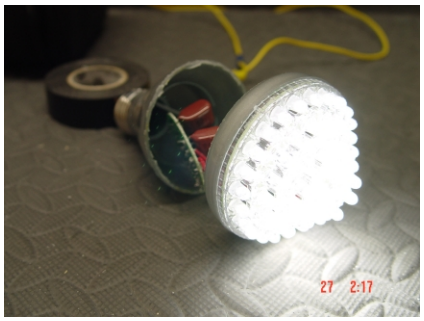
386

Customer User Code: ID #

6832254

Make Your Own LIGHT BULBS



Example of a 120V AC L.E.D Light Bulb.

Example of a 220V AC light bulb. Inside view.

Examples of commercial made light bulbs far left LED bulb, 100 watt bulb 220 V AV bulb.

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Www.FuellessPower.com Phone: 1-812-945-5839

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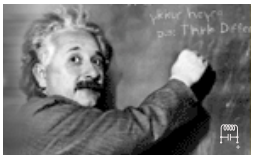

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Our Mason Jar Light Bulb

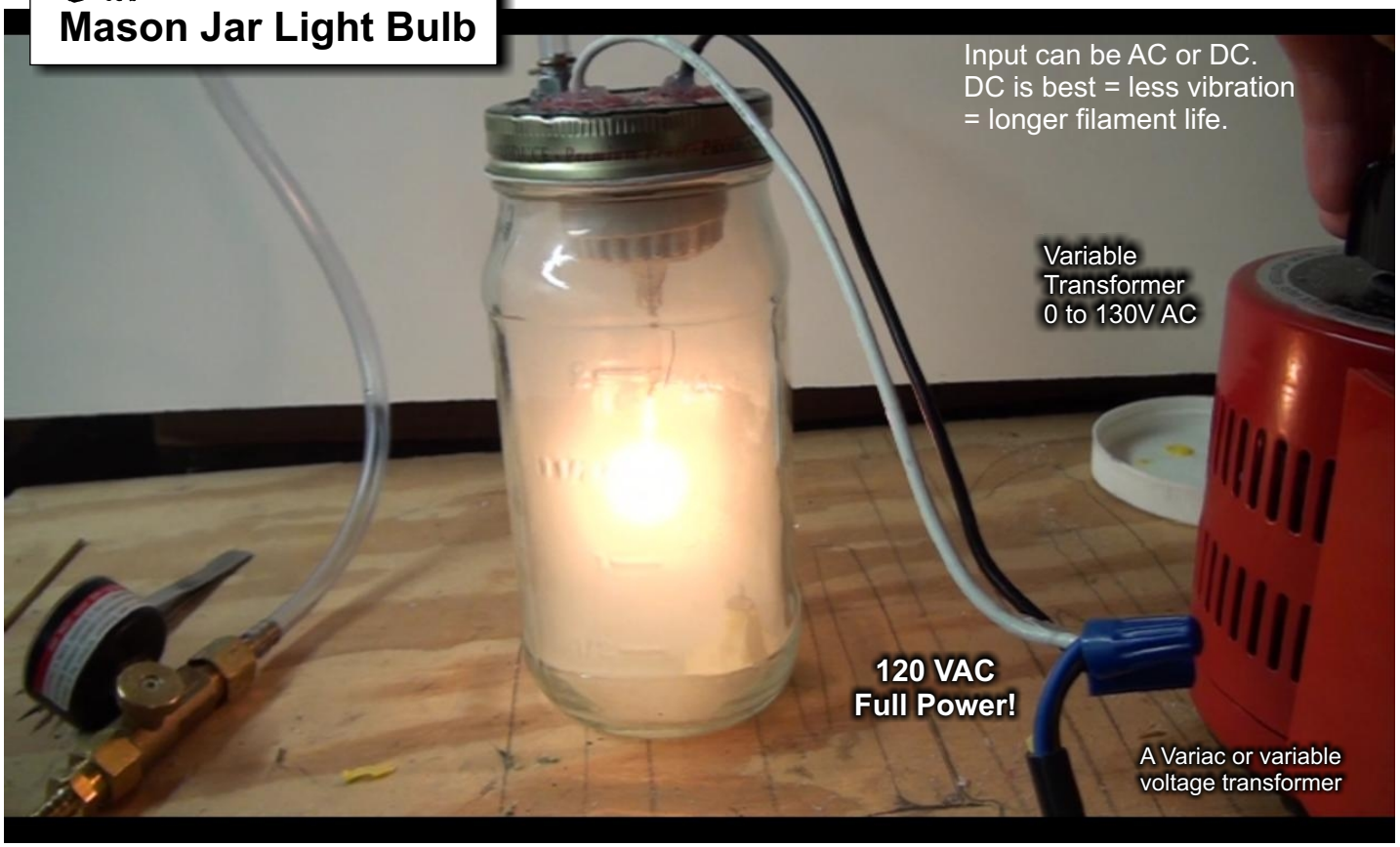

Photo of our mason jar light bulb! One of many lab tests. In this test we used a small candle to burn the oxygen out of the inside of the mason jar. Worked very well at low voltages of about 90V AC. Any voltage higher than that burnt out our filaments. We were using filaments from old burnt out light bulbs. We taped the entire glass bulb to protect ourselves from broken glass. We then used a hammer at the base of the bulb, then removed the glass bulb from the conductor base. We then collected the filament from the bulb to use in our mason jar light bulb or lamp.

We also tried to use a hand pump vacuum to remove all air from the glass jar. This can work well if you make sure there are no air leaks. The best way to make a long lasting mason jar light bulb or lamp, would be to fill the jar with argon gas or nitrogen gas. This is what light bulb manufactures used. You can purchase these gases from gas supply companies locally or online. You would want to have to air tight valves on top of the mason jar lid. One would be the for the input gas and the other would be for the air output. Use a one way air valve on the air output tube so air will not try to come back into the glass. You should be able to find one way air valves at hardware stores or online. See: www.SmartProducts.com or www.SmallParts.com

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#386 Make Your Own Light Bulb Plans

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NOTICE! Anti Pirate Customers ID Number! 6832254

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This is new. ID numbers are located at the top of the plans and are also hidden in code within these plans. In paper form as well as adobe pdf format.

We are not responsible for anything in these plans. You build at your own risk. Always be careful when working with tools or electricity. Wear the proper clothing, hand and face protection.
We hope you enjoy these plans. When working with high voltage wear rubber gloves and shoes.

Thank you
David Waggoner
Owner

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www.FuellessPower.com

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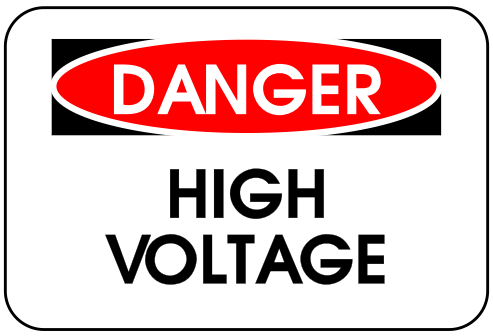

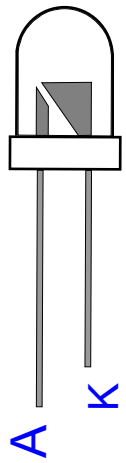

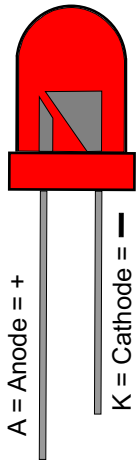

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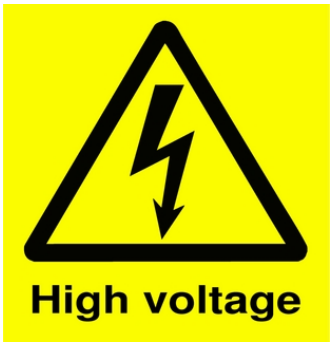
Make Your Own LIGHT BULBS



Be careful and use rubber gloves when working with 120 volts AC or DC. Adult supervision is required.

Incandescent Light Bulb
100 watts

LED Light Bulb
3.5 watts

You can make LED bulbs yourself, or purchase them already made.

Creative Science & Research

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Make Your Own Light Bulbs #386

Introduction

Making your own light bulbs is easy as well as fun and educational! You can make light bulbs from old mason jars or reuse an old burnt out bulb by cutting the base of the bulbs glass and removing the glass bulb intact. You can then find the broken filament wire and reconnect it to the two conductor wires of the bulb. When an incandescent light bulb burns out the filament coil usually breaks on one end of the filament wire only, leaving about 95% of the wire in good condition. The filament wire can be reattached to the conductor wires and reused. It would be very rare if the entire filament wire was totally burned out where it could not be used. The glass bulb can then be reassembled with a vacuum tube hole inserted some where on the glass bulb. I have not tried this one yet, but it should work. You could use a propane torch to melt a hole into the glass and insert a 1/4" threaded screw with a center air hole drilled out. Or any 1/4" metal tubing would also work. Simply cut off about a ½"or .50" length of tubing and insert it into the hole in the glass bulb. You would then apply 100% silicon to the glass and the metal tube to attach it to the glass bulb. Then let it dry overnight. You can then use a hand vacuum pump or a electric lab vacuum pump to suck all the air out of the light bulb after you reassemble it to the conductor screw base, using 100% silicon. You can purchase 100% silicon at any hardware store near you or online.

Making an air tight vacuum in a mason jar will work, but I like using nitrogen or argon the best. Using a mason jar as a light bulb case makes it very user friendly. When the filament breaks you can simply unscrew the lid, reattach the filament, screw the lid back on, then vacuum all air back out of the jar. The mason jar light bulb is then ready to be used again.

Of course there is one big draw back to using these type of light bulbs, and that is the cost to operate them is very high. That is why the US Government is forcing Americans to use the high efficiency type bulbs. LEDs and flourescent types. They are very cheap to operate but are very expensive. L.E.D lighting is the way to go if you want to save hundreds of dollars on your electric bill. Or if you use a solar electric system to power your home you will want to save all the energy you can. You will want the energy in your storage batteries to last as long as it can.

L.E.D lighting is not as nice as incandescent bulb lighting, but if you still want to use the old incandescent light bulb you can! Once they are all gone from the store shelves that is. You will then have no choice but to make your own.

In this e-book we will also show you how to make your own L.E.D light bulbs.

Make Your Own Light Bulbs #386

The incandescent light bulb makes light by heating a metal filament wire to a high temperature until it glows. AC or DC voltage will light these type of bulbs. The more voltage you apply to the bulbs, the brighter they will be. These bulbs can operate on 12 VAC or DC, 120V AC or DC, 220V AC or DC or 300V AC or DC.

120 Volts DC is the best. The filament will last much longer. By connecting a full bridge rectifier to the AC line it will change the AC to DC. You can purchase these at: www.Radioshack.com or Google key word " Full wave bridge rectifier "

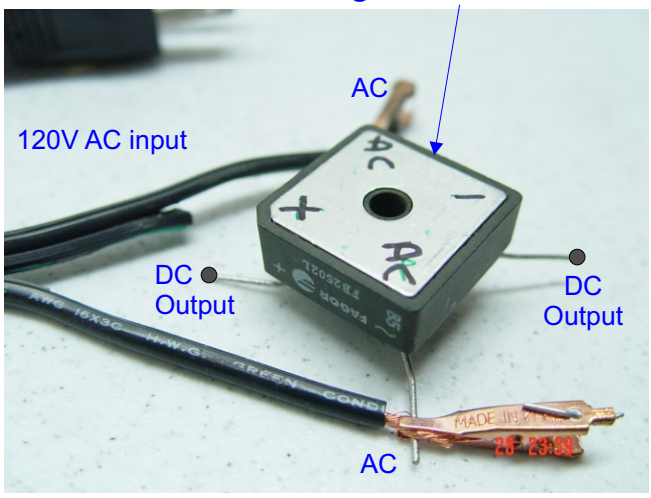
Most incandescent light bulbs consist of a glass enclosure, also known as the envelope or bulb. With a filament of **tungsten wire** inside the bulb, through which an electric current can be passed. Contact wires and a base with two (or more) conductors provide electrical connections to the filament. Incandescent light bulbs usually contain a stem or glass mount anchored to the bulb's base that allows the electrical contacts to run through preventing any gas or air leaks.

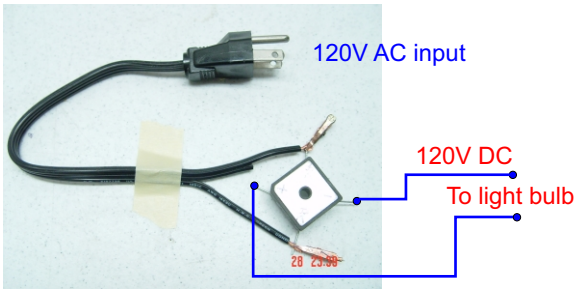
Small wires embedded in the stem in turn support the filament and its lead wires. The bulb is filled with a gas such as **argon.** This gas helps to reduce evaporation and to prevent oxidation of the **tungsten wire** filament.

An electric current then heats the filament to about 3,140 to 5,480 °F, well below tungsten's melting point of 6,191 °F. Filament temperatures depend on the filament type, shape, size, and amount of current drawn. The heated filament emits light that approximates a continuous spectrum. The useful part of the emitted energy is visible light, but most of the energy is given off as heat in the near-infrared wavelengths.

A 100 watt incandescent light bulb is a amperage and wattage hog. It will make the wheel on your electric meter spin at about 28 rpms. If you are looking into lowering your electric bill or eliminating it all together, then you will want to use LED light bulbs as well as some type of free energy device. Wind and solar or our free energy electric motor = The Fuelless Engine and Sp500 AC or DC Generator. Plans are $70 each.

Full wave bridge rectifier





Our Fuelless Engine motor, has been known to stop an electric meter in it's tracks! And sometimes reverse the meter without the use of any external AC generator! The Fuelless Engine can replace the energy it uses, sending it back into the electric grid. Thus the motor can run itself and more!

I am sorry to say as of April 21 2011 you still can not go anywhere in the world to buy one of our devices already made and put together. The only way you can get one is to build it yourself or hire a friend to build it for you.

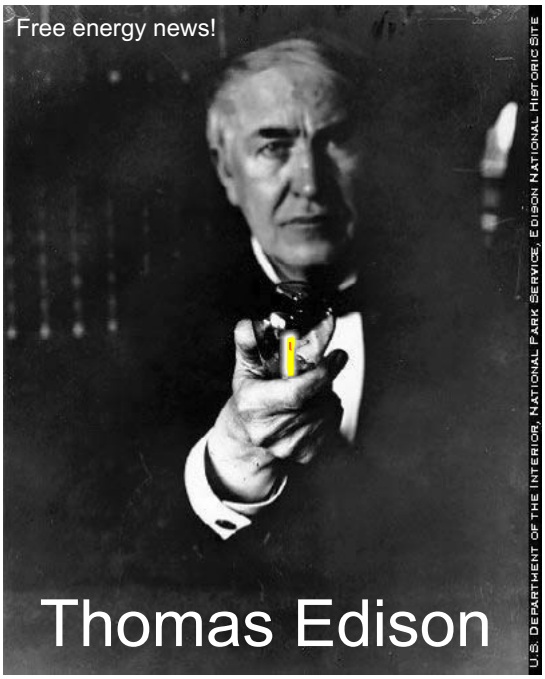
Make Your Own Light Bulbs #386

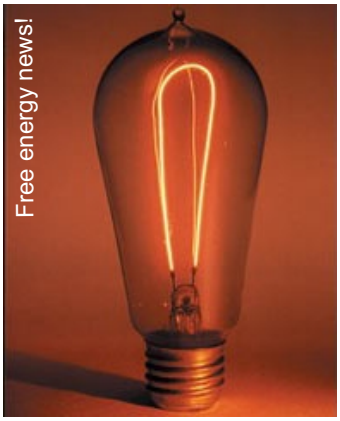
Free energy news!

Over 100 years ago, Thomas Edison used a thin sliver of bamboo to make the first lightbulb. He reportedly experimented with hundreds of different materials before succeeding with bamboo. He tried many different varieties of bamboo and settled on one from Kyoto. His company manufactured lightbulbs using bamboo filaments back in 1882.

William Joseph Jenks explained that the Thomas Edison bulb was not derived from the current and sparks that jumped across scores of carbon rods in a series of arc lights nor some related measured expenditure, burning away at the tips of such rods. William Jenks explained in great effort to point out that Thomas Edison's lights exploit the fact of the perfect filament operating in a totally oxygen free environment **can last forever!** Adding to the effect, Edison's electrical system was a function of each incandescent bulb's wattage, the precise voltage and amperage capacities of each feeder line along with the support of newly devised breakdown plugs and safe lead wire fuses!

Bamboo carbon filament: You maybe able to make your own by heating a strand or tread of bamboo until it turns to carbon. You maybe able to purchase the carbon thread already made. Try the internet - www.google.com keywords: bamboo carbon filament. Or try fabric supply companies, hobby and craft shops etc.

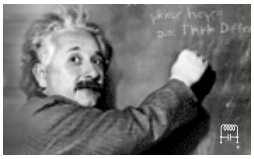




Bamboo carbon filament light bulb!

#386

Www.FuellessPower.com



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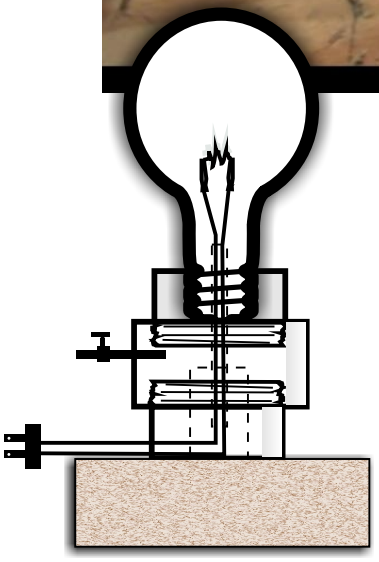
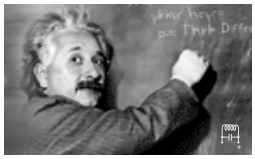
The Mason Jar Light Bulb!

By David Waggoner Creative Science & Research

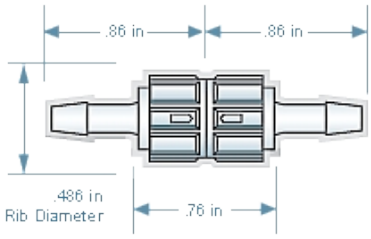
HOW TO BUILD





Supply List
For Mason Jar Light Bulb

1. **One way check valve.** Also called an air valve. Allows air or gases to flow in one direction only. Used for filling mason jar light bulb with argon or nitrogen gases. Or can also be used for removing air from the glass jar with a vacuum



Shurflo 340-001
In-Line Check Valve 1/2”

PumpVendor.com

---

2. **Vacuum pump.** You will need a vacuum pump of some kind, if you wish to do try the no air method. You could use a hand held vacuum pump or an electric vacuum pump. You could also convert most any type of air pump to work as an vacuum pump. Old fish tank air pumps may work as well, and maybe easy to convert.

ScienceLab.com
Chemicals & Laboratory Equipment

Www.ScienceLab.com

United States: 1.800.901.7247
Internationally: 1.281.441.4400

Also see: www.ArborSci.com
1-800-367-6695

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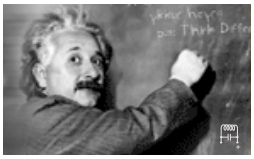
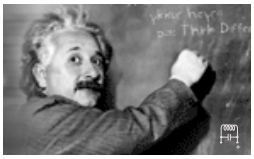


Supply List
For Mason Jar Light Bulb



Supply List
For Mason Jar Light Bulb

8. Variable - Variac Transformer.

This device is a must if you plans on doing some serious free energy research. The input voltage is 120V AC and the output voltage is 0 to 130V AC or can be changed to DC using a diode or full bridge rectifier. This is what we used for our mason jar light bulb. It is not needed but is very nice to have for this project in testing the bulbs. This device is also great or adjusting the rpms of our free energy motors. Our Fuelless Engine motor will run itself and more! See our plans order # 362-RC350 for only $70.00

Http://www.allelectronics.com/

or at a Radio Shack near you

9. TOOLS NEEDED.

Wire stripper, needle nose pliers and a fine set of tweezer's (not shown), solder, soldering gun and a black perm marker. You will also need some wire so you can plug in the bulb to the 120V AC outlet or variable transformer. You could try using an old extension cord. Cut off the plug with about 15" inches of the wire and use it.

Supply List
For Mason Jar Light Bulb

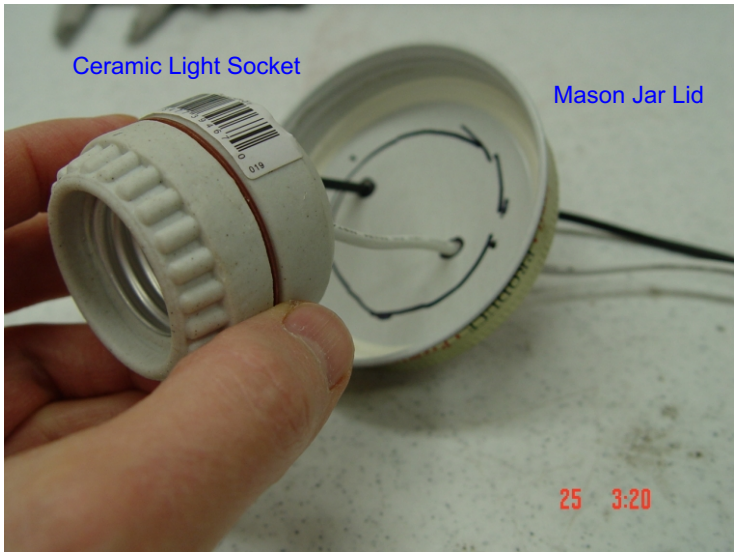
10. Clear Tubing.

You can buy this clear tubing online or at most local hardware stores. Purchase the Air pump first. IT may already come with the clear tubing needed. If not the instruction will tell you the size you will need. The tubing can also be used for inserting the argon gas or the nitrogen gas.

