Life Forms & 3D Studio Max

User Guide

Installing the 3D Studio plug-ins

Plug-ins for importing and exporting 3DS files are automatically installed with Life Forms. However, if you need to update your plug-ins or if you have removed the required plug-ins, you must install the 3DS plug-ins again.

To install plug-ins

- Put the 3DS plug-ins files, **3ds.in.dll** and **3ds.out.dll,** in the *Plug-in folder* in the *Life Forms program folder.*

Building Models for Animation

Life Forms only animates segmented models. When you build a model that will be animated, consider how it is going to move. This helps you to determine how many segments the models should have and where the pivot points of each segment should be.

There are no restrictions to the model's zero-angle position (*the position where all joints have no rotation values.*) Life Forms can animate and apply motion to models with any zero-angle positions. However, when building a segmented model ensure that:

- joint names are unique.
- joint names have no spaces or special characters.
- the polygon count for the model is less than 10,000.
- the model is a reasonable size. Model height of 1 - 5 meters is recommended. Props must be no larger than 50 m by 50 m..

Tip: if your model is very detailed, create a lower resolution. You can animate the low resolution model and apply the motion to the high resolution model before rendering. Note, however, that the low and high resolution models must be identical except for the resolution.

Opening 3DS files in Life Forms

To open a 3DS file in Life Forms

1   In Life Forms, choose **File menu > Open**.

2   In the Open dialog box, select **3DS** in the File types menu. Browse and se-
     lect the 3DS file you want to open. Click Open.

Note: Geometry, Animation and Colour information is preserved when a 3DS file
is opened in Life Forms. Textures are also imported, but their positions may not be
accurate.

To scale a model in Life Forms

When a model is too large, it will be difficult to manipulate in Life Forms. You can
scale down the model using Life Forms' **Height and Scale command**.

1   In the Stage window, select a figure by clicking on it.

2   Choose **Figure menu > Height & Scale**.

3   In the Height & Scale dialog box, enter a height for the model, or scale it
     by entering a percentage (for example 80%). A suggested height is 1.7 m.

4   Click OK.

Exporting a 3DS file from Life Forms

You can export to a 3DS file by merging or by exporting a new 3DS file. Merging
allows you to insert only the keyframe motion data into the original 3DS file. The
advantage of merging is that it adds motion data to the scene without affecting other
elements.

To merge keyframed animation to a 3DS file

1   Choose **File menu > Export**.

2   Select the **3D Studio Max** icon from the Export Format list.

3   In the Export dialog box, enter the range of frames you want to export. By
     default all keyframes are exported.

4   Select the export options as follows:

   • Select the **Merge** checkbox to merge keyframed animation to the
     Source 3DS file.
   • Click the **Merge File** button. In the Open dialog box, select the **Source
     3DS** file. This file must contain the same model and scene elements
     as the animation you are now exporting.
   • Select the **Scale to original size** checkbox if you have scaled any
     model using the Life Forms **Height & Scale** command.

**Merging is a good
way to insert key-
frames into a 3DS
file without affecting
the scene's lighting,
camera, colour or
texture set up.**

5 You can export the motion data by exporting only keyframes, or by exporting all frames. For exporting motion to 3D Studio Max, it is recommended that you clear the **Keyframes Only** option and select the **Position Frames** option.

The following explains the options and when to select them.

Keyframes Only	Select this option to export only the keyframes in the animation. This option is not recommended for exporting to 3D Studio Max. When this option is selected, the motion data exported is thinner and easier to change. However, the motion may not be exactly the same as in Life Forms because it is dependent on the interpolation method used by 3D Studio Max.
All Frames	This option is available when the Keyframes Only option is cleared. When you select this option, the motion is exported so that every joint in the model is keyframed in all frames. This creates dense motion data that is difficult to modify. This option is recommended for exporting to Cinema 4D.
Position Frames	This option is available when the Keyframes Only option is cleared. When you select this option, the pelvis is keyframed at all frames but other joints are not. This ensures that the location and altitude of the figure are independent of the interpolation method used. The motion will be accurately represented in 3D Studio max when this option is selected. Thus, this option is recommended for exporting motion to 3D Studio Max.

