

# How to Make a Table-Top Van de Graaff Generator

by [DevCoder](#) on April 1, 2010

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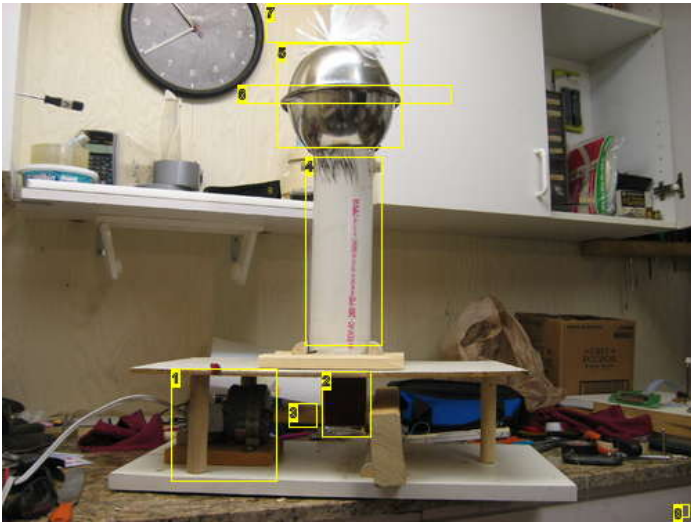


Author: DevCoder My Homepage

Devin is a cool guy, eh doesnt kill himself while doing stupid things, and doesnt afraid of anything.

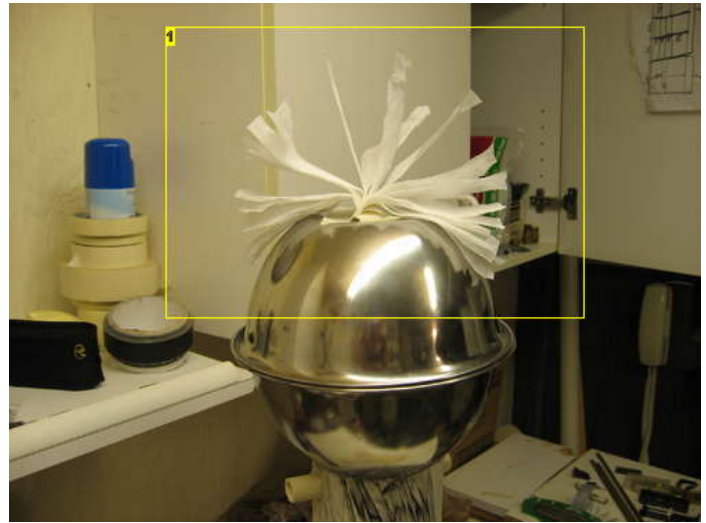
### Intro: How to Make a Table-Top Van de Graaff Generator

Michael, Elizabeth, and I made a table-top sized Van de Graaff generator.



#### Image Notes

- 1. Motor
- 2. Airplane Blanket
- 3. Dowel that makes the blanket turn
- 4. PVC Tube
- 5. Bowls
- 6. JB Weld!
- 7. Kleenex
- 8. Too many picture comments? I THINK NOT.



#### Image Notes

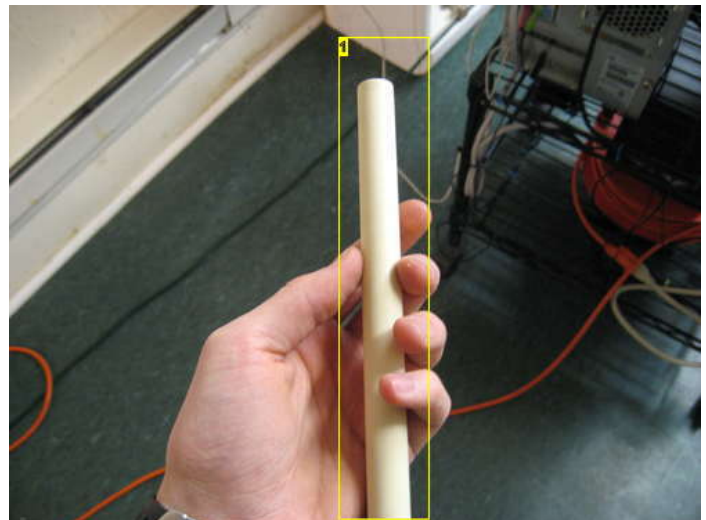
- 1. Ionized Kleenex! It Works!!!

