Tesla Coil - Task # 717: Power supply

<table>
<thead>
<tr>
<th>Status:</th>
<th>New</th>
<th>Priority:</th>
<th>High</th>
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</thead>
<tbody>
<tr>
<td>Author:</td>
<td>Michael Adams</td>
<td>Category:</td>
<td></td>
</tr>
<tr>
<td>Created:</td>
<td>09/18/2012</td>
<td>Assigned to:</td>
<td>Michael Adams</td>
</tr>
<tr>
<td>Updated:</td>
<td>10/23/2012</td>
<td>Due date:</td>
<td>09/06/2013</td>
</tr>
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Subject: Power supply

Description: Started working on power supply last week(9/13/2012). I was lucky enough to find an old 700W PC power supply that I could scrap for parts. From that power supply I was able to salvage a 3-prong power cable and socket already fit with a fuse. I was also able to grab a large fan from the supply that will probably be used to cool the base of the Tesla coil. I started my work on the smaller secondary power supply and was able to attach a 12.6v AC 2A step-down transformer to a full-wave rectifier and smoothing capacitor. Since it was my first time really dealing with solder, this step has taken longer then expected. I dedicated some time on testing the adjustable voltage regulator, but have not had any success creating a regulated voltage. I hope to resolve my regulator problems and complete the secondary power supply by the end of the week.

History

10/02/2012 06:21 pm - Michael Adams
- Due date changed from 09/23/2012 to 09/06/2013
- Start changed from 09/13/2012 to 09/23/2012
- % Done changed from 60 to 90

I was able to figure out the trouble I was having with the adjustable voltage regulator. I achieved an output of 9.72V from the regulator, and plan on adding a 5V regulator for the next update. I also added an LED to the output of the voltage regulator, which will be used to show if the circuit is on/off. I started working on the primary power supply circuit, but ran into a problem with the diodes/capacitor not fitting on the circuit board. Using a drill-press I added holes to the circuit board, which allowed me to place the smoothing capacitor and rectifier diodes. I was not able to wire up the rest of the circuit because I did not have my 16 gauge wire at the time. I plan on soldering the 16 gauge wire to the primary supply on 10/5/12.

10/23/2012 10:35 pm - Michael Adams
- % Done changed from 90 to 100

Primary and secondary power supply are complete. Added a 5v regulator with diode to the secondary supply. When dealing with the primary circuit we ran into a problem with discharging the large smoothing capacitor. I decided to add a 10 amp switch that is connected to a terminal block containing a diode/resistor. When the 10 amp fuse is active the current will flow to the control circuit. When its time to turn off the circuit we pop the 10 amp fuse and close the terminal block. Currently the terminal block contains a 500K ohm resistor which slowly discharges the capacitor. With that resistive value it take 60 minutes to discharge the capacitor. I will be replacing the 500k ohm resistor with a 10–20K ohm 4–5 W resistor. We have to use a high watt resistor due to the capacitor having a charge of 170 Vdc. The new resistor value will cause the capacitor to discharge in about a minute. When testing the supply, we are getting a 9.72 Vdc and 5Vdc output from the secondary supply, and a 170 Vdc output from the primary supply.