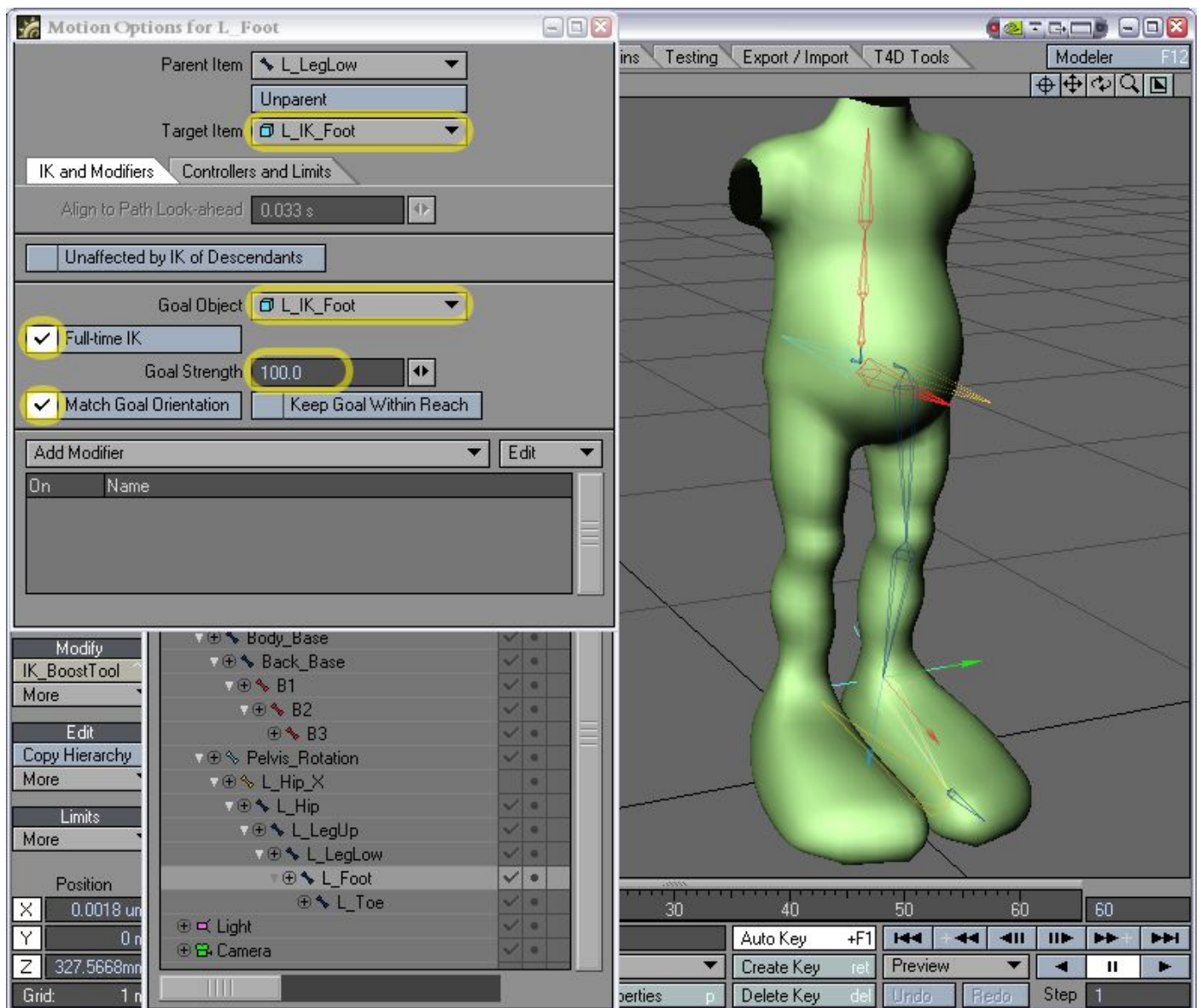
Parent the **Null L_IK_Foot** to the **L_Foot_X** bone.



IT'S IK TIME !!