### Step 1: Materials

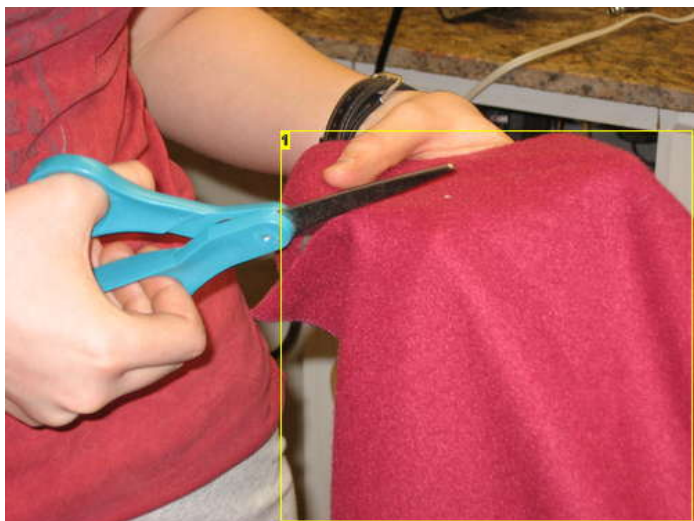
This is what you need:

- 1' long 4" diameter PVC tube
- 5" long section of 1/2" CPVC pipe
- 1 airplane blanket (or other static material like rubber or fleece)
- Metal Bowls
- Scraps of 2x4
- Motor
- Dowel (lots of dowel)
- JB Weld (I now love this stuff)
- Hot Glue
- \*Optional\* a ball bearing for shoving in a hole

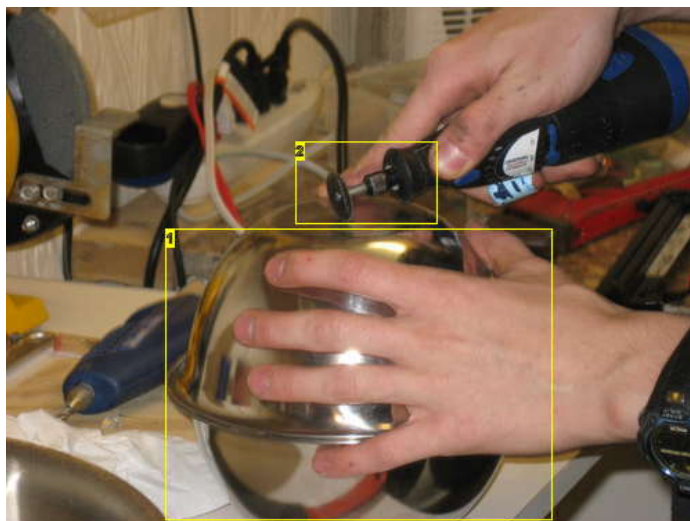
Also, 2 friends insane enough to do this with you!



**Image Notes**  
1. PVC!!!!

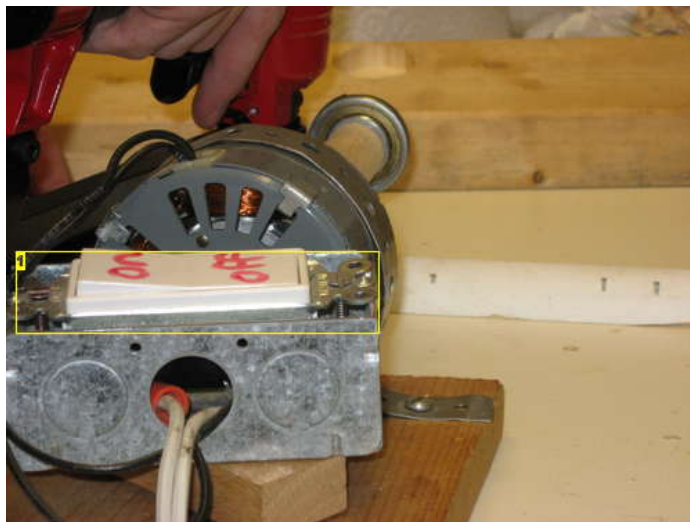
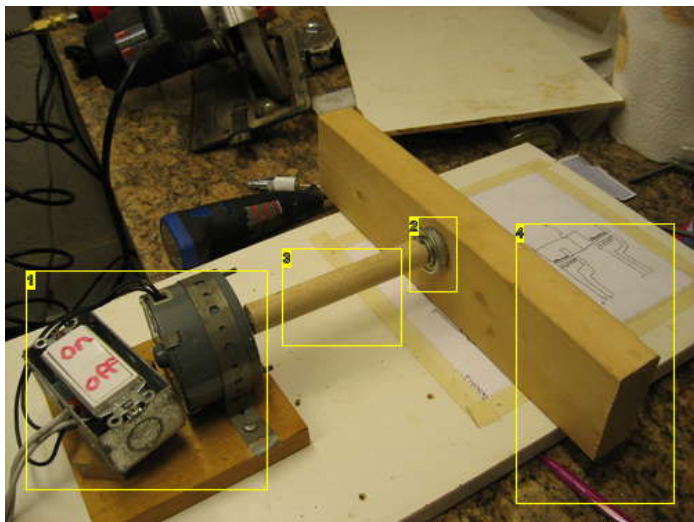