Hand Vacuum Pump

11. Light Bulb Socket.

You can buy these at any hardware store or online. I am not sure what this one is called. But it comes with the two wires (black and white) already attached.



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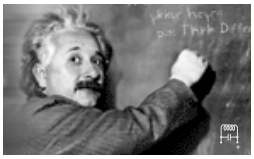

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Supply List
For Mason Jar Light Bulb

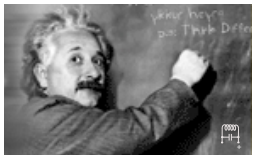
1/4" steel bolt or plastic
(2) 1/4" nuts and washers
(2) 1/4" Rubber washers

Argon or nitrogen gas. Purchase a small tank of one or the other.

Http://www.airgas.com

Airgas
You'll find it with us.

Call:
(866) 924-7427 for an Airgas location near you!

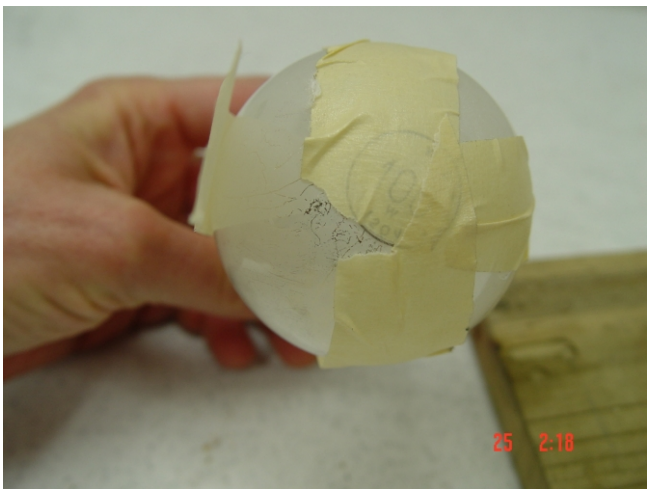


Mason Jar Light Bulb

STEP 1 Removing the glass bulb & collecting the filament

Getting the filament from an old burnt out 100 watt bulb. Or a you can use a new one just for testing purposes.

Begin taping the glass bulb from **A** to **B** just as shown.



Apply the masking tape until all of the glass is covered from top to bottom. Smooth down all bubbles and high points with your fingers.

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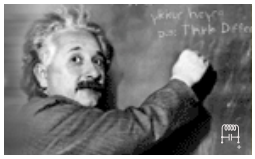


Mason Jar Light Bulb

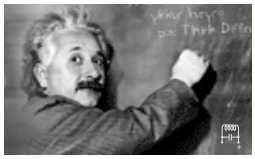
STEP 1 Removing the glass bulb & collecting the filament

Now cut the masking tape with a razor, along the top of the metal base.

Place the bottom edge of the glass bulb on the edge of a metal surface. Do not let the metal base touch the metal surface. Only the glass.

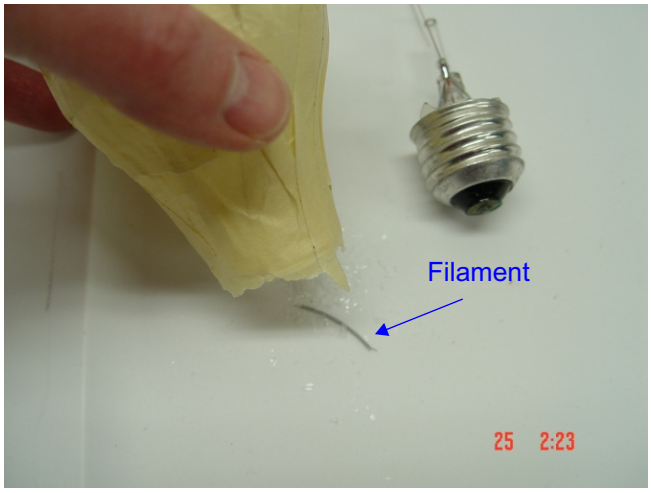
Now gently strike the glass with the edge of the hammer. Repeat while at the same time turning the bulb. Objective is to break the end of the bulb glass all the way around the metal base.

Now remove the inner parts. **WARNING!** Be careful of the small glass pieces. Carefully discard them in a metal can and throw them into the trash. Wash your hands when done to prevent any small glass dust pieces to get in your skin or eyes. Wash work area with tamp paper towel.



Mason Jar Light Bulb

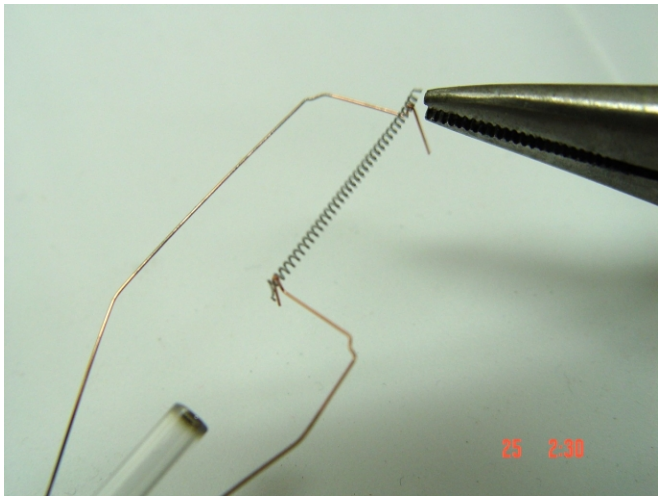
STEP 1 Removing the glass bulb & collecting the filament



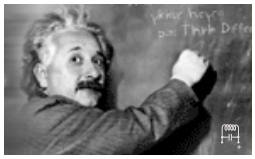
If the filament is not connect to the inner part. You will have to get it out of the glass bulb.

If there are any sharp glass sticking out from the base, then put on your clear protective face helmet or goggles, and using a needle nose pliers break them off.

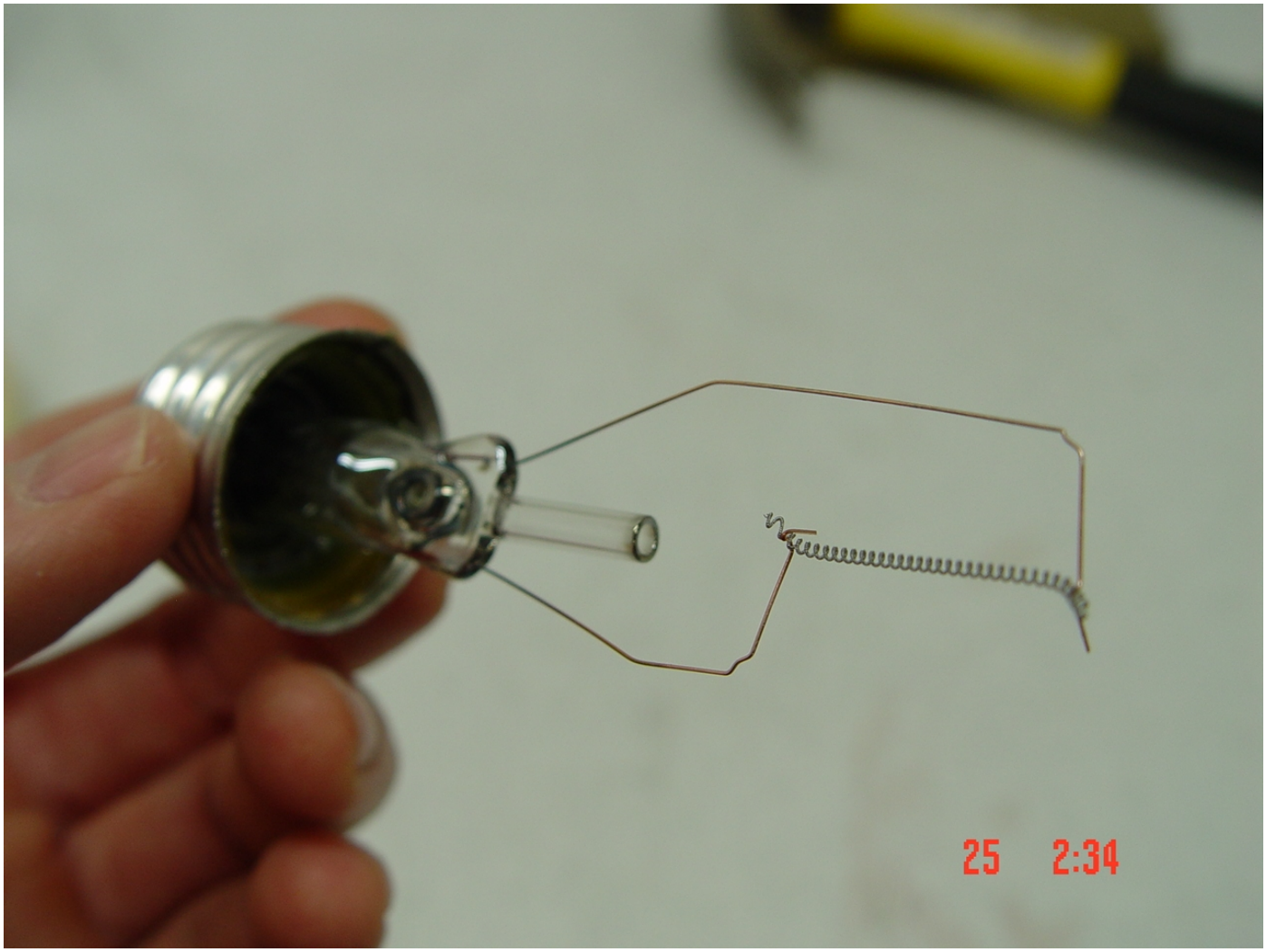
Now very carefully pick up the filament with pliers or best use small pointy tweezers.



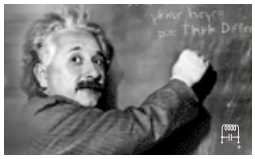
Securely, place the filament on both wire contacts.



Mason Jar Light Bulb

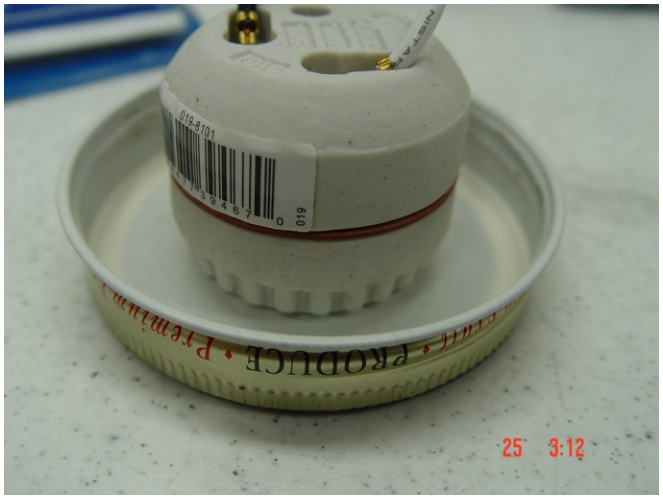


The electrical base and filament is now done and ready to install. Flip the base upside down to make sure no broken glass is still down in the hole.

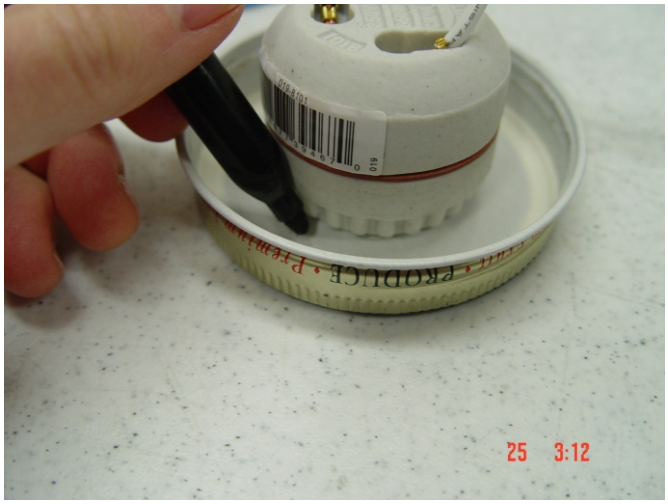


Mason Jar Light Bulb

STEP 2 Installing the light socket on the mason jar lid.



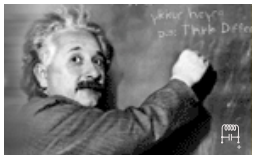
Place socket on inside of lid, faced down and well centered.



Using a black marker. Mark the position of the socket on the lid.

Now measure from the wire to the outside of lid. This is a bit harder. But you are measuring were you will need to drill the two wire holes.

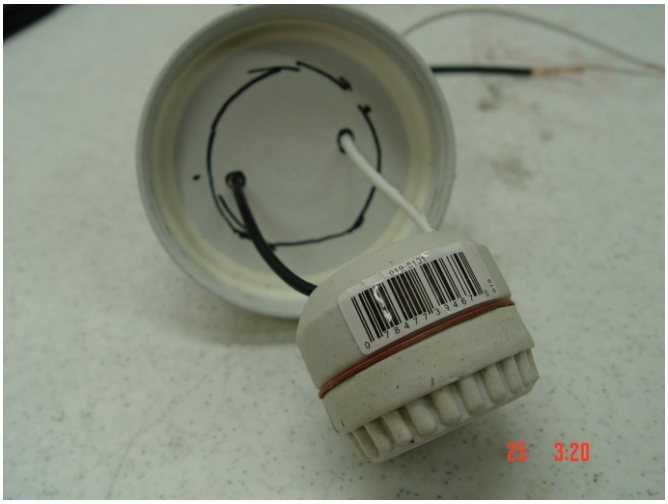
Remove the socket and mark the drill holes.



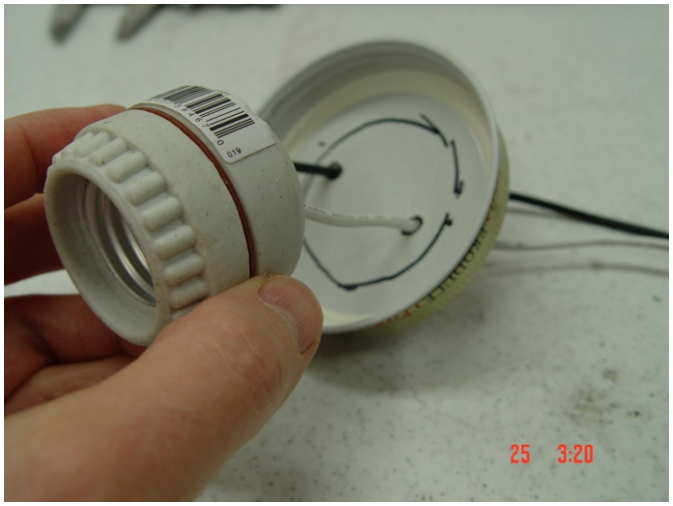
Mason Jar Light Bulb

STEP 2 Installing the light socket on the mason jar lid.

Drill two holes just a bit larger than the diameter of each wire.

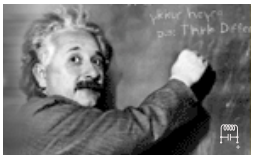


Now lets test it to see if it fits. Place the wires in there holes.



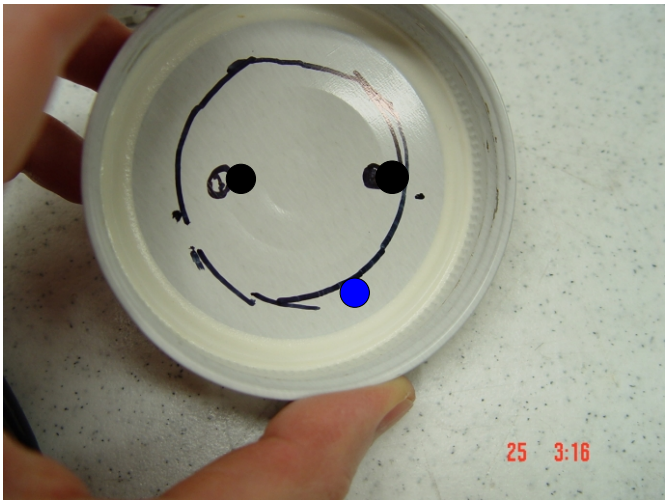
Push the socket all the way down to the lid to see if it fits. If it is not a perfect fit. Do not worry. You will be applying 100% silicone to the bottom to fill in the gaps and spaces. And to glue the socket to the lid.

Now remove socket from lid.



Mason Jar Light Bulb

STEP 3 Installing the vacuum air outlet.



Drill a 1/4” hole about where the blue dot is.

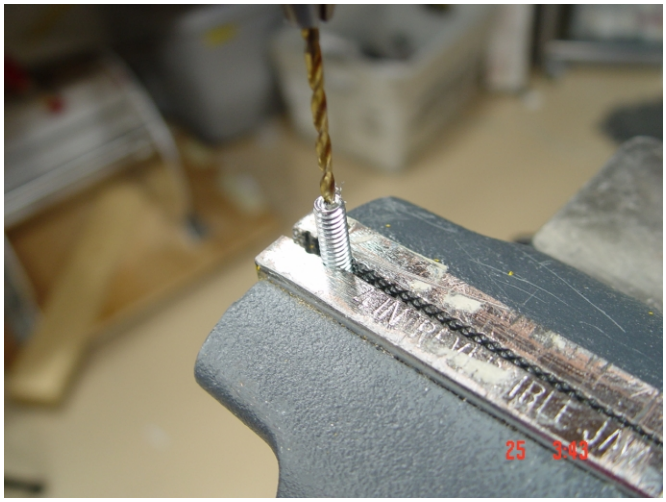
If you do not have access to a brass fitting, you can make your own air tube fitting from a steel bolt.

For the vacuum air outlet you can use a 1/4” bolt or what ever size bolt to fit the clear tubing that you have purchased or are going to purchase. You could also simply use 1/4” brass air fitting and silicone - glue into place. Cut a short 1/4” bolt to about 1” in length. You will not need the head of the bolt.

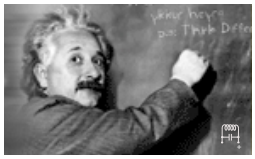
Optional

Grainger.com Item # 3DVC3

A brass fitting would be a good first choice. You can purchase many different sizes at most local hardware stores or online. You can drill a hole in the lid and fit the bottom part of brass fitting into the hole. Apply silicone glue as well as rubber washers if using a nut to bolt it into place.

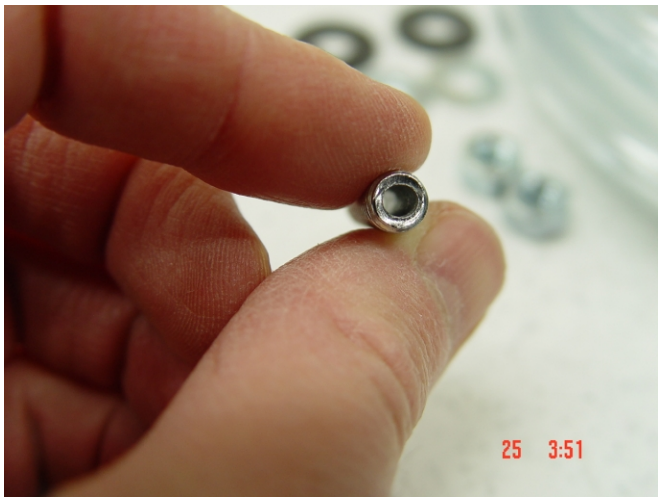


Place one end of the bolt into a vice. Grip about 2/16” of an inch. Use a starter drill bit to start your hole. Then use a regular drill bit to drill a hole all the way through to the other side of the bolt.



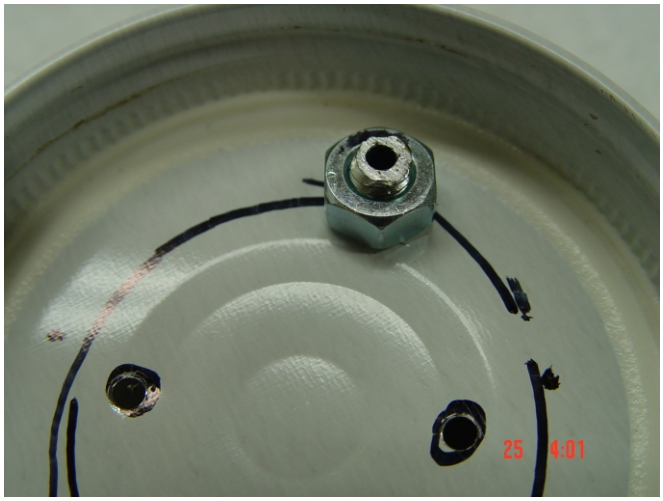
Mason Jar Light Bulb

STEP 3 Installing the vacuum air outlet.



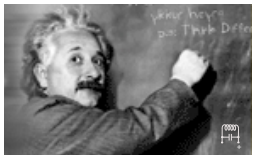
The hole is now complete. And ready to install.

Now attach the 1/4” nut to one end of the bolt. Starting from the top and screwing it all the way to the bottom until you feel a resistance. Now apply a bead of 100% silicone as shown.



Quickly insert the bolt through the air vacuum hole. As a second option you can also use a 1/4” rubber washer on this side as well. The photo is not using a rubber washer on this side of the lid.

Now turn the mason jar lid right side up ans apply another bead of silicone glue all the way around the bolt and the hole.

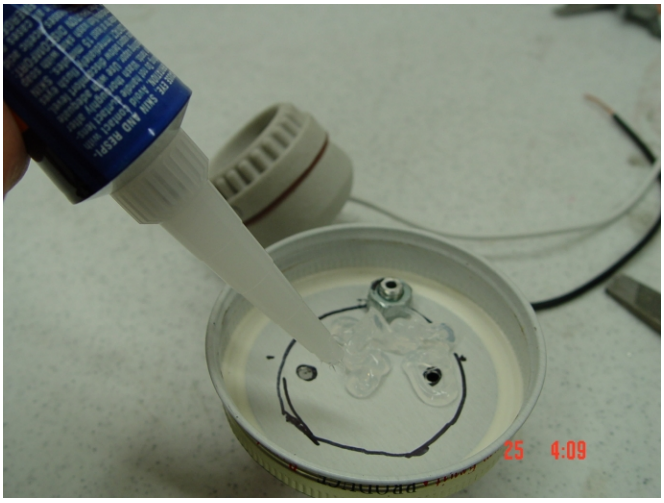


Mason Jar Light Bulb

STEP 3 Vacuum outlet done.

