

## Sgt. Paper's Instructions

The Sgt. Paper's patterns should be printed on a heavy weight cardstock paper. I use 110 pound stock but anything over 60 pounds should work well. You should use a straight edge and a sharp blade such as an *X-Acto* to cut out all the pieces. Creases should be done with a straight edge as well. I was able to use the backside of my blade to crease the patterns. The key is straight, precise cuts and creases for a good assembly and smooth working device.

Regular white glue works well. Small amounts spread over the area needed with a toothpick keeps things neat and clean.

Read through the instructions to familiarize yourself with the steps. The instructions go step by step in a specific order but you may skip ahead several steps to glue something together while another part is drying, i.e., while the inner pushrod is drying (step 2) you could jump to step 5 or work on the head or the base. You can work on all the singers at once but I would recommend doing one singer from start to finish first to get a good idea of their assembly. Once one is completed you can work on the remaining 3 simultaneously.

Besides the paper you will need some  $\frac{1}{4}$ " and  $\frac{3}{16}$ " dowels. You can use plastic straws instead of the  $\frac{1}{4}$ " dowel. The straws that I have available are about  $\frac{1}{4}$ " in diameter. If straws are used another type of glue such as *Crazy Glue* may be needed to bond paper and plastic. Although I do not show it in the instructions, I did insert and glue a straw inside the inner pushrod tube of the body. This reduces the amount of play in the  $\frac{3}{16}$ " dowel pushrod and provides less friction than wood on paper. For paper purists you can attempt to roll your own dowels out of paper, just make sure they are straight.

Don't rush. There are lots of cuts and a lot of gluing. Plan to spend several hours spread over a few days.

## Singer Construction

1. Cut out and score all parts needed. Besides the singer sheets you will need the pin pivot stiffeners from Sheet 6.

2. Fold and glue the inner pushrod tube. Keep it square and straight.



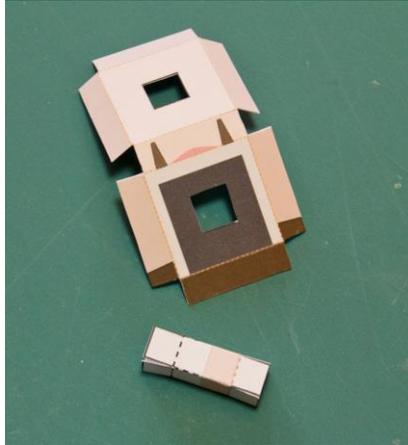
3. Glue pivot bracket to inner pushrod at black dots, aligning along center and green lines.



4. Wrap, fold and glue remaining parts of pivot bracket around inner pushrod.



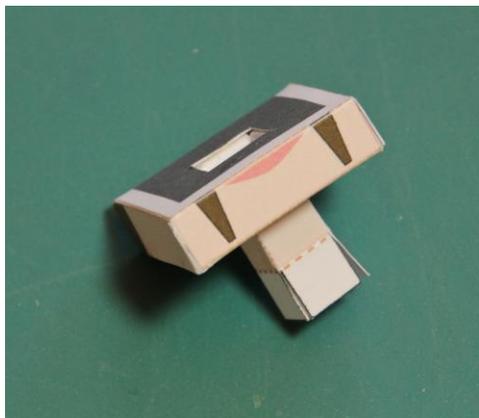
5. Fold and glue the neck.



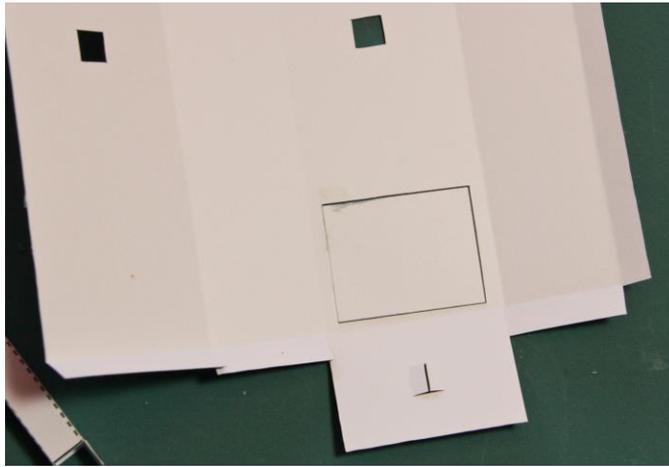
6. Insert neck into lower jaw, spread tabs and glue tabs to underside of the mouth.