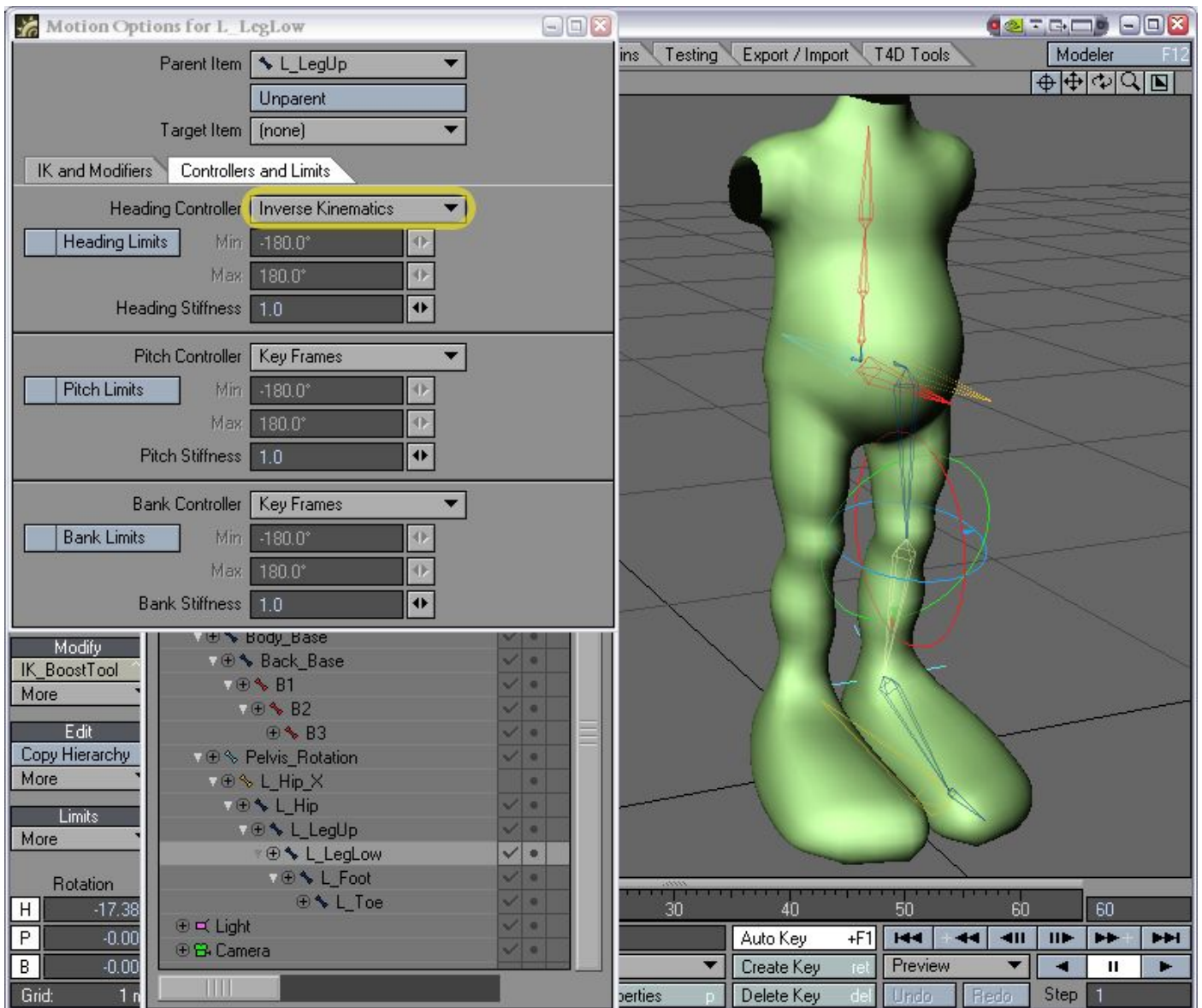
Now we'll go from the ground up. Select the Foot bone and open the Motion Options Panel. Target the bone to the L_IK_Foot Null. Set L_IK_Foot as the Goal Object

Turn on Full Time IK and Match Goal Orientation.

