
Animatronic Tail Construction How To, Spine Construction

Built by Wolves for Wolves
<http://www.wolftronix.com/tail/spine.htm>

A step by step guide on how to build your own animatronic tail

I have been told that I am doing a great service by having this "How To" available to the public, I do not charge anything for the viewing of it, I just make a few requests:

Share what you make as well, don't keep "trade secrets"

Send me some pics of your finished animatronic tail (which no one has done yet)

Try to innovate, it is a simple matter to copy another's work, believe me there is a lot that can be improved upon here, also my way is not always the best way

You may build an animatronic tail for yourself, but they are for personal use only, you may not profit from it, i.e. you

can not sell animatronic tails to others, if another person wants to buy a tail from you, then refer them to this site

Wolf Tronix assumes no responsibility of any damage to you or others, including objects (such as table lamps, that could be knocked off the table by an inadvertent wag of the tail) due to the use of the tail, or construction of the tail, in other words, build this at your own risk!!!

Step 1. Obtain parts

You will need the following:

1 to 2 Klxxx toys, depending on the length of your tail

2 sections of bicycle brake cable, approximately 1.5 times the length of you tail

1 box of paperclips

1 candle, or other flame producing device

1 pair of pliers

1 knife, or other sharp object

8 hours of free time, plus or minus depending on tail length, and your abilities

Step 2. Spine preparation

2.0 Remove the Klixx toy from its packaging using a pair of pliers on all the zip ties

2.1 Play with the Klixx toy and notice how there are some small nubs that "click" in the grooves on the mating piece, these will have to be removed, unless you want your tail to click every time it moves

2.2 Using a pair of pliers or your fingers, whichever works best, disassemble the entire Klixx toy into all its "bits"

2.3 Take the knife, or other sharp object, and remove the top and bottom nub off each "bit", connect it back to another "bit" and make sure it moves freely and does not "click" any more, pics show before and after the clicking parts have been removed



2.4 Disassemble all the "bits" that may have been put back together and place them in a pile, within reach



Step 3. Spine preparation continued (original tail version 1.0)

3.0 Light the candle, or other flame producing device

- 3.1 Using a pair of pliers unbend a paperclip so that you can use it to make holes
- 3.2 Move one of the "bits" from the pile and place it right in front of you
- 3.3 Heat the end of the unbent part of the paperclip over the flame until it is red hot
- 3.4 Locate where the mold line and the radius of curvature diameter intersects and press the hot end of the paperclip into the "bit"
- 3.5 Attempt to go through both sides and keep it nice and straight, you have about 3 seconds to do this, before the paper clip gets cool
- 3.6 Rotate the paperclip back out of the hole you just made, you will notice all the excess plastic oozed out around the paperclip
- 3.7 Flip the "bit" 90° on the roll axis
- 3.8 Heat the paperclip again and press it though the other side of the bit, where the indentation is located
- 3.9 Using a knife remove the excess plastic that oozed around the paperclip and connect the "bit" to another one and see if it moves freely, if not remove more of the excess plastic



3.10 Repeat steps 3.2 - 3.10 until all the bits have holes in them

3.11 Extinguish the flame source

Step 3. Spine preparation continued (tail version 2.0)

3.0 Obtain a drill press attachment for Dremel tool and a drill bit that is the correct size for the paperclips you are using



3.1 Insert the drill bit in to the Dremel tool and attach the tool to the drill press

3.2 Set up stop blocks, such that you simply have to place in a "bit" and pull the handle for a perfect holes every time



3.3 Next rotate each bit and drill the hole through the other side



3.4 hehehe, you can do a lot of them at one sitting



Step 4. Spine wire guides and reinforcement

4.0 Take a hand full of paperclips and unbend them until they are completely straight

4.1 Using a pair of pliers bend one end of a paperclip into a small loop, large enough for the bicycle brake cable to go through



4.2 Then determine the length the paperclip has to be

4.2.0 I currently do not have a formula for this but I am working on one, but for now use the following points

4.2.1 The shorter the length of the wire guide

4.2.1.0 The harder it is for the servo to move the tail

4.2.1.1 A small movement in the servo will result in a large movement in the tail

4.2.2 The longer the length of the wire guide

4.2.2.0 The easier it is for the servo to move it the tail

4.2.2.1 A large movement in the servo will result in a small movement in the tail

4.5 Cut the paperclip to length, plus a little extra for the other loop

4.4 Connect two "bits" together

4.5 Push the paperclip into the holes you created in Step 3.

4.6 Flex the joint if it moves freely then you made nice straight holes, if it does not then the hole is off, but that is ok

4.7 bend the other side of the paper clip

4.8 look to see that this is the correct length

4.9 If it looks good, then unbend one of the loops and remove the paperclip from the joint

4.10 Unbend the other loop as well, so you have a single straight paperclip of the correct length

4.11 Using this paperclip as a guide cut all the paperclips you unfolded earlier into segments the same length, unless you are making a linear taper tail

4.12 Using a pair of pliers bend one end of a paperclip into a small loop, do this for all the paperclip segments

4.13 Repeat steps 4.4 - 4.6 until you have a completed spine



4.14 Flex each joint in the spine, note which ones move better than others

4.15 Disassemble and reorder the "bits" such that the really flexible joints are at the tip of the tail and the less flexible joints are at the base of the tail

4.16 Bend all the paperclips so that there is a loop on both sides



Step 5. Push Pull Cable

5.0 Take the end of the bicycle brake cable and route it through all the wire guides on one side

5.1 Loop the cable around the end of the tail tip and back through all the wire guides opposite to the original ones

5.2 Lay the tail flat on the ground and using a pair of pliers bend the very last wire guides, at the tail tip, such that the cable will no longer slide

5.3 Rotate the spine 90° on the roll axis

5.4 Repeat steps 5.0 - 5.2

5.5 With the cables now in the spine, align all the loops so that they are not twisted or off center

5.6 Hold the tail by the base and pull on all the cables in turn, the tail spine should move correctly, with no binding



5.7 If binding occurs, locate and correct or replace the binding "bit"

5.8 Show your friend they will get a kick out of playing with just the spine, lay it on a table and move two of the cables and you can get a really cool looking snake effect

5.9 Also notice all the different positions that can be done with a simple push pull cables, especially when a combination of cables are pulled, keep this in mind when you want to program the different tail positions and wags

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