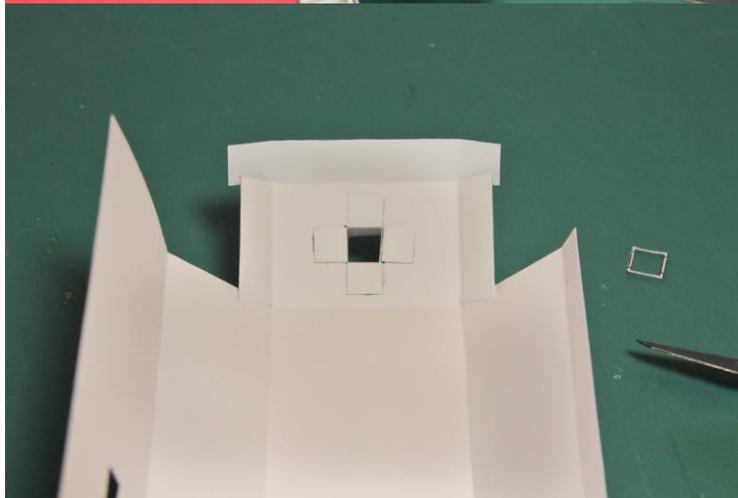
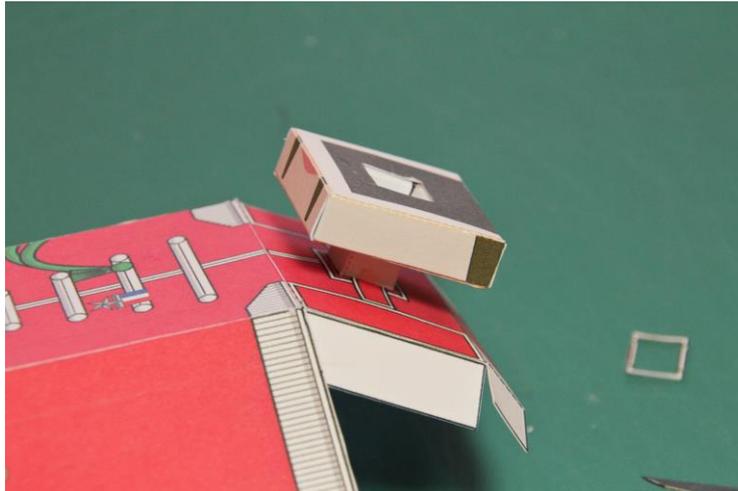
7. Finish glue up of lower jaw.



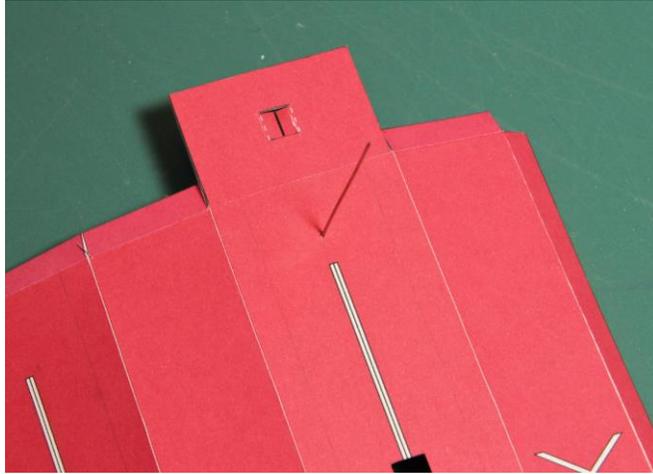
8. Glue a pin pivot stiffener to the inside front of the singer just above the fold line at the bottom.