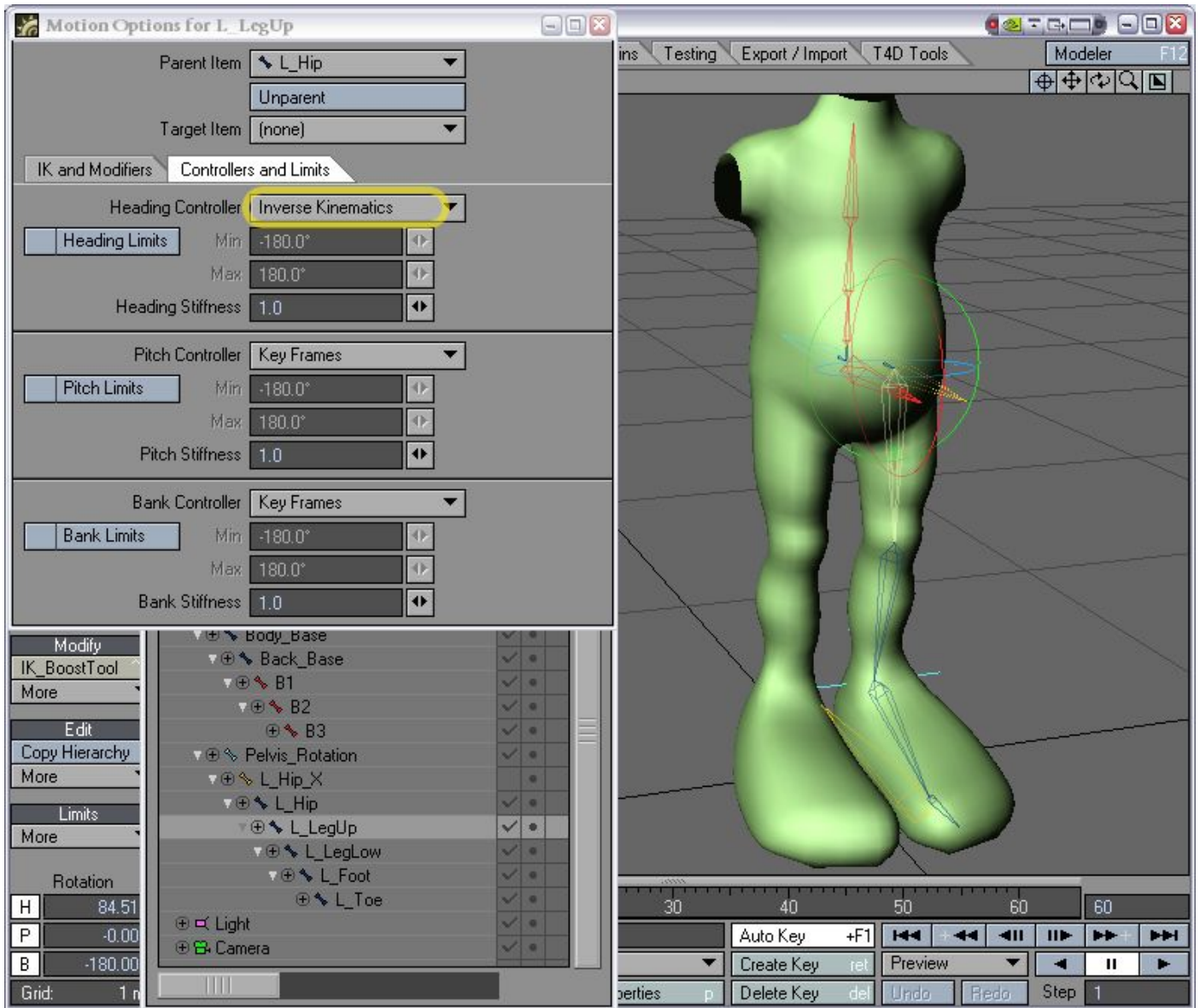


Select lower leg and open the Motion Panel again. This time go to the Controllers and Limits Tab. Turn IK On the Heading Channel.

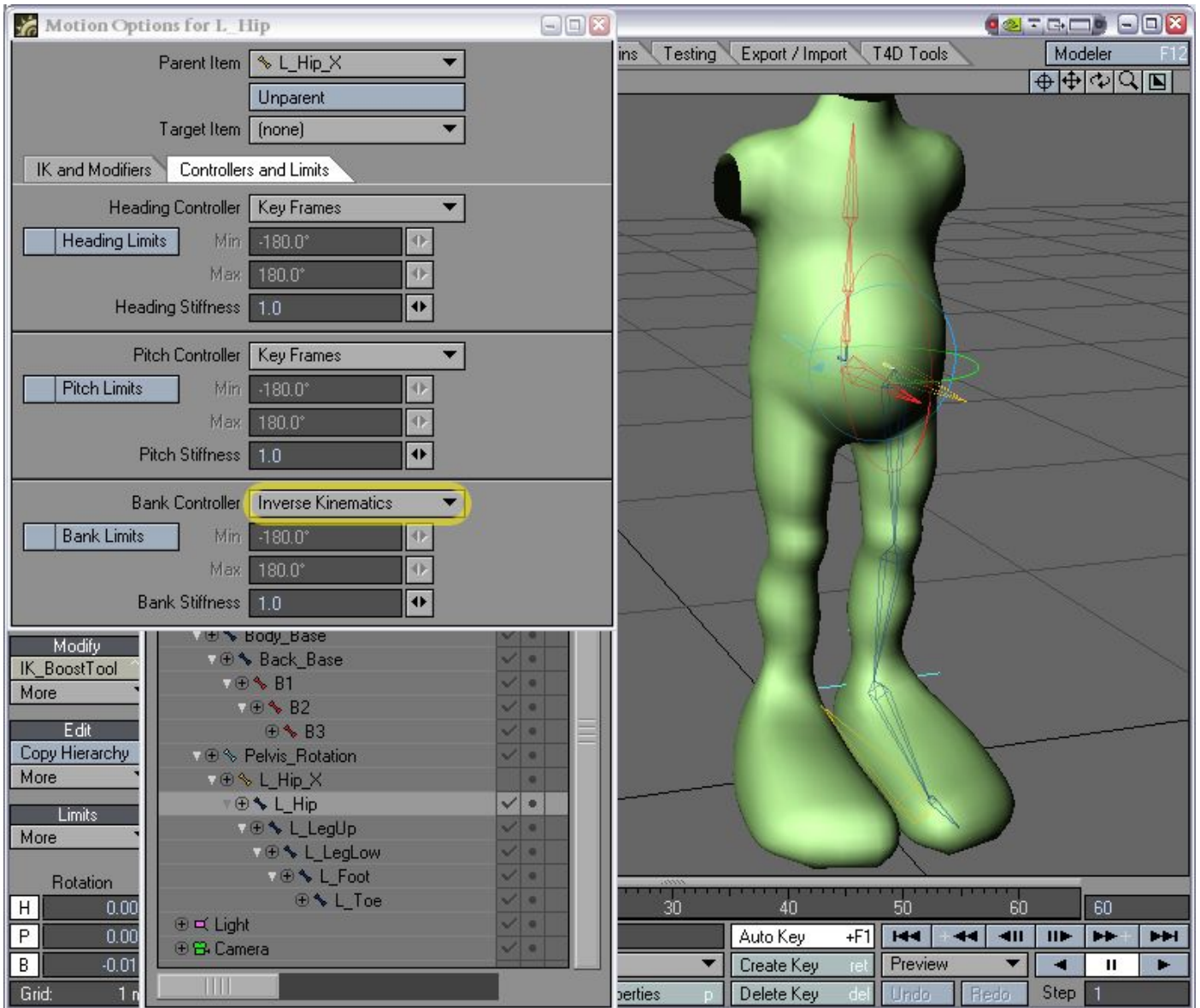
Tip; Turning Rotation Tool on at this stage is helpful to show what Channels control the rotation of each bone.



