

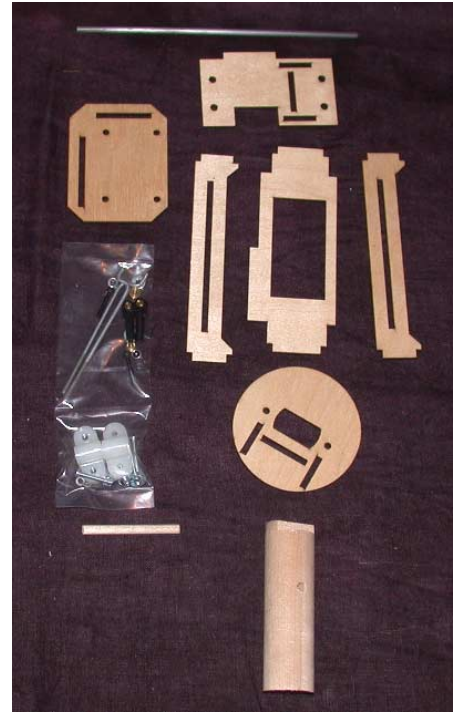
## Maxwell Animatronic Head Kit - Neck Sub Assembly

Neck Pivot Sub Assembly Parts:

- 1 pivot rod, 1" diameter birch dowel (bottom of photo)
- 1 head tilt servo mounting plate (center of photo w/ rectangular cutout)
- 2 x upright side plates (narrow long pieces in photo)
- 1 top mounting plate ( top of photo )
- 1 SSC servo controller mounting plate (left of photo)
- 1 bottom mounting plate (circular piece bottom center of photo)

- 2 x head tile bearing blocks, white nylon plastic (Du-Bro #156)
- 2 x 4-40 screws, lock washer, blind nut for bearing blocks

- 1 head tilt axle rod, 5/32" diameter 6 3/4 " long
- 2 x 4-40 servo link rods w/ z-bends
- 2 x swivel ball links, brass spacer, washer, lock nut
- 2 x nylon spacer 1/2" long
- 2 x nylon spacer 3/4" long
- 1 pivot rod locking pin, 3/16" diameter wood dowel
- 2 5/32" locking collars



First step is to glue the circular plate to the pivot post. This is the most important glue joint in the head, so it is important to do it carefully.

It is recommended to use long cure time epoxy for this step, even if this is the only joint that type is used on. The longer cure time creates a stronger resin.

Place the circular plate onto the pivot rod, then add epoxy around the top of the rod as shown in the photo. Avoid getting glue on the servo link holes. The epoxy serves to lock the circular plate onto the top of the pivot rod.



Once the pivot rod and circular plate have cured, you can use them as a base to help assemble the rest of the neck. But before you glue up the rest of the pieces, drill mounting holes for the neck servo.

If you are using the screws included with the servos, use the servo to mark the mounting hole locations and use a 1/16" diameter bit to drill the pilot holes.

## Maxwell Animatronic Head Kit - Neck Sub Assembly cont.

Once the head tilt servo mounting holes are all set, you are ready to glue up the neck. Insert the post into the completed should assembly.

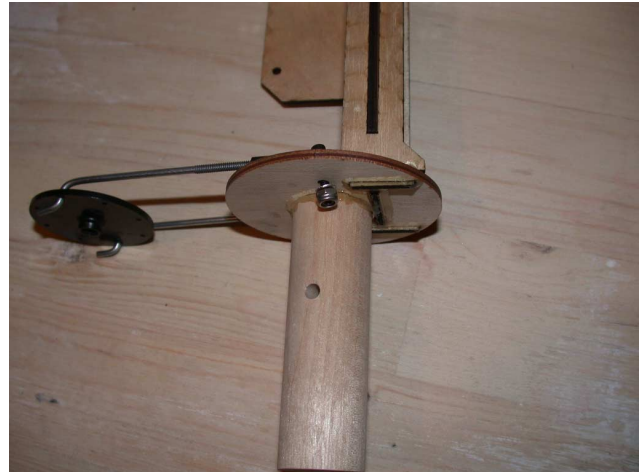
If the neck pivot hole is too tight, use some 100 grit sandpaper to adjust the fit.

Then, fit the neck pieces together. The servo controller mounting plate goes in the back. Slide the two narrow uprights onto the servo mounting plate, then add the top plate. The servo controller plate fits on the back, then the whole mess can be slipped on top of the circular plate on the post.