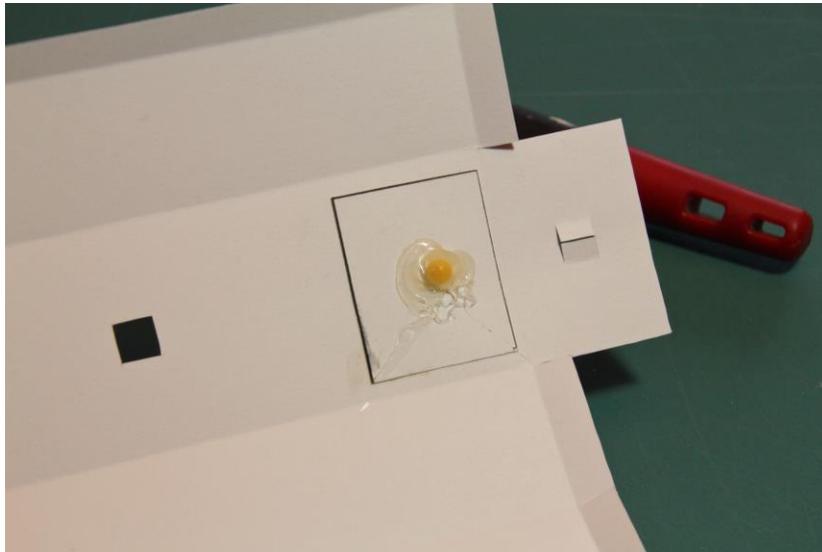
9. Insert neck tabs of the neck and lower jaw assembly into body, trim hole if needed, spread and glue tabs.



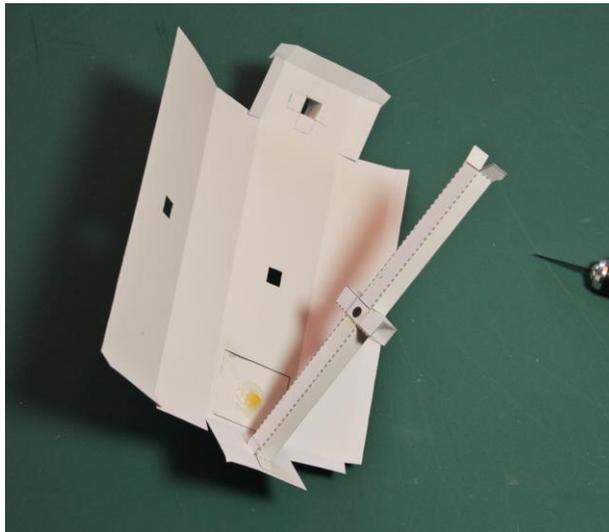
10. Using a pin, poke a hole through the front of the body through pin pivot stiffener at crosshairs.



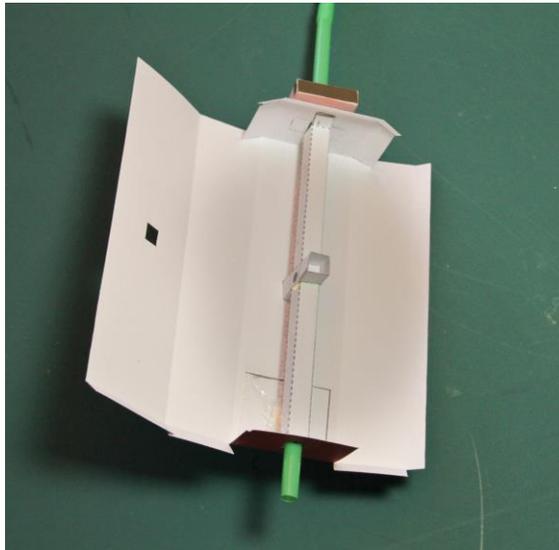
11. Insert pin from inside body and glue to stiffener with a good sized glob of hot glue. If hot glue not available you can glue a 1 inch square piece of scrap paper over the head of the pin.



12. Glue inner pushrod inside the body. Glue to the bottom first. Push tabs on the bottom of the body to inside and glue to inner pushrod tube. Tabs of the inner pushrod tube are spread and glued to the inside of body bottom.



13. Glue top of inner pushrod tube to top of body. Spread tabs and glue to the inside. Place dowel or straw through jaw, neck and body to make sure of alignment.