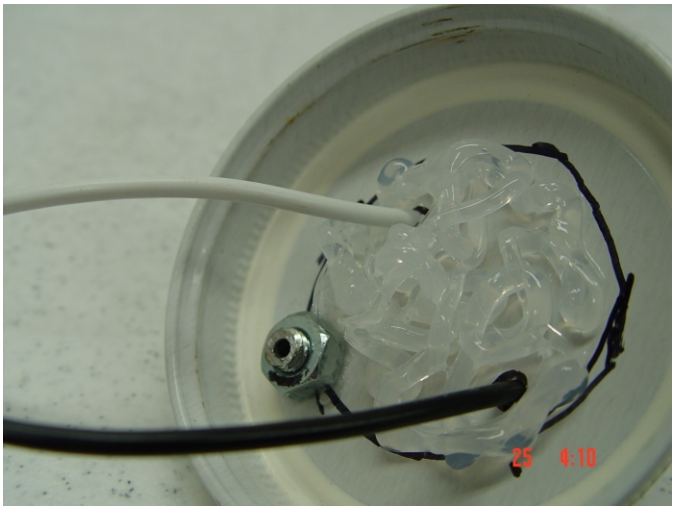
Attach the 1/4” rubber washer first. Now attach the 1/4” nut to the bolt and tighten.

STEP 4 Install light socket.



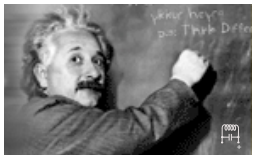
Now apply 100% silicone glue to the area where the light socket will be sitting.

STEP 4 Install light socket.



Insert the wires first as shown. Then push the entire socket down onto the surface of the lid. Get it as close as you can.

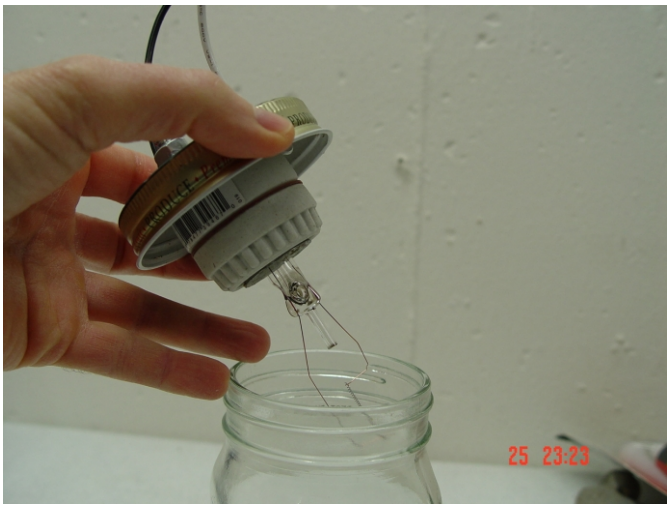
Now flip the entire assembly right side up. Tape down if needed to the table and use anchor weights if needed. Allow to dry over night.



Mason Jar Light Bulb

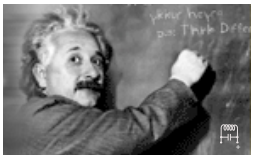
STEP 5 Install light bulb base and filament.

Now take the inner parts of the burnt out light bulb and screw it into the socket. Be careful the edge of the base metal is sharp.



Now place the entire assembly onto the top of the jar and screw it onto the mason jar.

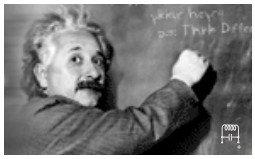
Tighten the lid as tight as you can get it without breaking anything.



Mason Jar Light Bulb

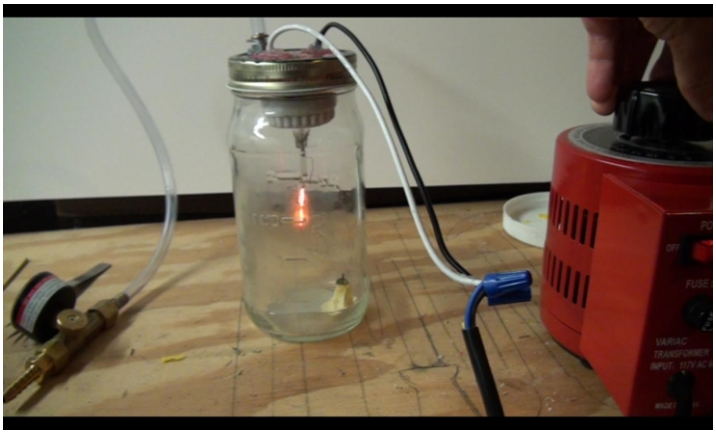
STEP 6 Testing the bulb by removing all air.

At this point, you may want to go ahead and try your first experiment by first removing all the air out of the mason jar light bulb. Attach your vacuum pump to the air outlet adapter on the mason jar. Now connect the two wires coming from the mason jar light bulb / lamp to a wire plug. Connect the wires using wire nuts. Make sure the variable voltage transformer or variac transformer is off. Plug the light bulb / lamp into the outlet on the variac transformer. You will now need to vacuum out all the air out of the jar. I am not sure what the best vacuum pressure is at this point, we still need to do more testing at the time these plans were written. If you want to use argon or nitrogen gas. You would have to go back and apply another air outlet to the mason jar lid. You would then use the argon gas tank connected to one of the inlet hoses. The outlet hose would have a one way valve connected to it. Both the outlet hose and the inlet hose would both need to have shut off valves. As the gas comes into the inlet hole it will push the air out of the outlet hole. I would then shut off the outlet hole and then allow some pressure to build inside the jar. Careful not to much. You do not want to break the glass. Be sure to wear safety glasses and gloves and coat.

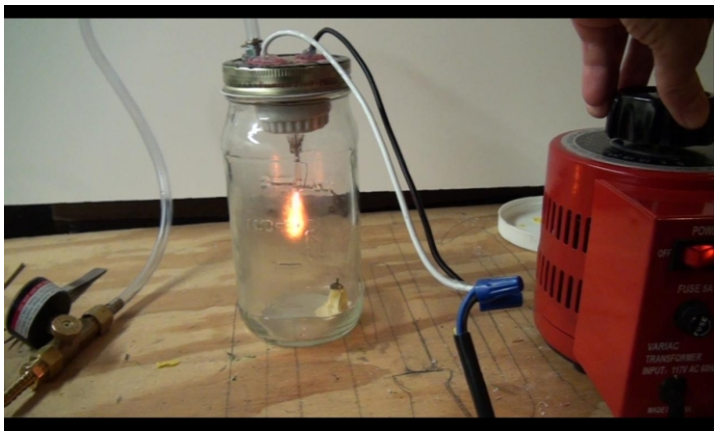


Mason Jar Light Bulb

STEP 7



STEP 8

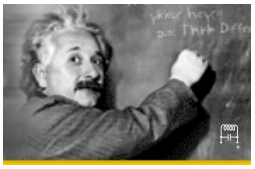


Slowly turn the black knob of the red variac / variable transformer clock wise. The voltage will slowly rise from 0 to 120 volts AC. I may want to try DC first. It is has the best chance of protecting the filament and keeping it from burning out.

STEP 9

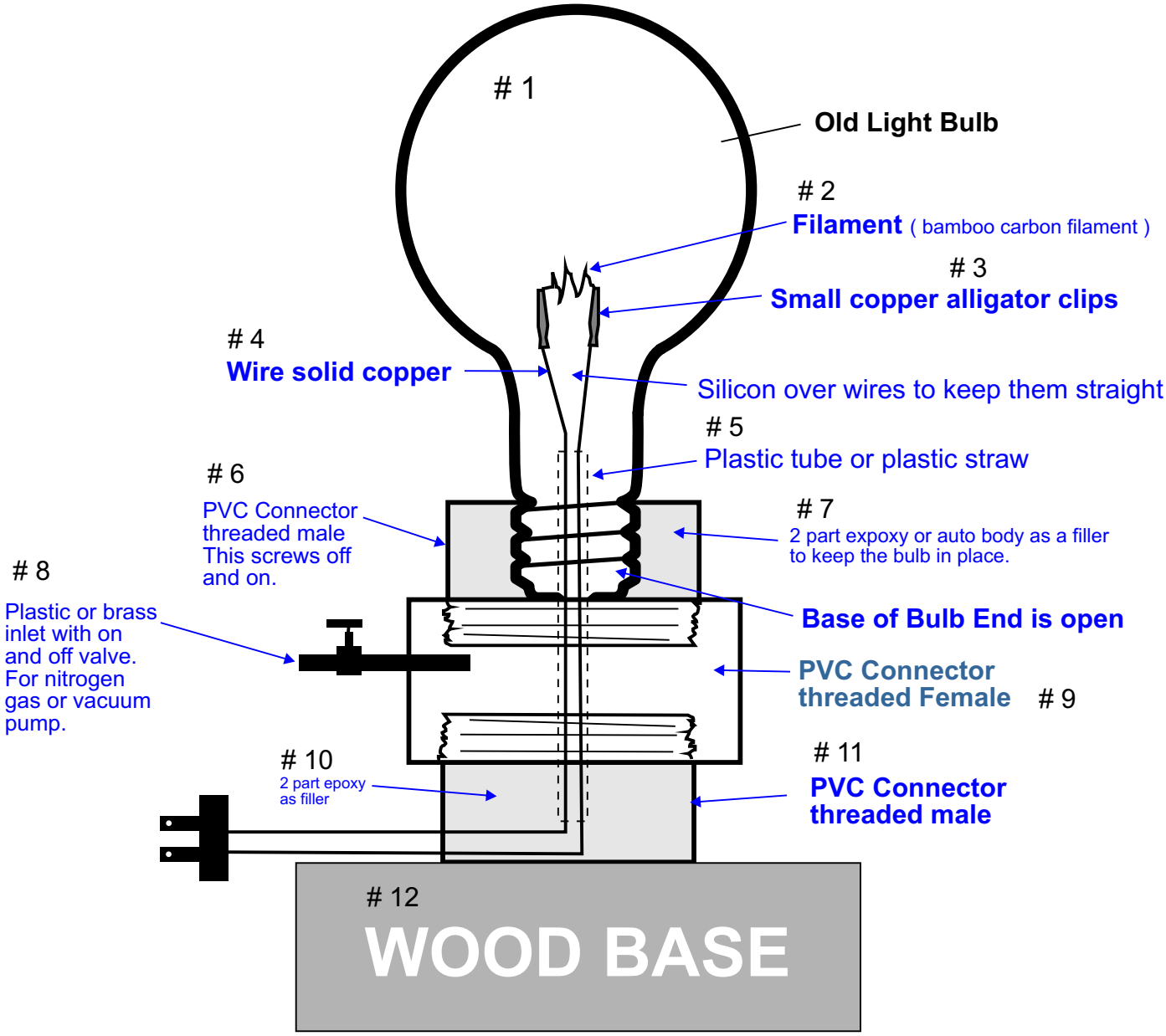
STEP 10

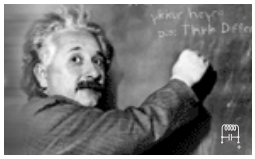
Trouble shooting. If the filament is burning out, then you must have a leak some where. Reglue all areas; You may want to try and add a thin layer of rubber or a cut out gasket to the inside of the lid.



OPTION 2

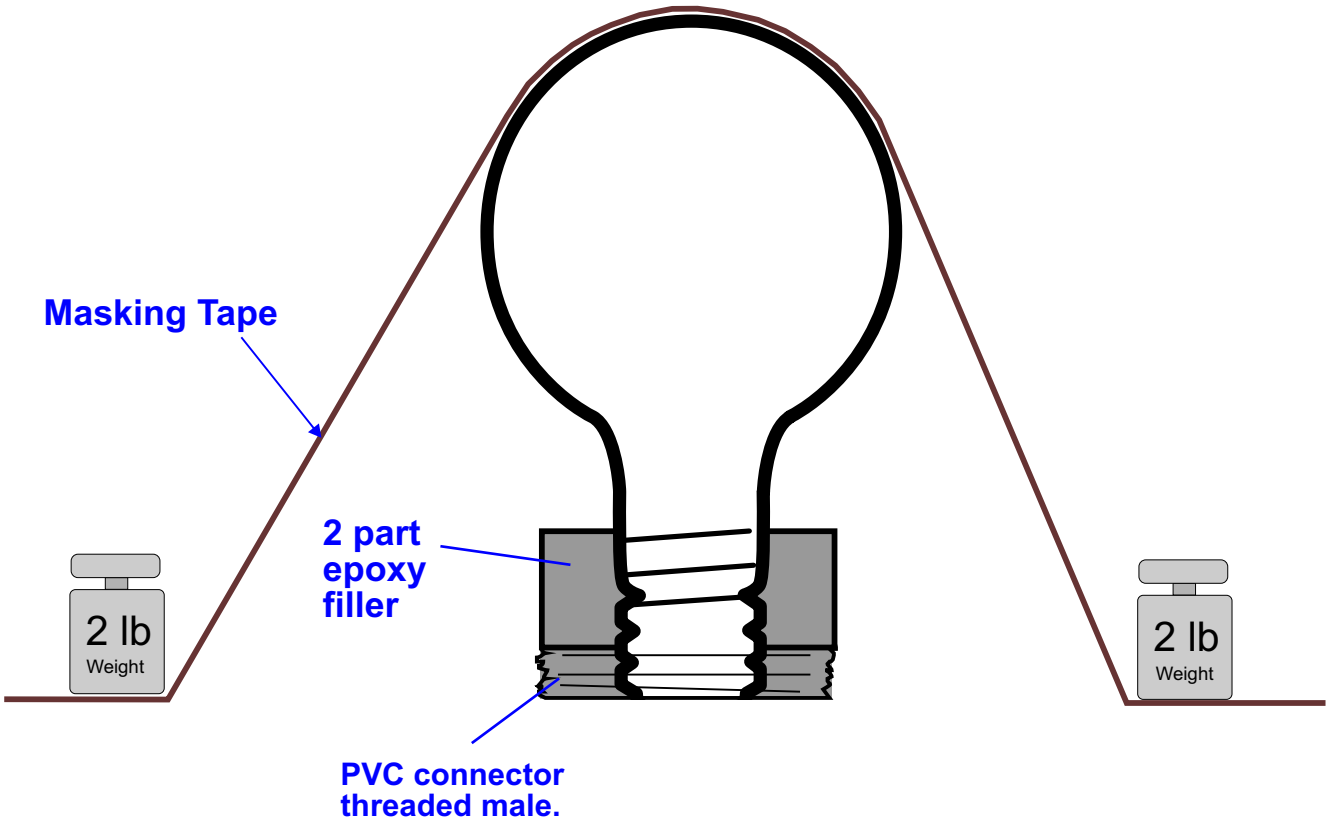
Here is another idea you might like to try. You can make your own long lasting light bulbs by redesigning the bulb and casing, and making the filament interchangeable, or by using a long lasting bamboo carbon filament that you can buy or make yourself. The bulb simply screws on and off so when it does burn out you can reconnect the old one or find another filament from an old burnt out light bulb and use it. The filament attaches with 2 small copper or steel alligator clips.

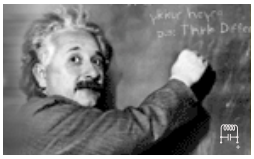




Make Your Own Light Bulb!

Again find an old burnt out 100 watt light bulb or you can use a glass jar or drinking glass. Use a Hack saw or high speed grinding or cutting tool to remove the tip off of the light bulb bottom so the bottom is open. Now break everything out of the filament area. Be careful not to break bulb, you may want to place masking tape all over the bulb incase it does break (remove the tape later). Next, use a PVC threaded male piece (Which you can buy at any hardware store) and place it on a piece of wax paper on a flat surface, Place the bulb in the center of it, let the bulb go all the way to the flat surface of the table (not shown in other drawings). Now using masking tape, center the bulb and tape it to the table so it will not move. Mix 2 part epoxy or body putty as a mold filler. Now let it dry and cure over night or 12 to 24 hours. Auto body puddy may work very well as a filler and is much cheaper. You can buy any of these products at an automotive supply store near you or online.



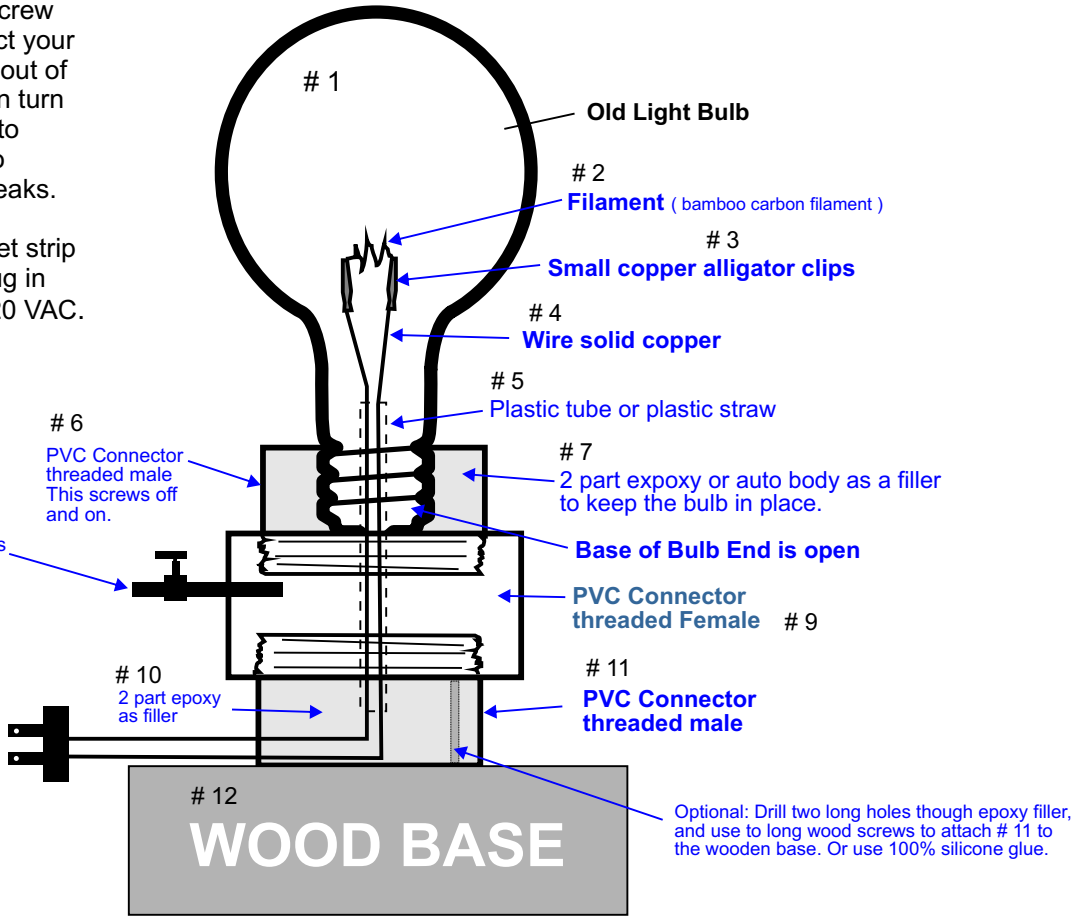


Make Your Own Light Bulb!

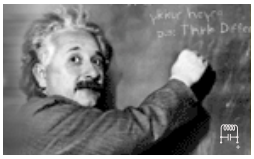
The wood base #12, can be wood or white plastic. If wood, it is easier to glue the base of the lamp to the surface. If using white plastic you would need to drill two holes at an angle so you can attach the PVC lamp base to the plastic base. # 8 valve and pipe should be about 1/2" or less, or to fit your vacuum pump hose or gas hose. You may want to purchase the vacuum pump and hose first, then purchase the on and off PVC valve or brass type valve to match the size of the vacuum or gas hose. You can find these valves online or at any hardware store. Drill a hole in the side of the # 9 PVC connector. If the on / off valve is to use PVC tube, then you can fit and glue the PVC tube into the # 8 hole, using PVC glue. Now cut your # 5 plastic tube to proper length. Drill a hole on the left side of # 11 PVC so the AC cord can go through it. Place your AC cord into the center of # 11 PVC connector, then slip the AC cord through the # 5 tube. Allow enough wire so you can attach and solder the copper alligator clips (# 3). You can keep # 5 tube centered with card board and tape. Now fill # 11 PVC connector with 2 part epoxy filler and let dry overnight. Now glue the # 11 PVC connector onto the #12 wood base, use 100% silicone and let dry over night. Or you can drill 2 long holes through the # 11 filler, and connect the # 11 to the wood base with long wood screws. Attach # 2 filament to the alligator clips # 3. Now apply plastic thread sealer to # 11 and # 9 and screw them together. This should make an air tight fit. You could try PVC glue, making it more permanent. Now apply tape thread to # 7 and screw # 7 into # 9 PVC connector. Connect your vacuum pump and pump out all air out of the bulb, or vacuum air out and then turn off valve and connect nitrogen gas to the inlet valve. Now turn on valve to allow gas to enter bulb. Check for leaks.

Now Plug the AC outlet into an outlet strip with it's own circuit breaker, and plug in the outlet strip into a wall plug of 120 VAC. Bulb should now light up!

A ½"PVC valve may work well.

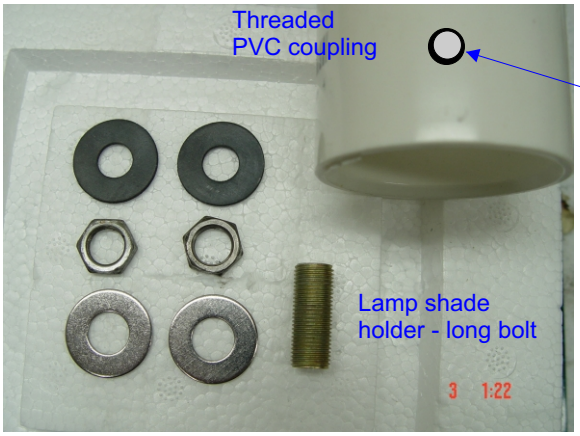


WARNING HIGH VOLTAGE; 115 VAC house current can kill you be careful make everything is connected properly before plugging into the wall outlet of your house.

