

IK arm setup with 3dsmax5

Ok guys, here is a setup of a arm, done with 3dsmax5, and inspired from [IKJoe](#), the Daniel Martinez Lara setup. It has ergonomic and easy controls, and at the end, a better forearm setup for the wrist.

The hand is simply made with five chains of four bones. FK stay the best method for animate fingers (you can use AniPose script, or wiring to have nice movements), so no solver.

■ 1) Bones chains.

Nothing special here, In the left view, create the arm chains with B_Coll, B_Arm, B_ForeArm, and B_ForeArm_End. Put an IKHI solver (between B_Arm and B_ForeArm_End), and create a point helper (name it IKsw_Arm) behind the arm. Attribute this point helper as Swivel Angle for the arm HI solver.

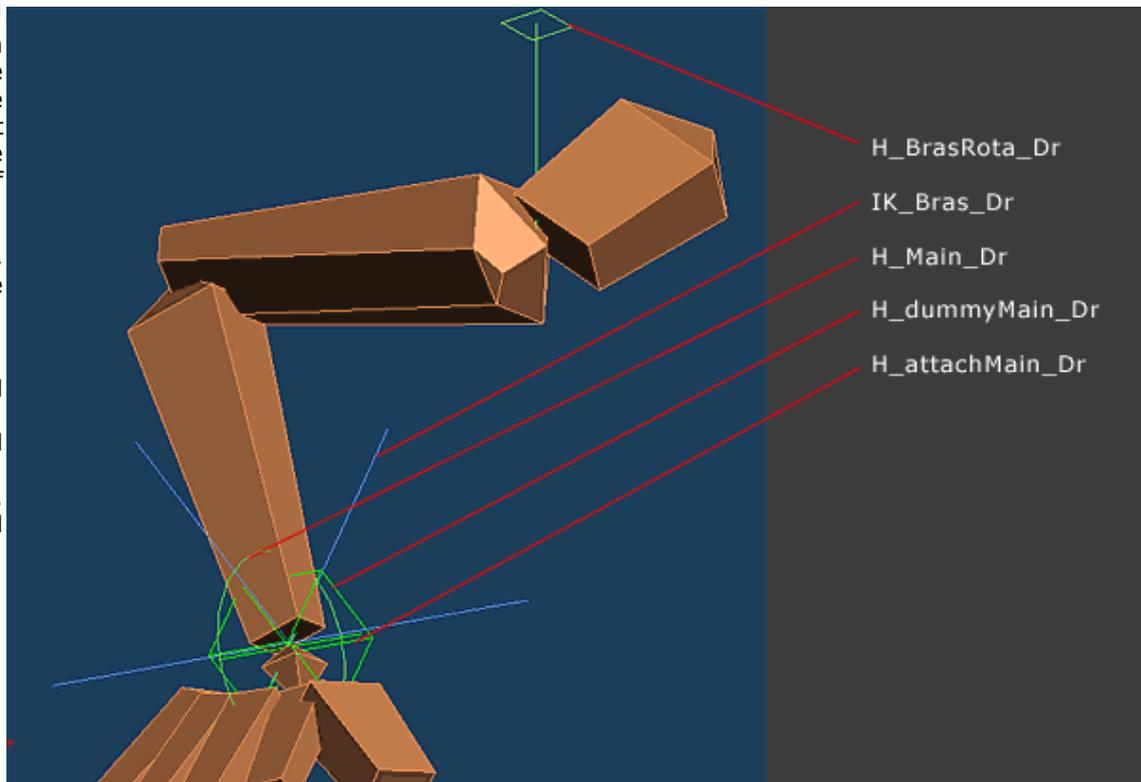
Create now the five chains for the fingers (I won't name them all hey !!), and let these chains without solver.

■ 2) helpers.

Ok, let's create the helper ! Create a circle at the end of a segment (like a pin), make it one editable spline, place it like on the screen beside, and center its pivot with the B_Arm one. This will be the control for the orientation of the arm ,-). Name it H_Arm_Rota

Create at least the hand helpers, which will be all centered on the arm IK goal :

- A point helper named H_AttachHand
- A dummy named H_dummyHand
- A circle (spline) named H_Hand. This is with him you will move/rotate the hand !



■ 3) links.

Ok, time to do a few links between all these stuffs ! Do it like this :

- IKsw_Arm --> H_Arm_Rota --> B_Coll (lock the movements of H_ArmRota)
- IK_Arm --> H_DummyHand --> H_Hand

Then select the first bone of each hand chain, and link them on H_attachHand. Select H_attachHand, and constrain its position on these of B_Arm_end and its orientation on these of H_Hand.

Now all should work nicely.

■ 4) A bit further with the wrist !

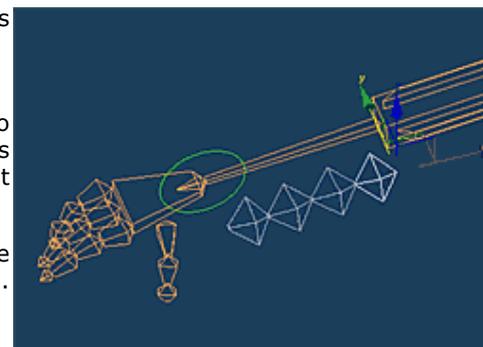
One of the common problem with such a setup is that the hand rotation cause a break on the wrist mesh, between forearm and hand bones. So, we will modify the forearm to get a nice progressive rotation of the forearm. Indeed, your real arm is made of two long bones, making the arm turning along.

