# Introducing MOCCA

For this introduction to basic MOCCA tools, we will set up joints to move the arms, head, and hat of a simple single-mesh hand puppet character. Navigate to Chapter 09>C4D Files>Hand Puppet FK.c4d. Later, the complete character you'll make can become the puppeteer! The Hand Puppet model has already been prepared for rigging, as discussed above. Even this simple look at MOCCA tools is time consuming, so be sure to save frequently!

Creating the Joints

Step 1   To place your Character tools close at hand, dock the Character palette from the top menu next to the Object Manager. (See Figure 9-9 and consult the Online Help if you need a refresher on docking.)

Figure 9-9 The Character Palette Docked, Joint Tool Selected.

◆ ***Tip:*** Take a minute to experiment with different Display choices for your work with joints. Sometimes you'll need to see the joints and the subdivisions, but at other times Lines and Isoparms offer the most uncluttered view as you work on the joints.
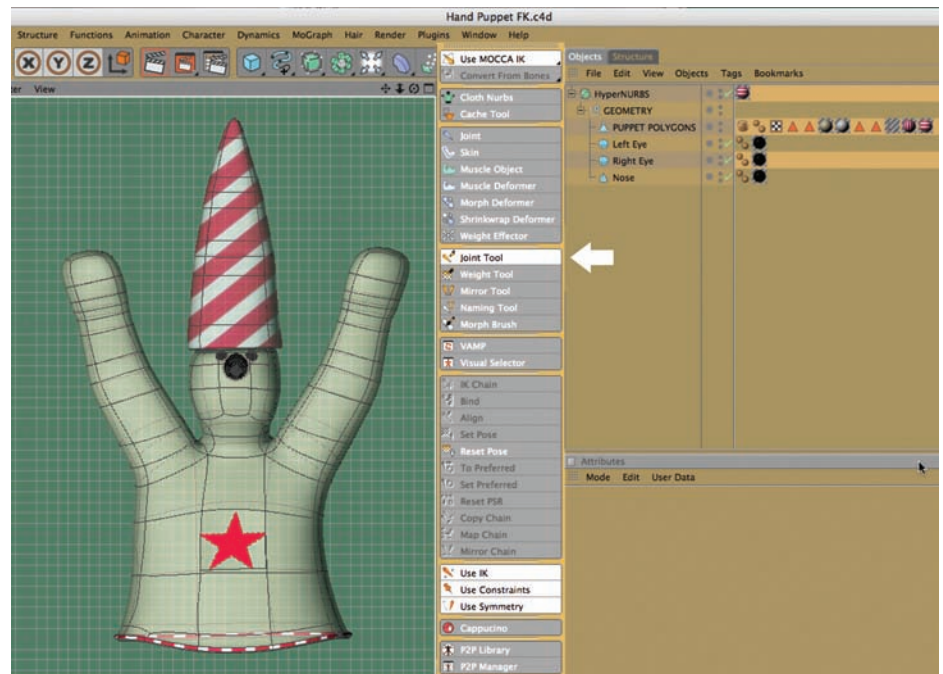
■ ***Shortcut:*** Create a custom shortcut for the Select Children Command, which you will use often when setting up joints and working with FK. Press Shift + F12 and type Select Children in the Name Filter input box. In the bottom panel of the Command Manager, press Opt (Alt) + C in the Shortcut box, and click the Assign button. Close the Command Manager. Now when you want to select a joint and all its children, just press Opt (Alt) + C.

Step 2 Press the F3 key to work in the Side view. From the Character palette, select the Joint tool. In the Attributes Manager, uncheck Root Null and Align Axis. Control-click at the center of weight (circled in Figure 9-10) and work upward, Control-clicking a new joint wherever the character (and his large hat) might be bending. (See Figure 9-10.) In general, the joints should coincide with the extra subdivisions in the mesh.

Step 3 Rename these joints using Figure 9-11 as a guide.

Step 4 Return to the Front view (F4). If the position of any of the joints needs adjustment from the Front view, select the joint in the Object Manager and work with the X and Y values in the Attributes Manager Coordinates, or use the Model tool and Move tool to align them.