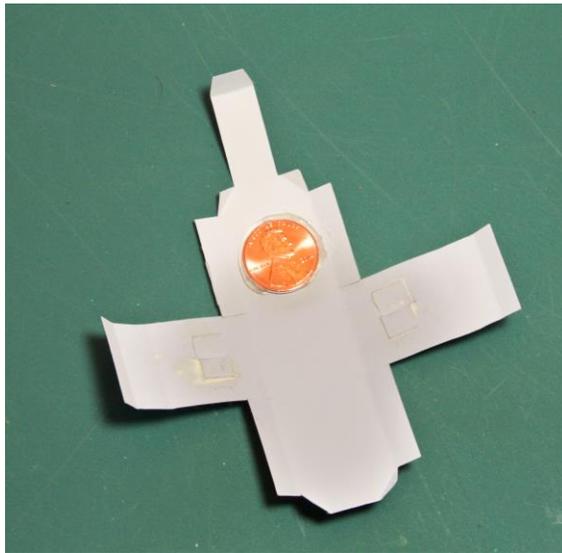


14. Glue body together working from the top down. Tops of shoulders are folded and glued. Arms and body is wrapped around the shoulder "box." Tabs on the bottom of the arms and back are glued to the outside of the bottom. Keep edges aligned and squared.

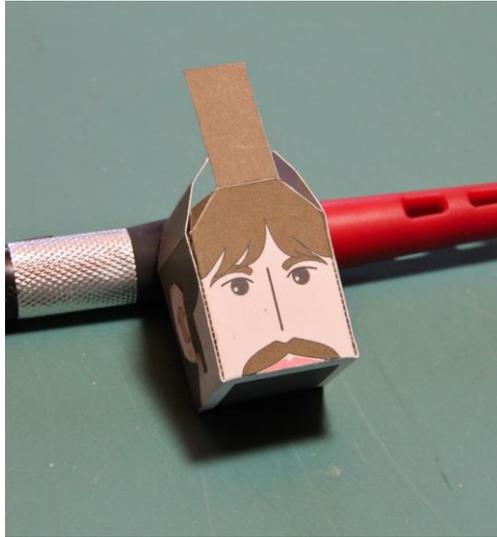
15. Cut out the little black rectangles on the head piece for the ears.



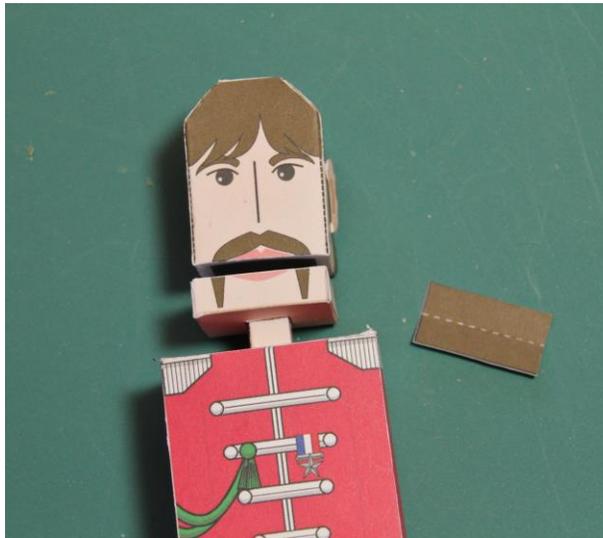
16. Glue/tape a penny to the inside of the head on the backside of the face.
17. Fold ears in half and glue ear parts only. When dry, cut along the fold to separate the tabs.
18. Insert ears into slots, spread tabs and glue to the inside of head. Make sure ear orientation is correct.



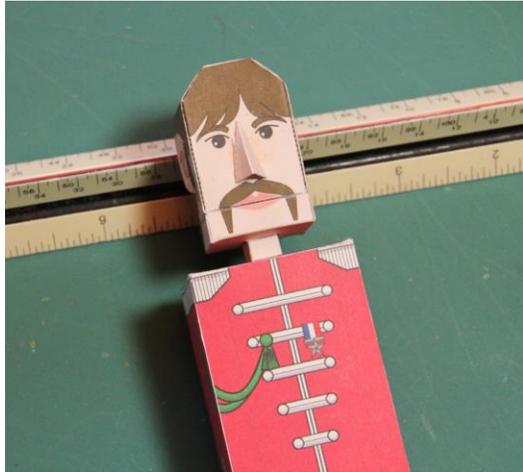
19. Fold and glue up head.