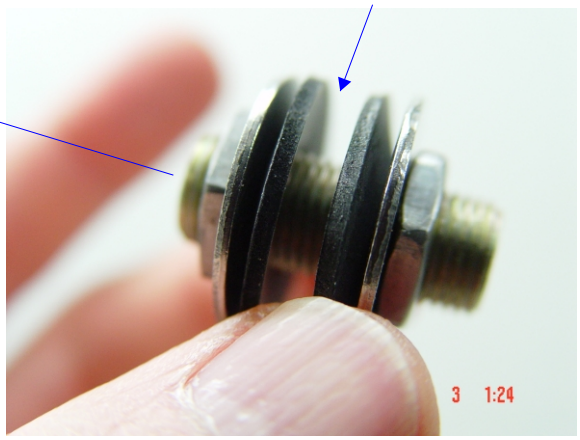


Make Your Own Light Bulb!

Optional valve vacuum inlet - hose adapter

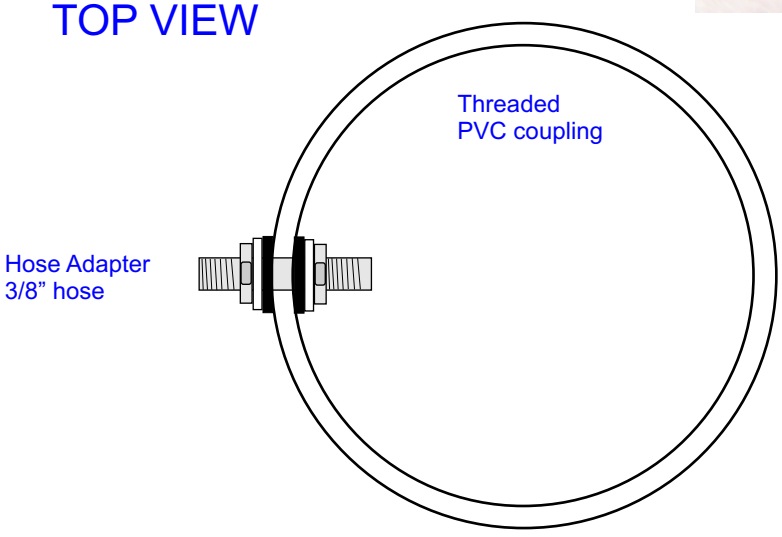


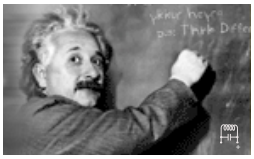
PVC pipe
fits in center



Use a 3/8” lamp shade holder bolt.
Works pretty good as a hose adapter.
You can buy these online or at a local hardware store.
You will also need:
(2) rubber washers 3/8” ID
(2) 3/8” lamps shade holder nuts
(2) 3/8” stainless steel washers

TOP VIEW





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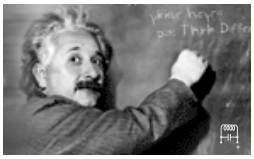
Make Your Own Light Bulb!

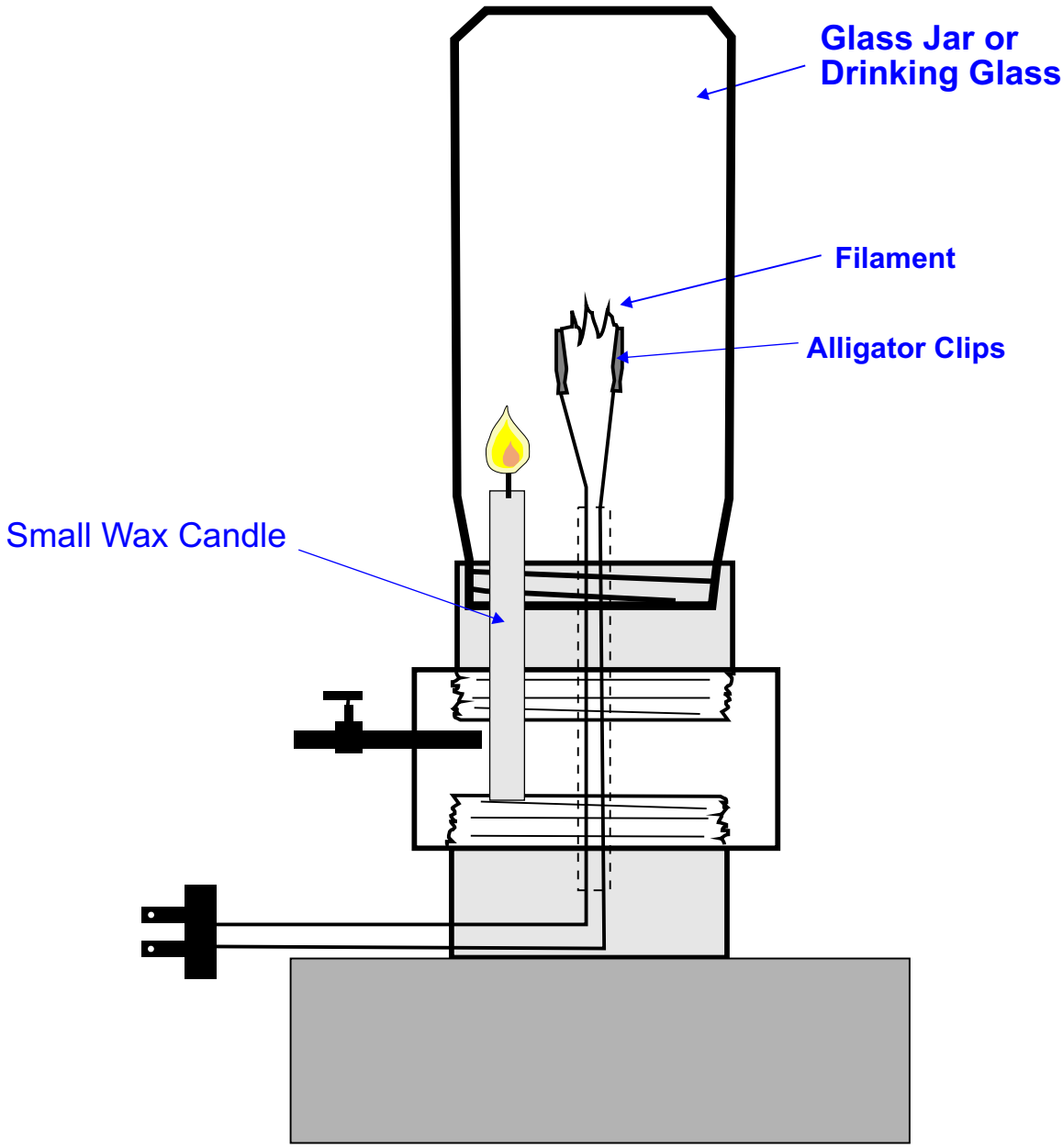
You also may want to consider using a on / off valve (brass). This valve is using 1/4” adapters and can be used for 1/4” clear gas or vacuum tubing. You can get this in the air compressor section of any store that sells air compressors and adapters. Or you can find them online. This one also comes with a pressure gauge.

Another option might be to use a 1/8 or 3/8” Hose barb adapter (brass). The PVC can be threaded and the adapter screwed into the threaded hole. If you use this, make sure you use threading compound of some type to keep the hole air tight. You could try 100% silicone.



Make Your Own Light Bulb!

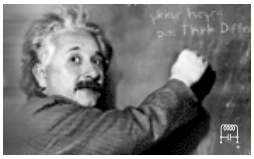
Another option would be to use an old glass jar or drinking glass instead of a old burnt out bulb. Glass jars are a lot easier to work with. If you do not have a vacuum or nitrogen gas, you could try using a wax candle to burn the air out of the jar bulb.



#386

Www.FuellessPower.com

Anti-Pirate Customer ID # 6832254



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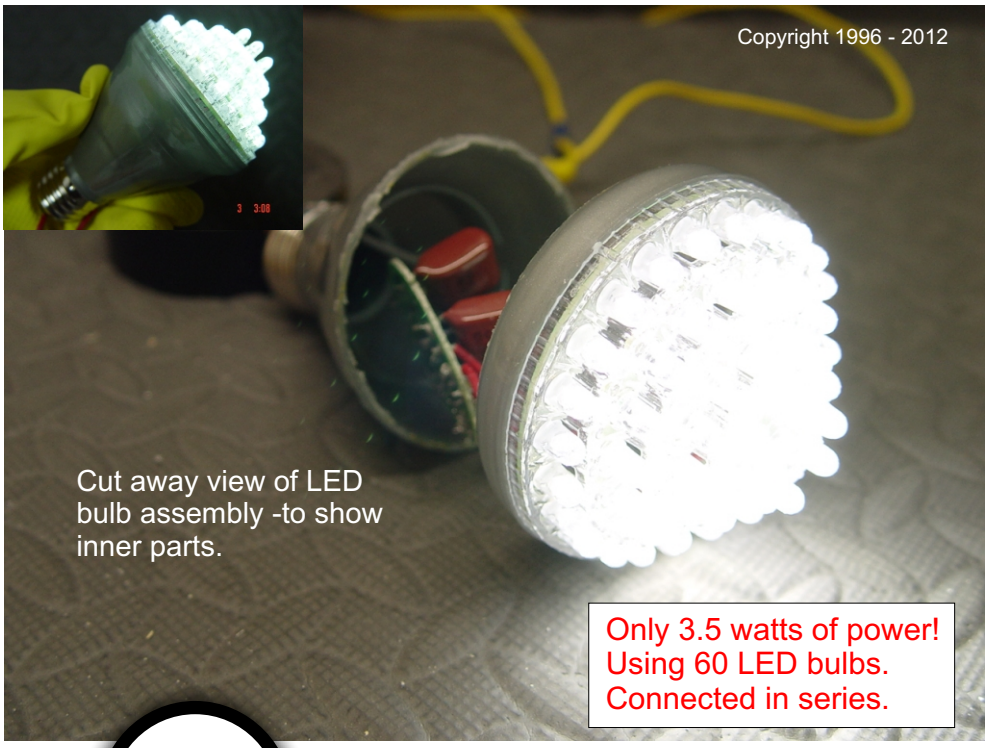
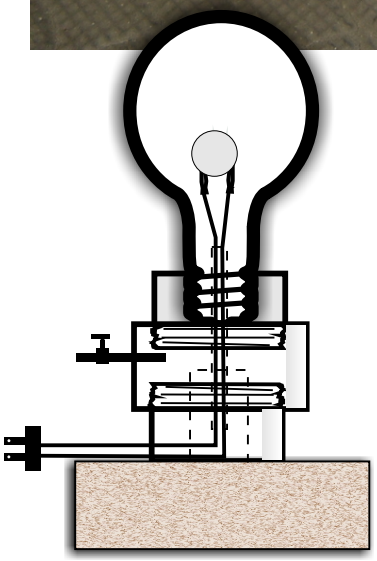
The LED Light Bulb!

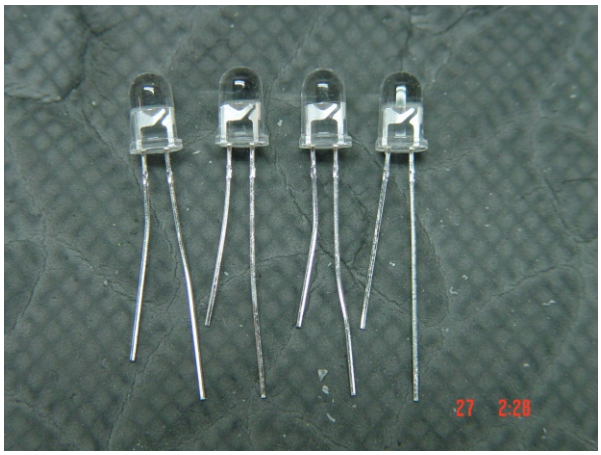
By David Waggoner Creative Science & Research

Super High Efficient Lighting!

HOW TO BUILD







Example of just 4 LEDs not yet connected

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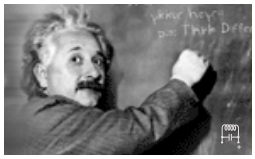

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The LED Component

You will need to know how to solder for best results. You can learn online,

By David Waggoner Creative Science & Research

NOTICE: Please take your time and learn all about LED's before trying to make your own LED light bulb.

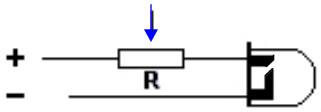
The LED light bulb is the most high efficient long lasting light source in the world! An L.E.D is a light emitting diode. The LED in photo 1 represents one LED. Super bright white LEDs are great for using in home lighting and cost almost nothing to operate! A great way to lower your electric bill. An even greater way to lower or have no electric bill at all would be to build our Fuelless Engine (free energy electric motor) and our Sp500 AC or DC Generator to run your entire home!

LED bulbs as you see in photo 2, represent a multitude of LEDs connected in series or parallel. This LED light bulb runs only on 3.5 watts and can light an entire room! The less wattage the more money in your pocket! Also great for emergency lighting as well. The bulb has 60 LEDs connected in series. We will show you more about this bulb later. Notice: Red LEDs are even better for emergency situations. Your emergency backup batteries will last longer using RED LEDs than if you use white LEDs.

Photo 1

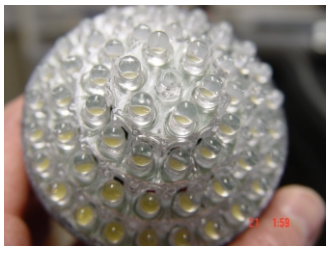
One LED

Series Current Limiting Resistor



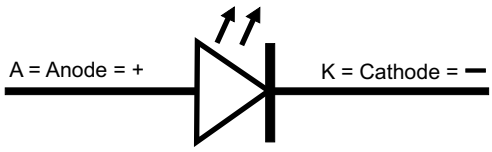
LEDs (Light Emitting Diodes) must always be operated with a resistor in series to limit the current to a safe level. Most LEDs can only tolerate a current of about 30mA maximum. To calculate the resistor value required the forward voltage (Vf) and current (If)of the LED must be known. These can be found from the suppliers catalogue. For standard LEDs Vf is about 2V and If is about 20mA (0.020 amps)

Photo 2

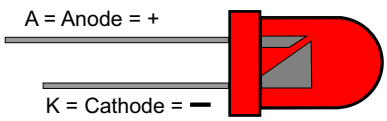


(60) LEDs

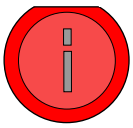
LED Supplier: www.allelectronics.com



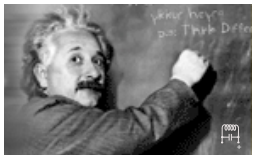
Circuit symbol for one LED



Also
Flat side = K Cathode



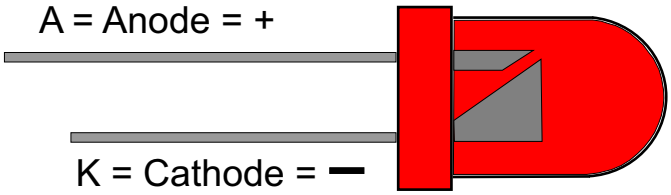
Top View



More About LEDs

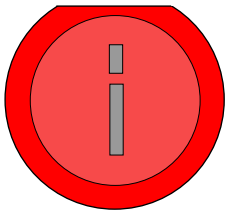
You may be able to find some used diodes in old broken down electronic devices in your home or trash. Finding which wire is the + plus side and which wire is the - negative side can be hard if both wires are cut the same size. If so you can find the - negative wire also known as the K or cathode wire, by looking at the top view of the LED. The LED will have a flat side, this is the K cathode or negative side. This is where you connect the - negative side of the DC battery power source you are using. LED come in many colors.

Side View



A brand new diode will have one wire longer than the other as shown. The longer wire is the + or Anode, and the shorter wire is the - negative or also known as the K or cathode side.

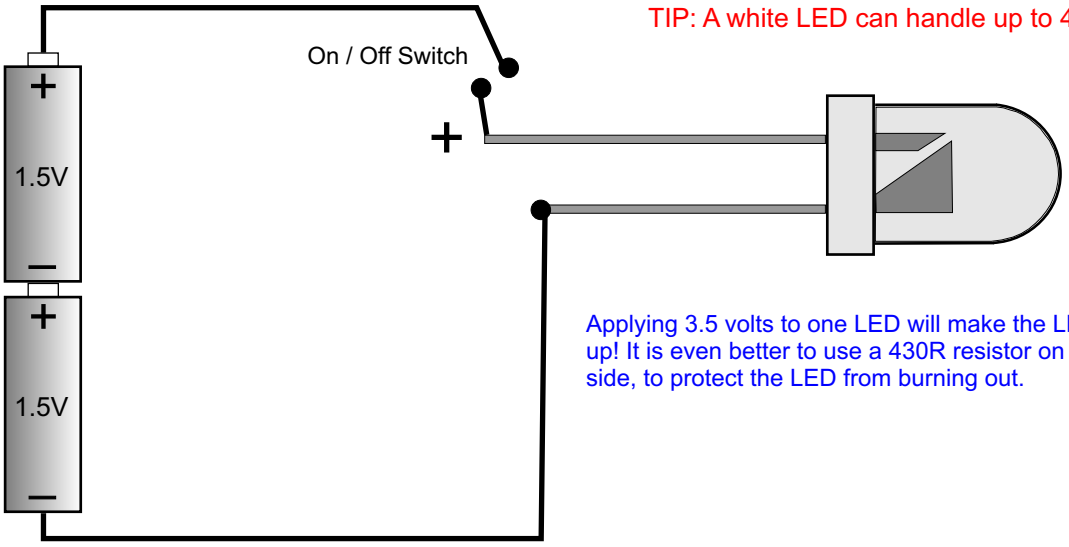
Also
Flat side = K Cathode



Top View

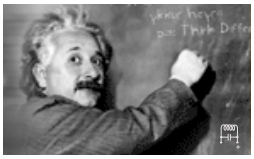
TIP: Colored LEDs can handle up to 2V DC

TIP: A white LED can handle up to 4V DC, 5V max



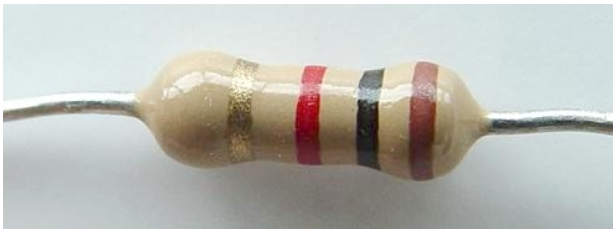
Applying 3.5 volts to one LED will make the LED light up! It is even better to use a 430R resistor on the + side, to protect the LED from burning out.

Tip: Use a small white or clear PVC pipe with an inner diameter of about 5/8 inch to place the batteries in. Use a push spring and aluminum or copper flashing as contacts. Glue a PVC end cap on the bottom. Or for a quick setup, Use thin paper or rigid cardboard and masking tape. Tape and roll the batteries up in the paper. Solder small wires on both ends.



About Resistors and LEDs

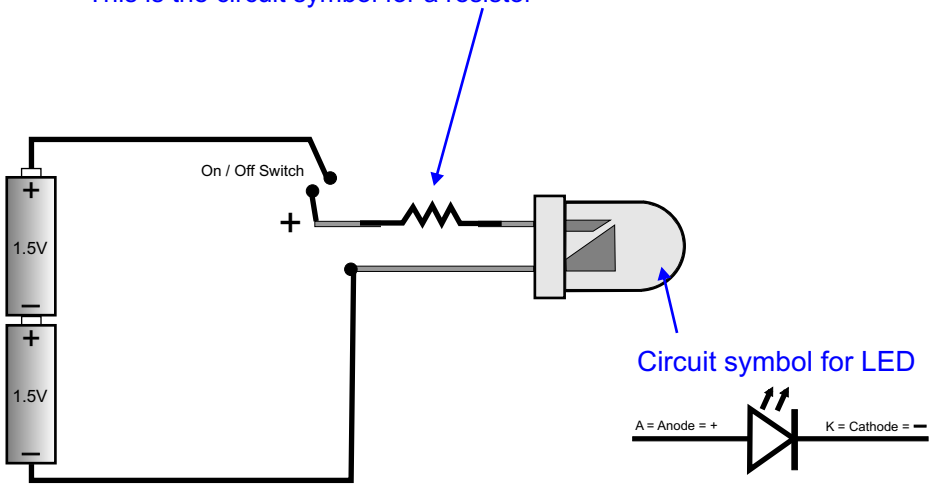
Placing a resistor on the cathode or + side of the LED will limit the current going to the LED and protect it from a current over load and will keep it from burning out. One white LED can take up to 5 volts max, but is best to operate them at about 3 to 3.5 volts DC. Do not try to operate LEDs on AC current. If using AC current you must change the AC to DC by using a diode(s) or full bridge rectifier. A resister limits how much DC current or electrical current that can travel though the wire to the load. The load could be a DC motor, A light bulb or in this case the load is LED(s). You can connect LEDs in series and this will increase the voltage input rating of the LED array. For example: (1) LED = 3.5 VDC, (2) LEDs = up to 7V DC, (3) LEDs = 10.5V DC and so on.



This is a resistor, also known as a series limiting resistor.

