A Beginners Guide to Avimator.
By: Rubin Webb

Introduction:
    This Guide, as many before it, was born out of necessity. It is a basic guide to start effectively using Avimator, the Awesomely robust, and Free (under GNU licensing) posing program made by: Vince Invincible. This guide contains general program information, tutorials on posing, and animation, along with time saving tips, hints, and a section on how to successfully upload your animation files to Second Life. This Information has been compiled by the author through basic trial and error. It is written VERY basically, so please dont think I am trying to insult your intelligence by being very basic, I simply wanted to eliminate all beginner questions possible within the scope of this guide. It was also written on a PC using windows XP, but I have tried to take into account Mac, and LINUX users while editing.  This Document is written as an aid to those who are familiar with the "Second Life" 3-D virtual world, but should help anyone needing to make BVH files with Avimator. It should also hopefully  save you a few $Lindens by keeping you from uploading unusable files. If you who are reading this and have any corrections, suggestions or edits please notify me by IM in game or on the Avimator forum. Thank you, and Enjoy.

-Rubin Webb.

# Chapter 1
## Avimator: A first look
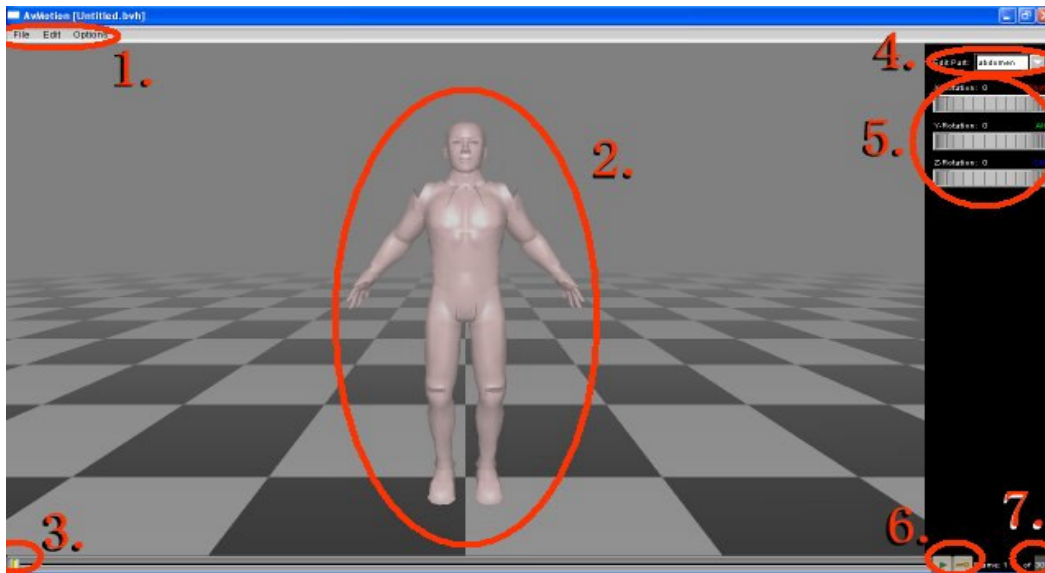


Highlighted are these important areas of the program:

1. The File Menu: File management, Program options, and Settings.
2. Figure: The Posing / Animation dummy (or Actor), standing on the stage: This is our main click and drag edit element.
3. Frame Slider Bar: the control to move between frames.
4. Edit Part Menu: An alternative to click select. A Menu to pick a particular body part to be edited.
5. Rotational Sliders: Fine controls to edit the X,Y,Z coordinates of selected body part.
6. Play Button / Keyframe Button: Preview plays animation / Sets the "Keyframe" of an animation.
7. Frame Quantity edit box: This is the control to edit the number of frames in an animation.

Chapter 2
Controlling Your Work Area.

Second Life builders will be pleased to know that Mr. Invincible has retained the same Keyboard control format as the "Build" Tools in Second life. Those familiar with Building in SL will find it an easy transition to animating in Avimator. This Program also has many redundant features, to allow you to pose and animate in your own style. When you are comfortable with the controls, experiment with different ways of controlling your figure and you will discover your animations will be quicker and more enjoyable to make.