Always check the position of the joints in several views to be sure they are aligned within the mesh and situated at the right point to correctly affect the character movement. (For example, if you created leg joints downward out of the first joint at the center of weight, that chain of leg joints would be in the center of the figure when you switched to the Front view, so you would need to move them over into one of the legs. You would later mirror the joints of that leg over to the other leg.)

Step 5 In the Object Manager, select the Chest joint. Making sure that the Joint tool is selected in the Character palette, Control-click at the shoulder, elbow, wrist, mid-hand, and tip of the hand. The example shows five joints Control-clicked in the arm from Joint.1, but this number allows for a wave of the upper

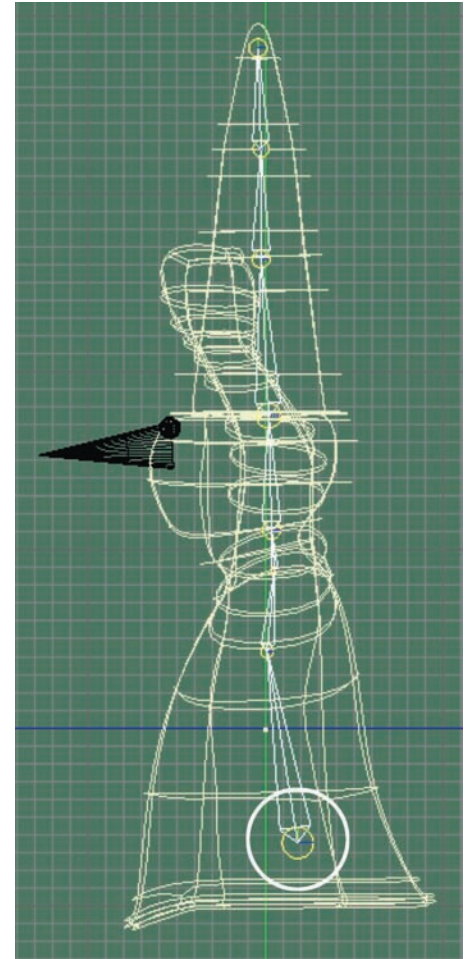**Figure 9-10** Center of Weight, Joints Control-Clicked Upward (Side View).
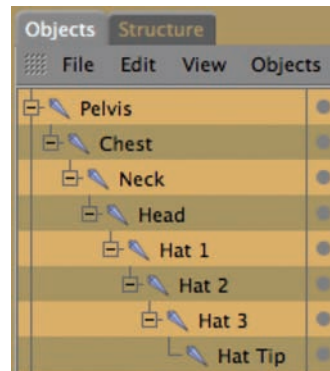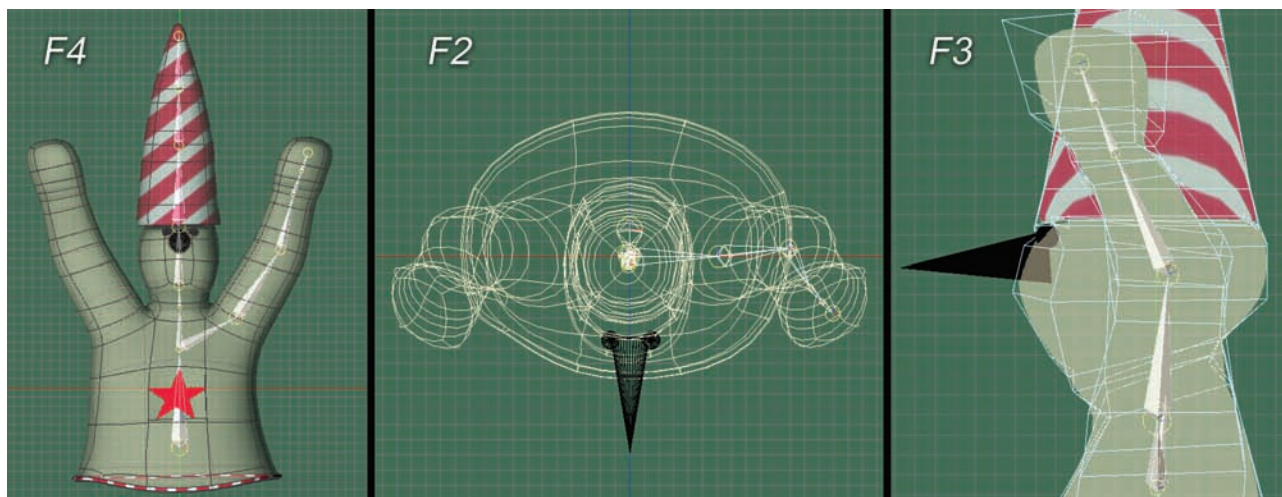

Figure 9-11 Joints Renamed.