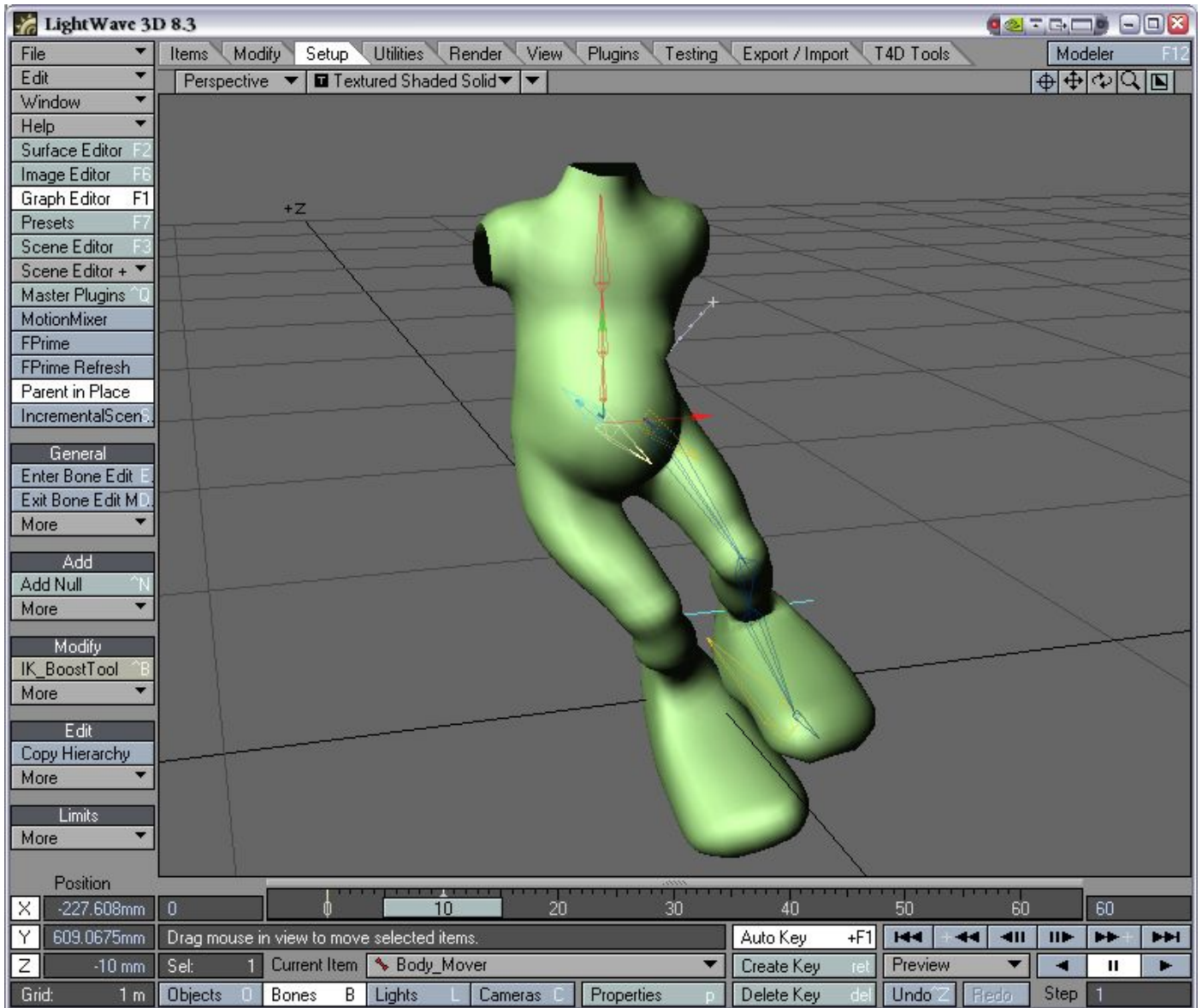
Next the Upper Leg. Repeat the same thing you did for the lower leg.



