



## ADVANCED SHADOW PUPPETS

You can make excellent shadow puppets using my techniques of cardboard, paper fasteners and bamboo skewers, but if work professionally day in and day out with a shadow show, you may want to consider using this advanced technique. It is more time consuming but will leave you with a puppet that is going to last a lot longer. You will still need to make repairs, but not as often and your puppets, the instruments of your trade, will inspire you every time you pick them up.

### HDPE SHEETING

I make these shadow puppets with HDPE or High Density Poly Ethylene sheeting. I buy it online at plastic suppliers under the category of HDPE sheeting. Ask for matte black which is non reflective. The thickness I use is approximately .030 " or the thickness of poster board, more or less. I usually settle for what they have in stock. It costs roughly \$8 for a 24" X 48" sheet but they will usually have \$50 minimum orders so you might want to get some to last a while or to share with others. The properties of the material should be so you can cut it with scissors and it is flexible without being brittle. Plexiglass

is for example very brittle and shatters or breaks under stress. The HDPE sheeting has all the right properties to work with.

This is the type of material I buy.

<http://abs-rods-sheets.com/hdpe/colored-hdpe-sheet.htm>

Product # KS-15995

#### CUTTING TOOLS

I use scissors, paper punches and Indonesian shadow puppet making chisels to cut the sheeting. Exacto knives are not effective for cutting it, as it is too thick. These chisels can be bought online at:

<http://www.balibeyond.com/wayangshop.html>

I use an eighth inch diameter hole punch for jointing and a sixteenth of an inch diameter punch for attaching wire, rods and elastic. The hole punches can be bought at craft shop supply store in the “scrapbooking” section.

#### JOINTING TOOLS

The overlapping sections of your puppet are hinged with plastic rivets. These rivets are made with either weed eater cord or styrene rods (hobby shop item). The diameter is just under 1/8” so it moves easily in the 1/8” diameter holes you make with your hole punch. You will often have a hole placement which can’t be reached with a hole punch. It is worth investing in a 1/8” punch tool. It is a round chisel with a sharp 1/8” hole on the tip. It is placed over the plastic sheeting upon a piece of scrap wood, a log end works well. Then you strike the back end with a hammer to make a hole. Other wise you can make the 1/8” hole with a very small round Indonesian shadow chisel. This chisel must be rotated around to complete one hole. The rivet ends are melted with a soldering Iron which has been modified. Take a cheap soldering iron and hammer the tip flat creating a 3/16” spatula end on it, but don’t hammer it too thin. It is best to make a bunch of these rivets at once. Get a scrap of 3/4” plywood around 6” X 2” and lay it flat on a table and drill a couple dozen holes in it the diameter of your weed eater cord or styrene rod material. Make the holes 3/16” deep. Stick a section of cord into the hole and cut it off 1/8” above the surface of the board. Let your soldering iron heat up on a safe surface, an ashtray or asbestos board or soldering iron holder. Now having cut all your plastic rod sections and have them all poking up out of the board, get a small plate with a little water in it. Dip the tip of the soldering iron in the water for less than a second to cool it slightly. Then immediately press the iron tip on top of one plastic rod end. As it heats put downward pressure on the iron, melting the end of the rod flat. Stop as the melted end touches the surface of the board. Pull the iron upward quickly and set the iron down quickly on its safe holder and wet your finger and lightly touch the melted plastic end. It shouldn’t burn you if your finger is wet and you hold it on the hot plastic less than a second. This creates a rivet end. Cooling the iron tip between rivets in the water as I said

before will keep the tool from getting too hot. A regular soldering iron will get too hot for this method of rivet making and the plastic will get too hot and as you pull the iron away the rivet end will pull away with the iron. .

