

Wingman

General instructions

Print out the patterns on heavyweight cardstock. I use 110# paper but anything over 60# will work. Pages were designed for an 8.5" X 11" sheet of paper. Read through all the instructions to familiarize yourself with the construction. You can choose to cut, crease and glue each piece as you go or you may prefer to cut all the pieces out and then start construction. I prefer cutting out the pieces with a sharp blade and a straight edge. An X-acto knife or similar works well. The particular blade I use has a shape that allowed me to use the back of the blade to do the creasing. In any case, nice straight cuts and creases will produce a better working result. Regular white glue works well. I use a toothpick to apply the glue onto the smaller parts. Take your time and enjoy the process.

Head construction

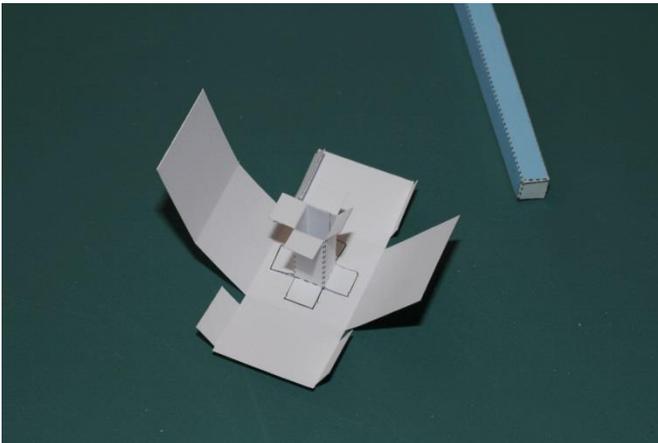
1. Cut out all the parts on Sheet 1 except for the body and tail. You will also need the body pushrod tube from Sheet 5.
2. Crease, fold and glue the body pushrod tube into a long skinny box. Keep it straight and square.



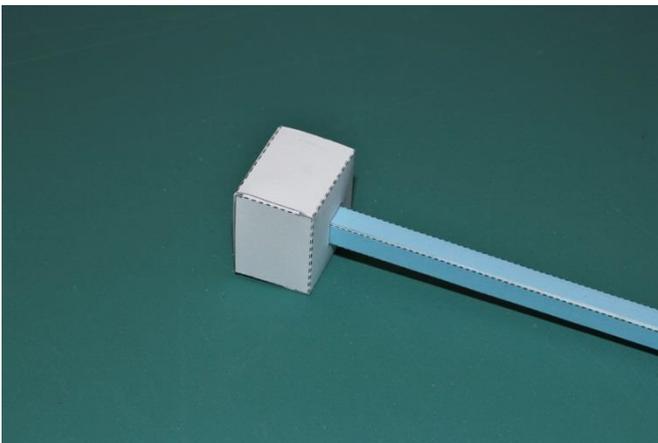
3. Crease, fold and glue the inner body pushrod support. Make sure it fits around the body pushrod tube by test fitting it.



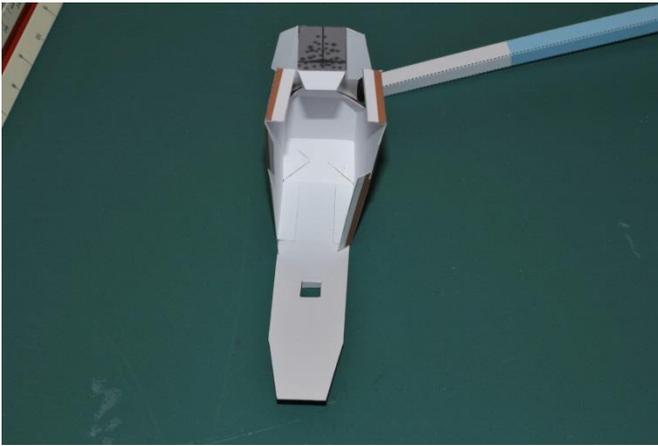
4. Crease and fold the body pushrod support. Fold out the tabs of the inner body pushrod support and glue it to the body pushrod support aligning the square holes. Check alignment by inserting the body pushrod tube.



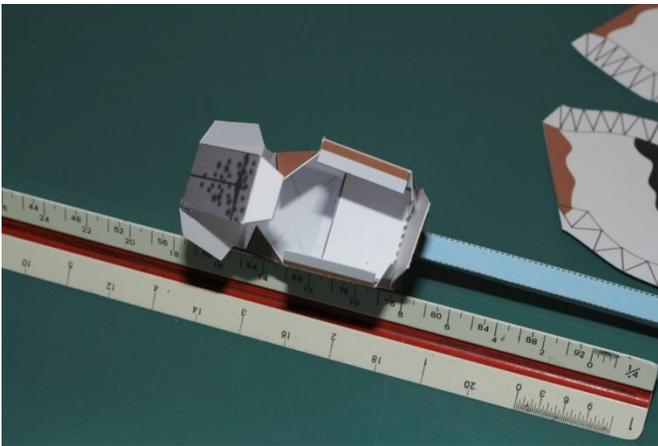
5. Fold and glue up the body pushrod support forming a box. Insert the body pushrod tube into the body pushrod support but do not glue at this time.