6 Click OK. Name and save the 3DS file.

Note: When exporting an animation from Life Forms as a 3DS file, color is exported but textures may not be exported properly.

To export a 3DS file

1 Choose **File menu > Export**.

2 Select the **3D Studio Max** icon from the Export Format list.

3   In the Export dialog box, enter the range of frames you want to export. By default all keyframes are exported.

4   Select the export options as follows:

- Select the **Scale to original size** checkbox if you have scaled any model using the Life Forms **Height & Scale** command.

- Ensure that the Merge checkbox is not selected.

- For exporting motion to 3D Studio Max, clear the **Keyframes Only** option and select the **Position Frames** option. Other options are explained in the preceding table.

5   Click Ok. Name and save the 3DS file.

Inserting Tracks in 3D Studio Max

The Insert Tracks command allows you to apply motion data from one model to another. This command works well when the source and destination figures are identical or have similar hierarchical structure.

1   Select the pelvis of the destination model. Choose **File menu > Insert Tracks**.

2   In the Open dialog box, select a Max file that contains an animated model.

3   In Insert Track dialog box, select:

- Pelvis as Source
- Click Subtree checkbox
- Click Paste time. Specify the frames to insert and the Insertion time.

Click OK.

Life Forms imports and exports motion data to 3DS Studio Max via the 3DS file format. This allows you to:

1   Create motion for segmented characters built in 3D Studio Max.

2   Create motion for animating single-skin characters using Physique modifiers.

3   Bring a Life Forms animation into 3D Studio Max for rendering.

About the Tutorials

This document contains four tutorials:

- Tutorial 1: Bringing Animations into 3D Studio Max.
- Tutorial 2: Setting up Models for Animation.

- Tutorial 3: Applying Motion using Physique.

- Tutorial 4: Animating a Single Skin Mesh with Max version 3.0

Sample files are provided for each part of the tutorial so that you can enter the tutorial at any step. Even though the tutorials span several pages they are actually quite short. We expect each tutorial to take 45 minutes or less.

Note: Tutorials 1-3 were tested with 3D Studio Max v 2.5, tutorial 4 with version 3.0.

For the tutorials you will need:

- **3D Studio Max 2 or higher**
- **Life Forms 3 Studio or later. Version 3.9 is preferred**.

Note: You can order a free Life Forms 3.9 demo CD from www.CharacterMotion.com

Tutorial

Tutorial 1: Bringing Animations into 3D Studio Max

All Life Forms animations can be exported as 3DS files. You can then import the animation into 3D Studio max for rendering.

1   In Life Forms, open **Sundancer_move.lfa**.

1   Choose **File menu > Export**.

2   Select the **3D Studio Max** icon from the Export Format list.

3   In the Export dialog box, enter the range of frames you want to export. By default all keyframes are exported.

4   Select the export options as follows:

- Select the **Merge** checkbox to merge keyframed animation to the Source 3DS file.
- Click the **Merge File** button. In the Open dialog box, select the **Source 3DS** file. This file must contain the same model and scene elements as the animation you are now exporting.
- Select the **Scale to original size** checkbox if you have scaled any model using the Life Forms **Height & Scale** command.
- Clear the Keyframes Only checkbox. Two additional options will now appear.
- Select the **Position Frames** option.

5 Click OK.

6 Name and Save the 3DS file.

7 In 3D Studio Max, choose **File menu > Import**. In the Import dialog box, select the 3DS file.

8 Click the **Completely Replace the Scene** radio button.

Tutorial

Tutorial 2: Setting Up Models for Animation

This tutorial walks through a typical procedure for setting up a segmented model so that it can be animated. This tutorial begins with assembling objects to form the model. Then, it shows you how to set pivot points and link the model to make it *animatable*. The technique explained in this tutorial can be applied to any segmented 3D character you are using.

We won't cover the basics of 3D Studio Max in this tutorial. You should be familiar with the basics before attempting this tutorial.