Start selecting B_ForeArm and edit it to make it really fine, like the screen beside. This bone is now here just for the IK.

Create a chain of four bones like beside.

You have now to create a progressive rotation between these bones. We will use wiring to set the rotation of each one the half of the previous bone. Name the new bones B_ArmTwist_01_Dr (beside the hand), B_ArmTwist_02_Dr, B_ArmTwist_03_Dr, et B_ArmTwist_04_Dr.

Select these four bones, and unlink them (Unlink Selection). Center them along the B_ForeArm, and link them to. Now these four bones follow the arm while moving H_Hand. For each one, into Link Info panel, lock their movements on x,y,z and their rotation on y,z.



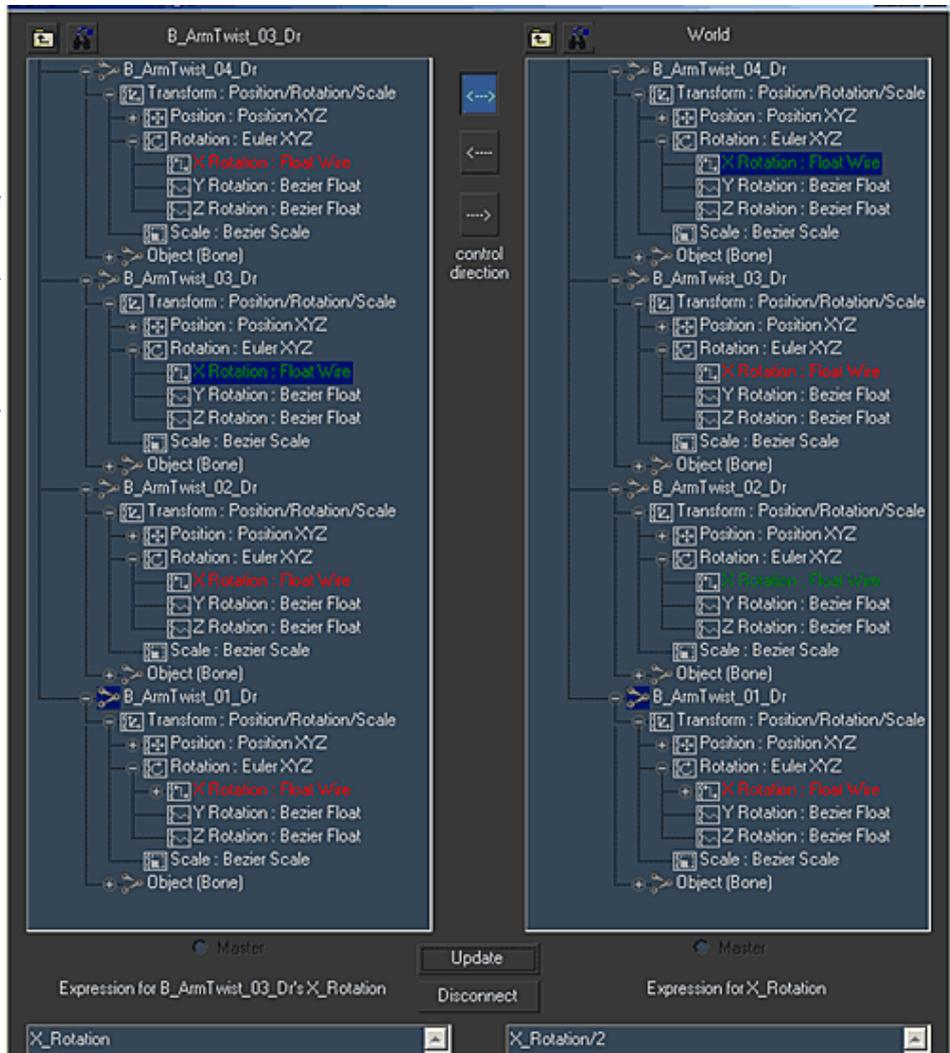
Ok, time for a wiring party now ...

Select B_ArmTwist_01_Dr, right click, wire Parameters, Transform, Rotation, X rotation, click on B_ArmTwist_02_Dr then Transform, Rotation, X rotation.

Define B_ArmTwist_01_Dr as Master, and into the right window, enter X_Rotation/2 as expression.

You can repeat this operation for other bones, or simpler doing it into the wire dialog windows (click on the screen beside to see what I mean).

Atm, if you turn the first bone on x, you get a progressive rotation of the forearm bones. For different anatomy (cartoon, woman, strong man, etc) you can setup different ratio of rotation between bones.



■ ■ To animate quicker this wrist rotation, I suggest you to put a Custom Attribute on the H_Hand. Link the Custom Attribute on the x rotation of B_ArmTwist_01_Dr, and voilà !