Resistors limit current flow or electrical flow. They have a resistance. They will only allow so much energy to flow through them. Resistors come in many different sizes and

This is the circuit symbol for a resistor



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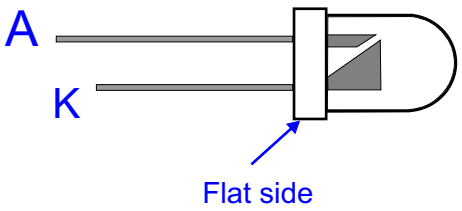
LEDs Basic Function

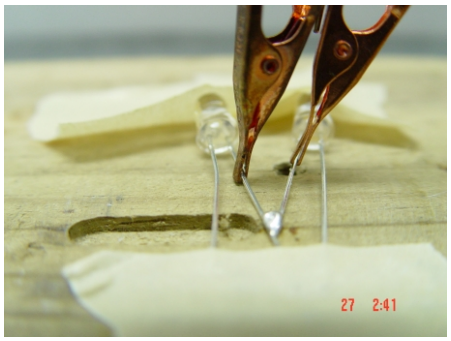
LEDs emit light when an electric current passes through them.

Connecting and soldering

LEDs must be connected the correct way. The diagram that you may get when you purchase the LED may be labeled a or + for anode and k or - for cathode (I am not sure why the manufactures use K when it would seem to be best to use a C). The cathode is the short lead and there may be a slight flat on the body of round LEDs. If you can see inside the LED the cathode is the larger electrode.



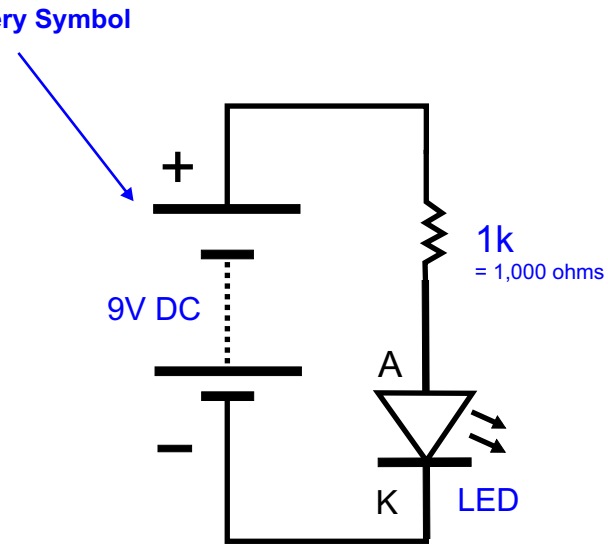
Be careful, LEDs can be damaged by heat when soldering, but the risk is small unless you are very slow. No special precautions are needed for soldering most LEDs. But for added protection you could place alligator clips on the terminals during soldering so the heat will be collected by them, instead of allowing all the heat to go to the LED.



Testing an LED

It may be a good idea to never connect an LED directly to a battery or power supply without a resistor! They could possibly be destroyed, burn out.

LEDs must have a resistor in series to limit the current to a safe value. For quick testing purposes a 1k resistor is suitable for most LEDs, if your supply voltage is 12V or less. Remember to connect the LED the correct way round! + to + and - to -



Tip:
If you do not know how to solder go to www.Youtube.com and type in the keywords -

“ How to solder “

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Notice: What you are getting ready to study below may seem a bit over your head. But if you study it carefully it can help you in the future to use any type of rated LED in a project. You don't have to learn this, but it can be very helpful.

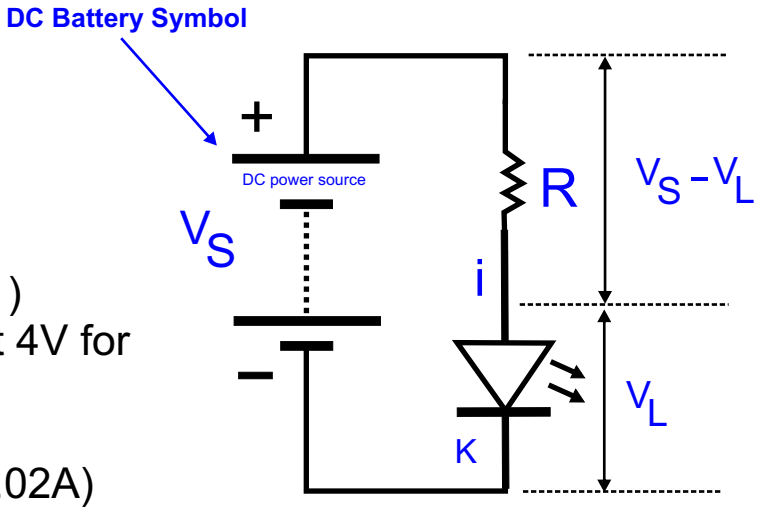
Calculating an LED resistor value

An LED must have a resistor connected in series to limit the current through the LED, otherwise it may burn out.

R = resistor
The resistor value, R is given by:

$$R = (V_S - V_L) / i$$

VS = supply voltage (DC Battery)
VL = LED voltage (usually 2V, but 4V for blue and white LEDs)
i = LED current
(e.g. 10mA = 0.01A, or 20mA = 0.02A)



Make sure the LED current you choose is less than the maximum permitted and convert the current to amps (A) so the calculation will give the resistor value in ohms ().
To convert mA to A divide the current in mA by 1000 because 1mA = 0.001A.
If the calculated value is not available choose the nearest standard resistor value which is greater, so that the current will be a little less than you chose. In fact you may wish to choose a greater resistor value to reduce the current (to increase battery life for example) but this will make the LED less bright.

For example
If the supply voltage VS = 9V, and you have a red LED (VL = 2V), requiring a current i = 20mA = 0.020A,
R = (9V - 2V) / 0.02A = 350, so choose 390 (the nearest standard value which is greater).
Working out the LED resistor formula using Ohm's law
Ohm's law says that the resistance of the resistor, R = V/I, where:
V = voltage across the resistor (= VS - VL in this case)
i = the current through the resistor

Example of a white LED and a resistor

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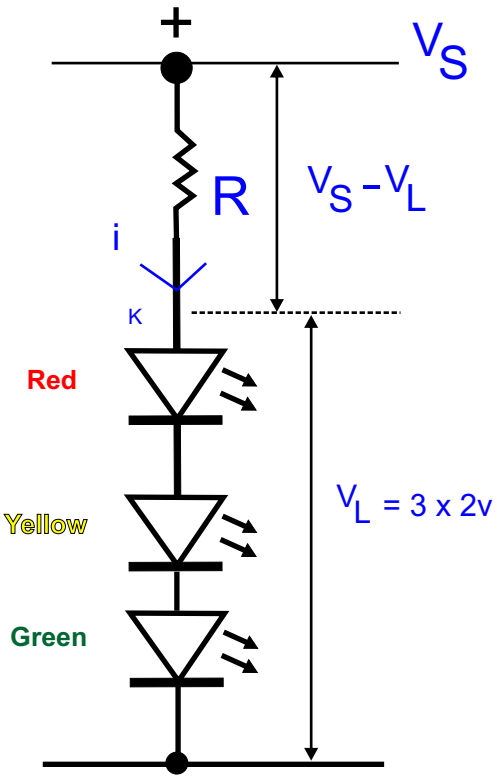
Connecting LEDs in series

If you wish to have several LEDs on at the same time it may be possible to connect them in series. This prolongs battery life by lighting several LEDs with the same current as just one LED.
All the LEDs connected in series pass the same current so it is best if they are all the same type. The power supply must have sufficient voltage to provide about 2V for each LED (4V for blue and white) plus at least another 2V for the resistor. To work out a value for the resistor you must add up all the LED voltages and use this for VL.



Example calculations:
A red, a yellow and a green LED in series need a supply voltage of at least 3 × 2V + 2V = 8V, so a 9V battery would be ideal.

VL = 2V + 2V + 2V = 6V (the three LED voltages added up).

If the supply voltage VS is 9V and the current i must be 15mA = 0.015A.

Resistor R = (VS - VL) / i = (9 - 6) / 0.015 = 3 / 0.015 = 200.

So you can choose a resistor R = 220

It is recomended at this point to purchase your own LEDs - color and bright white. And do some of these small experiments with the LEDs. I would also purchase (4) 1k resistors, (8) 260 ohm resistors and (8) 460 ohm resistors. You can but these from a Radio Shack store located in your area or online at. LED Supplier: www.allelectronics.com or go to www.google.com and type in LED suppliers or electronic suppliers as key words. Your power supply can be a 12 volt battery, a 9 volt battery or 2 1.5 volt batteries. If you do not now how to solder, you can connect all connections on a board with nuts and bolts and wire connectors. See our #378 HV power supply plans.

ALL ELECTRONICS CORPORATION

CAT# LED-83

5V Max
Current 20ma

ULTRABRIGHT WHITE LED, 3MM DIA.(T-1)
.99 cents each - Or shop around for the best qty price.

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More About Connecting LEDs

To connect LED's into a circuit, it is useful to know a little bit about Ohm's Law. A few basic formulas is all that is needed.

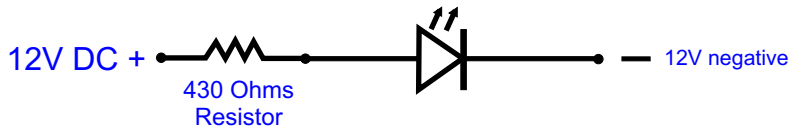
The figures you need to calculate the formula is the voltage you wish to work from, the current you wish to pass through the LED, and the forward voltage of the LED itself. The forward voltage can be found in the data sheet for that particular LED, it is the value of Vf, around 3.4V DC for White and different colors have different values.

Ohms law formula is V = I * R.

As we wish to calculate resistance it can be arranged to say R = V / I.

Connecting one LED and one resistor

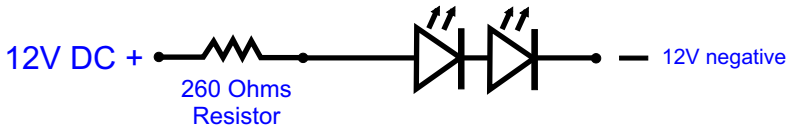
As an example lets say we have a 12V power supply, and we wish to run one Blue LED. We know the forward voltage Vf is 3.4V, and we wish to pass 20mA (0.020Amps) through the LED. Connect the LED and resistor as so.



R = (12 - 3.4) / 0.020
R = 430 ohm resistor.

Connecting two LEDs to one resistor

As we have plenty of volts to drop across the resistor we could add another LED in the circuit which would make the circuit more high efficient. You may notice that the resistor will get warm, depending on power dissipation of that resistor. The reason for the heat is that you are converting energy to heat which is wasted power. By using two LED's there are less volts to loose across the resistor. It will still be the same current as passing thought one LED, in effect you are getting extra light as its two LED's, with less heat being generated.



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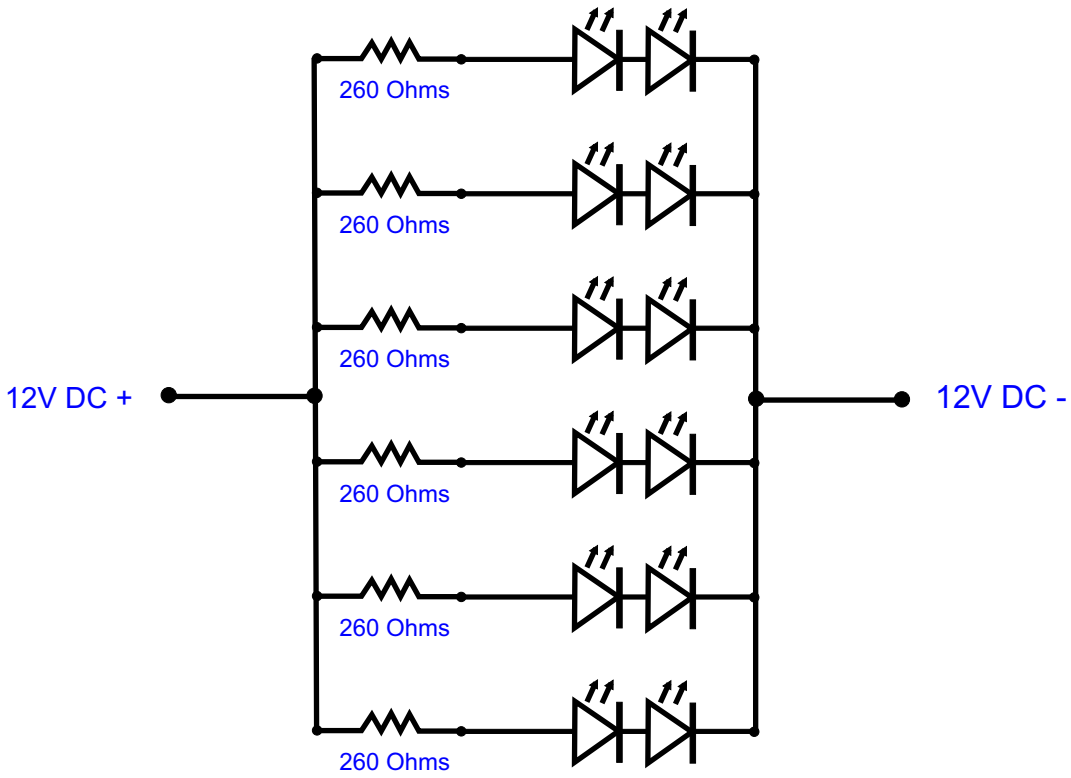
Connecting LEDs in Series and Parallel

The above methods of connecting LED's was in series, if you wished to have many more LED's in the circuit you can basically multiply up the circuit across your power source to have as many LED's as you desire, this is where you may need to take care of the resistor heat, if you have



Multiple LEDs (12) Connected in Series and Parallel

TIP:
You may be able to make your own 12 volt light bulbs using this design. You can then place these LED bulbs with lamps all around your entire home. You can easily convert any 120V AC lamp with a very small 1 amp or less wall transformer. The transformer will step down the voltage to 12V DC. Make sure the you purchase a 12V DC transformer. You can make an AC 12V transformer work by adding a diode on one leg of wire or by adding a full wave bridge rectifier. Any and all of these items can be purchased online or at any Radio Shack store in the USA. Some homes are wired to run off of 12V DC batteries instead of AC and some are 120V AC and 12V DC. If this is what you have are want to do, then you would not need a wall transformer to step down the 120V voltage to 12V DC.

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Helpful Tips

Resistor Color Coding Scheme

There are three types of resistor color coding. They have different number of color bands and hence provide different information. This is illustrated by the next table. You can calculate the value of an unknown resistor by entering its color code in the fields below the table.

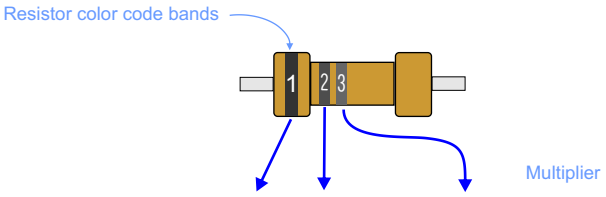
Check out this website - Resistor Calculator

Http://www.ealnet.com/m-eal/resistor/resistor.htm

Or

Http://www.hobby-hour.com/electronics/e24-resistors.php

		
6-band color code 3 digits, multiplier, tolerance, thermal coefficient	5-band color code 3 digits, multiplier, tolerance,	4-band color code 2 digits, multiplier, tolerance,
Enter all the color bands	Select none for field 6	Select none for fields 3 and 6



Black	0	0	x	1
Brown	1	1	x	10
Red	2	2	x	100
Orange	3	3	x	1,000
Yellow	4	4	x	10,000
Green	5	5	x	100,000
Blue	6	6	x	1,000,000
Violet	7	7	x	10,000,000
Gray	8	8	x	100,000,000
White	9	9	x	-

See the color bands on the resistors? They indicate the resistance of the resistor they decorate. For example: What's the resistance of a resistor that is color coded - Yellow, Violet and Red? Look at the chart to the right. Yellow = 4 and Violet = 7, The 3rd number is the multiplier, so since the 3rd color is red the multiplier is 100. Therefore the resistance is 47 x 100 = 4700 ohms.

Now since there was no 4th color band that means the actual resistance is 4700 ± 20%. 20% of 4700 is 940. So the actual value of the resistor is between 3760 and 5640 ohms.

Ohms = resistance

What if you need a resistor that is 7600 ohms but you can only find one that is 7700 ohms? You can still use the resistor since it is 10 to 20% of the required value. If a circuit requires more accuracy it will tell you.

NOTICE: Sometimes there is a 4th band. A 4th band indicates the tolerance of the resistor: GOLD = ± 5%, SILVER = ± 10%, NONE = ± 20%

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More Helpful Tips - Running LEDs on 120V AC

There are many options in running your diodes on 120V AC. The LEDs will not run very well on pure AC, so the AC should be turned into DC. The information discussed here is for educational purposes only. You can have fun trying these ideas out yourself. Would make a great science project. Please notice: We are not responsible for anything in these plans, you build at your own risk.

You can use a capacitor as a reactive element to reduce the AC voltage and limit the current. Assuming the input power source is 60 Hz x 120 VAC.

A 1 uF capacitor will have pretty close to 2600 Ohms resistance. The reactance is inversely proportional to capacitance. A .68 uF cap will be about 4000 ohms equivalent. A 2.2 uF cap will be about 1200 Ohms. Using the formula of Xc = 1/(2*pi*F*C) in Ohms Hz and Farads.

Reducing this
leads to Xc = 1,000,000/377 * C (in uF), or approximately 2600*C (in uF).

A Simple Circuit

A simple circuit uses a cap in series in one line, and a small fuse (1/8 or 1/4 amp max) in series with the other line. These then go to the AC inputs of a 600 PIV or greater 1A full wave bridge rectifier. Across the + and - outputs use a 10 to 100 uF, appropriately voltage rated electrolytic capacitor and MOV (Metal Oxide Varistor). This voltage then feeds the LED(s).

A typical unit uses 36 white LEDs in 4 paralleled strings of nine LEDs in series, with a 180 ohm resistor in each of the 4 strings. This arrangement requires about 33 VDC at 60 to 80 mA.
For this you could use a 39 to 47 Volt MOV, a 2.2 uF 250 VAC mylar or poly capacitor (with a 1 megohm 1/4 watt resistor across it).

For a single string of 9 LEDs, you could use a .68 uF, 250 VAC capacitor.
The reactive element (the capacitor) drops the voltage according to the current drawn. The MOV is there to protect the LEDs from line spikes and transients. The 1 megohm resistor isn't really active in the circuit, it is used to discharge any residual voltage that may remain in the capacitor when the unit is unplugged. This will eliminate any stored charged problems.

A couple notes of caution: Since this is an AC line-operated device, the entire circuitry is HOT, electrically; and NEVER run this on a lamp dimmer circuit, they generate a lot of high frequency component, and the reactance of the capacitor will become much lower, and components will fry.

If all of this has been too complex or confusing then try this very simple circuit!

Try using a 24 VDC wall transformer, and an appropriate sized resistor. If the transformer has a AC output then you must use a full wave bridge rectifier and a 100 uF cap. Use 36 LEDs (33V at 60-80 mA). The 100 uF cap isn't totally necessary, it eliminates flicker and makes the light output a little brighter. 24 VAC RMS is about 33.6 V zero-to-peak, the rectifier and cap will charge up to 33VDC (or a little more, unloaded).

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More Helpful Tips - Running LEDs on 120V AC

If your voltage is 110 VAC should not make any difference. If your power is 60 Hz, no changes are needed. If it is 50 Hz, then increase the capacitor value by 20% or as close as possible. The circuit in the other thread should work, though some parts values might have to be changed.

1 To 9 LEDs In Series -

Also - High efficiency if using a capacitor as a resistor!

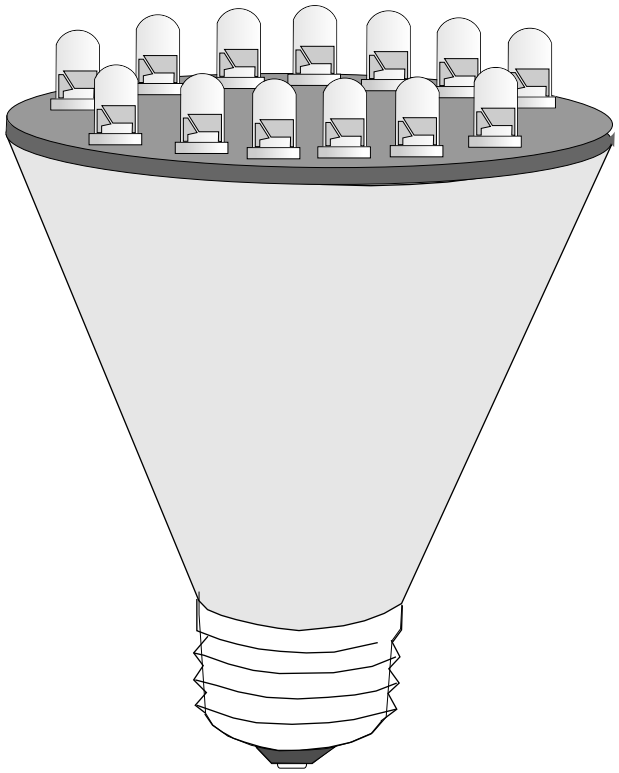
The simplest approach, for 1 to 9 LEDs in series is to use a .47 to .68 uF x 250 VAC capacitor, a single 1N4007 rectifier diode, a 39-47 V MOV (Metal Oxide Varistor), a 10 uF 50 to 100 VDC capacitor and the LED(s).

Assuming 60 Hz, a .47 uF capacitor would have about 5400 Ohms reactance, and a .68 would be about 3900 Ohms drawing 20 mA, that would drop approx 108V or 78V respectively. If you are driving a single LED, replace the MOV (Metal Oxide Varistor) with a 4.7 to 5.1V Zener Diode.

If you want a little less current through the LED, try a .33 to .39 uF cap (standard values, or as close as you can find), those will feed around 15 mA current to the LED(s).

The capacitor gives the voltage drop without generating heat as would a resistor, as voltage lags current by 90 degrees, in a capacitor, and the excess power is not "wasted" as it would be the case, using a resistor.

Figure 1



Make Your Own LED Light Bulbs!

Making your own LED light bulb is not as hard as you would think. The drawing in Figure 1a is just an example of what you can do. It can run on 120V AC turned to DC by using diodes, resistors and capacitors. You will need about 50 to 60 super bright white LEDs. Or you can design the bulb to run on 12V DC (12V DC car battery or deep cycle marine battery. If you make a 12V DC bulb make sure you label the bulb as this: WARNING 12V DC only! Do not place bulb in a 120V AC socket or lamp.