**Image Notes**  
1. CPVC!!!!



**Image Notes**  
1. Disgusting blanket

**Image Notes**  
1. Bowls: DO NOT glue them together until you have cut a hole in one of them  
2. I made that mistake... :'(



**Image Notes**  
1. Motor  
2. Bearing (WTF were we thinking)  
3. Dowel  
4. 2x4

**Image Notes**  
1. macro



**Image Notes**  
1. Michael



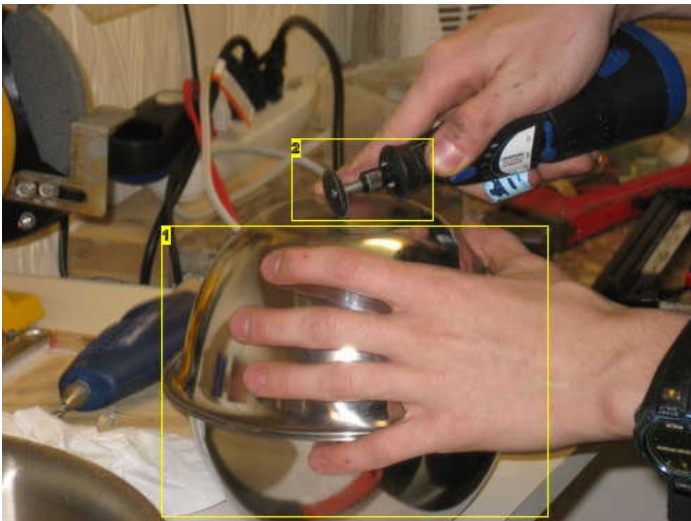
**Image Notes**  
1. Elizabeth

## Step 2: Cut and Drill

Sorry for the bullets, but there are some pretty simple steps to be done:

- Cut a hole in the bottom of one of the bowls to make room for the wire brushes
- Drill a hole in the PVC tube large enough to fit the CPVC through
- Route of drill a hole in the 2x4 to make room for the dowel to spin
- Drill the straightest possible hole in the dowel to put the motor stator in
- Cut a hole in the supra-base (is there a better word?) for the PVC tube to sit on
- Cut some pieces of dowel to support the supra-base

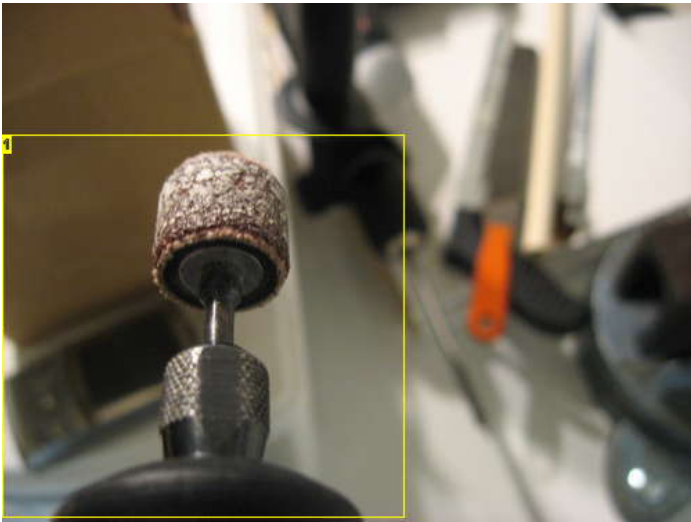
That's it for drilling and cutting, now on to the NAILGUN!!!