Sample files for this tutorial are in the **3DS_tutorial2** folder.

Part1: Assembling the Model

**1** In 3D Studio Max, open 3Back_part1.max.

The objects are scattered all over and have not been aligned to form the model.:
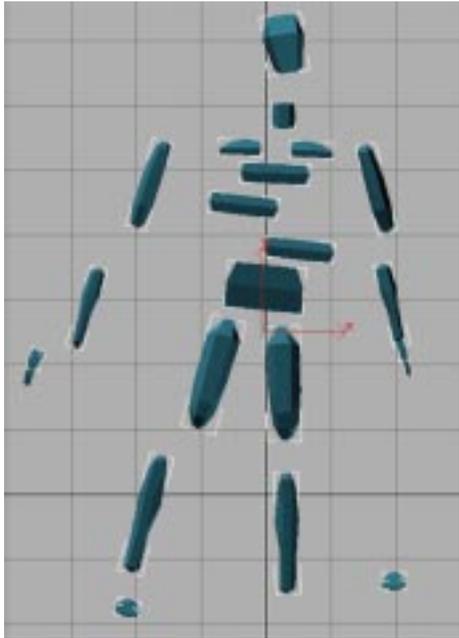
Note: This step mirrors the stage in the modelling process where each object has been modelled separately, or created by mirroring existing objects, but has not been positioned correctly to form the whole.

2   Move each object into position until you have assembled the model as shown.
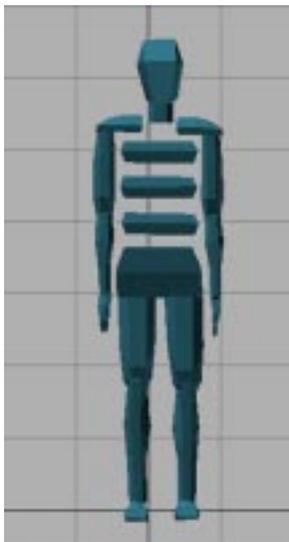

You can see the results in **3Back_part2.max.**

Part2: Setting the Pivot Point

The position and orientation of the pivot points is very important. We must set the pivot points of each object so that it rotates correctly in relation to the objects near it.

  1   Open **3Back_part2.max**.

  2   Select all objects and display their pivot points. To display the pivot points, click the **Affect Pivot Only** button in the Hierarchy panel.

  You will see that the arrows that represent the pivot points are not aligned with the gridlines.To align the pivot points we must reset their transformations..
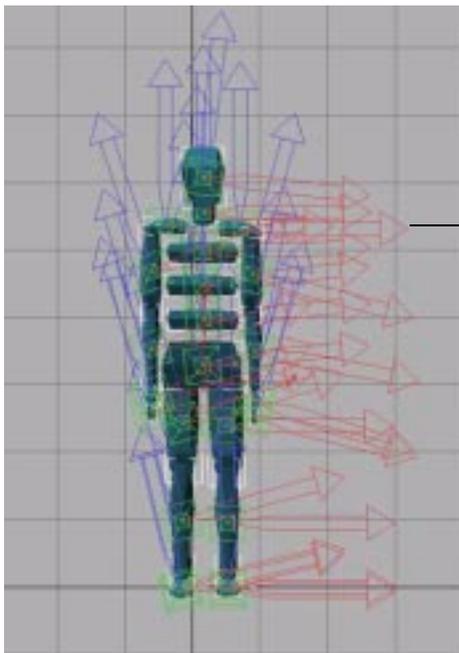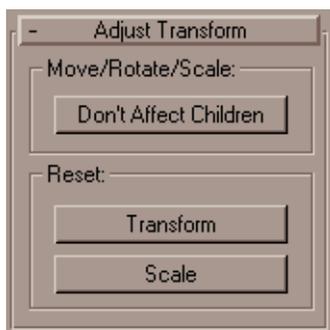

Arrows represent pivot points

Pivot points are not aligned

3   While all pivot points are displayed, click the **Transform** button. This button is found in the Hierarchy panel's Adjust Transform rollou.