We will begins with the Camera controls.

Again as in Second Life (Which we will now refer to as SL) The camera controls work the same. The three Keyboard Keys SHIFT, ALT, and CTRL all have specific functions for camera control, (Just as they will have in posing later in the guide).
Our figure/actor is there in the middle of the screen by default. He seems to be anxious to get into a position more interesting than his default "T" position.
(I will skip ahead just a bit here for your comfort. If you would like to work with a female figure, then click on the Menu Item OPTIONS + FIGURE Then select the Radio button for Male or Female as you please.) Now on to the Camera controls.

First begin by putting your mouse pointer on the checkered floor next to our figure, the Left or Right side. Click and hold the mouse button. Now move the mouse horizontally, you will notice that your camera is now rotating around your figure. If you pull the mouse toward you you will see that you are rotating vertically, or flying over the figure. This is your rough Camera control, it will get you basically around your figure. For more refined camera movement we will use the mouse in conjunction with our keyboard controls.

The ALT key:
Begin by again selecting an area of the floor (do not click on the figure yet), hold down the Mouse button, and depress the ALT key. With the Mouse + ALT held move the mouse forward. Now instead of flying over the figure we are zooming in. By moving the mouse vertically and horizontally you can  zoom in close to any part of the body.

The SHIFT Key:
Select The floor as in the prior example, but this time hold the SHIFT key, Now when you move the mouse forward, or backwards you will now Pan the entire stage up, down, right, or left.

The CTRL Key:
The CTRL Key has the same function as the default rotation without keys.

Now that we have a better view control of our Stage, and Actor, lets make our first Pose.

Chapter 3
The first Pose.

Our first pose will be a salute, this is a tribute to the many programing guides that begin with the "Hello World" first program.

Lets begin by clearing out our stage. Click on the menu item FILE then NEW, alternately you can use the keyboard shortcut CTRL+N.

Initial Setup

When Making a pose even though it is a static stance, it will still be considered an animation by SL. So to make a pose we need TWO frames. The first frame SL will use as a reference the second will be our actual pose and Key frame. Begin by clicking in the frame quantity edit box. Now either delete the default 30 frames and type in "2" or click in the edit box hold the mouse down and scroll left or right to increase or decrease the number of frames. Again for this example we will want "2".

Now move the slider bar all the way to the right, or alternately press the right arrow key to move to frame 2. (you can use the arrow keys to move between frames in larger animations also.)

This step is optional, but it is a step I use at the beginning to reduce frustration for me later. Open the menu item OPTIONS and JOINT LIMITS then select the radio button OFF. (Avimator does not currently have "Inverse Kinetics" (an advanced physics program that allows joints in the figure to act more naturally.) Avimator has Joint limits while usually they are very useful, in this example we will have to turn them off to achieve a good looking salute pose.

This is also an optional step, If you choose to work with a female figure, then from the menu choose OPTIONS + FIGURE Then select the FEMALE radio button as earlier in the guide.

We are now finally ready to begin moving our Actor to his final stance for this pose.

Again there are many redundant features in Avimator making it easy for animators to nurture their own style of animating. First there is the EDIT PART menu in the upper right of the program window. (See Number 4. in above illustration.) we can select the part we wish to edit from here or, of course, by clicking on the actor in the region desired.

Step 1.
Lets Click on the left thigh, (or lThigh in the dropdown menu). It now should be highlighted in red and at the joint you should see our XYZ coordinates in different colored circles indicating the rotational ability of each coordinate. Now on the right side of the screen go ahead and play with the Z rotation control or the bottom dial. (you may notice in blue CTRL we will discuss this soon) If you decided to turn off joint limits you will see just how far you can torture our actor here. Also you will notice the number reference change over the dial as you turn it. For this tutorial we will want it to finally be set to "zero".
Alternately going back to the Blue CTRL next to the Z axis, you can hold the CTRL key and you will notice the blue circle indicating the Z axis will highlight or thicken. Now if you hold both the mouse button down on the selected body part, and CTRL key and scroll left or right you will move that joint just like with the slider. The SHIFT and ALT keys do the same thing with the X and Y axis respectively.

Step 2.

Now click on the right thigh or select rThigh from the menu. And with the Z axis control set it to zero also.