**Image Notes**  
1. Bowls: DO NOT glue them together until you have cut a hole in one of them  
2. I made that mistake... :'(



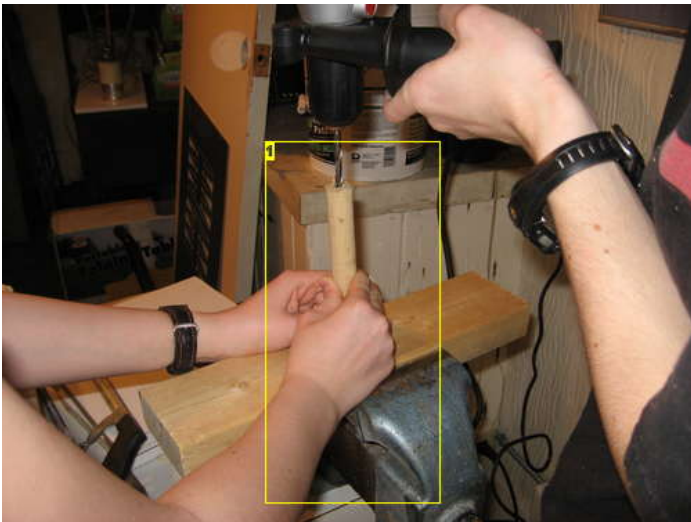
**Image Notes**  
1. Hole through PVC



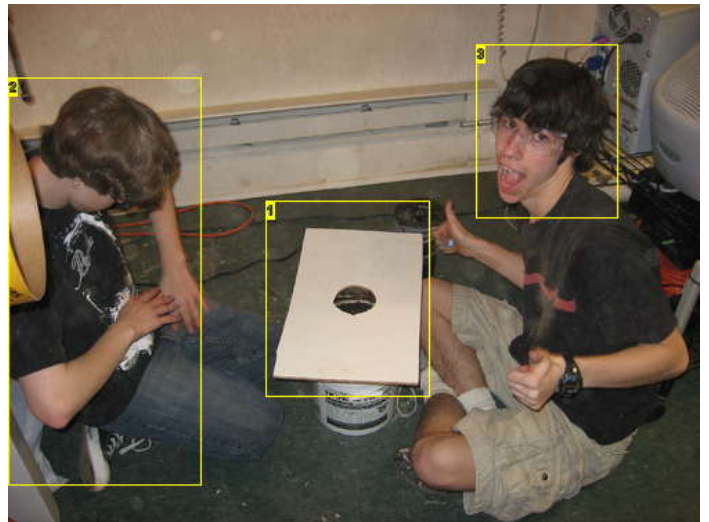
**Image Notes**  
1. Macro Dremel



**Image Notes**  
1. What to do when you don't have the right sized drill bit... (It doesn't work well)



**Image Notes**  
1. Must to drill press



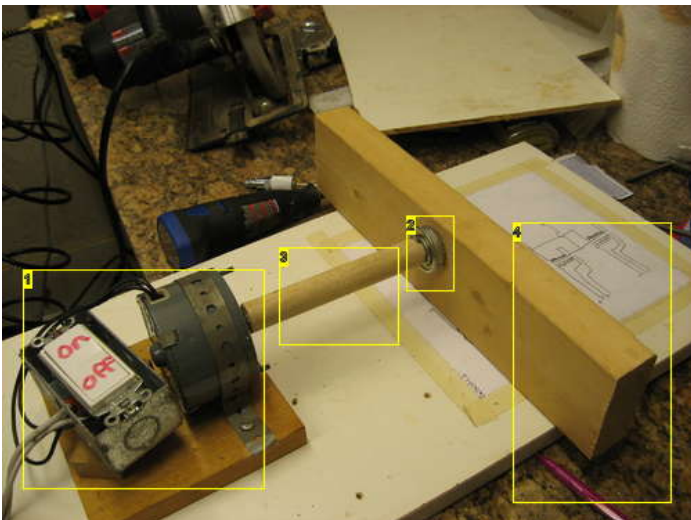
**Image Notes**  
1. Supra-base thing with hole  
2. i'm covered in saw dust, Devin! Whine!!!  
3. DURR



