9. When your first half has cooled off, it's time to carefully flip the whole arrangement over. Don't let the puppet slip out of the mold! When it's resting on the mold, you'll see the back side of your character with the flat clay wall still in place. Block the mold up with shims so it's level and steady, and begin removing the clay wall you built. All you want at this point is the puppet and the first half of the mold. You may have to do some repairs to the surface of your puppet where its back was blocked up. Just make sure you don't disturb the edge of the puppet where it meets the first mold. If ultracal leaks down there from the second half, you'll have a big mess.

10. Now you have a puppet floating on its face in a sea of hard ultracal. There should be some depressions in the ultracal from the keys you placed. Make sure the clay is cleaned out of those. If necessary, use a cotton swab dipped in water (for regular clay) or rubbing alcohol (for oil-based clay) to clean the ultracal. Make another clay wall perpendicular to the surface of the ultracal so the next batch of ultracal doesn't go pouring off the sides. block it up however necessary from the outside. The inside should be joined to the top surface of the ultracal.

11. Make your separation wedges. These are little ramps about 1 inch square and 1/4 inch thick that lie flat on the surface of the ultracal and join to the clay wall. They create a clay space in the mold where you can stick a screwdriver to pry the mold apart when it's done. Don't let them touch the puppet, but obviously they need to touch the outside wall.

12. Coat everything inside the "well" with Crystal Clear or vaseline, making sure the ultracal is well coated.

13. Mix and apply your second half of the mold as you did the first half. Don't forget to dress it. Now your puppet is entirely encased in ultracal with a thin layer of vaseline and some wedges of clay between the layers of mold.

14. When the second half is COMPLETELY cooled off (overnight is best) you can pull your mold apart. Use a screwdriver to pry if necessary but be careful! If it's not coming apart, use a different thing to pry, usually something thicker like a butter knife or even a small pry bar. It may give suddenly so be prepared to catch it. Your sculpture will be destroyed. Clean all traces of clay out of the mold. Don't rub hard on fresh ultracal, it will rub away. Wait a day or two to let it completely set and dry out a bit. WHEW!

15. Assemble your mold and bake it at very low heat for about four or five hours. This helps to drive the moisture out of it. In the meantime, you can begin to make your animation armature. See the armature section for hints!

16. Make sure the mold is dry and cool. Make sure your armature fits into the mold and can be suspended in it without touching the surface of your puppet. Dust the entire inside of the mold thoroughly with baby powder but don't leave deposits anywhere; blow it out after you're done to make sure there's no bits left. Mix the foam rubber latex according to the instructions provided

for it. Call the help line if you have difficulty with GM foam, they are very good there. WORKING VERY QUICKLY, use a large brush to gently brush gobs of foam into one half of the mold, making sure you get it into the details.

Pile it up so it is overflowing. Set the armature into the foam, placing it where you arranged so it is suspended and doesn't touch the surface of the puppet. The foam will not hold it up! See the armature section for help on how to do this. Brush foam onto the other half of the mold as the first. Pile it up too. Now mash the two halves together, lining the mold up and making sure the keys match. Press it very hard together, lots of foam will probably squish out. That means that you won't have large air bubbles in the puppet. If you have not managed to fill the mold and join it together in about three minutes, the foam may have gelled before you were ready. It's tricky stuff.....just wait till it gels completely, clean it off, and start another batch. Hold or gently clamp the mold together until the foam gels or sets. Without bumping it too much, place the mold into the oven and bake at the lowest possible temperature for about 2-4 hours for an 8" puppet, or better yet follow the instructions for the foam.

17. Remove the mold and let it cool down until you can handle it without gloves. Don't let it cool down completely or the puppet will be difficult to remove. You'll probably need your prying tool again to break the seal of the foam to the ultracal; be careful as the mold is now susceptible to breaking. If it does break, just glue it back together with chinaweld, or china mending cement. Pry the mold apart, don't let it press back together once it comes apart as the puppet is still tender and will get pinched. Pull one side off, then powder your warm puppet with baby powder. Brush it all over. The latex will stick to itself, especially the flash (the fringe left on the edges) so the powder keeps it from sticking. Pull the puppet out of the other half of the mold BUT don't handle the puppet itself. Use the wires you mounted it into the mold with. Don't bend it too much and don't poke it to see if it's done. It needs to hang to dry overnight before it's ready to be manipulated. DONE!