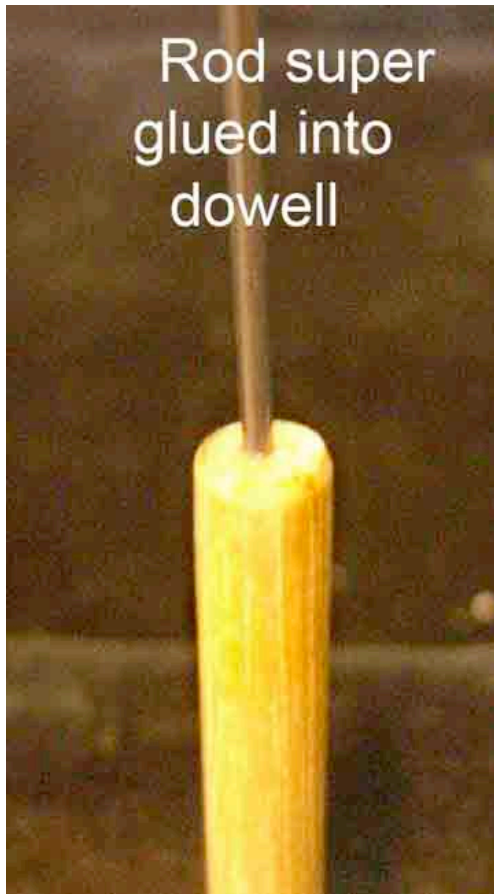
To joint your puppet parts of overlapping pieces of sheeting, create holes as instructed and insert a rivet through both pieces, flip the work being careful to keep it all together, and then melt the other end of the rivet stopping as the melted plastic just touches the surface of the sheeting. If you mess up somehow, re-melt the rivet head and pull the sheeting apart and redo the rivet. With some practice you will create strong plastic rivets.

## RODS

I make rods using music wire from the Hobby Shop. The wire is displayed at hobby shops under the trademark K&S Engineering. The wire comes in many thicknesses. I use an appropriate thickness for the weight of my puppet. It is inexpensive so buy a selection of thicknesses. Once you get into mechanisms with any style puppet, this stuff will become a staple. Bend the tip into a hangman noose type of shape as shown in the photos. Determine the length of the rod calculating for a wooden dowel handle. I keep my rods as short as possible or just long enough not to show my hand shadows on the shadow screen. The shorter they are, the better control you will have over your puppet. To cut music wire you will want goggles as working with this material can pose a hazard to the eye or teeth for that matter. The wire is VERY tough and can't just be snipped unless you have bolt cutters which is not a bad investment. Otherwise you will need some wire cutters, pliers and perhaps vise grip pliers or channel lock pliers or a vise. Mark your cut on the wire with a sharpie marker and then as you bear down with wire cutters, wriggle the handles back and forth to give the cutters extra bite. Don't attempt to cut all the way through unless you are using bolt cutters. A set of wire cutting pliers won't cut through the wire but will make a dent or bite into the wire. You will then "fatigue" the mark to snap it in half. To do this, hold the wire just below the place you bit into the wire with the cutters. Use a vise or vise grip pliers to hold the wire this way, then bend the wire with a second pair of pliers holding the wire just above the cut. Bending back and forth firmly with these tools will fatigue the wire into breaking. WARNING: the moment the wire breaks can be dangerous. The ends are razor sharp and can cut you as they snap apart. That's where the goggles come in, but look out for your fingers and face as well. Make all your bends and "fatiguing" in a controlled manner. If you are having a hard time, use bigger pliers, or get a vise or better yet invest in bolt cutters. A small set is all you need. The bite on the wire can also be made with a small sharp file. Working with music wire is challenging, but will take your puppet rods and mechanisms to the "next level". Just bending the wire can be hazardous as well as I've had the pliers slip off the wire with such force as to fly up in my face and nearly knock out my teeth. So take care. NOTE : Music wire over 3/32" diameter requires a small propane torch to bend easily. Heat the wire with the torch till a glowing red, then bend quickly with needle nose pliers. Cool without quenching in water as cooling quickly can make the wire so brittle that it will break in your fingers.