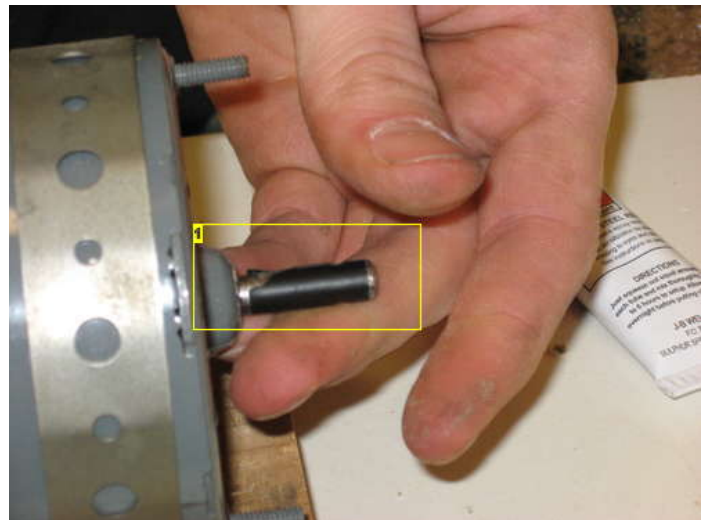
**Image Notes**  
1. Cutcutcutcutcutcut

**Step 3: NAILGUN!!!!**

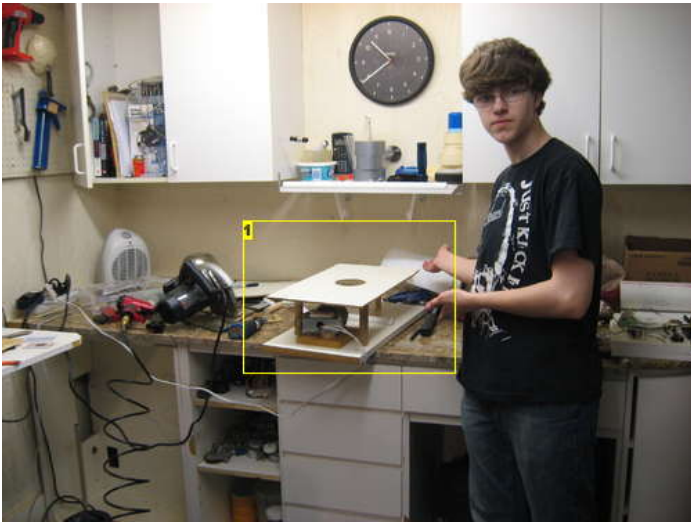
Use the NAILGUN! to nail everything together (you can use a hammer and brads if you want...). Nail the motor to the board, the other pieces of dowel in place, and put the 2x4 in place so that it allows the dowel to spin freely, but in a controlled manner. If you have some molding handy, it can be helpful to keep the 2x4 in place. You can also nail the supra-base in place now.



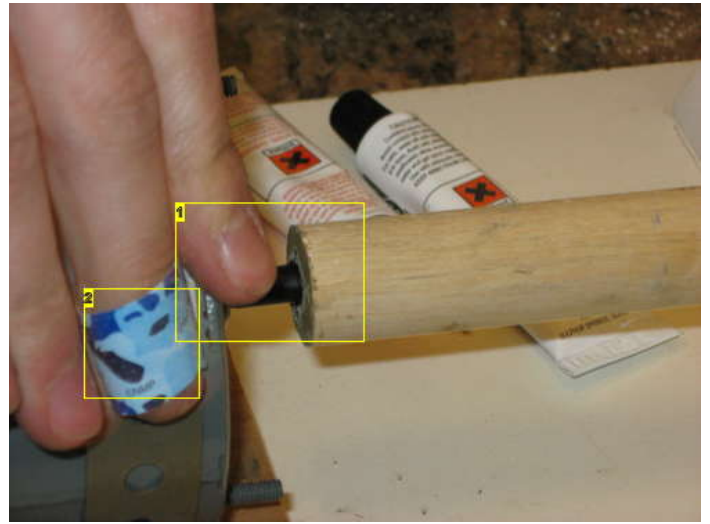
**Image Notes**  
1. Motor  
2. Bearing (WTF were we thinking)  
3. Dowel  
4. 2x4