For the L_Hip, set the Bank Channel to be controlled by IK.



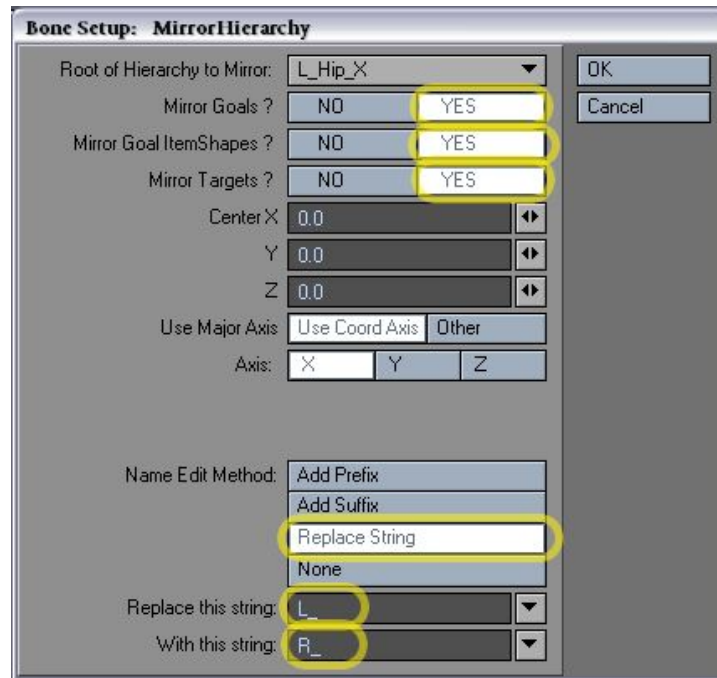
Go to frame 10, grab the Body Control and move it around to test the IK. It should look like this.



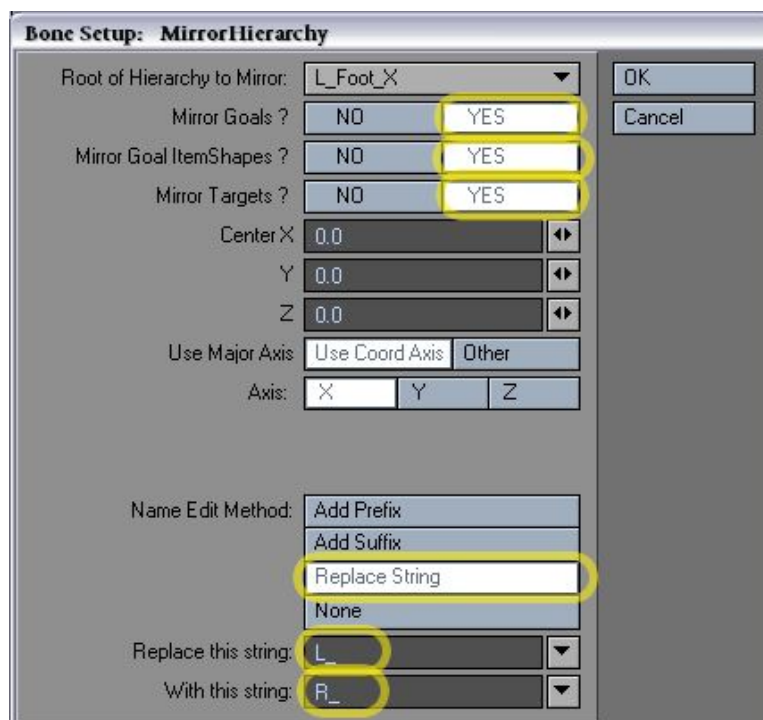
WHAT ABOUT THE OTHER LEG ??

No Problem! In Lightwave 8 there's Mirror Hierarchy.