Section of the Hierarchy panel

The pivot points are now aligned with the gridlines. Notice also that the pivot points are in the center of each object. Our next step is to reposition each pivot point.

Important: Always reset the transformations of the pivot point before moving the pivot point.

4   Make sure that the Adjust Pivot Only is selected and drag a pivot point to a new position. When the pivot point is in the correct position the object will rotate correctly relative to its parent. The correct position of the pivot point in the forearm object is near the elbow area and so on. Adjust the pivot point of all objects in this way. Results to this point are saved in **3Back_part3.max**.

Important: It is important to check the pivot point's position from at least two perspectives.

We have now assembled the model and adjusted its pivot points. The next step is to link all the objects so that it can be animated.

Important: If you need to scale all objects uniformly, or adjust the shape or size of selected objects, do so before the objects are linked. To make changes to a linked model, you must first unlink it. Thus, it's a good idea to save an unlinked version of the model.

Part3: Linking Objects

We will now link the objects into an structure that can be animated. Before linking the objects, we must first reset Xforms and collapse the stack (or edit history) .

1   Open **3Back_part3.max**

2   Reset Xforms as follows:

  •   Select all objects.

- Click the **Utilities tab**.
- In the Utilities panel, click **Reset Xforms**. The **Reset Transforms** roll-out will appear.
- In the Reset Transforms roll-out, click **Reset Selected.**

Tip: Resetting Xforms inverts mirrored objects making them look inside-out. To fix this, select the inverted object. Then, in the Modify panel, click **Edit Mesh**. In the Modifier Mesh rollout, set the Selection Level by selecting **Face** in the Subobject pop-up menu. Scroll to the Normals section and click **Flip.**

3 Because the next step cannot be undone, you save a copy of this file now.

4 Collapse the edit history of all objects as follows:

- Select all objects.
- Click the **Utilities tab**.
- In the Utilities panel, under Output type, click the **Modifier Stack Result**.
  Important: before clicking Collapse Selected, ensure that Output type is **Modifier Stact Result** and **not** Mesh. If Output type is Mesh, all objects will be fused into one mesh object.
- Click **Collapse Selected**.

5 Start with the extremeties (or leaf objects) and work towards the pelvis linking one object to the next as follows:

- Click the Select & Link button
- Click on a child object and drag the cursor to the parent object.

The relationship between the objects can be seen by opening the Track view. The results so far are saved in **3Back_part4.max**. The next step is to export the model to Life Forms as a 3DS file.

Part 4: Exporting a 3DS file

Here we will learn how to export a 3DS file for Life Forms.

1 File open **3Back_part4.max**

1 Choose **File menu > Export**.

2 Select the **3D Studio Max** icon from the Export Format list.

3 In the Export dialog box, enter the range of frames you want to export. By default all keyframes are exported.

4 Select the export options as follows:

- Select the **Scale to original size** checkbox if you have scaled any model using the Life Forms **Height & Scale** command.
- Clear the **Keyframes Only** option and select the **Position Frames** option. The export options are explained in the preceding table.
- Ensure that the Merge checkbox is cleared.

5   Click Ok. Name and save the 3DS file.

Tutorial

# Tutorial 3: Applying Motion using Physique

This tutorial explains how to use the Physique modifier to apply motion from a generic 3D model to a single-skin mesh.