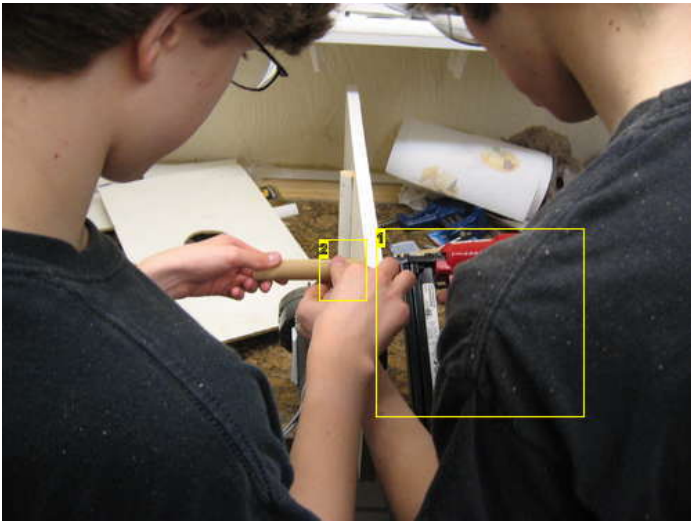
**Image Notes**  
1. Tape so it fits in better in the dowel



**Image Notes**  
1. Done



**Image Notes**  
1. SQUISH!  
2. liek my bandaid?



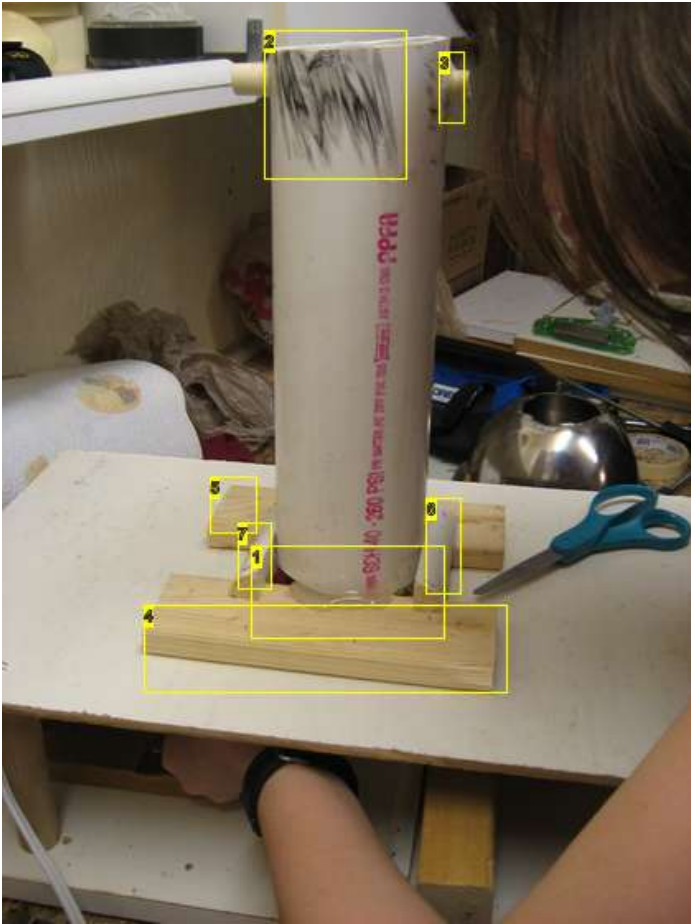
**Image Notes**  
1. NAILGUN!  
2. Watch the fingers...



**Image Notes**  
1. Almost there...

#### Step 4: Attach the Pipe

Plug your hot glue gun in and glue the PVC tube to the supra-base. If you planned it right, you won't need to add pieces of wood to keep the tube on the board (I routed the hole for the belt wrong). While you're at it, glue the CPVC tube in place.