PART II: the harder more expensive mold for hard-core enthusiasts. The following is a mold made of silicone with an ultracal jacket. If you skipped the easy mold steps, read them as we will be referring to them in this section. Silicone is an industrial rubber-like mold-making material. Look in your yellow pages for a supplier. This process can be done at home, except for the baking of the latex.
STEPS FOR PART II:

1. Sculpt your character out of sculpey. Don't use white, it's too hard to see imperfections. Colour each brick up with a block each of green, brown and black. You can build the same type of sculpting armature as above but you won't need the block in the chest. It's a good idea to wad out a core of sculpey, bake it to harden it, then sculpt the puppet on top of that because a thick sculpt won't bake all the way through and will crack. Bake your final sculpt well, but don't burn it...this causes the sculpey to bubble and will make a texture on your surface.

2. After baking, cut the sculpture from the wooden base and grind off the wires sticking out of its

feet. Build up the two clay walls as described above, one at a 90 degree angle to the puppet's surface and one perpendicular to that. Make sure there are absolutely no gaps between the puppet and the clay wall. This should be easy since the puppet is hard and you can use tools against it to smooth out the clay wall. Since it takes several days to make this mold, you'll need to use an oil-based clay like Clean Clay for the walls. Don't forget to make your keys, only this time make them smaller and closer to the puppet. The keys are for the silicone, not the ultracal. Here it is easier to use the end of a sharpie or other tapered item and gently push some dents into the clay rather than building up little mounds all over the place. Don't make them too deep, 1/4 inch at the most. Put lots in a ring all around the puppet. Faintly mark a line in the flat clay wall 1" out from the puppet. This will be your guide for the application of the silicone layer. The only other thing you may need is an injection hole. Make a 1/2 inch thick cylinder of clay and stick it to an unobtrusive part of the puppet. We often put it in the crotch or an area that will be covered by costume. Make sure it seals well to the puppet.

3. You don't need a release agent here since silicone does not stick to anything except itself.

4. Mix up a batch of silicone according to the directions. For an average human type figure, 8 inches tall, 80 to 100 grams of silicone should coat it. Mix the silicone until you think it is thoroughly stirred, then mix it that much again. Scrape the bottom and sides of the container as you mix. Improperly mixed silicone will not cure and uncured silicone is nearly impossible to clean up.

5. Drizzle some silicone onto your puppet. Use a drinking straw or better yet an air compressor to blow the silicone into the crevices of the sculpt. Apply a bit at a time, with a paintbrush, making sure you don't trap any air under the silicone. Gradually work the silicone over the entire puppet out to the mark you made on the flat clay wall. Make sure it goes into the dents you made for keys. Also work it about two inches up the cylinder that is for the injection hole.

6. Silicone will flow continually into the lowest spot on your mold until it sets up. If you catch it at the right time, you can brush it up to the high spots again. If however you touch it when it's tacky, it will stick to your finger and pull right off the puppet. Always test the edge of the silicone before touching the middle. If you put hot lights on the silicone it will set up within a few hours. The second layer needs to be put on when the first layer is still barely tacky to get good adhesion between the layers. If you put it on too soon, it will lift up the first layer....too late and the adhesion won't be the best.

7. Mix a second batch of silicone when you're ready but add 1% thixotropic additive to this one. It will be very thick, like stirring peanut butter. Apply it with a stiff 1 inch house-painting type brush. Carefully spread it around, being careful not to trap air between the two layers of silicone. You can't blow this layer around, it's too thick. Make sure you build up an equal layer over all points of the puppet, and pay special attention to make sure you have adequate depth in the high spots. It should be 1/4 to maximum 1/2 of an inch thick. Work this layer out to the mark you made on the flat clay wall as well. Make this layer as smooth as possible by carefully brushing over it with a clean paintbrush after it is applied. You shouldn't have any texture other than brush marks. This needs to cure completely, so leave it overnight. If it is still tacky in the morning, put hot lights on it and leave it till it's totally cured.

8. The next morning, trim the edge completely cured silicone with a very sharp exacto or artists' knife. The edge needs to be completely square and clean. Do this without lifting the silicone off the flat clay wall or cutting deeply into the clay.

9. Mix up a batch of ultracal as above. Make enough to cover the silicone to a depth of about 1 inch. Apply and dress the curing ultracal as above. Be sure not to cover the injection hole. As a matter of fact, this is the only area you can leave a bit of silicone still sticking out of the ultracal. It will be trimmed off level with the outside of the ultracal later and the clay cleaned out. This will make a perfect hole for injecting the puppet. Silicone molds may also be slush cast as above for ultracal molds.

10. Flip the whole arrangement over and peel off the clay wall without disturbing the sculpture or pulling it even a little bit out of the mold. It needs to stay totally sealed to the silicone until you are finished the mold. Clean the revealed surfaces of silicone and ultracal with rubbing alcohol on cotton swabs. You now have a puppet face down in what appears to be a puddle of silicone in a puddle of ultracal. Bumps of silicone will appear where you made the keys with your blunt tapered object.

Part 5 | **Part 7**