For this tutorial we will use a single-skin mesh called Hero. We will use the generic skeleton that has been set-up for Life Forms and animated. The process of setting up a segmented model for animation was explained in Tutorial 2.
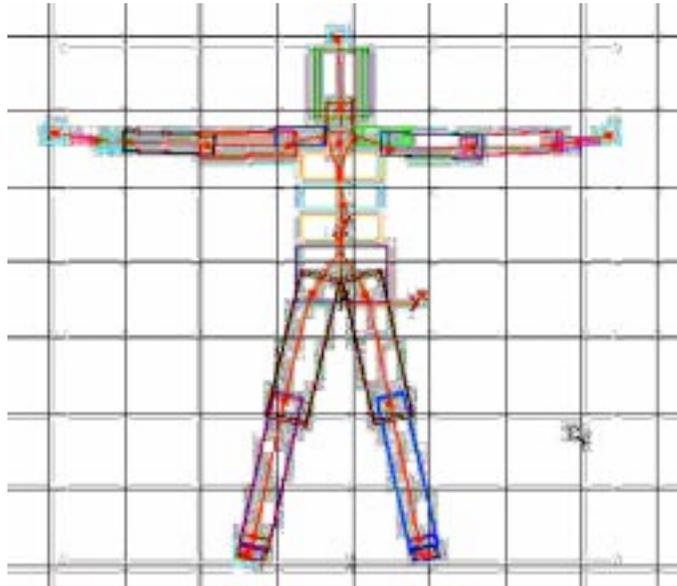
1   Open **Physique_setup.max**.

This file contains a segmented model with dummy effectors linked to each end joint in the hierarchy.

Dummy effectors ————
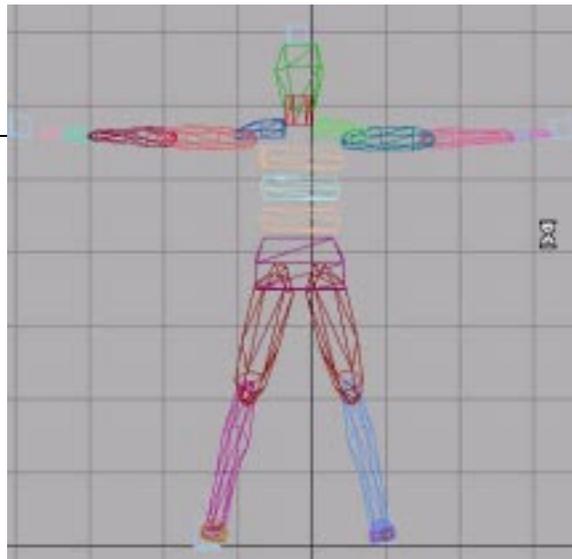
Dummy effectors extend the influence of the Physique modifiers to include all the faces of the end joint.


2 Open **Hero.max** and merge it to the file.

3 Position the single skin mesh so that it is centered over the segmented model.

Note: The segmented model was built to match the single-skin mesh closely. You can scale the entire model to fit the mesh if needed. However, if you want to scale selected objects you must unlink the objects before making the changes. You relink the objects before proceeding.

4 In the Modify Panel, Modifiers roll-out, Click **More**. Then select **Physique.**

5 Click the **Attach to Node** button and select the pelvis object of the segmented model. This makes the pelvis the root node for the Physique modifier.

6   The vertices of your mesh may be assigned to the wrong link. You should test the model by rotating its joint. You may see for example moving the arm distorts the chest as shown below.

Incorrectly assigned vertices ————————
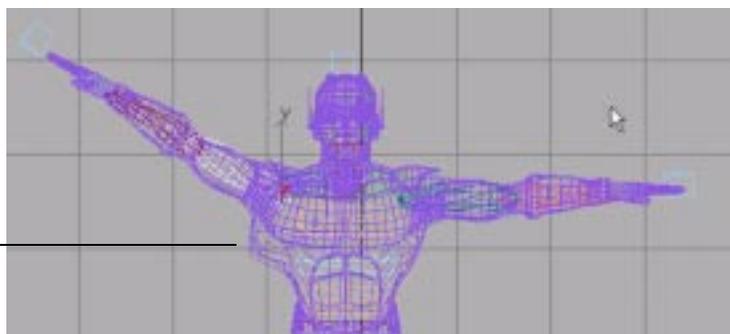
You must assign the problem vertices to the correct link. For more details please consult your User guide.

7   Position the Mesh in the arms-down position. After you have set up the Physique modifier properly, save the scene. See **Hero-Flexiskel.max**.

8   To apply motion, select the pelvis of FlexiSkel and use the **Insert Tracks** command to paste the keyframe motion from **Sword-die.max**. (This animation is from the PowerPak CD, a collection of ready to use motions that can be purchased separately.)