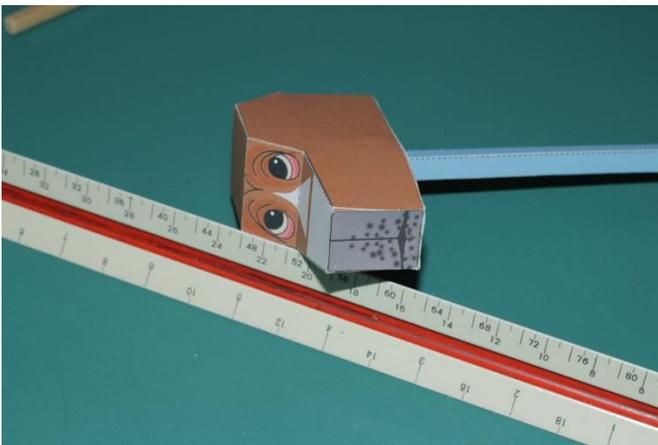
- Crease and fold the head piece. Starting at the top and working toward the back, fold and glue the triangular tabs. Fold and glue the next two tabs.



- Insert the body pushrod tube and the body pushrod support through the square hole at the bottom of the head from the inside. Put some glue on the bottom of the body pushrod support box and its sides. Glue the bottom of the head to the tabs and then press the body pushrod support box onto the tabs.



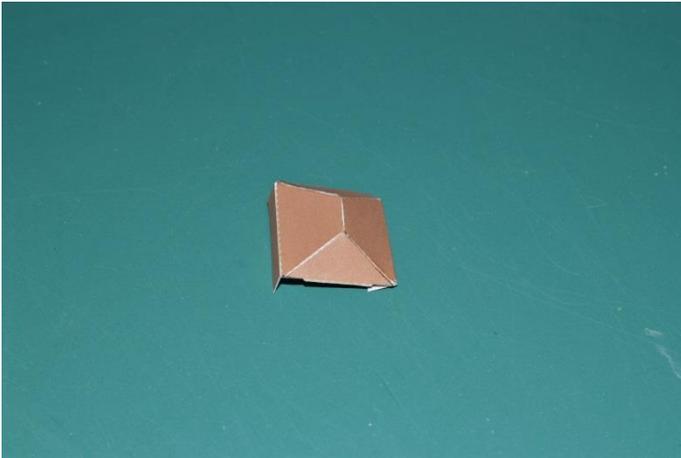
- Working from the top of the head, fold and glue the tabs forming the face and muzzle.



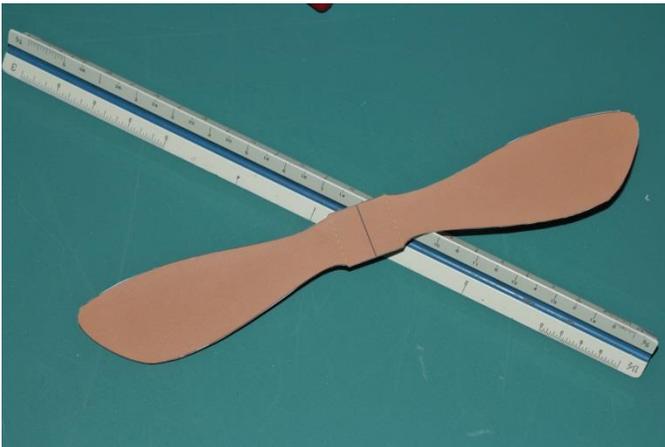
9. Fold and glue the jowls onto the head. The front of the jowls at the nose are pressed around the front rather than a heavy crease.



10. Fold and glue the top of the head to form a pyramidal shape.



11. Cut out the upper and lower ears from sheet 2. Glue the two ears together, keep flat and weigh down (magazines, etc) and allow to dry. Crease the ears along the dashed lines top and bottom and bend them to ease the joint.



12. Cut out the pigeon parts on sheet 3. Fold and glue up the body. Cut out the 2 slots on the body surround, one for the feet and one for the head. Gently shape the body surround by rolling it

around a pencil. Test fit it around the body and then glue. Glue the wings to the body. Fold and glue the head together and insert and glue it to the body. Fold and glue the small grey section of the feet and then insert and glue the feet to the body.



13. Glue the ears to the head.

14. Glue the top of the head on top of the ears. Make sure the ridge is running in the proper direction.



15. Glue the pigeon onto the top of the head.

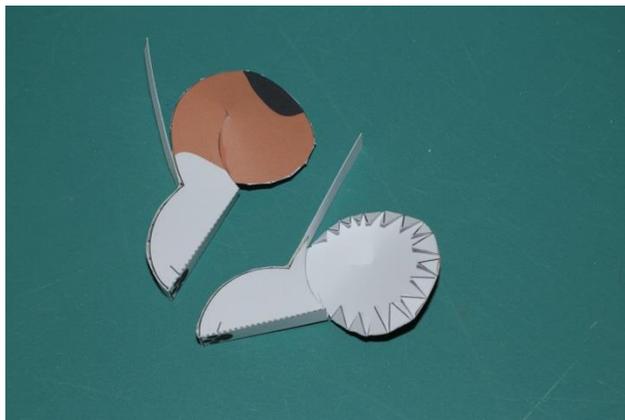


Body Construction

1. Cut out the body and tail from sheet 1, the front and hind legs from sheet 3 and the body surround from sheet 2. There are a lot of little triangles to cut and I think the easiest way to cut them out is make an outline cut along the tips of the triangles. Next make the cuts along one edge of each triangle rotating the piece as needed. Then cut the other sides of the triangles in the same manner. Lots of cuts but it does go quickly.
2. Crease the body all along the perimeter. The body surround has to fit the curve of the body so gently roll it and bend it a bit to help the gluing process. Start at the top of the neck and work along the back. Work a few tabs at a time. Use a pencil or dowel to press down the tabs from the inside as you press from the outside.