## ROD HANDLES

To make rod handles find the proper diameter of wooden dowell and saw it to length. I like to sand the ends with a belt sander as th makes them nicer to handle. Using a vise to hold the dowell, drill a hole slightly smaller than the music wire. Take the dowell out of the vise and drip a little drop of super glue into the hole. Rough up the end of the music wire with a hammer on the anvil of your vise and clamp the wire in your vise with the end sticking out a couple of inches or less and quickly hammer the dowell onto the wire. As you feel the dowell come to a stopping place in the hole, stop hammering or the dowell will split.



## ATTACHING RODS

You will attach the rods to the shadow puppet with 20 gauge craft wire. Rod placement is usually dictated by intuition and balance. When placing a head rod on a shadow puppet with a mouth mechanism the placement is critical, as the rod has to be in proximity of the mouth and especially where the “pull” point is considered. You have to factor in where your elastic “return“ is going to be rigged.

You have already made a small hang man end on the wire as shown. Note the dimensions of this bend. Using the 1/16” hole punch or the Indonesian tiny half round chisel, create (4) 1/16’ holes in the puppet at the desired spot on the puppet. Touch the

end of the rod at the placement spot and mark your holes as shown in the illustration. The wire used to attach the rod is common jewelry making wire found at craft stores. It is very light weight around a millimeter in diameter. I have come up with a technique which seems to work pretty well and have illustrated it in several steps.

### Step 1

You will need pliers, wire cutters and 20 gauge craft or jewelry wire.

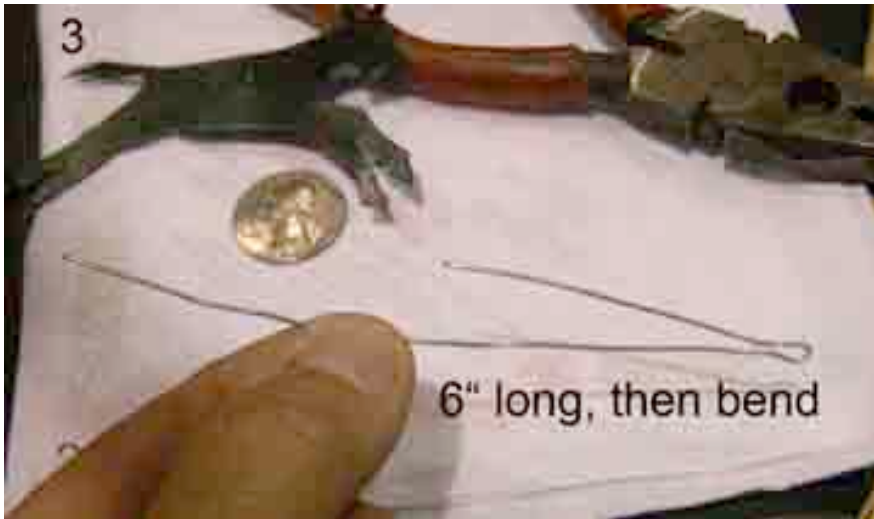


Select the piece of music wire the required thickness(  $1/16'' - 3/32''$ ) Measure out the length of rod you will need (12''-14 '') cut wire to length using the technique mentioned above. Glue wire into a dowell handle as explained above. Bend the other end into a hangman shape as shown

Using a  $1/16''$  hole punch or very small round chisels or drill make four holes in puppet at the desired placement of the rod as shown above.