Insert tracks as follows:

• Choose File menu > Insert Tracks.
• In the Open dialog box, select **Sword-die.max** file that contains an animated model.
• In the Insert Tracks dialog box, select the following options:
    Pelvis as Source
    Click **Subtree** checkbox
    Click **Paste time**. Specify the frames to insert and the Insertion time.

Tutorial

Tutorial 4: Animating a Single-Skin Mesh

You can animate single skin mesh models as well as segmented models in Life Forms. When you use Life Forms to animate a single-skin mesh character, you are basically just animating the skeleton. This process involves four steps:

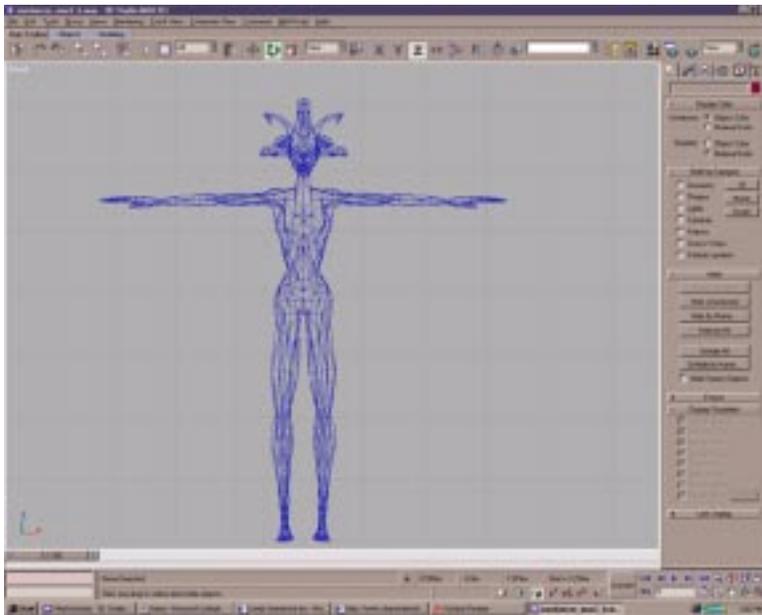• create the mesh in 3D Studio Max

- create bones to drive the mesh, and add a skin modifier to your mesh
- animate the skeleton in Life Forms
- merge the motion to your original setup file.

Creating the Mesh

Create your mesh model as you normally would in Max.

Below is an example of a single-skin mesh version of our Sundancer model.

This is an example of a single-skin mesh without a skeleton.

Creating the Bones to Drive the Mesh

You can create a skeleton, with simple boxes. However, animating boxes can be confusing because it is difficult to visualize your character while you are in the process of animating it.

A better way to make a skeleton is to make a copy of your mesh, then slice it into pieces that represent the body parts you want to animate, and linking it up again, as shown below.
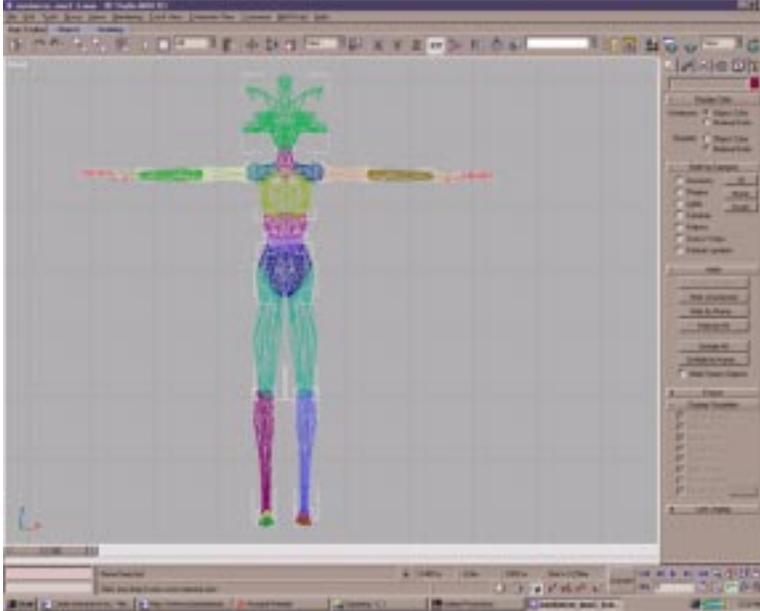
Once you have done this, add a skin modifier to your original mesh and use the skeleton you have created to drive your mesh. When you are happy with the way your model is moving, save this file as your setup file.