3. The front and rear legs are similar in construction. The haunch and shoulder is formed into a conical shape by gluing the small triangular section to the inside. The rest of the leg is similar to the body. Work a couple tabs at a time.



4. Glue the 2 halves of the tail together except for the 2 small tabs at the base. These are folded out.

5. Glue the legs and tail onto the body. Use the picture as a guide.

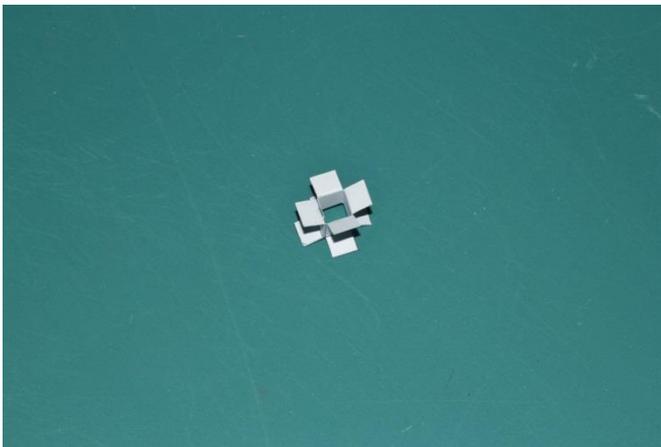


Body is complete but do not glue it to the head now.

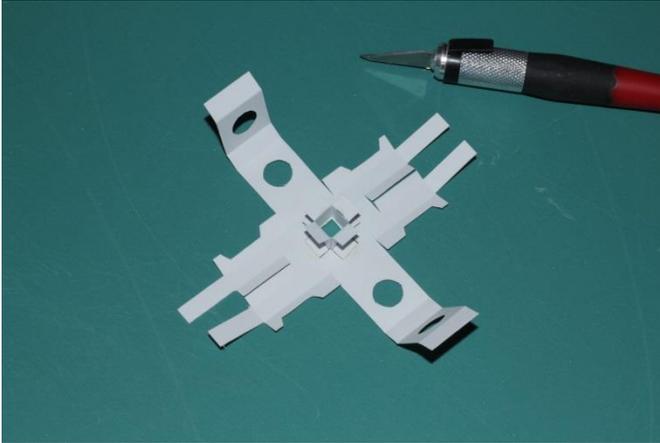
Crank construction

To make up the crank mechanism you will need the crank arm and handle from sheet 2, the crank shaft stops from sheet 3, everything on sheet 4 except the top braces and the cloud cams from sheet 5.

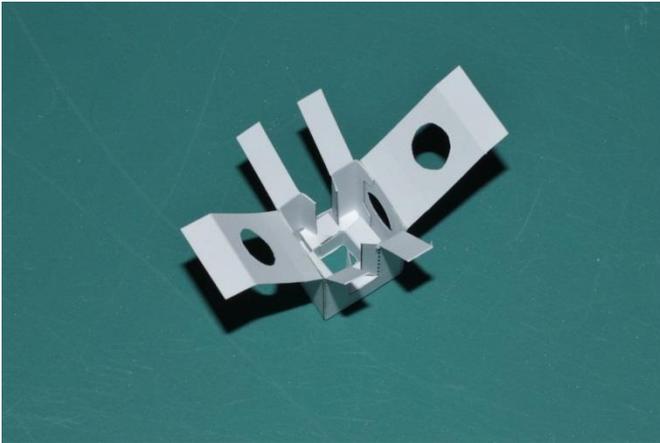
1. Fold and glue the inner support top of piston to form a tube similar to the inner body pushrod support. Check the fit with the bottom of the body pushrod tube.



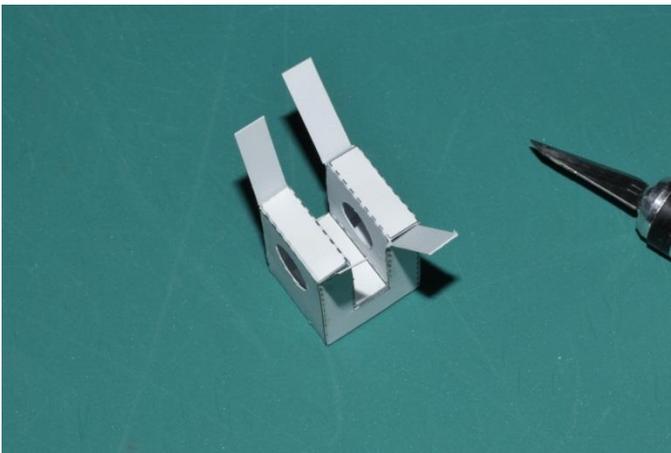
2. Glue the inner support top of piston to the piston head making sure the square holes are aligned.