Figure 9-12 Arm Joints in Front, Top, and Side Views.

◆ ***Tip:*** Have you saved lately?

part of the hand. If you wanted the hand to only be able to bend at the wrist (possibly adding an independent hand), four would be enough.

Step 6   Switch to the Top view and select the arm joints one by one, centering each one in the arm with the Move tool. Then switch to the Side view and center them from that view also.
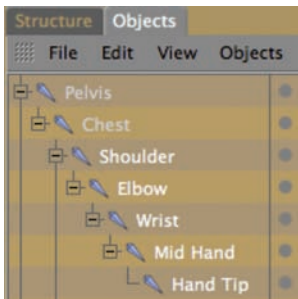
Figure 9-13 Arm Joints Renamed.

Figure 9-14 Puppet Personalities.

Figure 9-15 The Naming Tool: L_ Added to Joint Names.

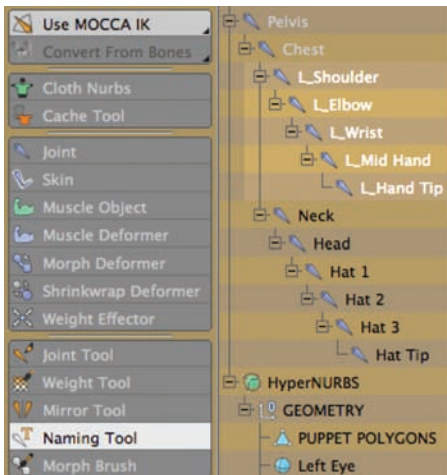**Step 7**   Rename the arm joints using Figure 9-13 as a guide.

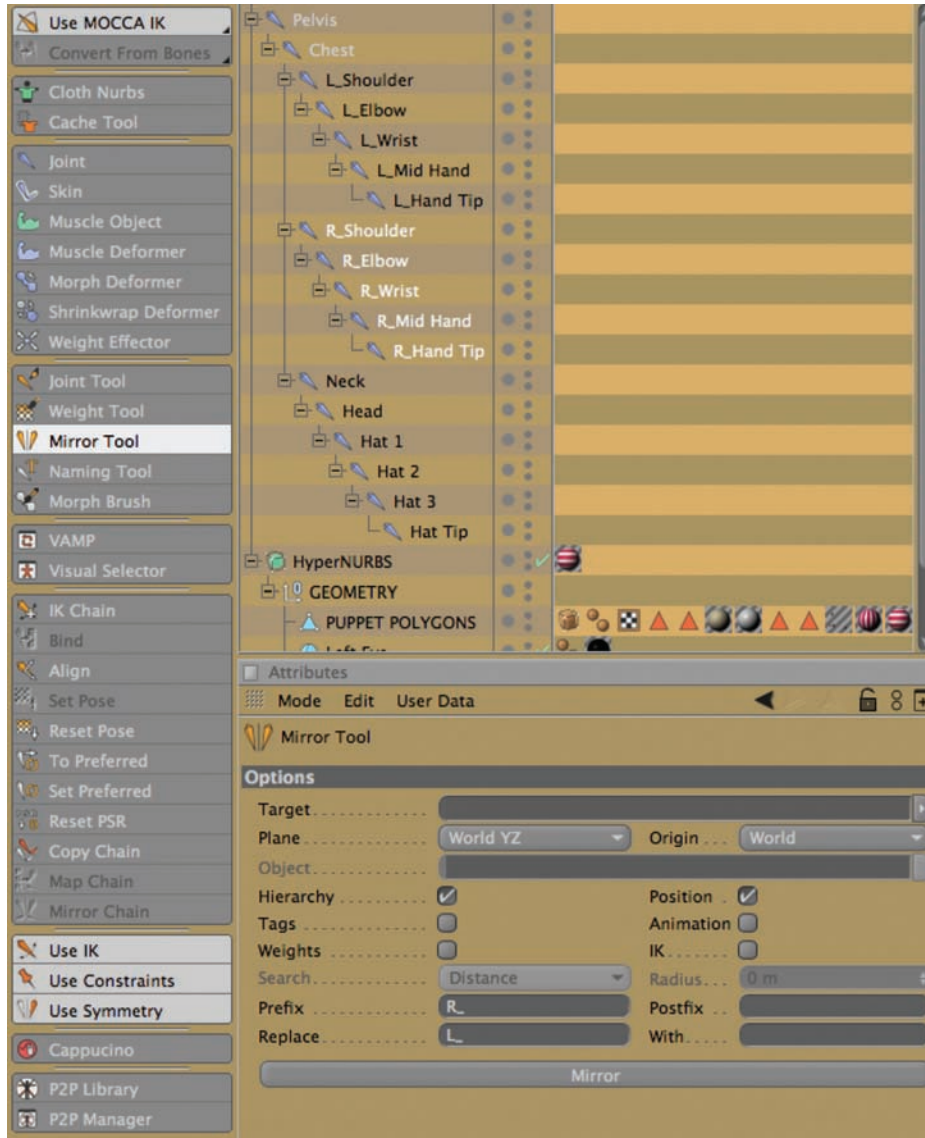**Figure 9-16** Puppet Personalities.