### Step 2

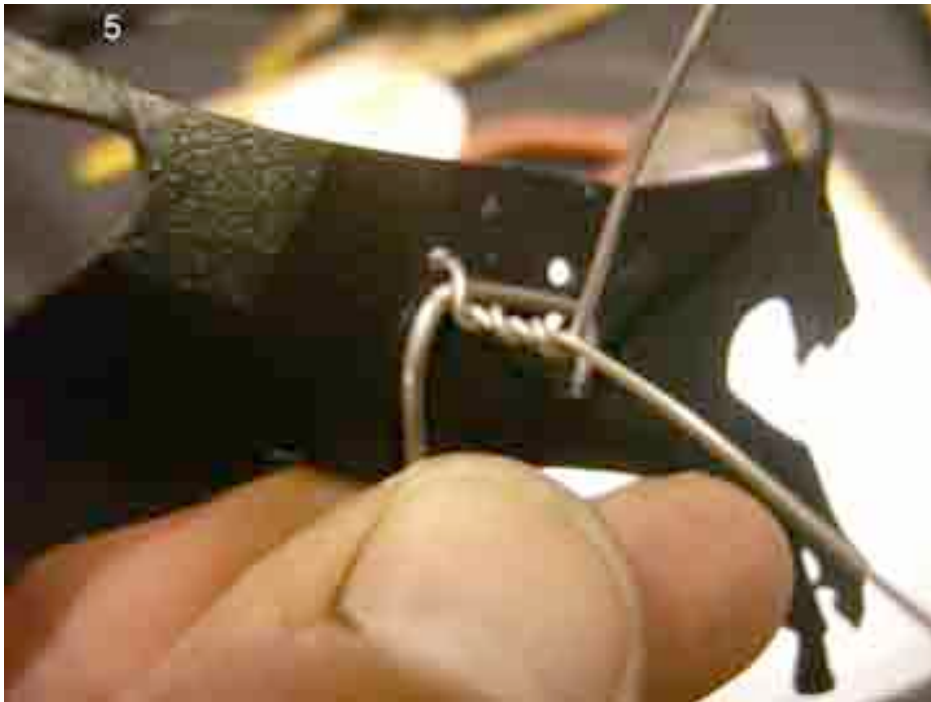
Cut 6'' of 20 gauge craft wire and bend it as shown below.



Thread wire through puppet as shown below.



Place rod inside wire and begin twisting.



Snug wire down with a careful light twist so as not to break wire.

7

Bend finished left twist to the right  
and thread long wire  
through top right hole



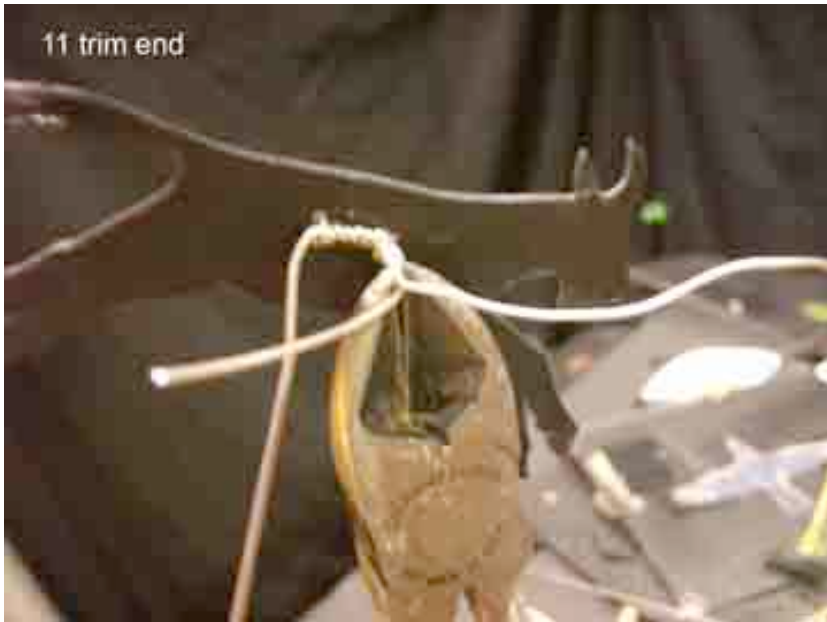
Bend twist to the right and thread the longer wire down the top right hole as shown



thread the wire back up through the bottom right hole. Work out any slack. Don't pull to hard or you will break plastic between the holes.



Twist these two wires and snug down with pliers carefully.



Trim off ends.



Fold toward left hand holes above rod to complete.