OK I know what your thinking, "Isn't there a way to make both move at the same time?". Fortunately the answer is YES! Heres how: hold down your SHIFT key, and Double click the left hip. If you did it right both hips should be highlighted in yellow. (see below image)
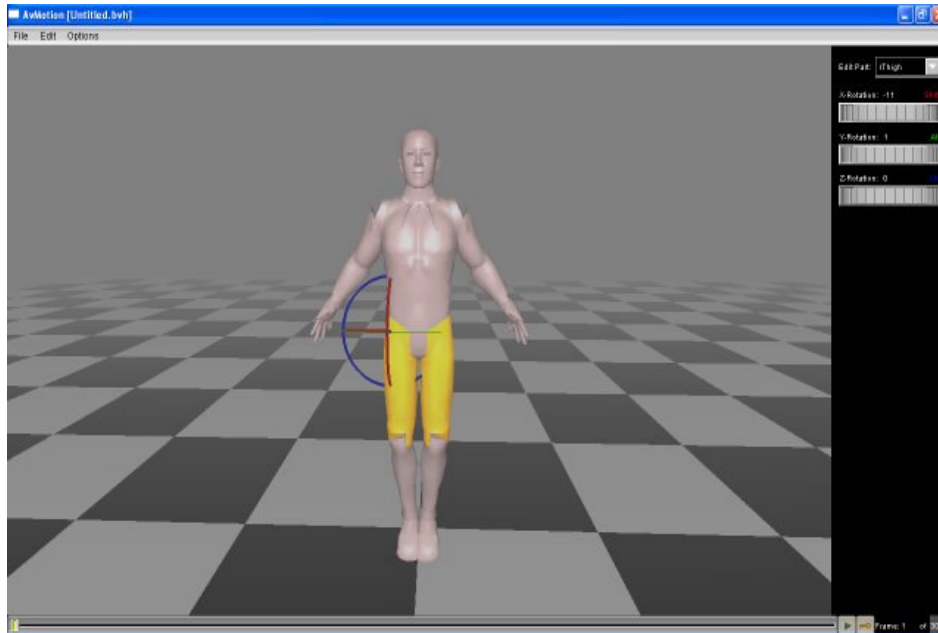


Now if you move the Z slider, or use the CTRL + Mouse control you will see both hips moving in tandem. (again at the end of experimenting we want the Z position of the hips to be "zero".)

Step 3.

you probably notice how close the ankles are in our pose so far. To fix this hold your SHIFT key and Double Click the right shin (or rShin). Both shins should now be highlighted in yellow. Set them both to Z axis "1". Looks pretty good right? Unfortunately no, not quite yet.

Step 4.

Our actor looks pretty good standing almost at attention. That is from the front. Click on the checkered floor, hold, and rotate the actor till you can see his (or her) profile. Now if you look at the legs you will notice they are slightly bent, thus showing us the need for looking at our figure from more than one angle when posing or animating.
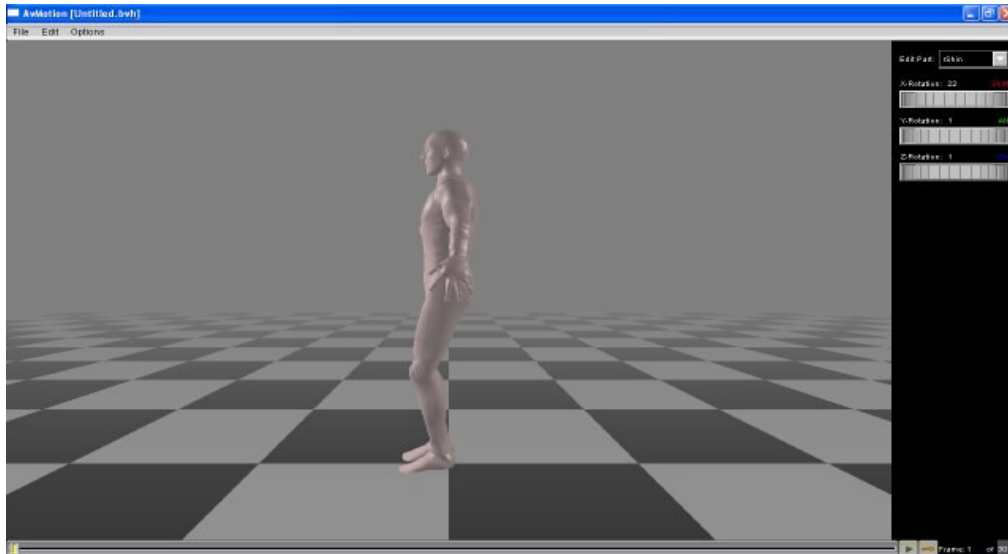
Step 5.