20. Connect head and lower jaw with jaw hinge. Score the hinge on the non-printed side to create an effective hinge movement.

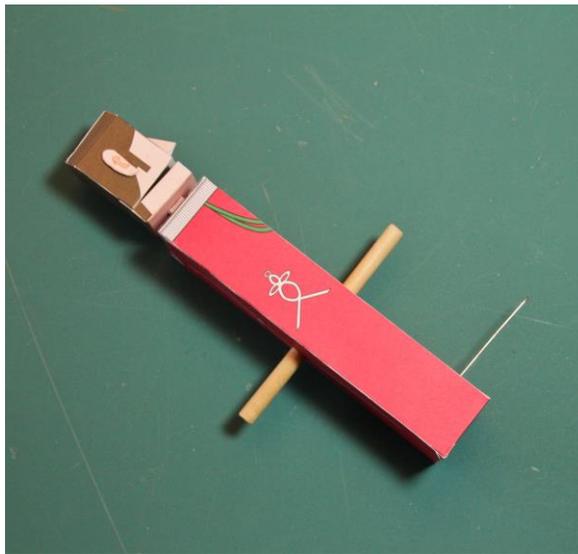


21. Fold and glue nose onto face along centerline.



22. Cut  $\frac{1}{4}$  inch dowels or straws to be used for pivots to  $1\frac{1}{4}$  inches long.

23. Glue dowels or straws into pivot bracket.

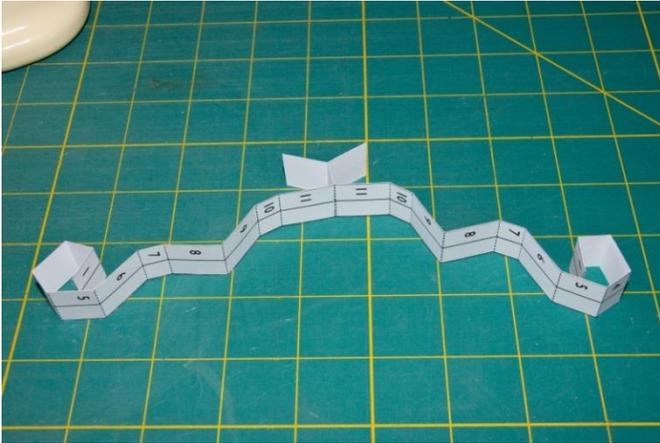


24. Repeat with 3 remaining singers.

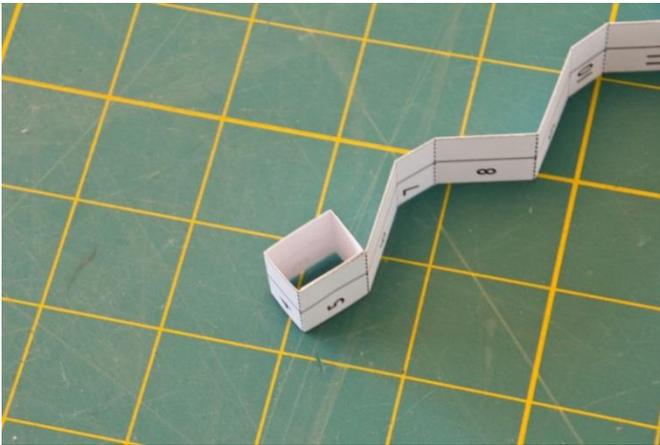