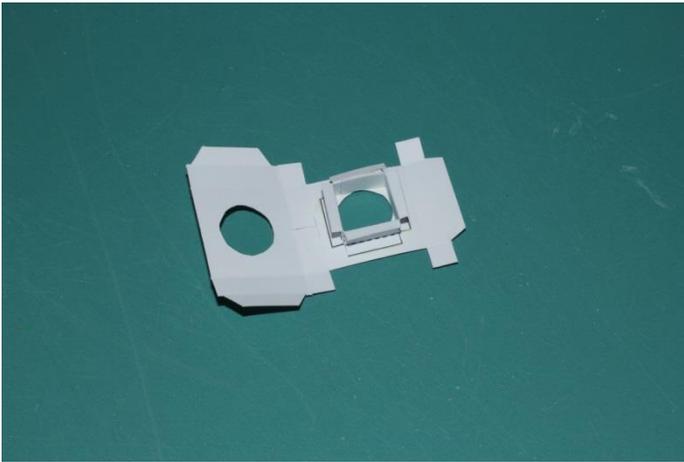
3. Fold and glue sides.



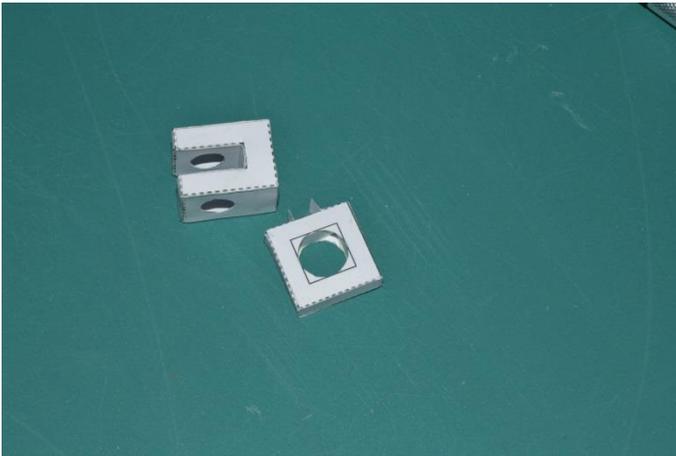
4. Fold and glue the 2 large sides with holes into place forming the inside of the piston. The long skinny tabs are glued down last.



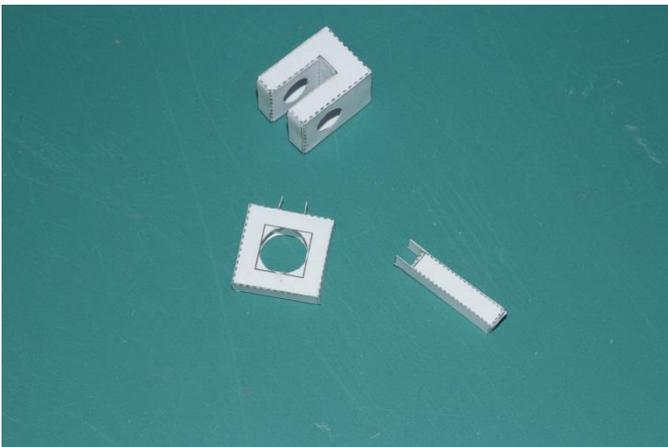
5. Make the inner axle bearing support tube. Glue it to the axle bearing carefully aligning it so that it sits square and does not interfere with the axle opening.



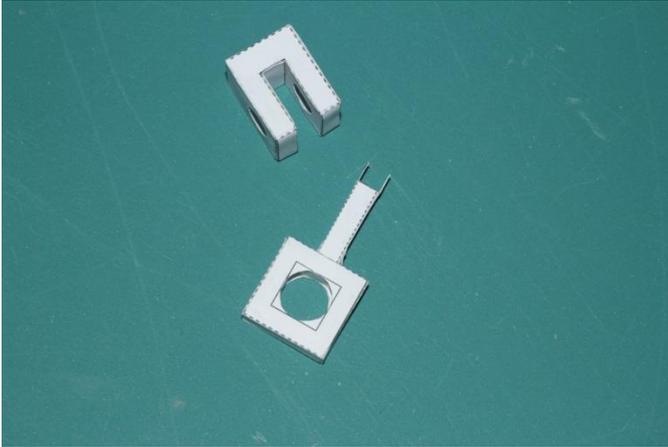
6. Fold and glue the rest of the axle bearing to form a box.



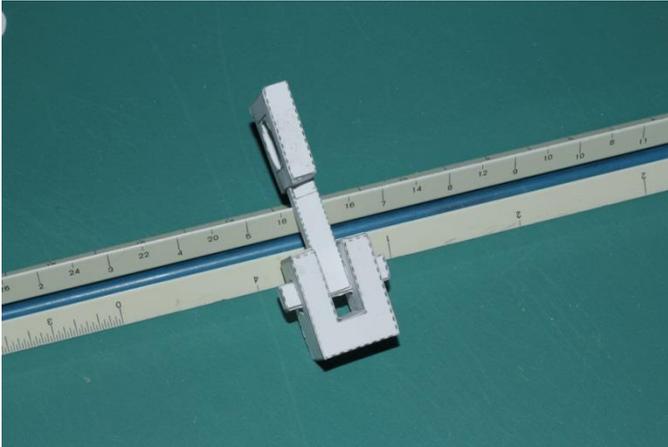
7. Fold and glue the piston rod. Note the 2 tabs left standing.