Make sure you place that label on the 12V DC lamp as well. Any lamp can be converted as a 12V DC lamp to except bulbs. You really do not need to change anything on the lamp. You only need to label the lamp as being used as a 12V DC lamp since it will be plugged into 12V DC power supply or output receptacle.

If making the 12V DC type you will need to follow the diagram on the previous pages. You will not need that many LEDs for a 12V bulb. You can place the LEDs anywhere on the circuit board disk. It does not have to be perfect unless you want it to look good. You can draw circles on top of the LED circuit board to place them more evenly on the board. This will look more neat and professional.

The E26 Edison screw can be obtained from an old burnout light bulb. Simply follow the procedures on breaking the bulb in the last chapters to learn how to remove the glass bulb. You can also remove some of the inner glass holding the filament electrodes if you like. If it is in your way. The holding base can be glued to the Edison screw by using 100% silicone or 2 part epoxy. I think silicone is best. You can purchase 100% clear silicone caulking at any hardware store or online.

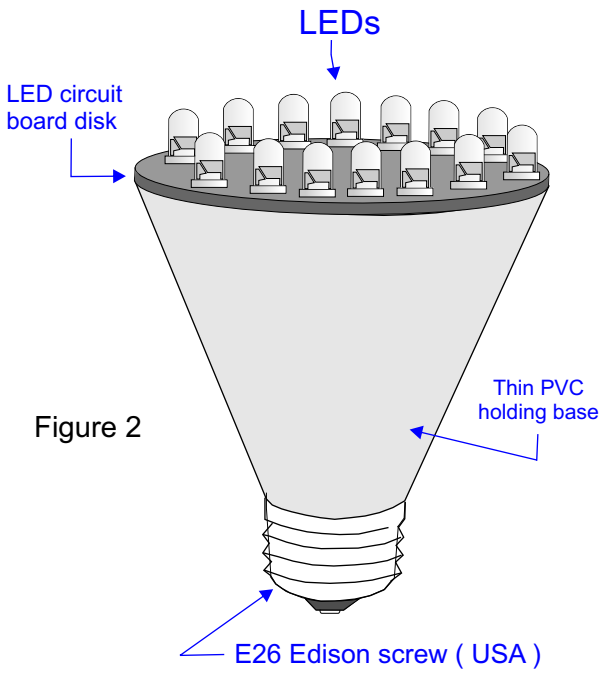


Figure 2

A homemade LED bulb!

A store bought LED bulb. Made by lights of America. Specs maybe included in the back of these plans.

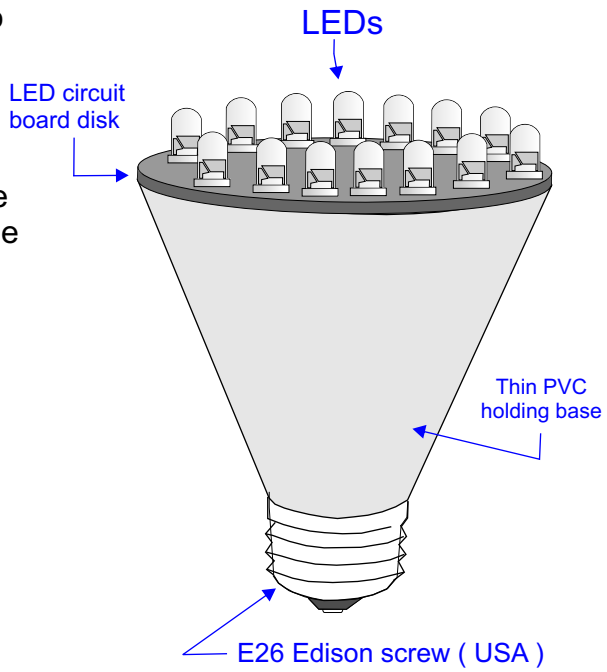
Make Your Own LED Light Bulbs!

Obtain the Edison screw from an old light bulb as sown in prevously. Then take and cut up thin PVC material to make holding base. You can buy thin PVC online at www.smallparts.com or some hardware stores carry yard or wall signs made of thin PVC.

Follow the instructions on the next page and then come back to this page. You will be cutting out and making the PVC cone base for the light bulb.

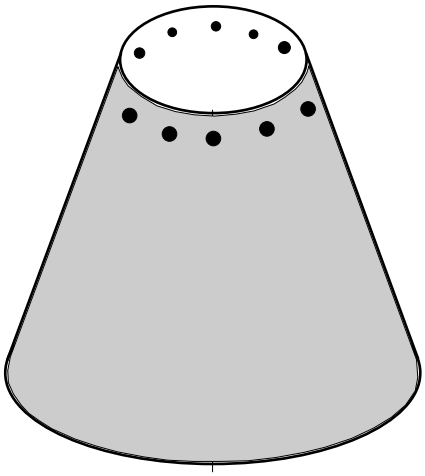
(One you learn how to make your own light bulb you make as many as you need quickly and easily).

Figure 3



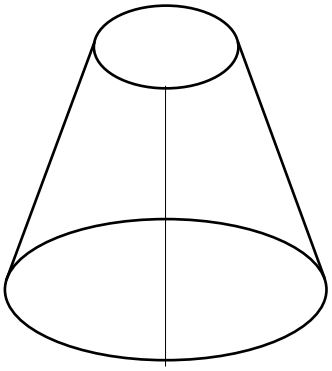
Now drill holes in the smallest end of the cone. This end will go into the Edison screw. The holes are to help hold the PVC cone in a permanent fixed place inside of the screw base, after the 100% silicon is applied to the inside of the Edison screw.

Figure 4



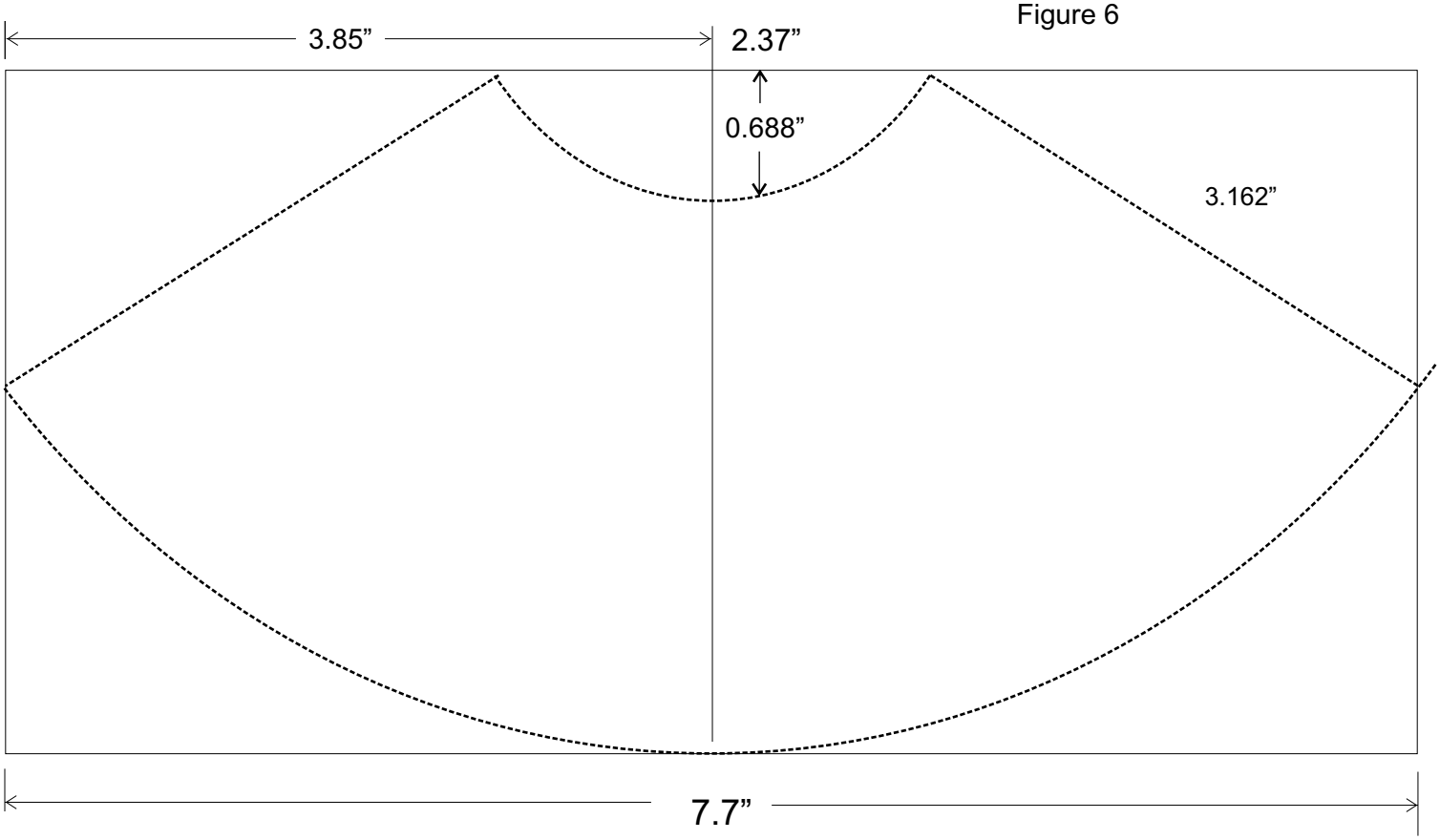
Making The Cone Base

Figure 5



Making the cone base is simple. Just print out the pattern below. Spray the back side of the paper and apply it to your thin PVC or flame resistant plastic material. Cut along the dotted lines. Pre-curve using your hand and the edge of a table. Or place the PVC cone piece that you just cut out on an ironing board. Place cotton cloth or other on top of it. Now apply heat using a hot iron, not to long, just enough time to soften the plastic so you can curve it into shape. (you may want to try a heat gun, you can buy heat guns at lumber yards such as lowes.com). Or if the plastic is flexible enough it may curve easy on it's own without heat. Now over lap the 2 edges and apply PVC glue to make the cone. Let dry and cure for at least 6 hours. You could try flexible cardboard. If so you may want to coat the inside and the outside of the cardboard cone with 2 part epoxy from a hardware store. This may make it more flame retardant.

Figure 6



Cut along the dotted lines. This is the cone pattern.

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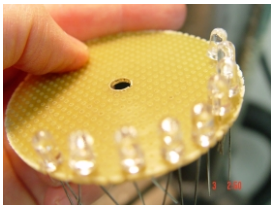
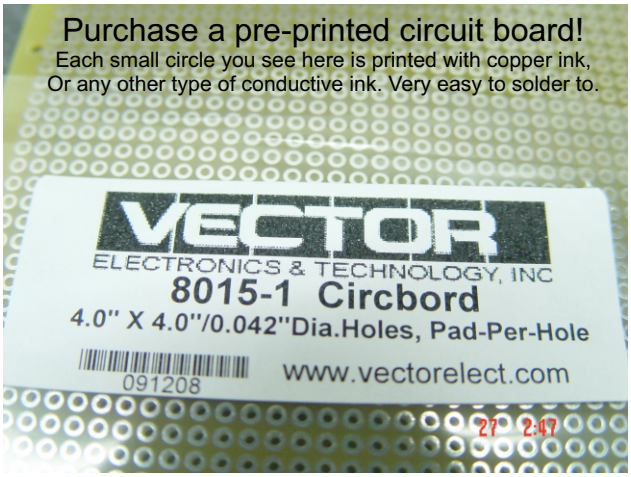
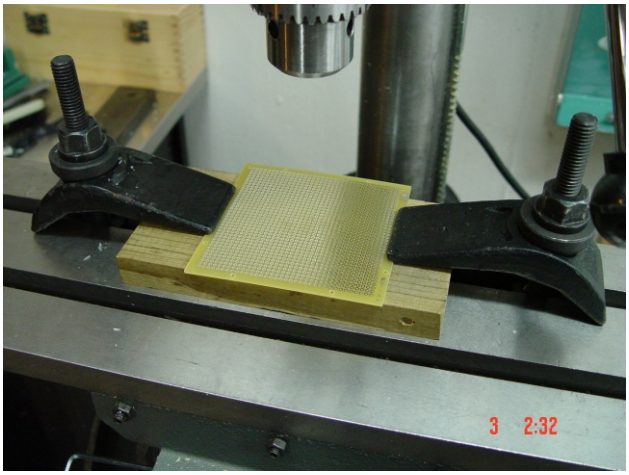
Making The LED Circuit Board



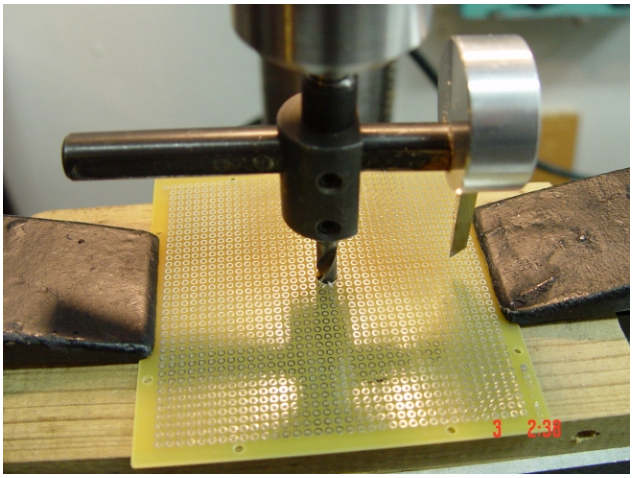
You will now need to cut out the LED disk circuit board for the LEDs to be soldered to. You can use a drill press circle cutter from sears.com. You will need a drill press, table top or floor model. Adjust the belt rpm to 100.



You can get purchase a 4” x 4” Circuit boards at Allied electronics or Radio Shack. Or at any on line electronic supplier. These boards have been pre printed with copper ink. Easy to solder and work with.

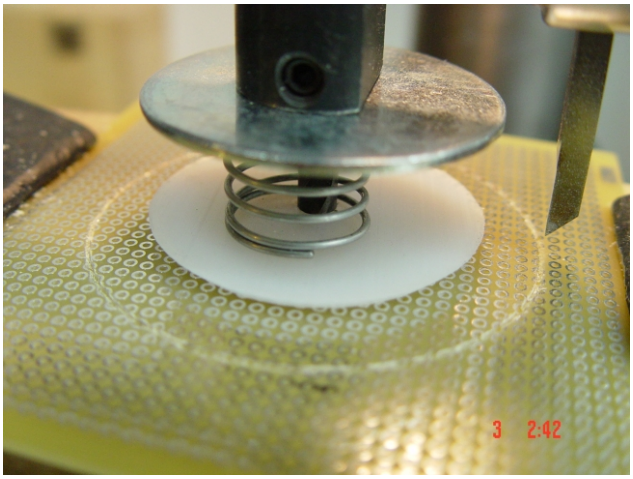


Place the board on the drill press table and secure it to a piece of wood.



Drill your center hole and slowly lower the drill and circle cutter. Make sure to wear a safety mask to protect your eyes.

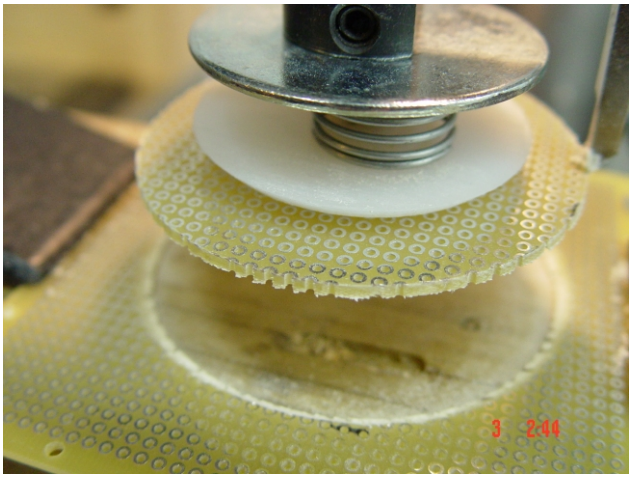
Adjust the cutter to cut a 2 5/8” outter diameter disk.



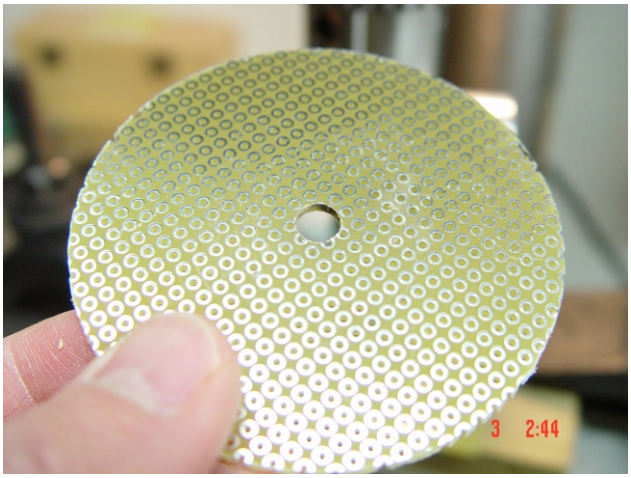
Begin to lower the circle cutter 1/32nd of an inch or less at a time. You can place a metal washer on top with a push spring in the middle and a plastic washer on bottom to push the material down and keep it in place while cutting.

Making The LED Circuit Board

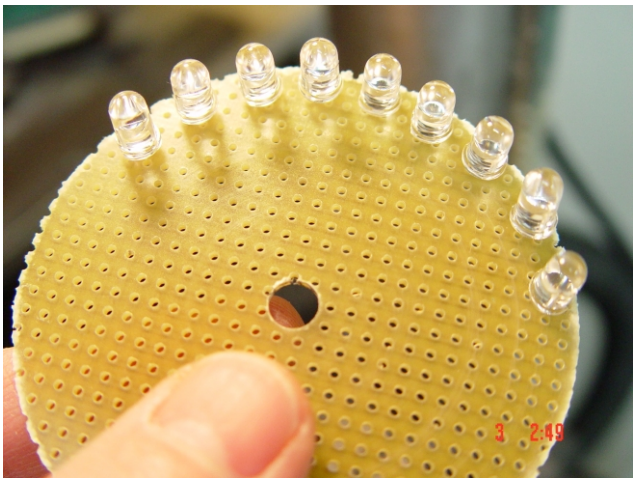
This design will be a flat type. All the LEDs will fit onto one flat surface which is the disk circuit board. The manufactures type as seen on the front cover is a bit harder to make, but can be done at home. You will be cutting a pre-printed circuit board. That is, each small circle is printed onto the board by the manufacture and is of a copper or conductive type material.



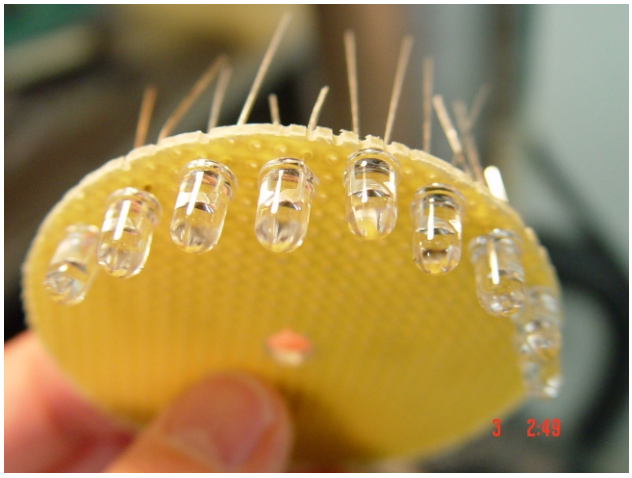
Very slowly and carefully cut, until you cut through. Remove disk.



2 5/8" outer diameter of disk. This is the pre-printed copper side or back side. This is the side you will be soldering the LED wires to. The LEDs will be on the other side. Wires will slip through the holes and out the back. You will want to trim the wires down a bit, shorten them so they don't hang out to far and will be easy to solder to the board.



This is an example of how you will start soldering and placing the LED onto the circuit board disk.



You will want to shorten the wire leads before soldering them in place. Option: You can glue the LEDs into place with super glue or other. Make sure all LEDs are pointed in the right direction of polarity. Once all LEDs are soldered in series. You can weather proof the top by filling in all holes with super glue or other.

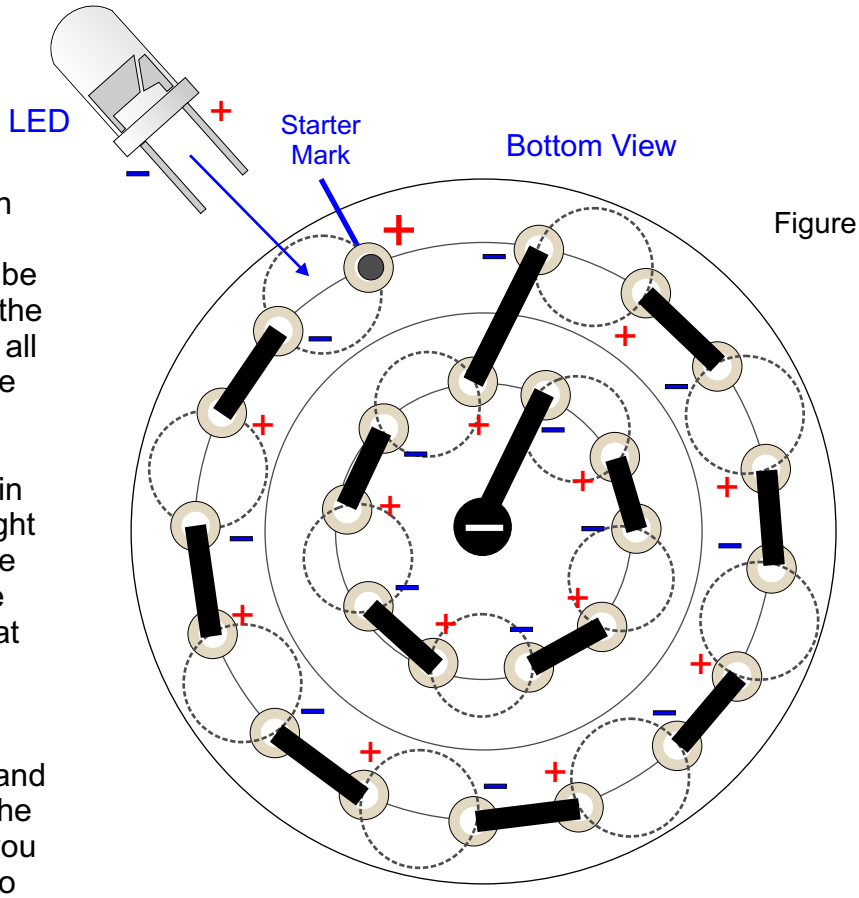


Figure 7

Place a black or blue starter mark on the first LED you put in. Shorten the wires on the LED so the LED(s) will be close to or sitting right on the top of the circuit board. You can cut and place all the LEDs that you are wanting to use in your project, and then super glue them to the top of the circuit board. Make sure that they are all pointing in the right direction. Positive on the right and negative on the left. Allow for the super glue to dry. Before you cut the wires you can mark the wire lead that is the shortest as the negative side. The longer wire is the positive. Now using a soldering iron and sloder, solder the wire terminals into place and use enough to fill the gap between the - negative and the + positive. After you solder the first one. Apply 3.5 VDC to just that one to see if it still works and was not burnt out by applying to much heat for to long. I think about 4 seconds of heat and solder is about all the LED can take. Let cool before trying again. If you do not know how to solder. Go to Youtube.com there are many videos that show you how to solder.
Use these key words " How to solder ".