## Base Construction and Assembly

1. Cut and crease all remaining pieces.

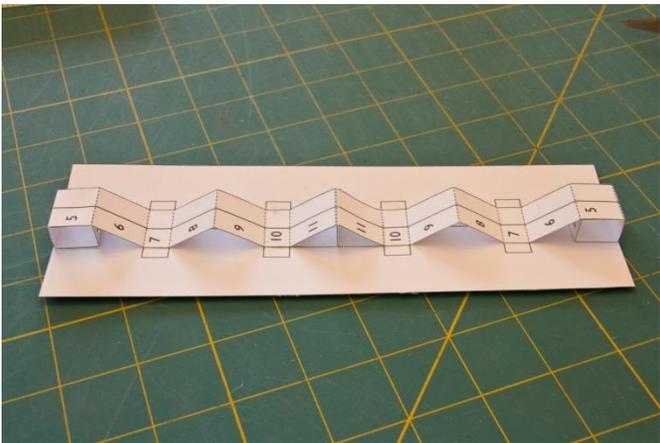
- Fold and glue cam strips together at sections 12 to form one strip.



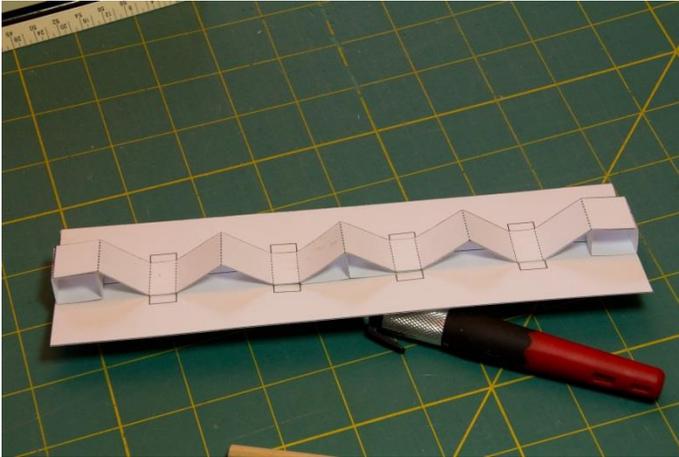
- Glue ends of cam strips to form a box at each end.



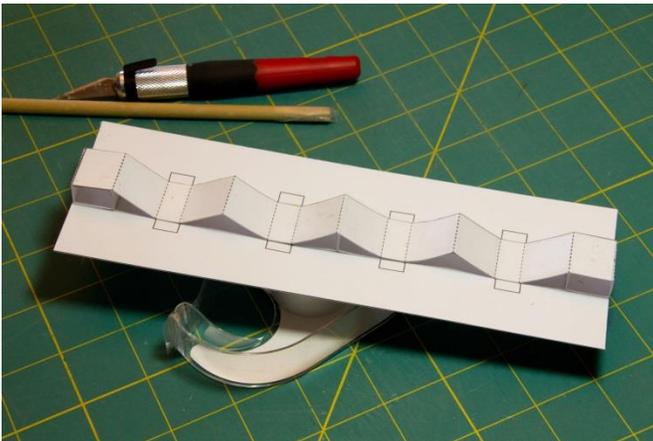
- Glue cam strips to base. Start with the 10's and work to the ends.



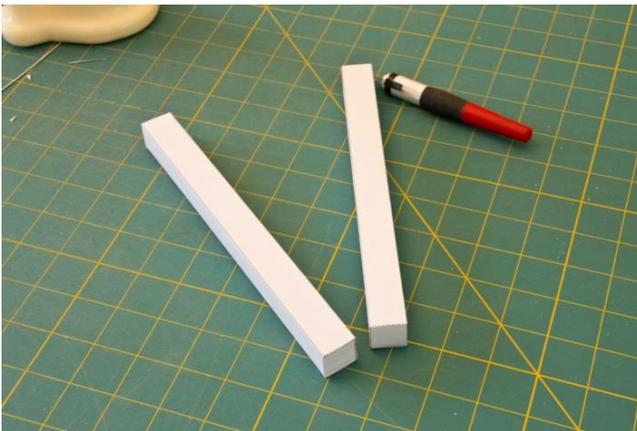
5. Glue Cam strip overlay onto cam strip/base assembly