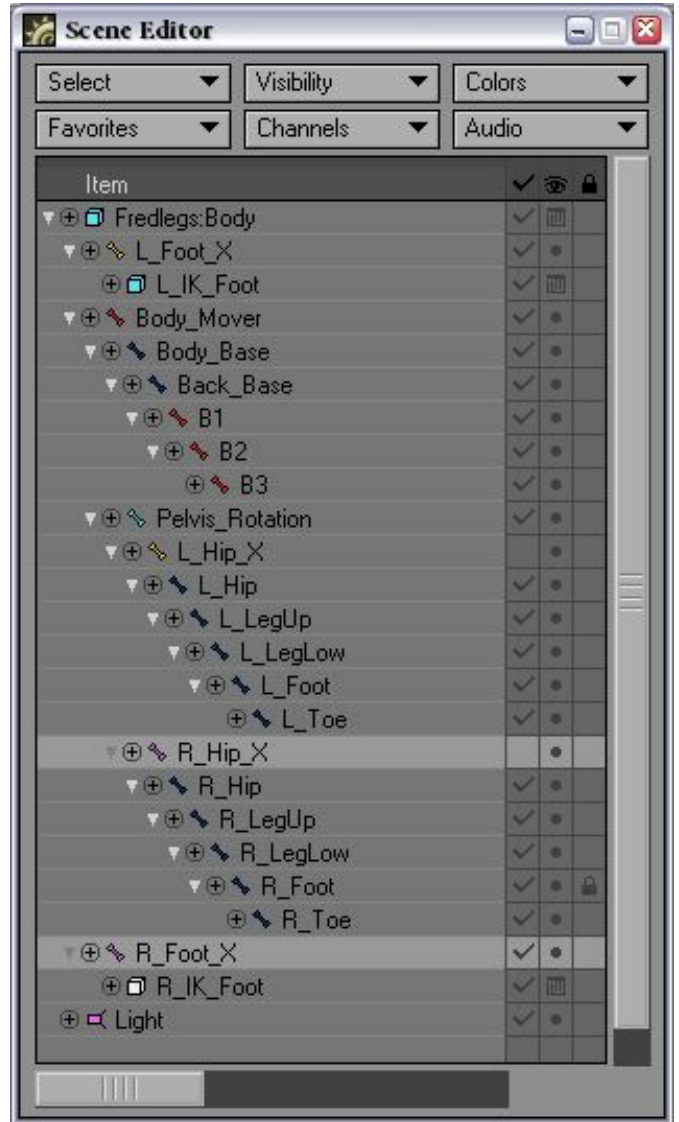
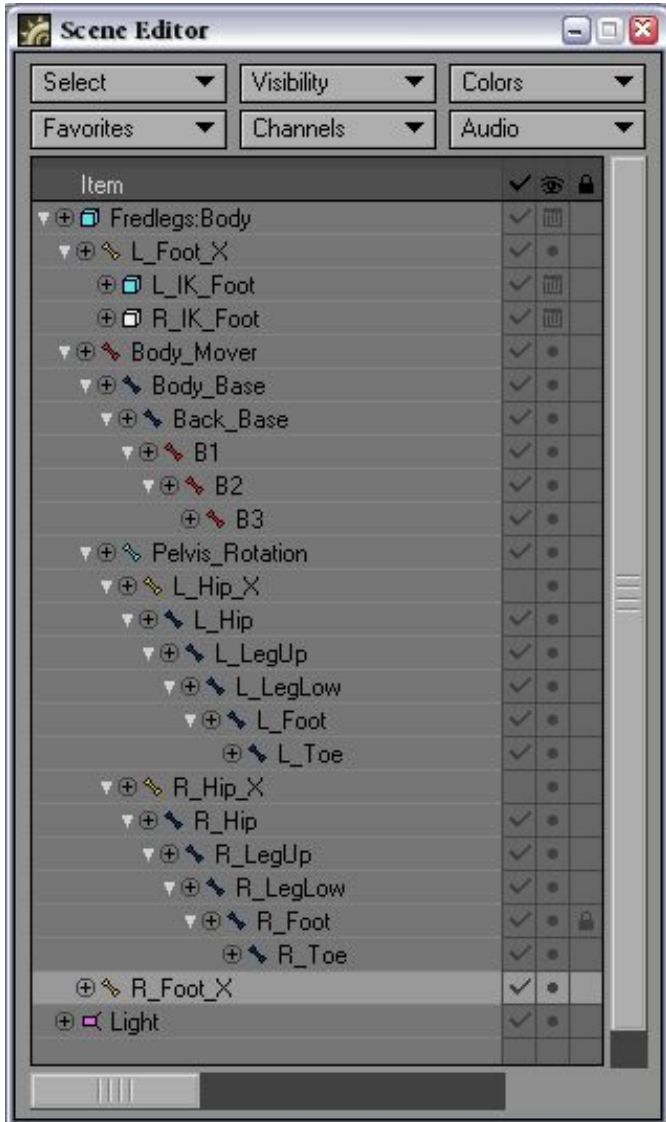
Select L_Hip_X and run Mirror Hierarchy. Change the settings to these.



Now it didn't mirror L_Foot_X Control Bone. No problem, just select the bone and run again.