Use some masking tap to hold the assembly in position, then add some epoxy to the joints to hold them in place.

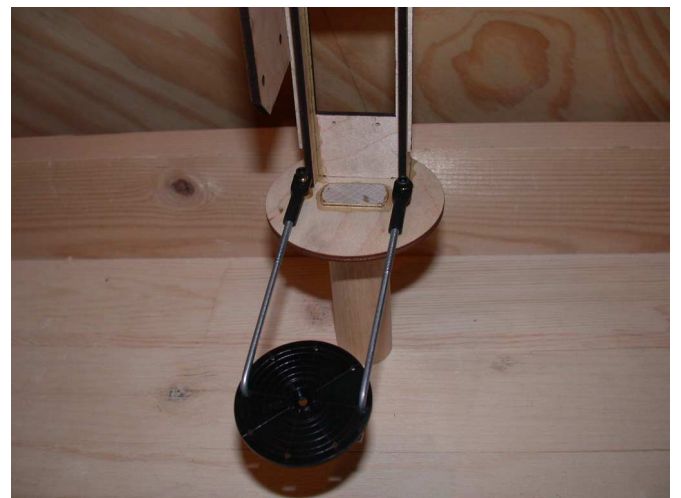
Make sure to add epoxy to the bottom of the circular plate, where the upright plates' tabs pass through. The epoxy will lock the tabs in place, and add strength.

Note the servo links are in, you can see the servo controller plate mounted on the back of the neck.



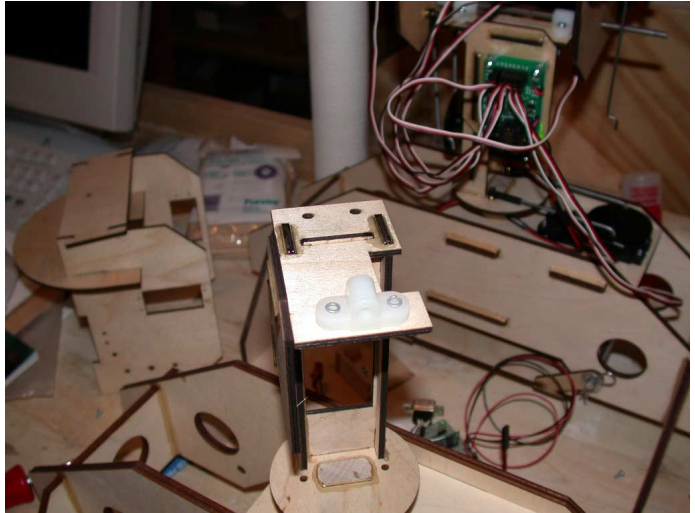
Another view of the post. The pieces are glued, and you can see the servo mounting holes in the upright plate.

The ball links must be attached to the metal rods, and then screwed onto the circular plate. The threaded rod cuts its own threads into the plastic of the ball link, so some pliers will be necessary to help screw the swivel link onto the link rod.

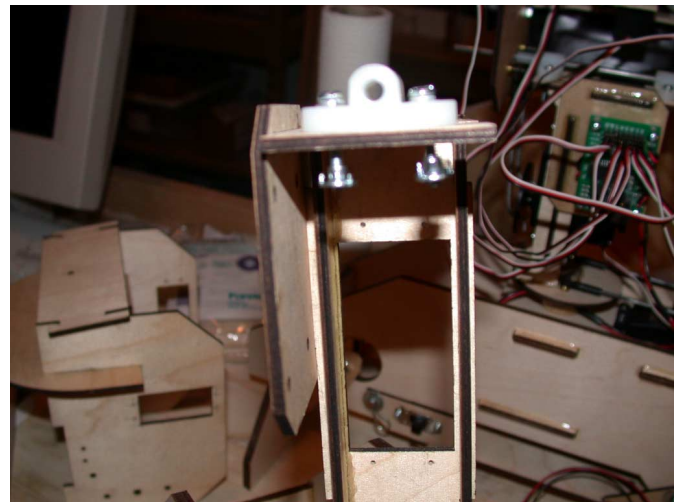


## Maxwell Animatronic Head Kit - Neck Sub Assembly cont.

Next step is to mount the plastic bearing blocks onto the top of the neck. The split lock washer goes on top. Note finished Maxwell head in background, rear view of both.