NOTICE: This is just an example - not actual size. Please follow the guidelines or info on previous pages as to how many LEDs to use and what to use as resistors.

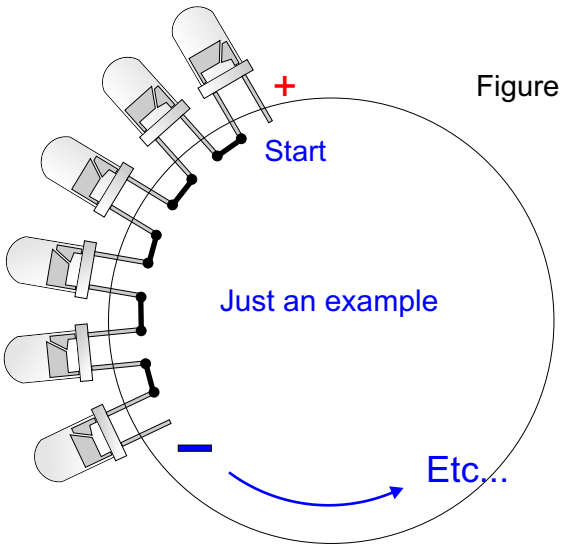
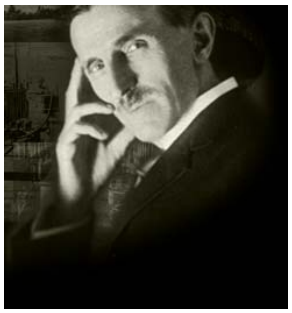


Figure 8

You will need about 60 LEDs connected in series for an input of 120 VDC. If each super bright white LED is rated at about 4.0 V. Then 4 x 60 = 240 volts will give you about a 240 V rating on the entire LED array. You may want to get more ideas from a manufactured LED light bulb before you begin. See the next chapter.

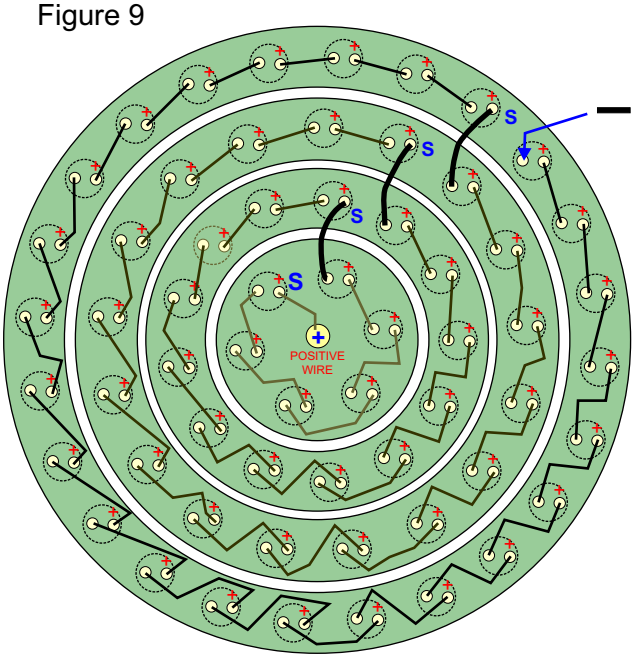


Running 60 LEDs in series x 120V AC to DC or other.

There are many different ways to hook this up. If you ask 7 different engineers on how to run 60 LEDS in series off of 120 VAC you will get 7 different answers. The ideas is to be careful not to burn out the LED. To match the proper amount of electricity and milliamps per LED. To low of a voltage and the LEDs will not light. To high and the amperage rating of the LED will increase and if a resistor is not present in the wiring you could over load the LEDs and burn them out. If you are a beginner it is worth the learning risk. I would go on the internet and try to find the cheapest white LED source I could find. No doubt buying the LEDs direct from China would be the cheapest way to go, but could have a one month delivery time.

60 LEDs can be directly connected to 120V AC without a resistor or capacitor. As long as the incoming voltage is higher than 2V (approx) voltage needed for each LED, all 60 LEDs will light up with the same current of about 20 mA for the entire string. The lights may flicker a bit and give a strobe effect at times. That is because the LEDs are acting as one way diodes and only using half of the AC sine wave cycle. I prefer using resistors and capacitors and for extra safety you can use a 120 V AC isolation transformer. A good design will use capacitors and resistors.

Figure 9



This is an example of 60 diodes connected in series. Taken from an LED light bulb manufactured by Lights Of America. You could take the LEDs and connect them in series as shown. S = start of row or also known as the first LED. Connect your red + positive wire to the center + mark. Connect your - negative wire to the 4th row array. Should be able to take 120 VDC with no problems.

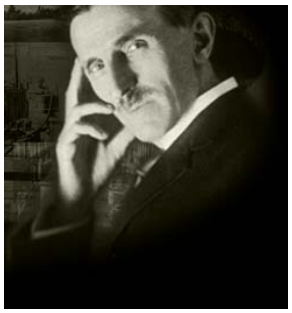
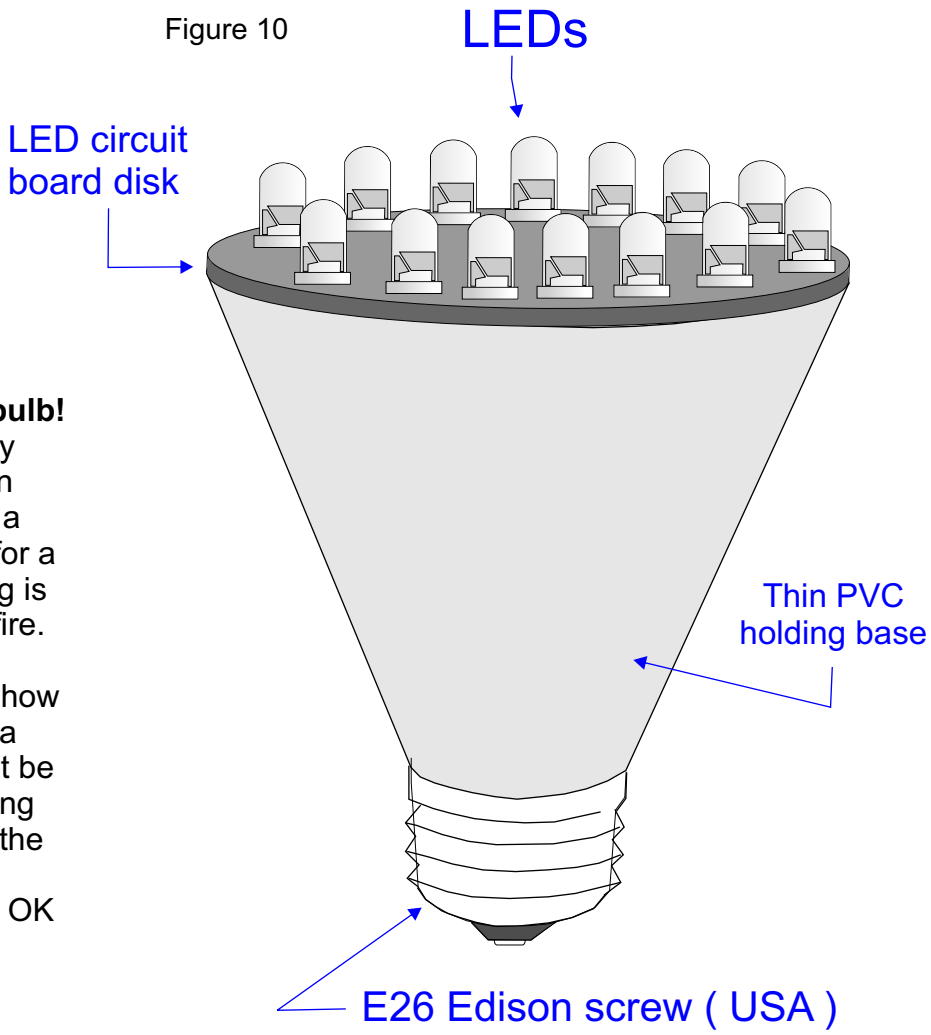


Figure 10



Bulbs containing E26 (USA style) or
E 27 (European style)
bases are usally interchangeable.

Testing your new LED light bulb!
Now test your new LED bulb by pacing it into a lamp. If turns on and does not blow up, you did a good job. Monitor the bulb to for a few hours to make sure nothing is going to go wrong and start a fire.

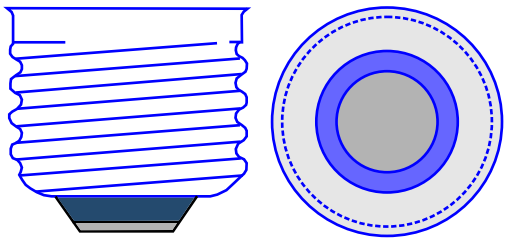
Of course that test would not show what would happen in case of a power surge. If may or may not be safe to leave unattended for long periods of time. If you monitor the bulb for 14 days and nothing happens. I would say it maybe OK to leave on unattended.

Problems?
If it does not work go back and check all connections before you glue it all together.
And try to find what went wrong.

Option: You could also consider trying to make the LED bulb that is manufactured by Lights of America. See the next pages. These lights can only be built for your own home use. You could not manufacture and sell them.

Figure 11

E26



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HOW ITS BUILT!

By David Waggoner 2011

Now let's take apart a professional LED light bulb made by Lights Of America.

If you would like to buy these bulbs instead of making them you can find them online. Go to www.google.com and type

" Lights of America - MODEL # 2004LEDDL "

OR

A website to purchase these type of bulbs would be located at:

http://www.acehardwaresuperstore.com/reflector-led/31391.html

Cost is $10.39 each.

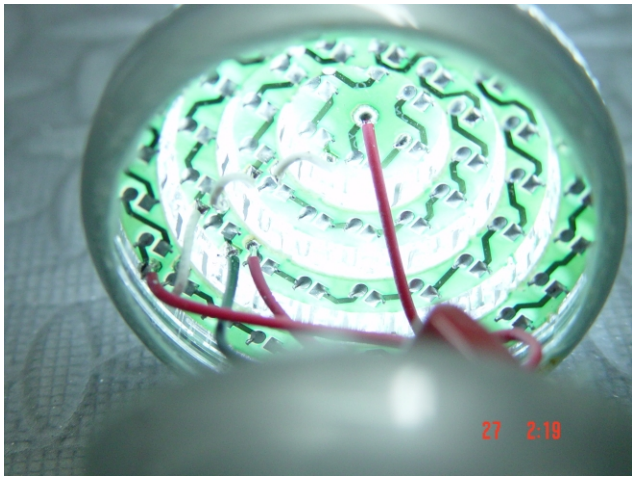
Specs:
Lights of America led downlight accent bulb *3.5 watts *60 - 5mm led bulbs *soft white light *e-26 (regular screw) base *indoor use *5600 kelvin *instant full brightness *15,000 hours bulb life *30 degree beam angle *mercury free *170 lumens

---

The wiring on this bulb looks hard to build but really it is not. You can make your own LED circuit board. It does not have to match this one. Use your own creativity and imagination. We will take apart this bulb and give you all the details so you can one for yourself. You can not legally manufacture and sell them, unless you design your own and get your own US Patent. They are for your own home use only. I have used these bulbs for over 1 year now and they are great! I give them a 4.5 star rating.

Equivalent to a 40W LIGHT BULB!

Lights of America - MODEL # 2004LEDDL



#386

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Anti-Pirate Customer ID # 6832254

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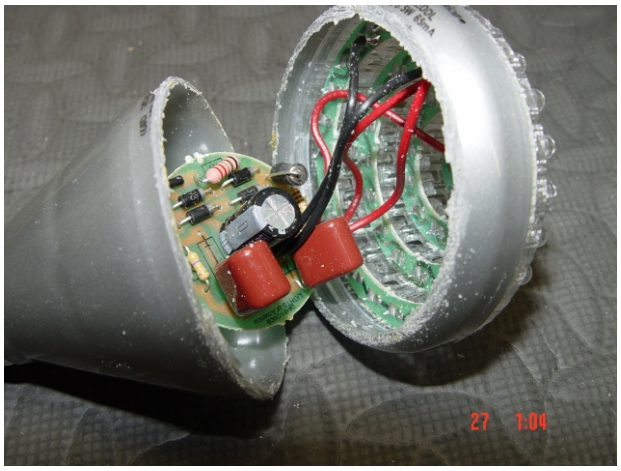
HOW ITS BUILT!

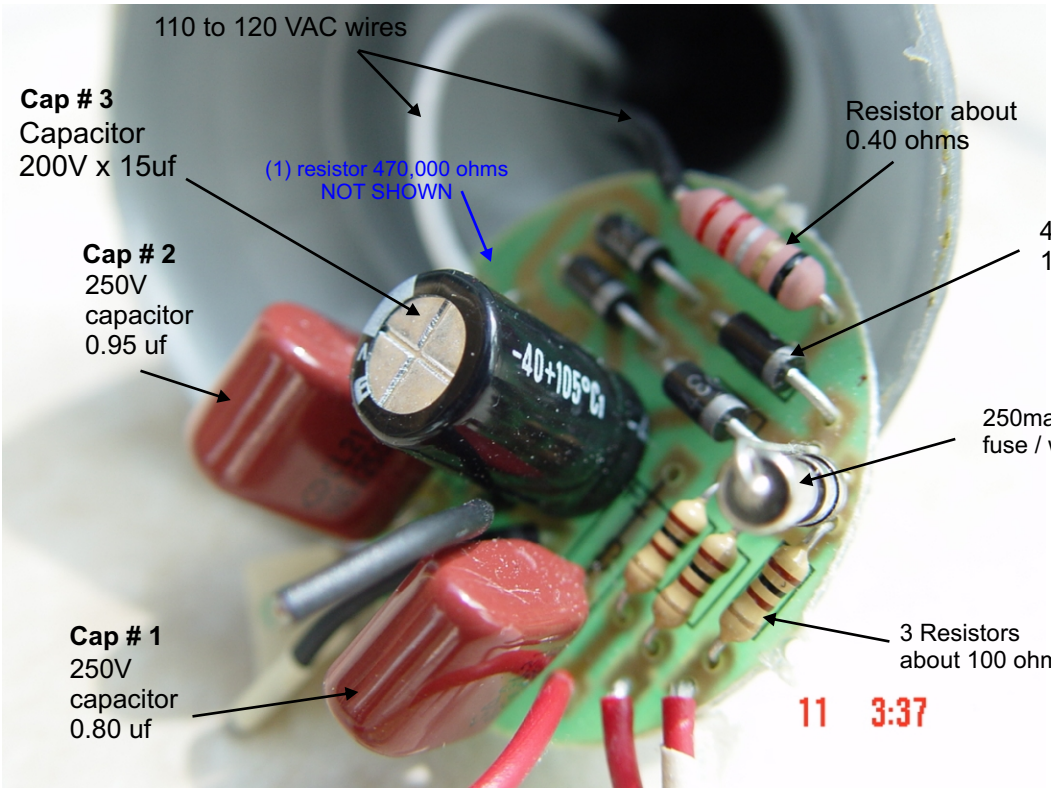


Using a hack saw, we cut the top off to see what was inside.

Hmmm, looks very simple. (3) capacitors, (4) diodes, (5) resistors and 1 radial type fuse rated at 250ma x 125V

250V x .80uf
Allied Stock#: 862-0920
Mfr. Part#: DME2P82K-F

You maybe able to use this capacitor for Cap # 1 & 2



You will need: (4) Diodes 1N4937, (1) Resistor 470,000 ohms (Color code: Yellow, violet, Yellow, gold). (1) Resistor *about* 0.40 ohms (Color code: Red, Red, Silver, Gold, Black =). (3) Resistors 100 ohms (Color code: Brown, Black, Brown, Gold). (1) 250ma fuse with radial holder. Rated 125v. (1) capacitor (blk) rated 200V x 15uf. (1st) Brown capacitors rated 250V x 0.95uf. (2nd) Brown capacitors rated 250V x 0.80uf - These are just rough estimates, get as close to those ratings as you can. They seem to be using the 2 brown capacitors as resistors.

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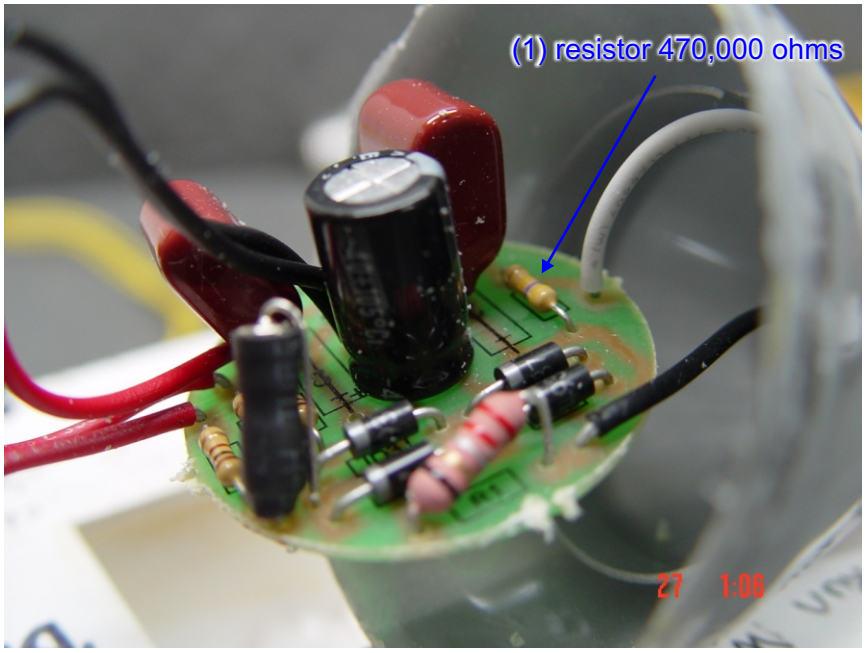
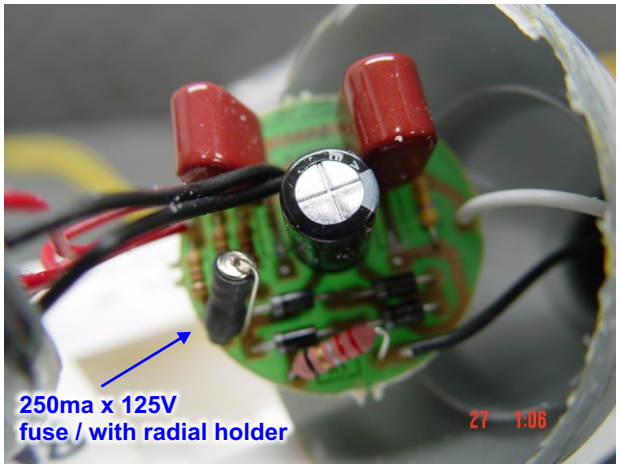
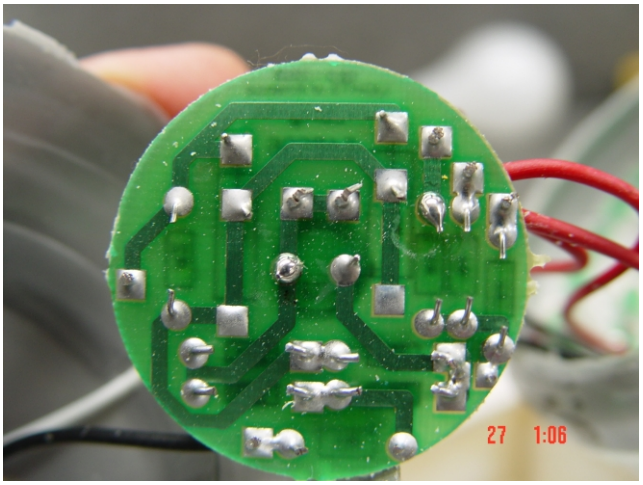
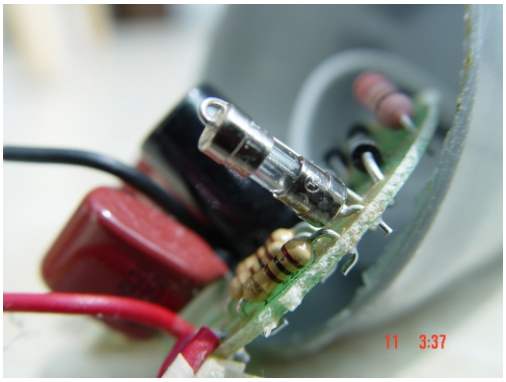
HOW ITS BUILT!