Also notice the R_IK_Foot is Parented incorrectly. Re-parent it to the R_Foot_X Bone. Colour the Right Control Bone to be different to the left side.

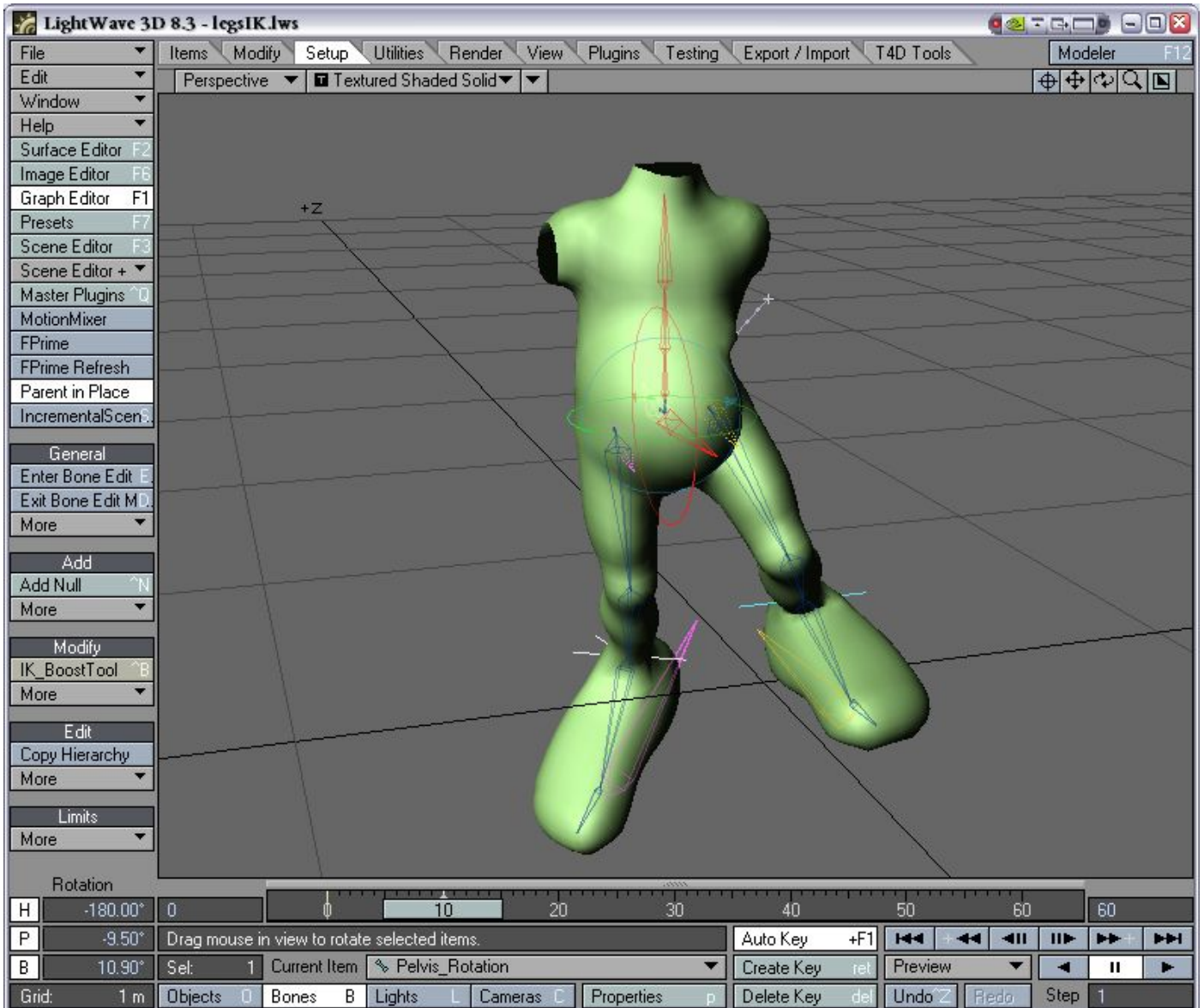


YOUR ALL DONE !!

This simple IK Leg System should work without a problem!

If not ??

email me t4d@thomas4d.com



F.A.Q

Q-Do I get ALL the Plugins listed for \$60 US dollars ! or is it \$60 each

Yes ALL the Plugins on the Thomas4D rigging Tools page you get for \$60 US Dollars =)

Q- Once I purchase the Plugins how do I get them? Do you post them?

A- I 'll email the email address used to purchase the plugin with the download links the Plugins are about 5 megs and a lot of video tutorials Videos able from the website.