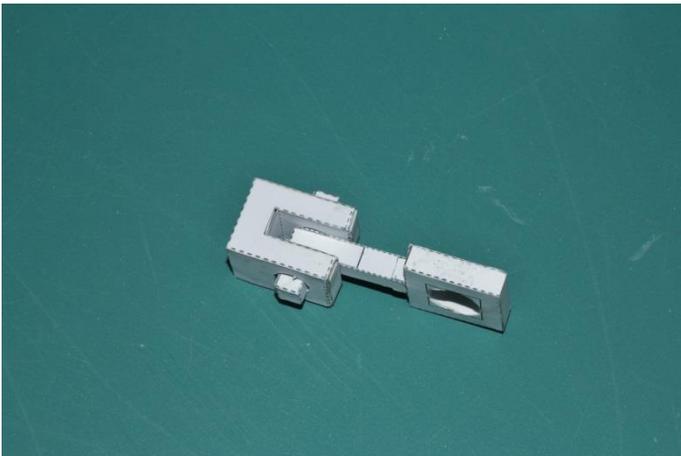
8. Fold and glue the piston rod into the axle bearing making sure it is centered, square and vertical. Make sure the tabs of the piston rod are oriented as pictured.



9. Fold and glue the cross pin into a box tube. Insert the cross pin into the piston head. Glue the upright tabs of the piston rod to the cross pin using the dotted lines of the cross pin as a guide.

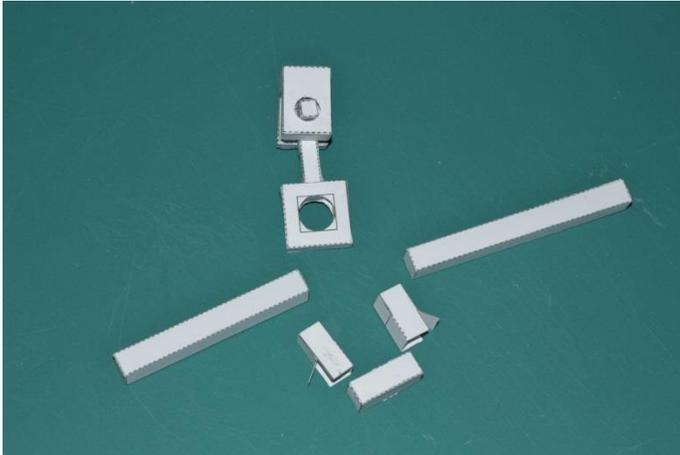


10. Fold and glue the piston rod connector strip to piston rod.

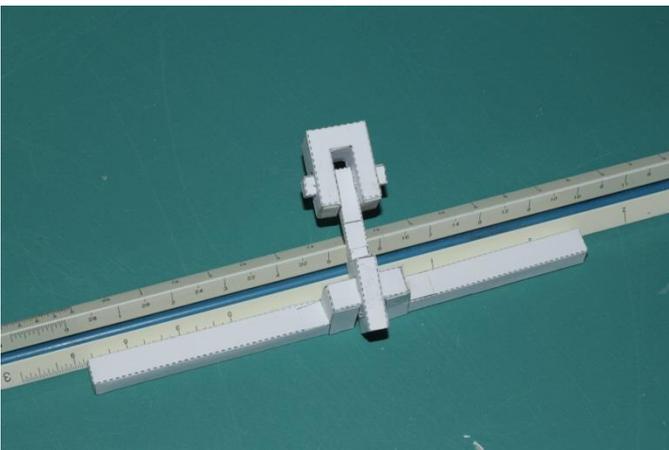
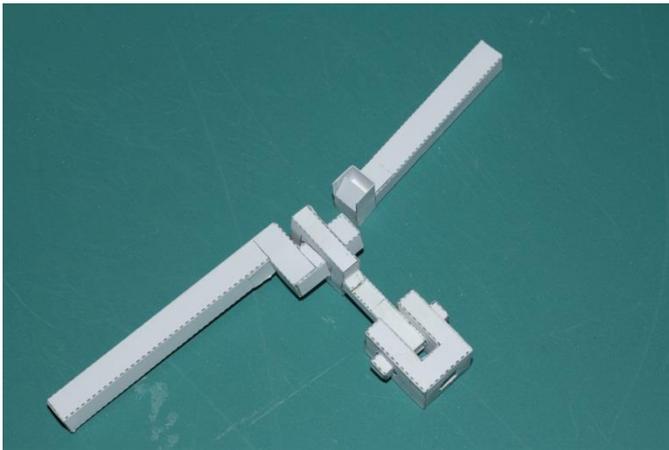


11. Make up the right and left crank axles and the crank cross, similar construction as the body pushrod tube (axles shown in pictures are white but have been updated to a sky blue color on plans).

12. Fold and glue the crank verticals into tubes.



13. Glue the crank verticals to the crank axles. Insert crank cross through axle bearing and glue to the crank verticals. Note how the tabs of the crank vertical are placed. The tab for the axle is bent out and the other tab for the crank cross is bent in. Keep things square and straight.

