

Instructions: BristleBot

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Parts and Supplies (Fig. 1):

1 toothbrush with angled bristles

1 pager motor

1 3v battery

1 roll of **double sided foam tape**

1 coil of **solder**

2 pieces of **electrical wire**



Figure 1

Overview of tools and supplies needed.

Tools (Fig. 1):

1 **Soldering gun**

1 pair of **wire cutters**

Note: The parts and supplies listed are enough to produce one bristlebot.

Estimated time to build: around 20 min.

Glossary Terms: Anything highlighted in **red** is defined on page 6.

Instructions:

1. Plug in the **soldering gun** to heat up for later use.
2. Use the **wire cutters** to cut off the toothbrush head at the base.
3. Tear off a piece of **foam tape** the same length as the toothbrush head.
4. Apply the piece of **tape** to the back of the toothbrush head.
5. Peel back the paper on the **tape** to expose its sticky surface and set the toothbrush head aside. (See Fig 2)
6. Gather the **soldering gun** (do not unplug), **electrical wire**, **solder**, and pager motor.

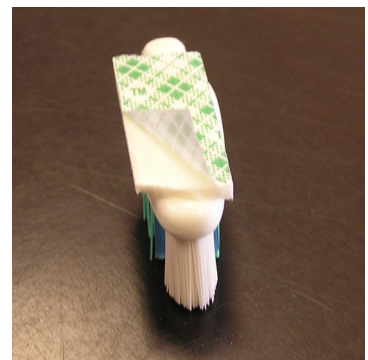



Figure 2
Double sided foam
tape placement

Note: Steps 7 and 8 involve the process of **soldering**. If you do not know how to **solder**, see Appendix A for instructions.

7. **Solder** one end of a piece of **electrical wire** to the left **lead** of the pager motor. (see Fig 3)

CAUTION: **Soldering gun** is hot. Do not place your fingers  near the tip of the **gun** while **soldering**.

Note: The word **solder** in step 7 refers to the process, not the material used.

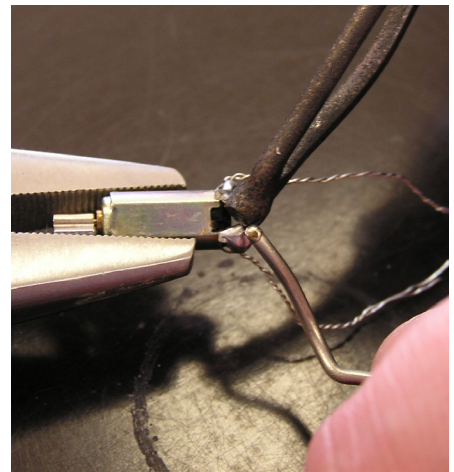


Figure 3
Soldering overview

8. Repeat step 7 for the right **lead** of the pager motor.
9. Attach the pager motor to the **tape** on the back of the toothbrush head. (see Fig 4)



Figure 4
Motor placement

10. Place one end of **electrical wire** down on the **tape** near the end of the toothbrush head.
11. Pick up the 3v battery and place it on top of the **wire** placed in the previous step. (see Fig 5)
12. Take the other end of **electrical wire** and place it on top of the battery. A piece of **tape** will hold it in place.



Figure 5
Battery placement

Optional: To better stabilize the bristle bot, you may use a piece of **solder** as shown in Fig. 6

That's it! Set down your bristle bot to watch your creation in action.