Figure 9-17 The Mirror Tool; Mirror Settings; Joints Mirrored and Renamed.

Using the Naming Tool

Step 1   Select the Shoulder joint.

Step 2   Click on the Naming tool in the Character palette.

Step 3   Click the Add button, and type L_ in the Name box. Choose L_ from the Type pull-down menu.

Step 4   Type L_ in the Prefix box.

Step 5   Click Apply Name.

Copying the Joints with the Mirror Tool

A copy of the joints you created on the character's left side can be easily flipped to the right side, even renaming the joints in the process! Later, you can include weights, tags, IK, and animation in mirroring maneuvers in more complex rigs.

Step 1   With L_Shoulder and its children still selected, choose the Mirror tool from the Character palette.

Step 2   In the Attributes Manager under Options, set the Plane pull-down menu to World YZ and the Origin pull-down menu to World. These settings are based on the assumption that everything is still centered at 0 on the X axis.

Step 3   Uncheck the Tags, Weights, Animation, and IK check boxes.

Step 4   Type R_ in the Prefix box and L_ in the Replace box.

Step 5   Click the Mirror bar.

Before proceeding, notice how the hierarchy of the Hand Puppet and his independent parts has been set up. All "floating" or added objects (in this case, two eyes and a nose) were placed on the same hierarchical level with the mesh, all inside a Null object renamed Geometry, which is a child of the HyperNURBS object. Now let's continue to work in the Hand Puppet FK file, where we will fine-tune the influence of the joints on the mesh. Then we'll test this copy out with some simple FK moves before moving on to the more intense IK Rig construction.

Binding the Joints to the Mesh

Step 1   In the Object Manager, select the Pelvis, and from the Object Manager menu choose Edit>Select Children, then Control-click Puppet Polygons (the mesh).

Step 2   From the Character palette, choose Bind.

Notice that when you chose Bind, a Skin object appeared as a child of Puppet Polygons and a Weight tag is added to the right of the object. The mesh is now set up to be affected by the joints, but what about those independent parts? Choose the Model tool and the Rotate tool and select the Chest joint, rotating it forward to make your puppet take a bow. That works just fine, but the Eyes

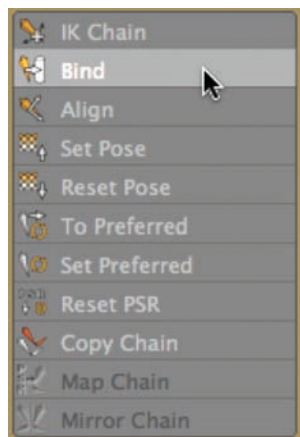**Figure 9-18** Bind in the Character Palette.

Figure 9-19 Skin Object (A) and Weight Tag (B).