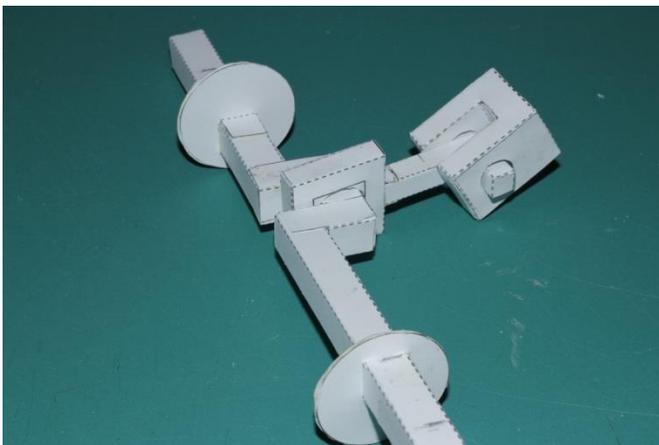


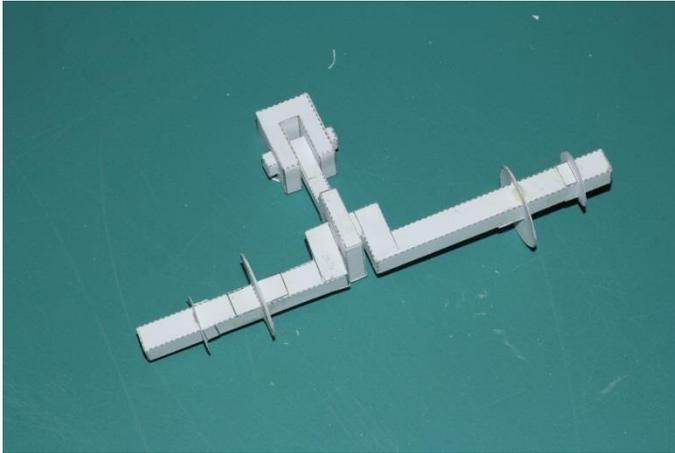
14. Lay the crank mechanism out with the left crank (smaller) to the left. Take a ruler and place it along the crank so that the center of the crank/piston lines up with the 2 1/2 inch mark. Place a mark on the crank axle at zero and 6 inches. These are the location of the crank stops. Place 2

more marks on the axle at 1 1/8 inches and 4 7/8 inches. These are the location of the cloud cams.



15. Cut the cloud cams from sheet 5. Note that 2 of the cams square holes are cut completely out while 4 of the cams have only 3 sides cut in order to form a tab. Make up 2 cams by sandwiching a non-tab cam between 2 tabbed cams. Use the crank axle to help align the cams.
16. Cut out the 2 crank stops from sheet 3. Crease and fold out the tabs.
17. Slide a cloud cam onto each side of the crank and then slide on a crank stop. Note in the picture the orientation of the cloud cams to each other and the crank. The cams are facing opposite directions (180 degrees) and are 90 degrees to the crank. This orientation keeps the clouds out of sync with each other and the basset. Glue the cams in place over their marks keeping them perpendicular to the axle. Glue the stops just to the inside of their marks.

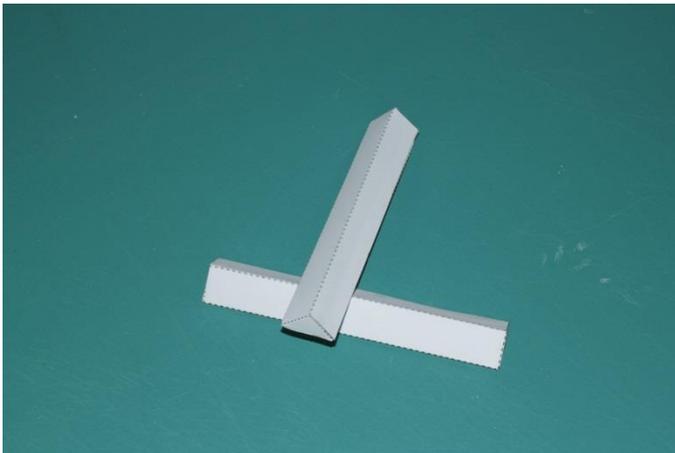




The crank mechanism is now complete and can be set aside while the base is constructed.

Base construction and final assembly

1. Cut and crease all remaining pieces.
2. Fold the top braces from sheet 4 into triangular boxes.



3. Fold and glue the body pushrod guide to form a tube. Check to make sure the body pushrod tube slides through the guide easily. (Pushrod guide has been modified since pictures were taken. Guide is taller and includes a sky blue section at the top.)

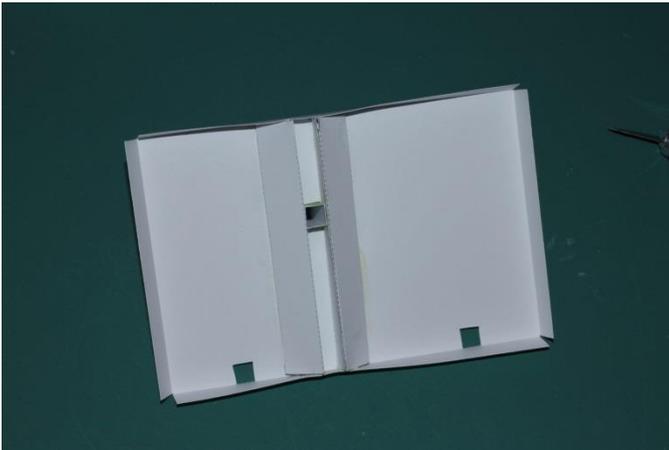
- Fold and glue the body pushrod braces to the guide so that the bottom of the braces align with the dashed line of the guide.



