"Easy as" pose rig.

By Matt Barker, 2011

Intro

This rig process is designed as an intro to the rigging/character setup process. It will teach you how to setup controllers and constraints to pose your first character, and do some basic animations. Once complete, this rig can be improved upon with more advanced techniques learnt at a later stage of the course.

To start you need a character model and a skeleton (covered in other tutorials), with **ALL** joints correctly named and oriented. Many steps of the rigging process highly rely on good naming and joint orients, don't skip this, or there **WILL be fail**.

Example joint hierarchy and naming:

Hip up to the head: hip_jnt, spine1_jnt, spine2_jnt, spine3_jnt, neck_jnt, crown_jnt

Arms: spine3_jnt, shoulder_l_jnt, elbow_l_jnt, wrist_l_jnt, handTip_l_jnt,

Legs: hip_jnt, leg_l_jnt, knee_l_jnt, ankle_l_jnt, ball_l_jnt, toe_l_jnt

Rigging the arms

We are going to setup an IK arm setup. This gives us simple but effective control over the arm position.

1. Firstly, switch to the "**Animation**" menuset (F2). Now click **Skeleton-IK Handle Tool**
2. Ensure in the settings you have "**Current solver:**" set to "**ikRPsolver**" this ensures we get control over the elbow position later on. If your Pole Vector constraint doesn't work later on in the tutorial, come back and do this step!

   Ok, now add your IK handle.

3. With the "**IK Handle Tool**" active, click on **shoulder_l_jnt**, then on **wrist_l_jnt**.
4. This creates "**ikHandle1**" rename it **NOW** in your outliner to "**armIK_l**"

We need controllers to control the arm and elbow, so let's create a nurbs circle.

5. Create – Nurbs Primitives – Circle. Snap it to the wrist joint and rotate it 90deg so it fits nicely around your geometry.
6. Do the same for the elbow controller, but snap this one to the elbow joint and move it back behind the arm a few feet.
7. **Freeze Transformations** and **Delete History** on the circles. **Forget this and it won't work.**
8. Name the controllers **arm_l_ctrl**, and **elbow_l_pv**

We need to add **3** constraints to get the arm to work. A constraint is where we connect 2 objects together, so one will drive the other. Sort of like parenting, but is way more useful.

9. First, select the **arm_l_ctrl**, then shift select the **armIK_l**. Click **Constrain-Point-options**, ensure "**Maintain Offset**" is ticked. Apply the constraint.
10. Second, select **arm_l_ctrl**, then shift select **wrist_l_jnt**, Click **Constrain-Orient-options**, ensure "**Maintain Offset**" is ticked. Apply the constraint.
11. Third, select **elbow_l_pv**, then shift select **armIK_l**. Click **Constrain-PoleVector.** Remember if the elbow control doesn't work or throws out an error, go back to step 1 and switch the IK tool to **RPsolver.** Many students forget this step.

We now have a working arm. Test it by moving the controls. Because you ran **Freeze Transformations** at an earlier step, you can zero out the numbers in the channel box and the rig will return to its original state.

12. Repeat for right arm.

Rigging the legs

The legs are the same procedure as the arms. Easy as.

1. Create an **RPsolver IK chain** for the leg. Click on **leg_l_jnt**, then **ankle_l_jnt**. Name the IK **footIK_l**
2. Create a knee and foot controller. **knee_l_pv, foot_l_ctrl.** Position the foot control around the foot geometry, and the knee controller sits a few feet out from the knee.
3. **Freeze Transforms** and **Delete History**
4. Move the pivot point of the foot controller to the **ankle_jnt**. Hold d and v then middle mouse over the jnt

Triple constraint time, just like the arms.

5. First, select the **foot_l_ctrl**, then shift seect the **footIK_l**. Click **Constrain-Point-options**, ensure "**Maintain Offset**" is ticked. Apply the constraint.
6. Second, select **foot_l_ctrl**, then shift select **ankle_l_jnt**, Click **Constrain-Orient-options**, ensure "**Maintain Offset**" is ticked. Apply the constraint.
7. Third, select **knee_l_pv**, then shift select **footIK_l**. Click **Constrain-PoleVector**

Your foot controller will now move the leg.

8. Repeat for left leg.

Rigging the spine.

For the "easy as" pose rig we create a basic FK spine.

1. Create nurbs circles for the **hip_jnt**, **spine1_jnt**, **spine2_jnt, spine3_jnt, neck_jnt**
2. Scale and squish these till they fit nicely around your character, but are still easily selectable.
3. **Name**, **Freeze**, and **Delete History** on each circle.
4. Orient constrain each circle into the joint it is snapped to. Ensure "**Maintain Offset**" is on in the Orient constraint option box. e.g. select **hip_ctrl** then shift select the **hip_jnt**, click **Constrain-Orient**
5. Continue orient constraining up the spine joints, last one is the **neck_jnt**.

We need to parent the spine controls together at this stage. This makes the controllers follow along as expected and is what makes it a complete basic FK spine.

6. Select **neck_ctrl**, shift select **spine3_ctrl**, press **p**.
7. Select **spine3_ctrl**, shift select **spine2_ctrl**, press **p**.
8. Select **spine2_ctrl**, shift select **spine1_ctrl**, press **p**.
9. Select **spine1_ctrl**, shift select **hip_ctrl**, press **p**.

Once complete, we need to bring the whole rig together in the next part.

Master control and finishing touches

Create a larger nurbs circle on the ground plane, around the whole character. This is known as a master control. This will drive all the controls at once, a "global control".

1. **Freeze and Delete History and name it master_ctrl.... or else.**

We need to parent the main controllers under the master control.

2. So, select both arm controllers, and both elbow controllers. Shift select the master control and press **p**.
3. Select the foot controllers, and both knee controllers. Shift select the master control and press **p**.
4. Select the hip controller. Shift select the master control and press **p**.
5. Select the root joint. Yours should be hip_jnt. Shift select the master control and press **p.**

Your outliner should be cleaner now, but now is the time to finish cleaning it up.

6. Get all the ik handles in the outliner and group them. Call the group "**myCharacter_IK_grp**".
7. Get all the meshes that make up your character and group them. Name the group "**myCharacter_Mesh_grp**".
8. Delete any empty group nodes, image planes or any random crap left over from the modelling stage.
9. You should have only 3 group nodes left. Group all these together and name that group "**myCharacter_grp**".

10. **SAVE!**

Enjoy, and any questions see your nearest art teacher.

Extra notes

Here are some extra tips to make the rig more versatile.

- Give your rig to a friend/animator/year 2 student to play with... get feedback, it will make your character setups way more pro, and have more features, and small things you missed will probably be picked up. They do this in the industry with rigs, where the rigging team gives it to the animators for a "stress-test"
- Try adding finger joints. Each finger has 4 joints coming out from the wrist (thumb has 3), e.g. **pinky1_jnt pinky2_jnt** etc. Rig each finger just like the spine, with orient constraints and parenting the controllers together. These can be manually animated or controlled with "Set Driven Keys" (separate tutorial for awesome students)
- For creating controllers, look up a maya script called kk_controllers. It greatly helps speed up the controller creation part, and makes much more professional and funkier looking controllers. http://www.creativecrash.com/maya/downloads/scripts-plugins/character/c/kk_controllers--2
- There are more advanced FK Spine setups that can be used on a character to isolate the head motion in animation. You can take it a step further using the "**Advanced FK Spine**" Tutorial