Q- how do i install /update the Plugins

A- OK first open the Plugins directory of your current version of Lightwave 7.5c or 8 if you have a old version move or delete those Plugins out of the Lightwave Plugins directory. unzip the files and move the directory T4D_Rigging_Tools with the sub-directory Face_Controls to the Plugins directory of lightwave

Now open lightwave layout and add the Plugins as you would normally in LW 8 go to Utilities Tab and select the add or edit Plugins button now find the thomas4D tools directory in the Plugins folder and select all of the Plugin in the file

(except the T4D_Face_Rigger.exp that's a lib for graph editor)

in LW 8 go to layout Tab upper left then Plugins and select the add or edit Plugins button now find the thomas4D tools directory in the Plugins folder and select all of the Plugin in the file (except the T4D_Face_Rigger.exp that's a lib for graph editor)

a message should come up saying you have installed Plugins now edit the menu's in lightwave by going In Lw 8 goto the edit tab top left corner and select edit menu layout and a panel will open up in the left side of the tab it list all the Lightwave commands open the Plugins tab move to the T section and selection all the new Plugin there with T4D in the name and then in the right side it lists all the Menus open one of the tabs under Main Menu and place the Plugin where you would like them to be (Personally create a new group called T4D Tools and place them there)

In Lw 7.5c goto the Layout tab top left corner and select interface and select edit menu layout and a panel will open up in the left side of the tab it list all the Lightwave commands open the Plugins tab move to the T section and selection all the new Plugin there with T4D in the name and then in the right side it lists all the Menus open one of the tabs under Main Menu and place the Plugin where you would like them to be (Personally create a new group called T4D Tools and place them there) and that's it you have installed the Plugins =)

Q- these Thomas4d_Rigger & Thomas4D Control file names are Too BIG

can I change them ? (NO NEED FOR THIS IN VERSION 3)

A- Once you run the scripts

just save the model in layout with a new name to where ever you like also you can save the Control objects with a new name to where ever you like too save the scene after you have done this, and all will be fixed =)

Q- why make a Boned face rig what wrong with the endomorphs

joystick rig they are 3 options for face animation

(THIS IS IN VERSION 2 WHICH YOU CAN DOWNLOAD FROM THE MEMBERS SECTION OF THE WEBSITE.)

1/ the normal endomorphs setup with slider Basic setup A,E,O,B,F & M this is a good method

but you always add lots of other like smile, sad, brows up etc and you can end up with 20 or 30 slider this is nicer to control in LW 8's new morph mixer, but controlling and keying all of them can turn into work

2/ Joysticks controlling 4 up to 8 endomorphs controlled by one key able object. Can be setup in lots of different ways you can tie the standard A,E,O,B,F, M smile & sad to one joystick or design a new system where each joystick controls each part of the face

(this type system is shown in the content for my tools But T4D face rigger can setup the endomorphs to joysticks any way you like)

this is a better system because you can control around 50 or up 88 endomorphs with 11 key able objects Allot of fun to animate with BUT

the down side is Making all those endomorphs (this is what got me thinking about bones making all those endomorphs because it does turn into work after awhile....)

3/ Bones No more making endomorphs you have a fully rigged character including face in under 15 mins you create your base face shapes A,E,O,B,F & M in Layout In negative frames and just paste the keys to the the correct frame when needed
you also have complete control over the face as you animate you can fine tune the shape anytime no going back to Modeler you can grab any apart of the face and just move, rotate or scale the bones where you want it when animating

you can used the joystick/Endomorphs rig as well as the bones rig on the same face

Downside you have to create 9 weight maps in modeler and you might have to fine tune them (blur weight maps works well as always) and maybe even move some bones around but LW 8 comes to play here and makes this Easy

it's Super Fast at Rigging and it totally rocks it does have limits to how far you can push the bones before they distort the face too much, But I think that understandable and the fact you can uses endomorphs with it makes any tidy up needed easy too.

Q -I get error R_Hip is not in the scene ?

A- Make sure you have used skelegon from one of the example Characters there should be 94 bones in total if you paste the skelegon twice in to the character layer layout will rename all the bones with a (1) or (2) at the end so the name would have been change due to have 2 of the same named bone

Q - Does it work on the Mac

A- YES it I have afew very happy Mac users and all LS and LSC should work in lightwave 7.5c & lightwave 8 on the Mac
(WE HAD A BUG ISSUE WITH THE LIGHTWAVE 8.3 RELEASE THE 3.01 RELEASE OF THE T4D RIGGING TOOLS FIXES THESE ISSUES)

Q- can I change the shoulder setup or setup my own IK feet

A- Yes you can do any changes you need to the rig they are no Plugin Expression on the main body rig is it is ready for anything you got ready for you to add in your own Expression and Plugin for your character the Plugin create a nice professional rig but can always be added to when needed

Q- The Script isn't working What do I do ??

A- First make sure your using Lightwave 7.5c or above then send me the character file = X_thomas4d_rigger and the scene file that Plugins creates, we'll help you as quickly as we can

t4d@thomas4d.com