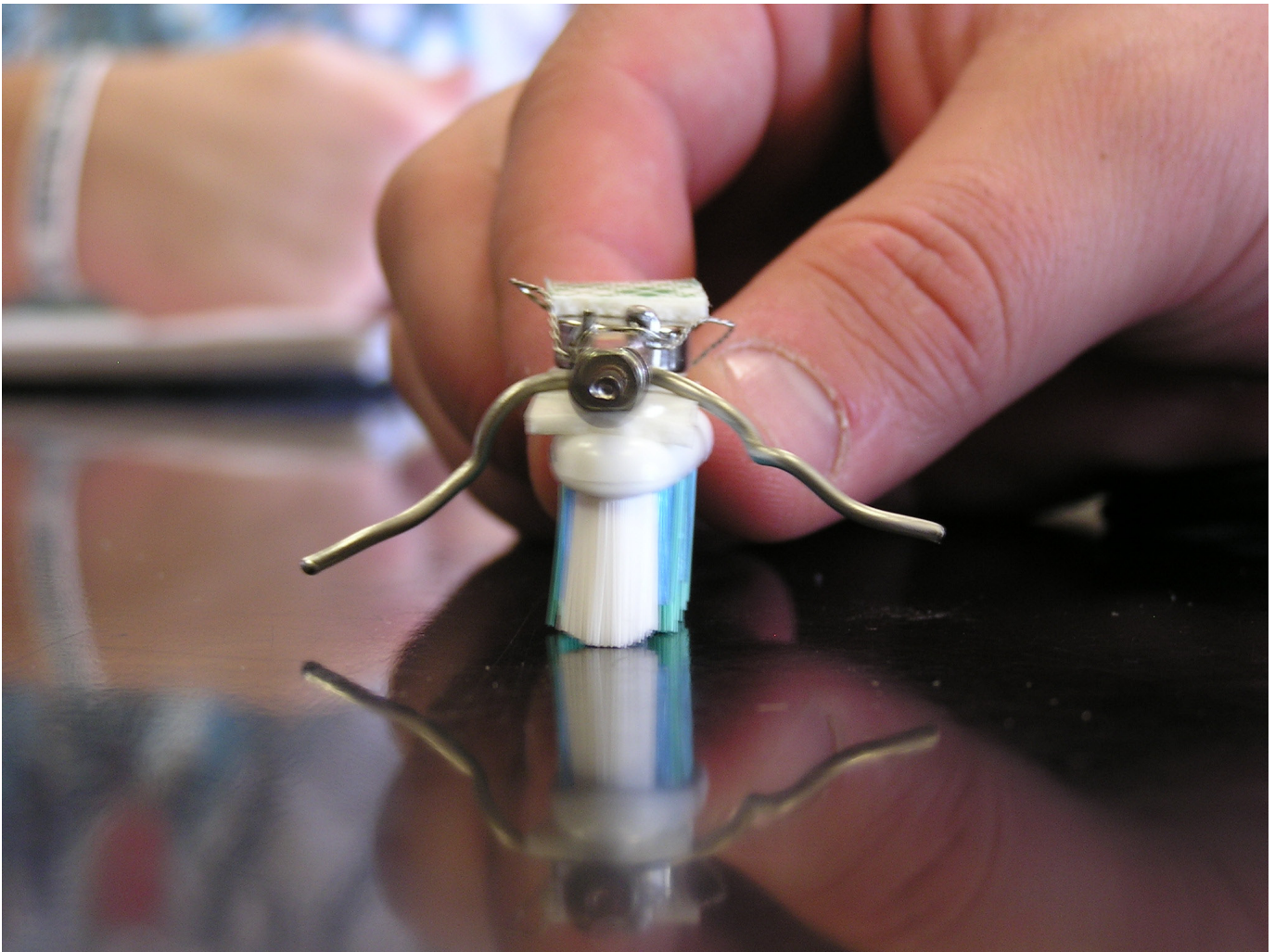


Figure 6

Final Product (Modifications are encouraged.)

Have Fun!


Appendix A

Soldering Instructions for BristleBot:

1. Place one end of **electrical wire** onto the desired location for **soldering**. In this case, the location is at the **leads** of the motor.
2. Pick up the coil of **solder** and transfer it to the same hand holding the **wire** in place.

Note: This can be tricky. You need to find a position you feel comfortable with.

3. Pick up the **soldering gun** in your free hand and apply a little heat to the area wished to be **soldered**.

CAUTION: Do not place your hands near the area being **soldered**;
 you can get burned. The same applies for steps 4-6.

4. Touch the end of the coil of **solder** to the area being heated to melt it onto the **wire** at the motor **lead**.
5. Remove the coil of **solder** when enough of it melts onto the **wire** to completely cover it.
6. Continue to apply heat to the **soldered surface** for a few more seconds before setting down the **gun**.

That's it. Just allow a few seconds for the **solder** to dry and you're ready to continue.

Glossary

Double sided foam tape: Used to hold everything onto the toothbrush head.

Electrical wire: Used to run an electric current from the battery to the pager motor.

Leads: The flaps on the motor you solder the electrical wire to.

Solder: The material used to join the electrical wire to the leads of the pager motor.

Soldering: The process of joining objects together with solder.

Soldering gun: The tool used to heat and melt the solder to join the electrical wire to the leads of the pager motor.

Wire cutters: Tool similar to scissors that will be used to cut off the toothbrush head.

Works Cited

Hewes, John. "Soldering Guide." The Electronics Club. <<http://www.kpsec.freeuk.com/solder.htm>> 2010. Web. 24 March 2010.

Windell. "Bristlebot: A Tiny Directional Vibrobot." Evil Mad Scientist Laboratories. <<http://www.evilmadscientist.com/article.php/bristlebot>> 19 December 2007. Web. 23 March 2010.