Animating in Life Forms

In order to animate your skeleton in Life Forms, you must first export it from 3D Studio Max as a 3ds file.

- To do this in Max version 3, simply select your skeleton and go to File > export selected.
- To do this in earlier versions of Max, delete everything from your scene except your skeleton and go to File > export.

Now, open Life Forms, go to File > Open, and select 3ds as your file type. Browse to your file and open it. You can now animate your skeleton by keyframing or applying pre-made motion, such as movements from PowerMoves. Once animated, export the skeleton back as a 3ds file.

Merging the Motion to Your Original Setup File

Import the 3ds file of your animated skeleton into Max and save as a Max file. You now have two files; your original set-up file, and your new animated skeleton file.

To apply the motion from your animated skeleton to your setup file, select the root object (parent of all objects) in your set-up file and go to File > Merge Animation in Max 3, (known as insert tracks in older versions of Max). Find the file that contains your skeleton.

This dialog will pop up:
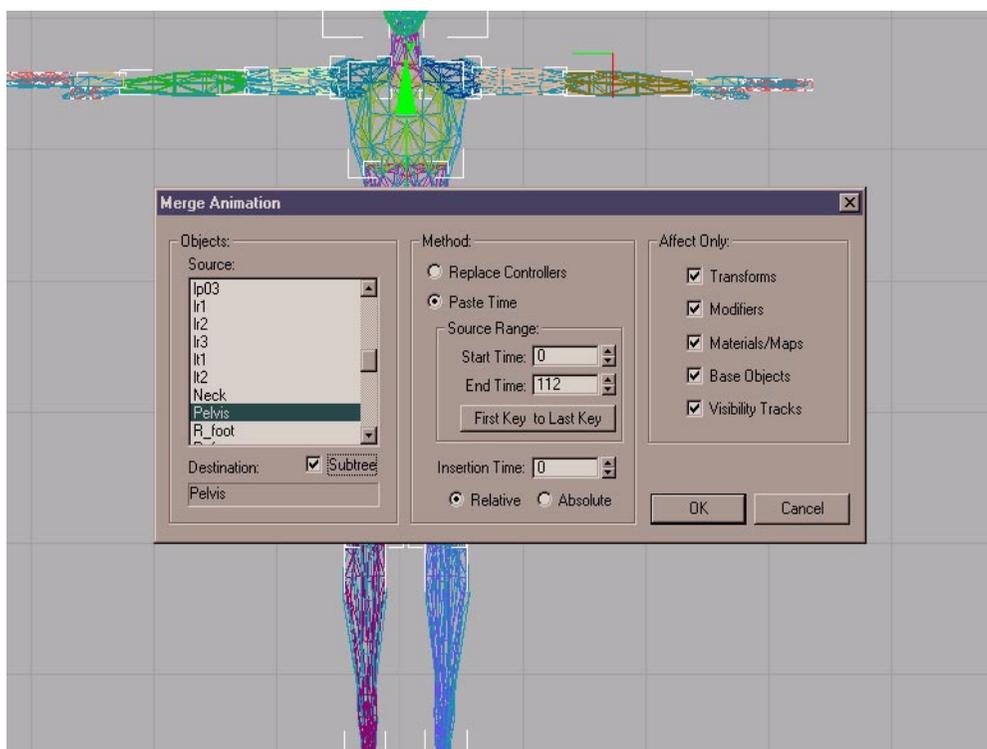
Make sure you select all options as they appear above so that the motion from your animated skeleton is properly applied to the setup file.