      To make our actor stand at attention we simply take the steps we've already learned and apply them to our actors parts using the X axis.
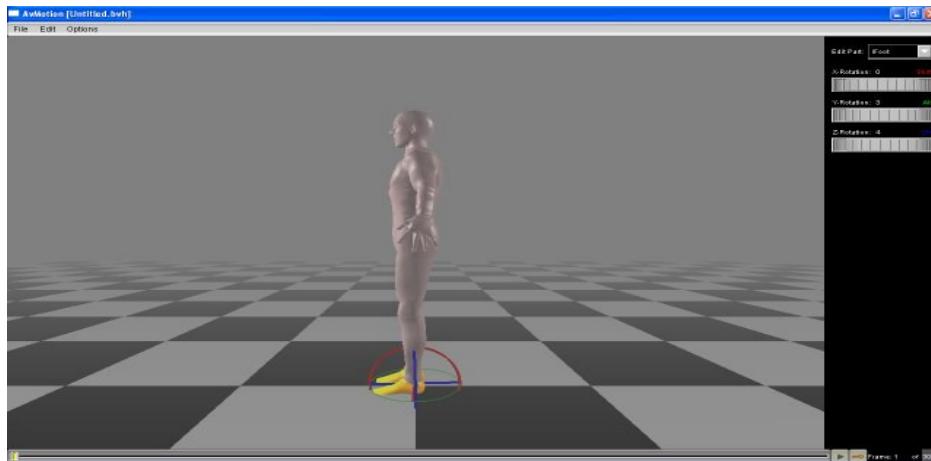
      Step 5a.

      Using SHIFT double click on the hip that is closest to you, it will highlight yellow, and then we rotate the hips on the X axis to "zero".

      Step 5b.

      Now SHIFT double click The Shin closest to you, again while it is yellow, rotate X to "1".

      Step 5c.

      Lastly, Shift Double click The foot closest to you, while it is yellow, rotate X to "zero"



      Now our figure is standing at attention. Rotate around the figure to see our progress so far. When you finish looking rotate your stage to face your actors front.

NOTE:
    If you now feel you've mastered the simple rotation of parts, you are well on your way to become a proficient Avimator user. If you feel like all is a mystery still, I suggest playing around with your mannequin, and with the controls. Then if you wish to return to the tutorial, simply Click FILE + NEW in Avimator, and start the tutorial over.

Step 6.
    The Left Arm. Click on the Actors left shoulder (or select lShoulder from the menu). Rotate the Z axis to "-82", then rotate the Y axis to "1".

Step 7.
    Now select the left forearm (or lForeArm). Rotate the X axis to "22". (you may notice the fingers of the hand are splayed out. There is no way to change this in the current versions of Avimator. Do not fret, you will be selecting the hand position when you upload your BVH file into SL.)

Step 8.
    We now begin with the arm that will be doing the salute.
Here we will shorten the format of positioning the various parts of the arm.
Simply select the part of the arm and rotate the axis' to the shorthand pattern below.