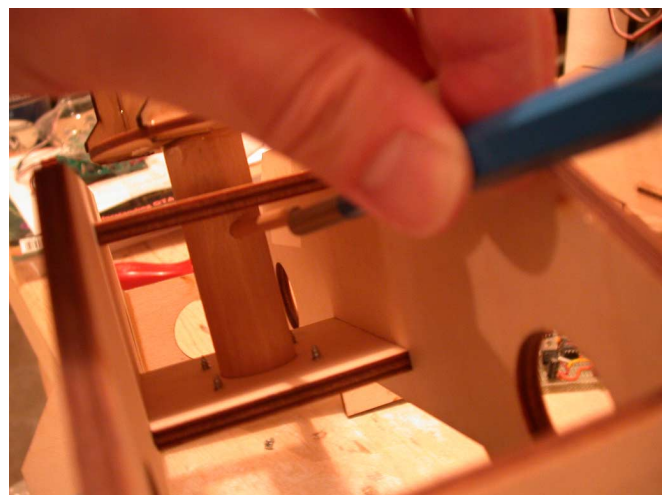


Here you can see the blind nuts on the end of the mounting screws. Tighten the screws to pull the blind nuts into the wood.



In order to hold the neck in, a locking pin is inserted into the neck pivot post. The pin is a 3/16" diameter wood dowel, and because it is a tight fit you will need to tap it in place with a hammer.

A pin punch like shown helps get the pin in place, however a piece of scrap wood or very strong fingers can do the job too.



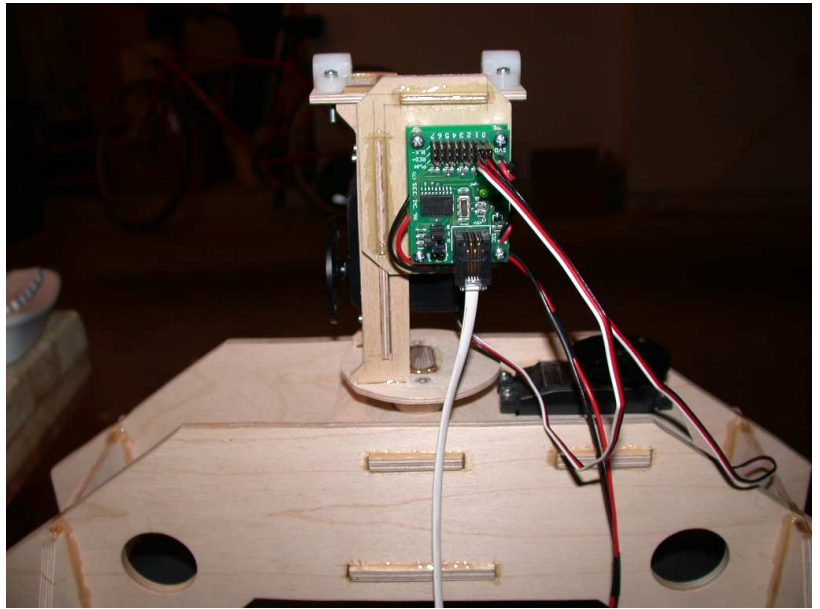
## Maxwell Animatronic Head Kit - Neck Sub Assembly cont.

Once the neck is glued up, the servo links can be attached between the neck and the servo bolted into the top of the shoulder assembly.



If you are using a Mini SSC II serial servo controller from Scott Edwards Electronics, the mounting plate on the back of the neck is designed for attaching the servo controller as shown.

Also, using a Battery Booster 12 (also from Medonis Engineering) simplifies the power connection to the servo controller. Instead of the two power supplies normally required, the Battery Booster 12 allows operation from a single 5 volt power supply or battery pack. Note power wire coming off SSC to the bottom right. Serial cable is the white cable in the center.



The neck servo is mounted after the servo controller, as the servo controllers screws are partially blocked by the servo.

Note that in the picture socket head screws are in place instead of the typical screws included with the servo. I prefer these for ease of assembly, available at your local hobby shop.



## Maxwell Animatronic Head Kit - Neck Sub Assembly cont.

This is what you should have so far, after assembling the shoulders and the neck. The large servos are mounted, bearing block on top ready for the underskull.