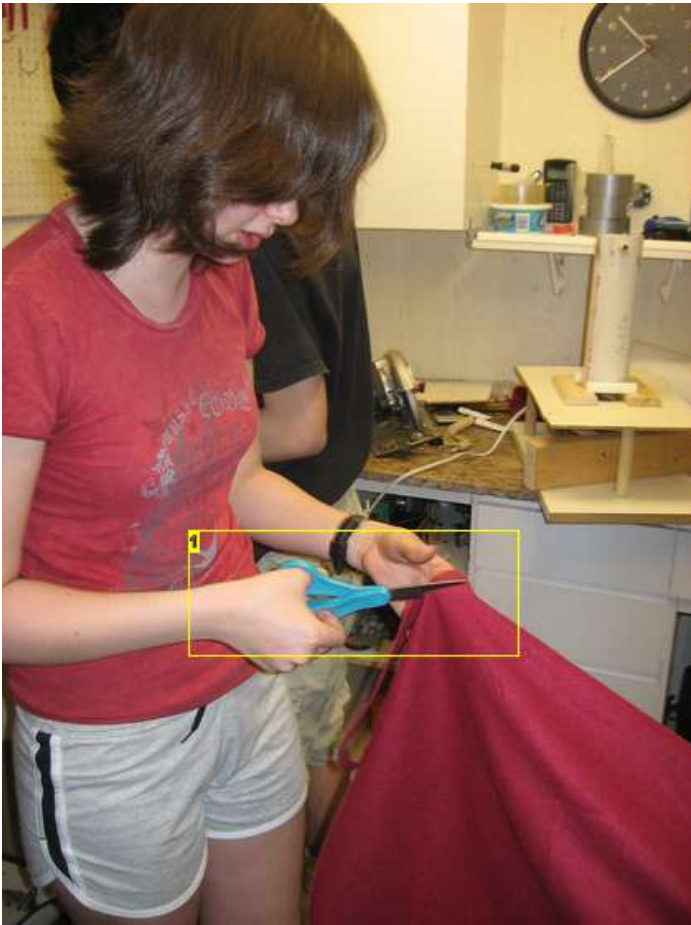
#### Image Notes

1. Glue
2. Michael dropped the tube while biking home, almost got killed...
3. Glue
4. Nail
5. Nail
6. Nail
7. Nail

#### Step 5: Make the Belt

Take your airplane blanket and cut a strip that will wrap around the CPVC and the stator twice. Fold it in half and finagle the strip in place around the stator and the piece of CPVC . Sew the two ends together. For better durability, I recommend that you sew down the sides of the blanket to keep it from ripping.





**Image Notes**

1. SNIP

**Step 6: Prepare the Discharge Ball**

If you haven't already JB Welded the two bowls together, do it now. Make sure that you push the bowls together so that they are touching, as JB Weld is not conductive. You could also weld the bowls together, but I lack a mask and rods for my DIY welder. Once the bowls are secure, attach the wire brush (it can be made of a piece of stranded wire splayed out) using a mixture of sand paper, solder, and whatever else you have to attach the brushes to the bowls and have zero resistance. An epoxy that conducts electricity would help here (does anyone know of one).

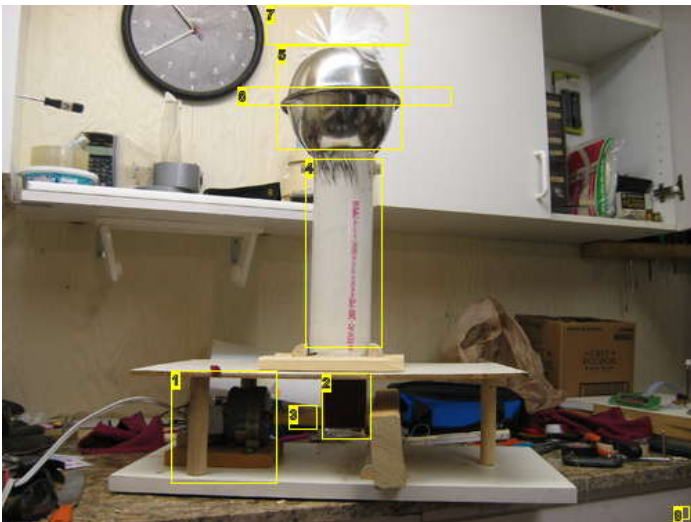


**Image Notes**

- 1. May get hot...
- 2. THEN WHO WAS SOLDERING IRON???