rCollar: X=0 Y=-30 Z=-27
rShoulder: X=-4 Y=-96 Z=74
rForeArm: X=-5 Y=99 Z=-1

Now your figure should be giving a pretty good (except the open fingers) salute!
(See illustration below)
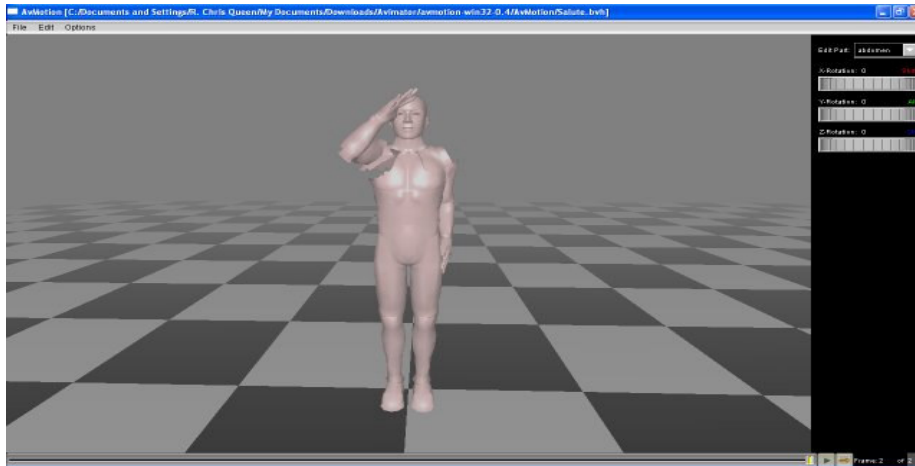


Step 9.
    Now about that all important "keyframe" button. For SL to recognize where animation sequences begin and end (so that it can properly interpolate the in between frames) it needs to know where the main parts of the animation are these are the Key Frames. Since our little salute pose only has one reference frame, and one usable frame we will make the latter, (or frame "2") the keyframe. Simply make sure the frame slider is on frame"2", and then click the button with they Key on it. Thats

it! We are done with our pose, and it is ready for saving and uploading to the SL servers.

Step 10.

Now we need to save our hard work. Click on menu FILE and SAVE, you will notice that it opens a save window hopefully wanting to save to the location you unzipped the main program to. You may also notice that the full path is in the save name field making it seem you have no room to make your save name. You need to press your END key on your keyboard and it will take you to the end of the file path. (Alternately you can use the right arrow button, but you will have to scroll all the way across.) Now type in your file name in our case "salute_pose.bvh". (please be sure to put in the .BVH or on windows the file will be called simply "salute_pose" and SL will not recognize it until you rename it with the .BVH.)

The next chapter will detail how to upload the file into Second Life, but first we need to discuss a bit more about posing in general.

Open a new File. Now click on the Hip of our actor. (or select it from Edit Part menu) You should notice that there are now three new sliders at the right of the screen. If you move these sliders you will see that our figure is maneuvered around the stage in each of our respective coordinates.

After playing around a bit with that now we will see something interesting and special about the Hip body part. If you've been wondering how we make our actor recline, or fly, etc. The Hip is our control for the mannequin's body alignment. Make sure the Hip is selected and rotate the X axis to "90", so you can see how he (or she) reclines.
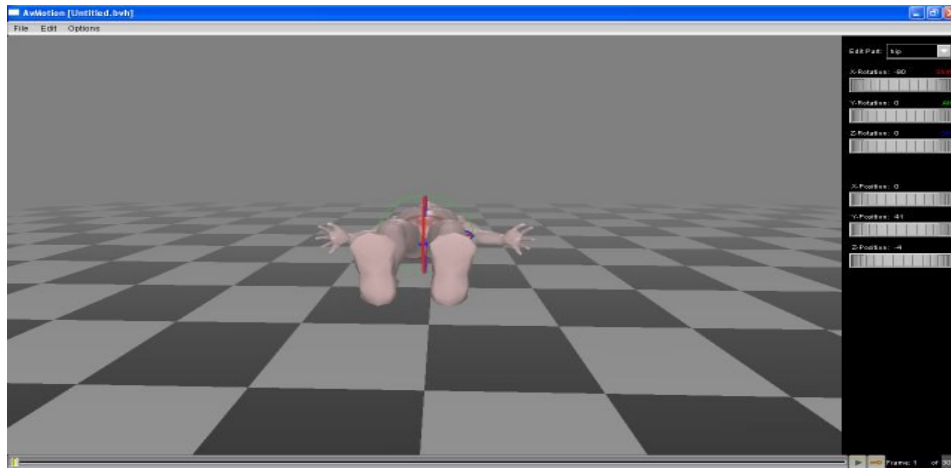


Now rotate the camera around to the side, and with the Hip selected see how the other coordinates rotate the entire body in our Stage space. The Hip is our reference point for any animation that requires moving the body as in running, dancing, etc.