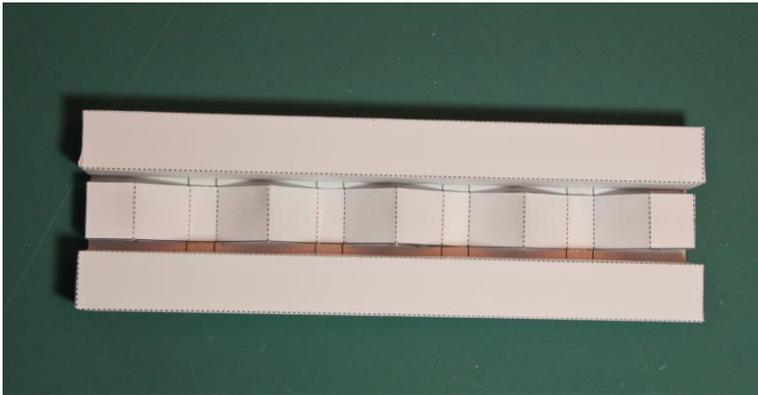
6. Place a strip of cellophane tape down the length of the cam strip. It is easier to do it in 4 separate sections. The tape will have less friction on the pushrods than just the paper.



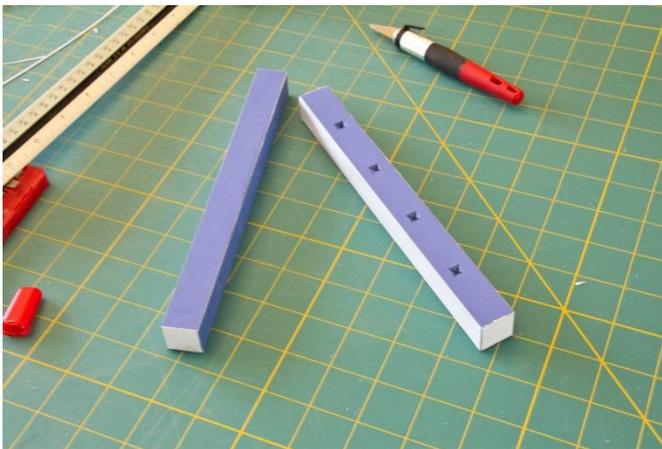
7. Fold and glue base bars. Keep straight and square.



8. Glue base bars to base. Keep the bars just to the inside of the base just so a sliver of the base is visible. This will make the end panels fit better.



9. Fold and glue pivot bars. Note: pivot holes on inside retain triangular tabs pushed inwards. (Note: on Sgt. Paper's the pivot bars are not blue.)



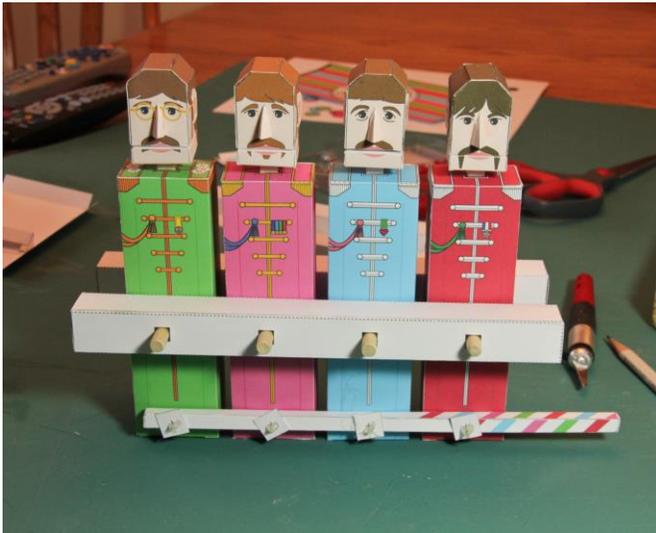
10. With a pin poke a hole in the pushrod at all 8 crosshairs. Fold and glue pushrod, similar to the base and pivot bars, keep square and straight.