**Step 7: Attach Everything**

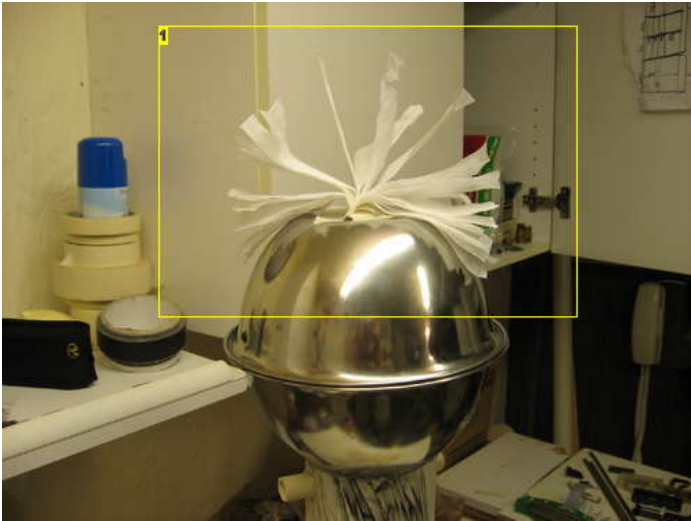
Place the discharge ball on top of the PVC tube and position the wire brush so that it is almost touching the blanket. Turn the motor on to make sure that the brush doesn't touch the blanket (because you don't have x-ray vision, listen for the sound of the fabric rubbing on the brush). If all is well, hot glue the discharge ball in place.



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- 8. Too many picture comments? I THINK NOT.

## Step 8: Shocking! (It Works!)



### Image Notes

1. Ionized Kleenex! It Works!!!

## Related Instructables



**120,000 Volt Van De Graaff Generator** by Tool Using Animal



**Homemade Van De Graaff Generator** by toddjwood



**900,000 volt Van de Graaff Generator Using Cheap Parts** by nickademuss



**DIY Lightning Wand a Handheld Van de Graaff Generator** by yardleydobon



**Mini Van De Graaf... M & M style!** by mcraghead



**Leyden jar of DOOM!** by nickademuss

## Comments

8 comments

[Add Comment](#)



**Kiteman** says:

Does it make sparks?

Can you do the *dancing monks* trick?

Apr 25, 2010. 3:26 PM [REPLY](#)



**DevCoder** says:

yes and ??? dancing monks???

Apr 25, 2010. 4:14 PM [REPLY](#)



**Kiteman** says:

Apr 26, 2010. 2:17 AM [REPLY](#)

Stand a line of people on insulators (plastic stools, in buckets etc), all holding hands and with one person touching the dome as it runs.

They all get charged, until the person at the other end of the line touches "ground", at which time they all get a shock.

It was first done to a line of monks that was connected to ground, and then the first monk touched the ground of a charged Leyden jar.

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**gb123** says:

Oct 17, 2010. 10:19 AM [REPLY](#)

i think i saw that on brainiac...

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**aliyevzaur1989** says:

Sep 8, 2010. 11:50 PM [REPLY](#)

cute girl =)

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**Tomahawk1020** says:

May 9, 2010. 4:44 PM [REPLY](#)

Well Hello Elizabeth!

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**Football viking boy** says:

May 3, 2010. 4:40 PM [REPLY](#)

I have lots of questions.

- \*Do you have to wrap the rollers with conductive or non conductive material
- \*How many RPM is the motor
- \*Do you attach 2 metal combs to the top and bottom of the airplane blanket
- \*Do the metal combs touch the airplane blanket
- \*Does it matter which side of the airplane blanket is attached to the combs
- \*If you make it 3 1/2 ft tall, will it be safe to touch it still
- \*Do the combs attach directly to the discharge in the inside
- \*I think I saw the motor attached to an outlet, do you keep the current at AC, or do attach a regulator to it
- \* and, does the top roller move, or stay still

I am sorry for all the questions. The Instructable is great though!

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**DevCoder** says:

May 3, 2010. 5:52 PM [REPLY](#)

And I have a lot of answers:

- Non-Conductive
- Mine is 3450, the faster the better, but keep in mind that it needs to have some torque
- They don't attach, they just almost touch it
- See previous answer...
- ?
- It'll just hurt like all hell (really? i want pics!!!)
- Attaching them to the outside is easier, but inside is better looking, and yes
- The motor is really a small part, many would work. I chose an AC motor because it was the easiest
- It can move if you want (or put a tube around a tube and make less friction), we just chose to keep it static

I don't mind at all, I'm more than happy to answer any question if you are nice.

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