Note:
this Chapter applies only to the Second Life interface, not the Avimator program, just to be clear.

## Chapter 4
## Getting our files into Second Life.

The Whole purpose of making an animation is to apply it to your Avatar, or sell it in a pose ball etc. Heres how to do it. While logged in to second life click on the FILE menu and select:
Upload Animation (L$10)
Yes, it will cost you L$10 to upload so make sure have money before you try to upload.
Next it will bring up a save window. (you do remember where you saved your "salute_pose.bvh" file right?) Select your file and click OK. Now Second Life will Bring up the Animation Upload window. (see below)

Upload Window.



The easiest way to get the file uploaded properly, is to start at the top and work your way to the bottom of the window ending with uploading the file. It is EXTREMLY important that you make sure all is working at this point before you upload or you will spend L$10 and have a nonworking animation.

To start is the name of the file. Of course it is here with out its BVH extension, and now is a good time to change the name if you aren't happy with it. (you can always rename it later though in your SL inventory under animations).

Next is the Description field especially nice if you plan on selling or giving the animation to others.

Priority: This is the order of importance the animation takes over other animations. In our tutorial we will want it to be set at "4", which is the highest priority.

(we will skip "Preview while" because it only relates to previewing the animation in this window)

Loop: this selects whether you want the animation to replay over and over. This will be needed for our pose too, because SL is treating our Salute as a one frame animation Remember?

In% Out%: this is a very helpful tool for all animations. In our current salute pose we will leave it In% 0 Out% 100. Later in longer animations you can select where in your animation you want it to continue looping (the beginning, the middle, the end, etc.)

Hand Pose: ah, here we go, this is where we can remove the splayed fingers effect of our salute. So for our example we will select "Relaxed".

Expression: this is the facial expression your Avatar will have during the pose or animation. Experiment have fun! For our example we will leave this at its default none.

Ease in And Ease out: is a buffer for how the animation eases in and out of your default Avatar's animations. In our example we will leave it default.

Play/Pause Preview buttons: these will give you a chance to see if you file is working before you spend your L$, If it doesn't look right here it probably won't look right in SL either. Heres your chance to cancel and save your L$10, fix your animation and try again.

Upload: This is our last step and afterward our animation will be saved into your animations folder in your inventory.

Once you find the animation double click on it in from your inventory. This will bring up a window giving you the option to play the animation in world or locally. If you choose locally you will be the only one who sees the animation. In world will let everyone watching see your animation.


We are Done with the Posing section of this guide!

You May want to take the time to make a few more Poses, or continue on into the Animation chapters ahead. Either way congratulations on making your first pose!

Chapter 5
Beginning Animation.

To begin Animations are changes in body parts axis' between frames. So first we need to think about how long our animation will last. The default for Avimator is 30 frames per second, which happens to be the default of a NEW BVH file. In our tutorial, we will be making our salute animated, and this will take about three seconds.

Step 1
Many of you probably figured out that we will be opening a NEW file and changing the number of frames to "90".

Step2
Lets Setup our new file by choosing male or female and turning off the joint limits. (If you don't remember these steps go back to the beginning of the Pose tutorial to the Initial Setup section.)

Step3
We have 90 frames ready for our use but just like in real life there are pauses in action in movement. This is fortunate for us because this means that we do NOT have to animate 90 frames individually. We can skip frames by 5's or 10's (or 30's in our example) depending on the detail you want. The wonderful program, that Avimator is, will pick up the slack in between frames for us. So as with the Pose we did earlier we will leave the first frame alone for a reference point.

Step4
Move to frame "2" by either moving the slider or using the right arrow button. Frame 2, this is our first Key Frame, so once we have 2 selected, click the "key frame" button. Also at Frame 2 we will setup our Actor to the starting position of the salute.

Using our shorthand select the body part indicated and Plug in these values.