- Insert the brace/guide assembly into the square hole of the base top making sure it is square and vertical.



- Glue the top braces to the underside of the top on either side of the pushrod guide.



7. Fold and glue the sections on each of the sides to form long boxes/columns. Glue tops and bottoms to the ends of the columns.



8. Glue the crankshaft bearing stiffeners to either side aligning the holes.



9. Glue the left side to the bottom panel just along the bottom of the side panel. Repeat with the right side. (Note: in this construction photo sides were not printed)

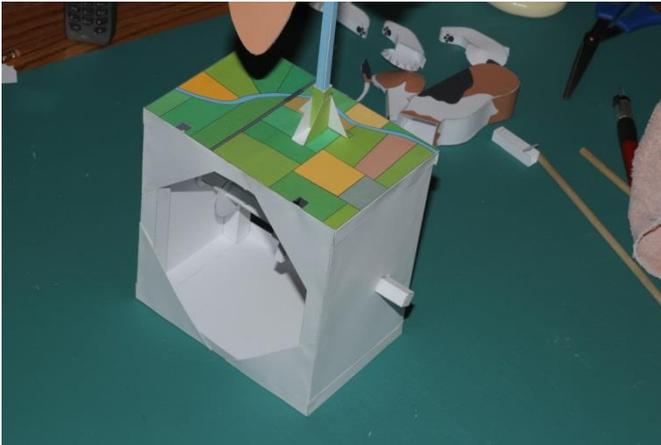


10. Insert the crank mechanism into the sides.

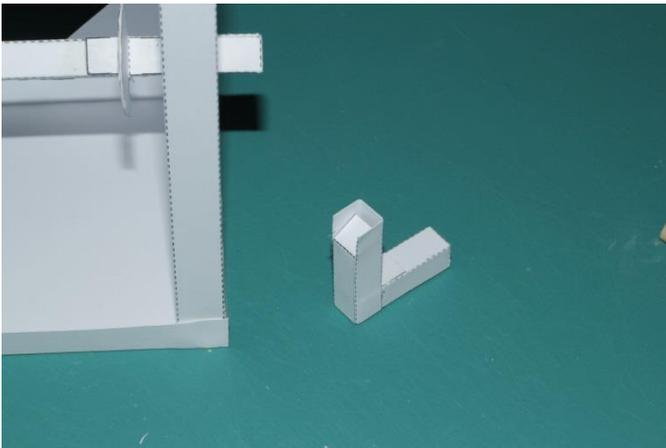


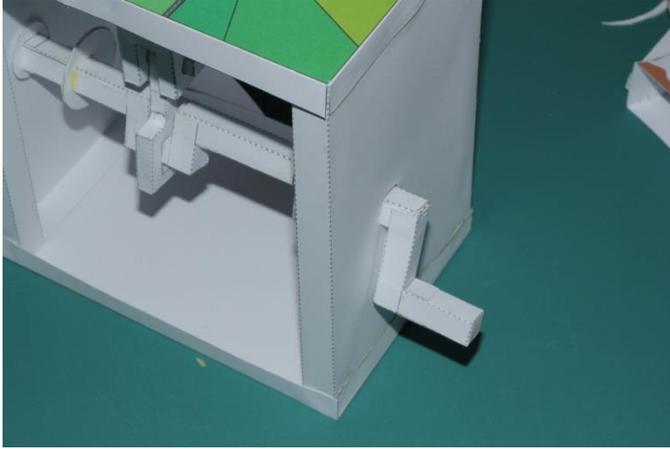
11. Place top onto base and glue all the flaps in place keeping it square.

12. Glue the back corner braces in place before the glue sets up from previous step.



13. Glue up the crank arm and handle. Glue one end of the handle onto the arm. Glue the arm/handle assembly onto the end of the right crank axle.

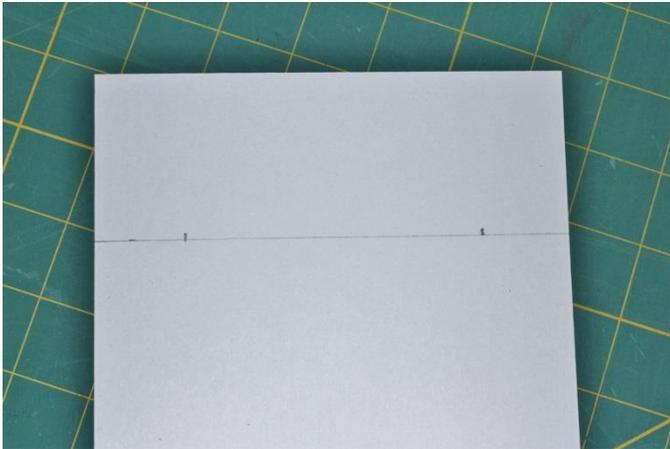




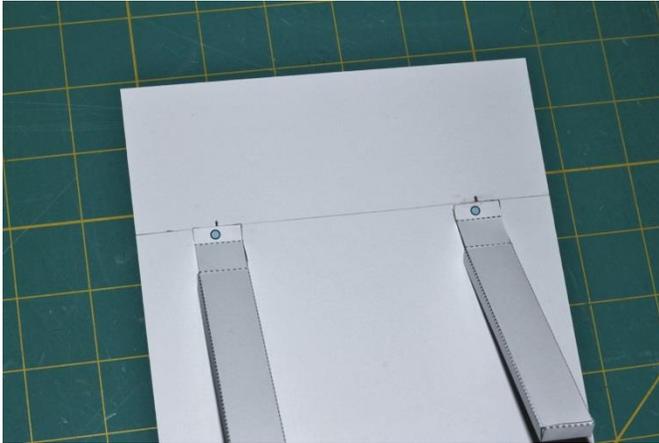
14. Fold and glue the 2 cloud levers into rectangular boxes.