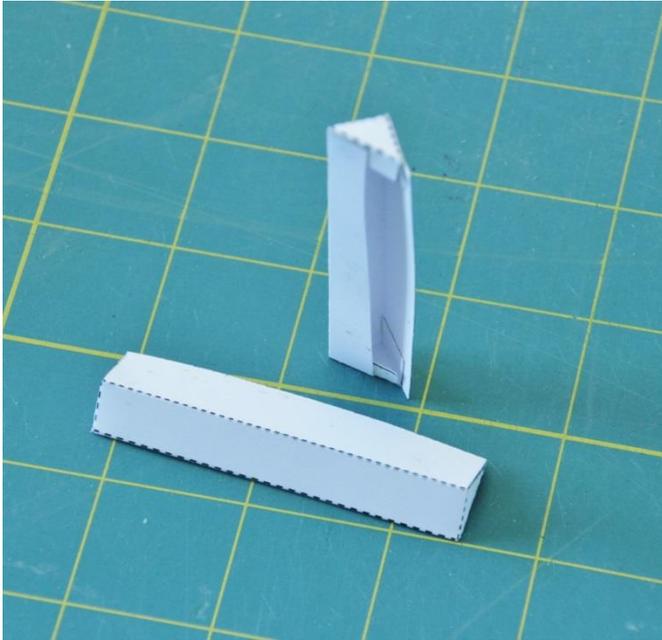
11. Thread the pushrod onto the pivot pins of the singers.
12. Take a pin and poke a hole in the pivot pin retainers. Slide retainers onto the pins. Cut the pins so that about  $\frac{1}{4}$ " extends out from the pushrod tube/retainer. Put a glob of hot glue onto pin and retainer. If no hot glue available, use regular glue but take care that the retainer does not get glued to the pushrod. Check for free movement of the pushrod.



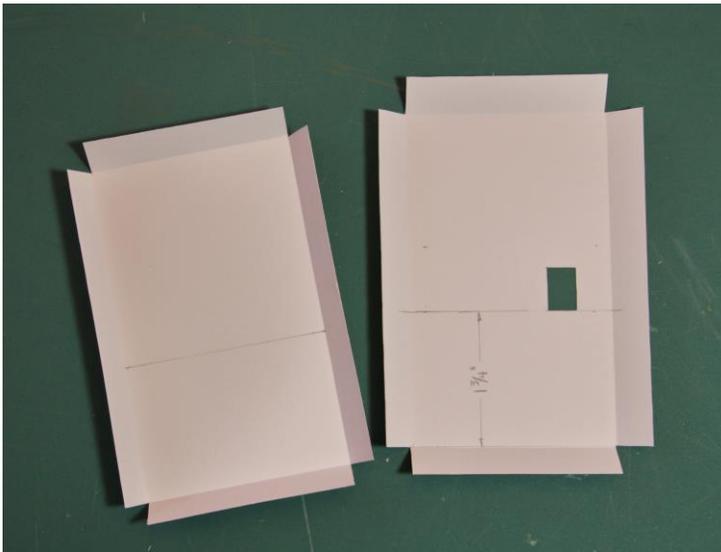
13. Install the Pivot bars by sliding onto the pivot dowels, "sliced" holes side in, square hole side out



14. Fold and glue the end panel stiffeners/stops.



15. Make a line 1  $\frac{3}{4}$ " up from the bottom of the end panels on the inside.



16. Glue stiffener/stops along the line.



17. Glue the left end panel to the Pivot bars just along the top and end of the bars. Thread right end panel over the pushrod and glue to pivot bars similar to the left panel.



18. Insert the base and glue up all remaining tabs. Make sure it is square.

19. Slide front cover over pivot dowels and glue to the front. Glue pivot covers on the ends of the dowels. Fold and glue the pushrod cover, similar to the lower jaw. Glue pushrod cover onto the end of the pushrod. With the singers vertical, open their mouths and drop a 3/16 inch dowel in and let it rest on the cam strip. Mark the dowel and cut it to be flush with the top of the mouth.

Round the bottom and top with sandpaper.



20. You should be complete! Move the pushrod back and forth. The dowel should move up the cams and open the mouths of the singers. The stops should prevent the dowels from going too far and cresting the cam top. As I stated in the beginning, a  $\frac{1}{4}$ " plastic straw can be cut and inserted into the pushrod tube to help center the  $\frac{3}{16}$ " dowel pushrod. Cut the straw so that it does not rub on the cam hills and does not protrude into the mouth opening. If your straws are loose fitting you may need a drop of glue to hold them in place.