1. Shift Double-Click rShldr X=-4 Y=-4 Z=82
2. Shift Double-Click rForeArm X=16 Y=9 Z=0
3. Shift Double-Click rThigh X=0 Y=1 Z=0
4. Shift Double-Click rShin X=1 Y=1 Z=0
5. Shift Double-Click rFoot X=0 Y=-3 Z=-4

Our Figure should look like this.
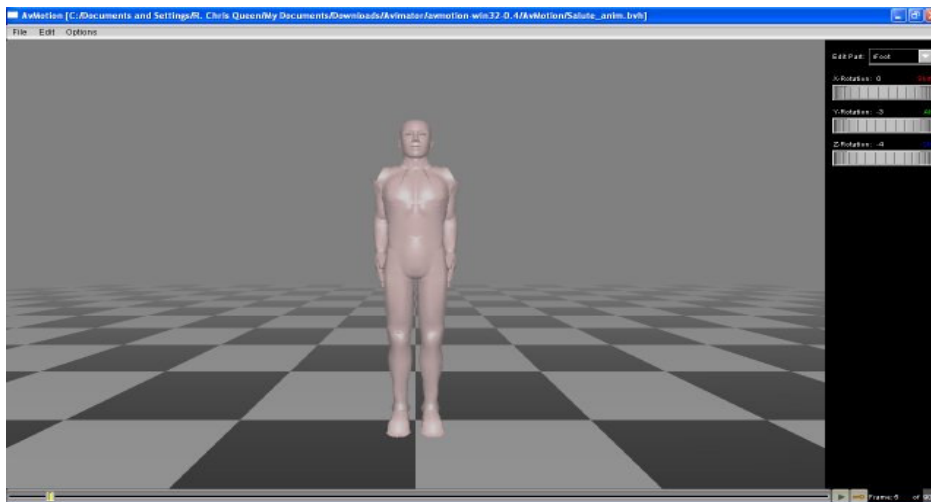
Step 5

Now we will begin to Animate. Move to frame "30". With our tutorial example we will be working with the three body parts; rCollar, rShldr, and rForeArm to keep it simple.

Again in shorthand we will plug in these values:

1. Select rCollar X=0 Y=-52 Z=-23
2. Select rShldr X=23 Y=106 Z=82
3. Select rForeArm X=-12 Y=99 Z=-9

Step 6

While we have Frame "30" selected click on EDIT from the menu at the top, and select COPY FRAME. Now move to frame "80", and select EDIT again, and then select PASTE FRAME. Nothing on screen will have changed but this is placing our top of salute pose till the end of this frame. Now be sure to click the "Key Frame" button to mark this as a priority animation frame.

Step 7

Now more time saving. First move to frame "2". (this should be our standing at attention pose.) and COPY FRAME again. Now move to Frame "90" and PASTE FRAME. Mark frame "90" as a KeyFrame.

Step 8

Now lets play our animation, to check for errors. If all is well our actor (or actress) should be repeatedly saluting us. After we are sure it is working (if not go back and check your steps) lets pause the animation.

Step 9

Lets save our file as before with FILE and SAVE. We will name this one "salute_anim.bvh" to differentiate between this and our first pose. Now we are ready to upload to SL.

# Chapter 6
## Animation Upload

Just as we uploaded our last file (Review Chapter 4 if needed) we will do the same for this animation. Below are the values and any explanations for changes needed.

Name: (should read) salute_anim
Description: (add any description you would like)
Priority: 4 (The highest override priority again.)
Loop: (checked) In% = 95 Out%= 100 (this is to stop the loop after the hand falls to the side again. So we are setting a loop at the end of the animation. This loop will look stationary at the end however, just like our pose.)
Hand Pose: Relaxed
Expression: None (Or pick one if you wish)
Ease In, Ease Out: Leave at Default.

Now we click the Upload button, and wait for it to be uploaded to SL. Again we go goto our Inventory and Animations folder, Double Click the salute_anim file and click play in world to see our end result.

NOTE: One last time saving hint. While animating a complex file using multiple body parts, you don't need to move all the parts at every key frame. You can concentrate on the arm for example. go all the way thought your animation with the arm, then return and work all the way through the left leg or whatever part comes next. This reduces frustration, and overloading you with remembering to move all the parts at each frame.

Congratulations! You have successfully finished the Avimator Beginners guide! Happy animating to you!