15. On the backside of the front panel make a line $2 \frac{1}{8}$ inches down from the top. Place a mark $1 \frac{1}{8}$ inches in from each side.



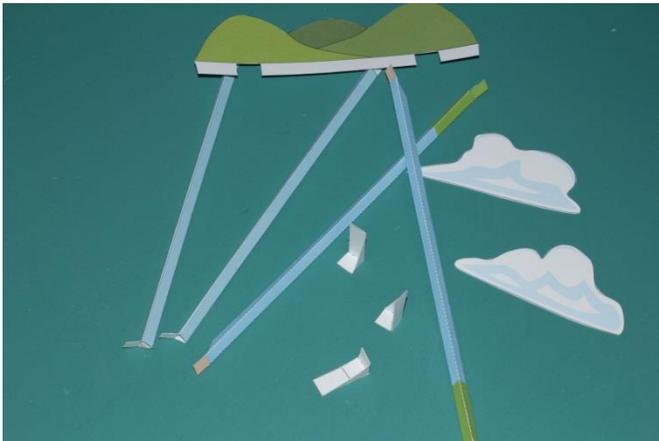
16. Glue the cloud cams centered on the marks just made.



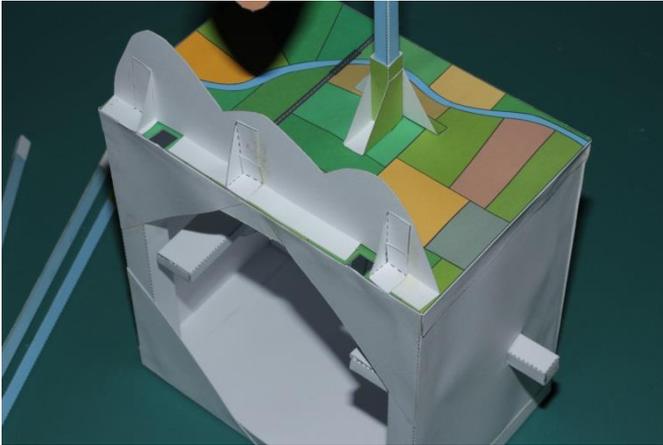
17. Glue the front panel to the base. Make sure the cloud levers rest on the cloud cams.



18. Fold and glue the ear pushrods, cloud pushrods and the hill braces.



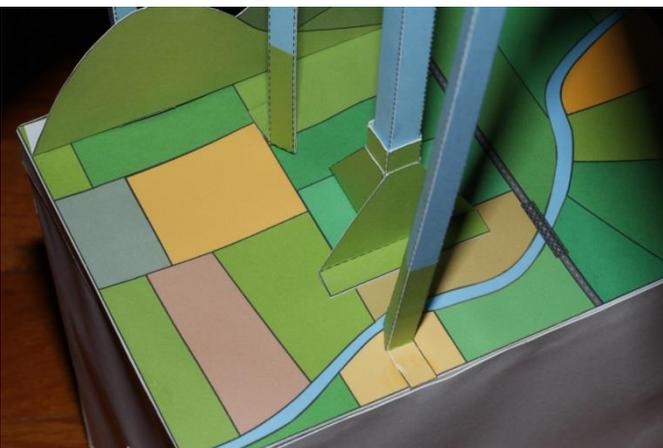
19. Glue the hills to the back of the base and the hill braces to the hills.



20. Insert the body pushrod through the guide and glue it to the piston head.

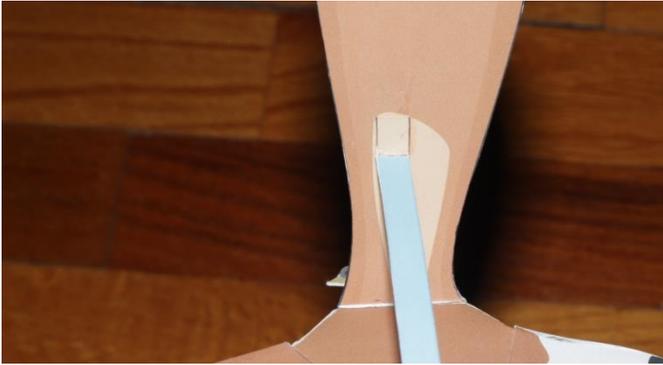
21. Insert and glue the head onto the top of the body pushrod.

22. Glue the ear pushrod tabs to the base. Use the photos for location.



23. You will need to determine where to attach the ear pushrods to the ears. Closer to the head will give more movement. The further away from the head, less movement. I glued my rod tabs so

that they are at the outermost edge of the lightest colored portion of the ear.



24. Insert cloud pushrods through holes in top and glue tabs to the cloud levers. Glue clouds onto the rods.
25. Finally glue the body to the head. You can choose at what angle the body hangs.



That is it! You are finished! Time to fly! I hope your basset has many terrific flights.