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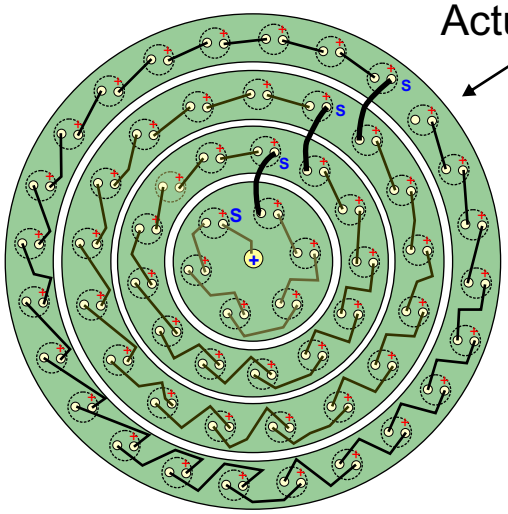
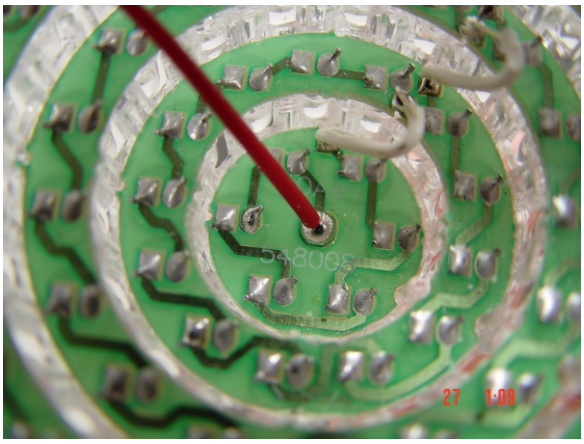
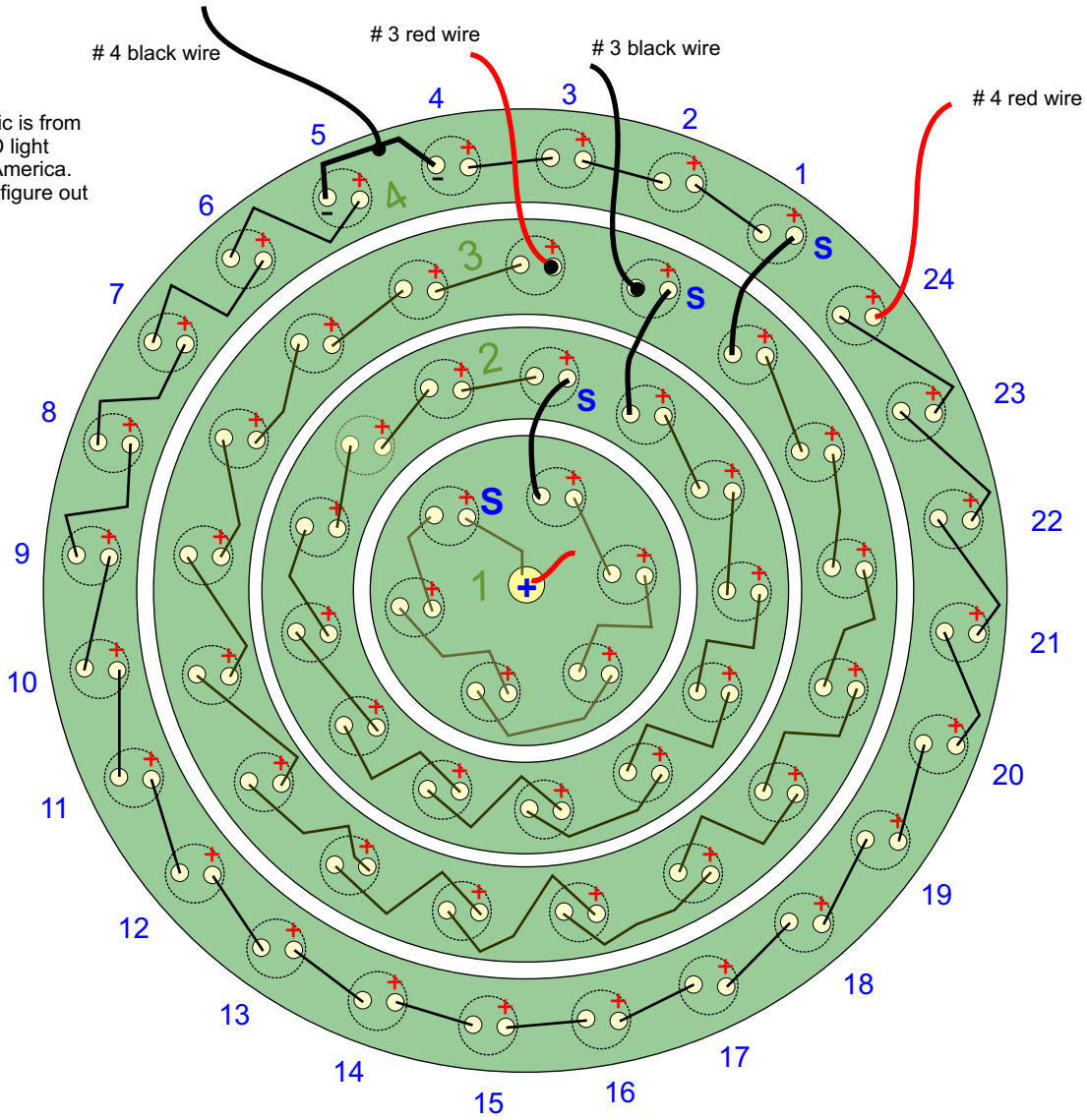
Actual Size





This wiring schematic is from a manufactured LED light bulb from Lights of America. We tried our best to figure out the wiring.



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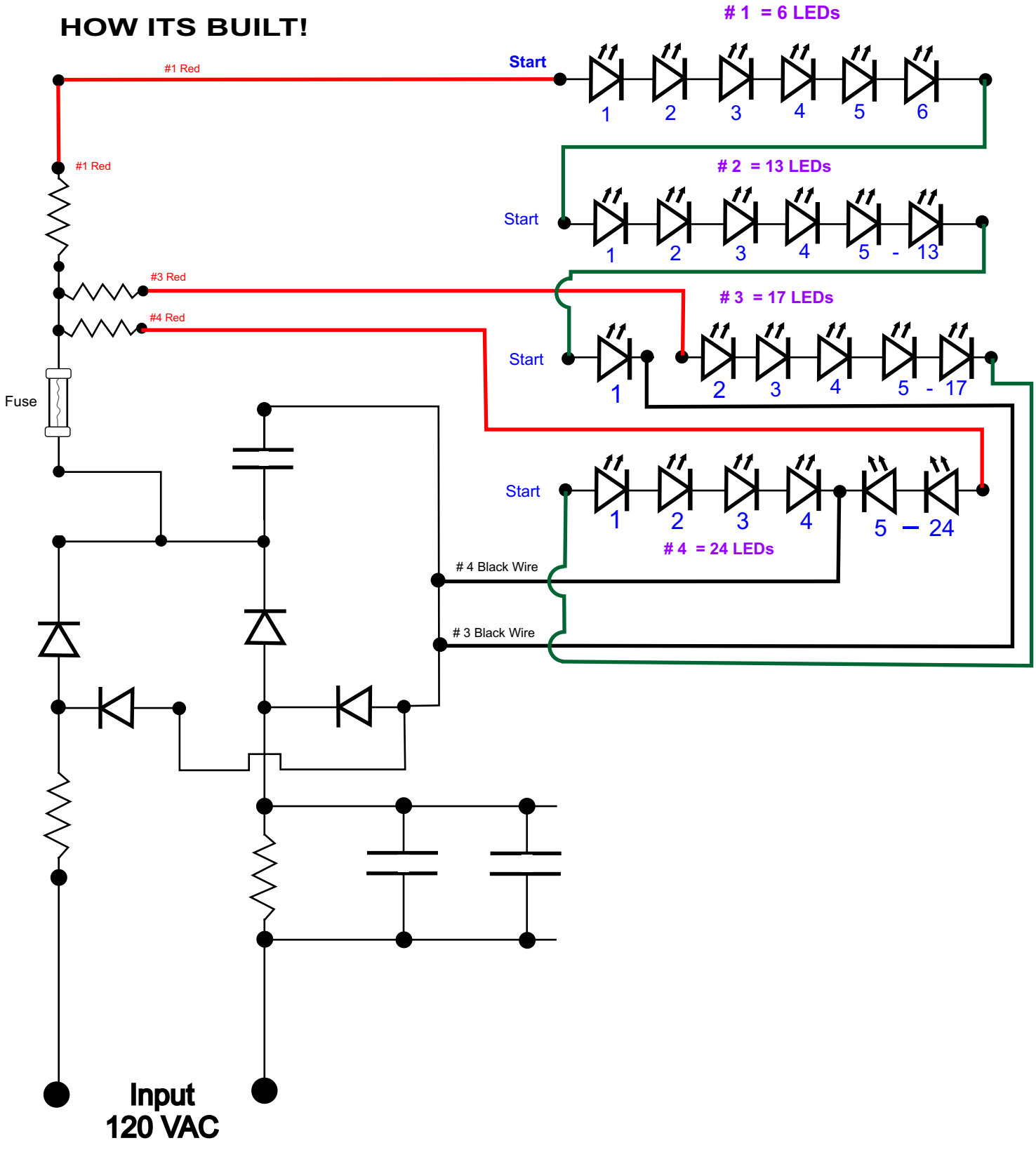

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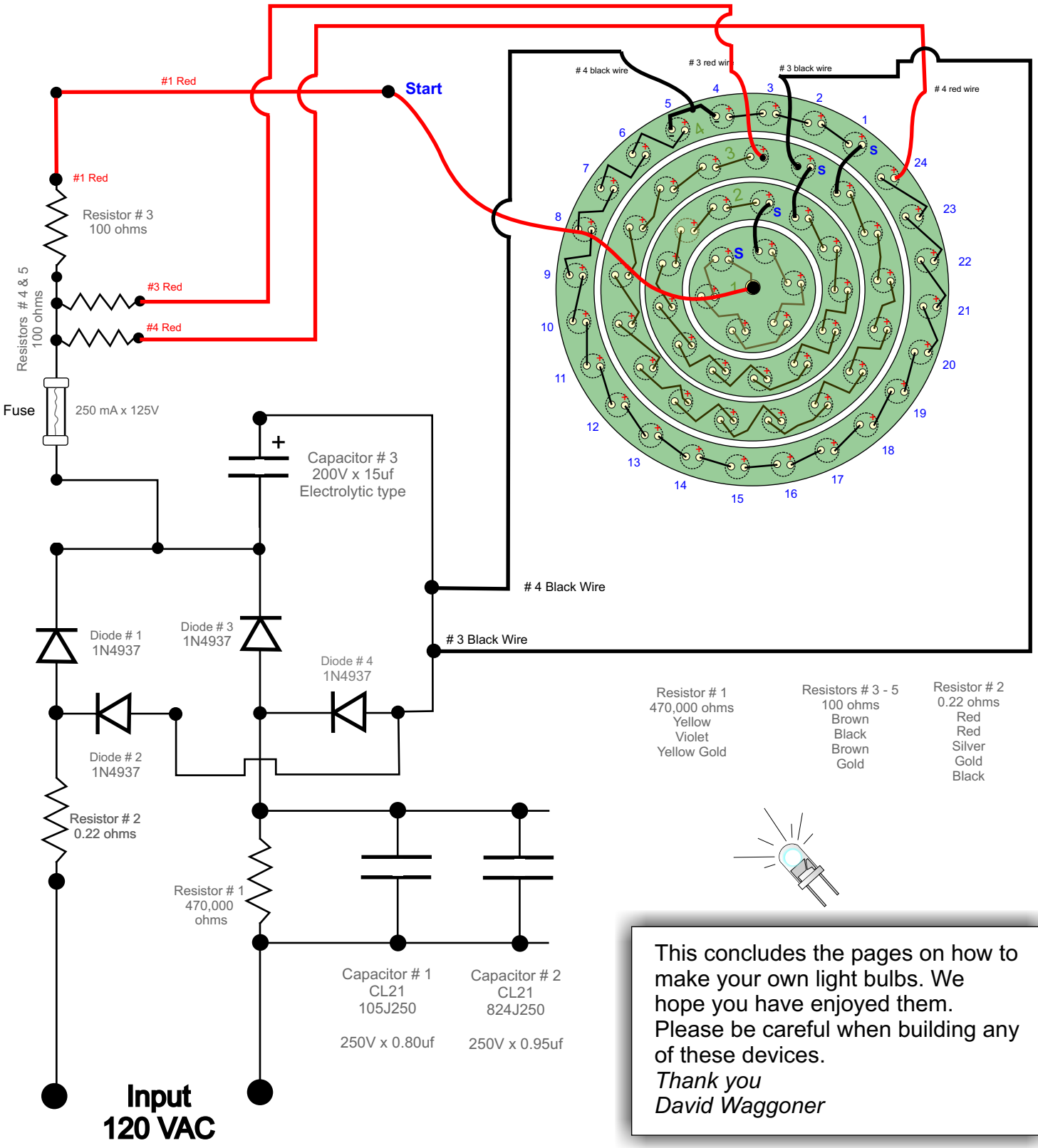
HOW ITS BUILT!



This concludes the pages on how to make your own light bulbs. We hope you have enjoyed them. Please be careful when building any of these devices.

Thank you

David Waggoner

What? Thomas Edison Did not invent the light bulb? .

Contrary to what schools have taught for many years, **Thomas Edison**, did not invent the light bulb, nor did he hold the first patent to the modern design of the light bulb.

It seems we gave Mr. Edison credit for the invention solely because he owned a power company, later known as **General Electric**,

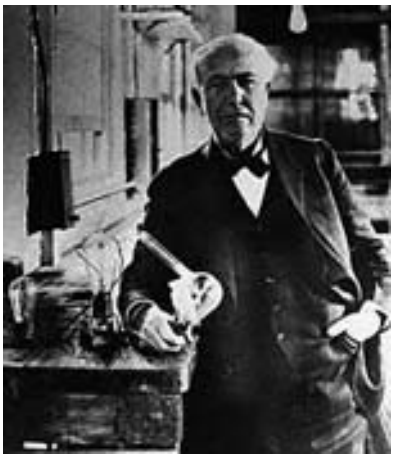
Light bulbs used as electric lights existed 50 years before Thomas Edison's 1879 US patent.

It was **Joseph Swan**, a British inventor, who obtained the first patent for the same light bulb in Britain one year before **Edison's** patent date. Swan showed many people his carbon filament light bulb in New Castle, England about 10 years before Edison shocked the world with the announcement that he invented the first light bulb. The fact was, Edison's light bulb was a carbon copy of Swan's light bulb invention.

Swans light bulb invention was shown in a magazine called Scientific American.

Without a doubt, Edison had access to, and eagerly read this article. Giving Mr. Edison the benefit of the doubt, and stopping short of calling him a theif, we can say that he invented the light bulb by making vast improvements to Swan's published, yet unperfected designs.

Swan, was very angry with Edison as he watched him make a load of money from his invention. He took Edison to Court for patent infringement. The British Courts stood by their patent award for the light bulb to Swan, and Edison lost.. The British Courts forced Edison, as part of the settlement, to name Swan a partner in his British electric company. Eventually, Edison managed to buy all of Swans' interest in the new company that was now renamed **Edison and Swan United Electric Company**.



Edison did no better back home in the U.S. the U.S. Patent Office ruled, on October 8, 1883, that Edison's patents were invalid, because he based them upon the earlier art of a gentleman named William Sawyer. To make matters worse, Swan then sold his U.S. patent rights, in June 1882, to **Brush Electric Company.** This stripped Edison of all patent rights to the light bulb, and left him with no hope of purchasing any.

Edison dusted himself off, and went into business setting up a direct current (DC) power company in New York City, and selling swans light bulbs that used this electricity. The light bulb business flickered between 1879 and 1889, Edison's customer base rapidly expanded to three million customers over the span of 10 years.

I'll Bet You Didn't Know,
The first light bulbs lasted only 150 hours, and then ten years later, Edison introduced one that lasted 1,200 hours? The average light bulb today lasts about 1,500 hours. You could build one that last longer.

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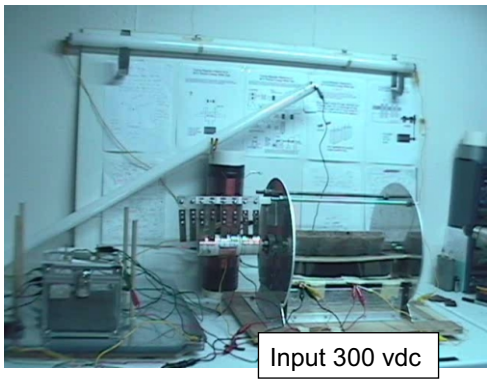
Creative SCIENCE

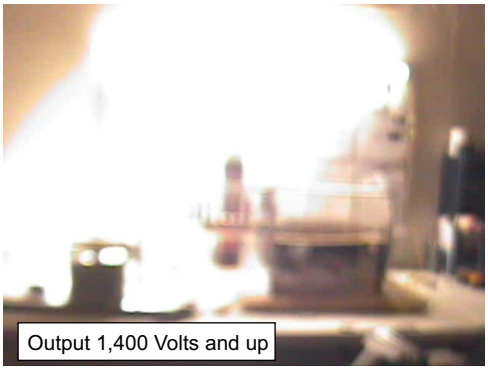
Lab Research Photos

Photo 1

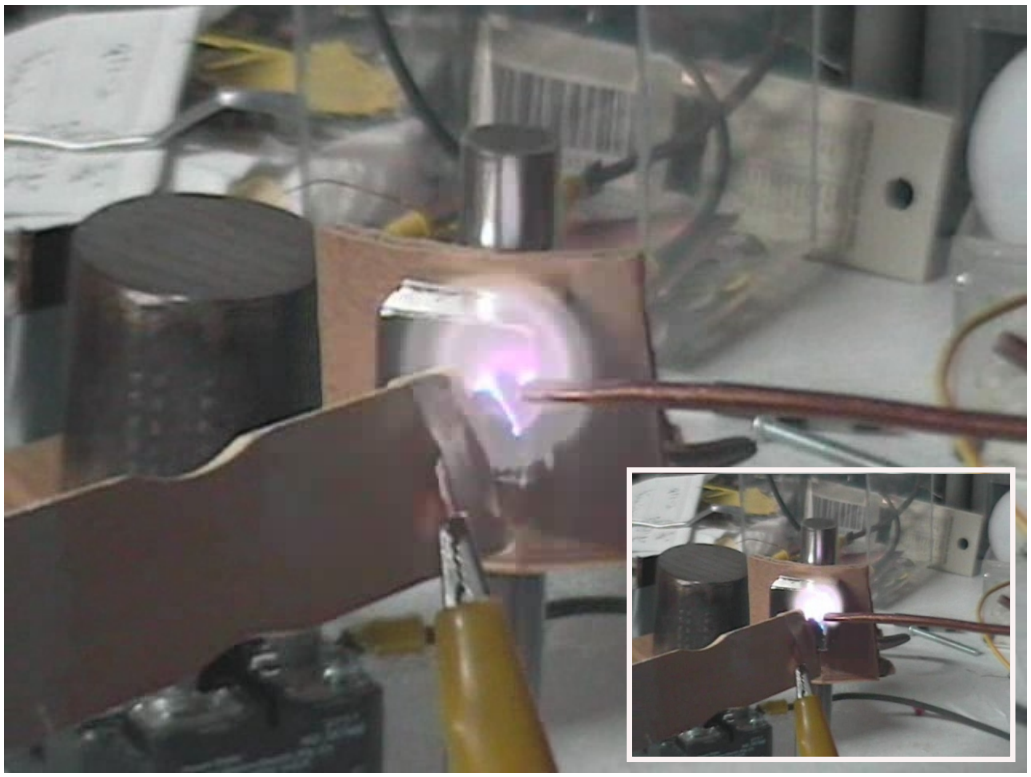


The Fuelless Engine

Photo 2



Free energy spikes from back emf



Creating plasma arcs

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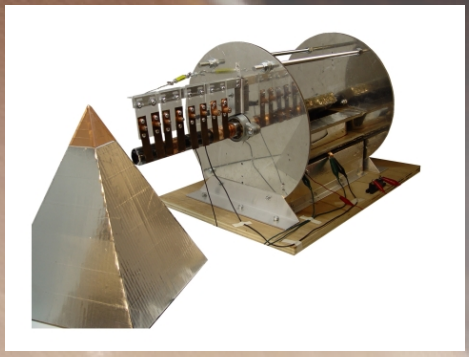
Fuelless ENGINE

Alternative Energy

Learn How To Build A Free Energy Motor!

Invented by David Waggoner of New Albany, Indiana USA
New Albany is located right across the Ohio river from Louisville Kentucky



The Fuelless Engine # 362-RC350

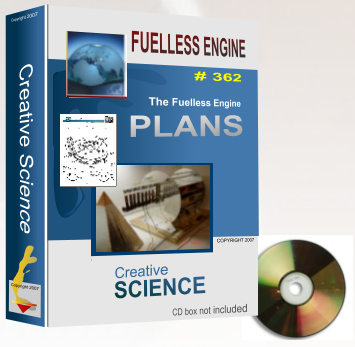
FREE ENERGY - FREE POWER FOR YOUR HOME, GARAGE CAR!
These type of motors have been seen and demonstrated on the Johnny Carson Show, as well as many local TV news and radio shows all around the country in the early 1970's and 1980's. These motors can be designed to run at any speed, from 0 - 5,000 rpms

I have spent hundreds of hours testing and designing this device! When you buy these plans you will not be disappointed! There is no other engine like it! We have customers that have successfully built this motor. We have made it easy for just about anyone to build this motor in the convenience of there own home, garage or basement. Use this motor to power our SP500 AC generator to generate AC electricity! The motors rpms can be designed to be adjustable. Our prototype designs can be scaled up to run at any horsepower you may desire.

These plans are loaded with information! Plans are professionally done and easy for many home owners to understand and build. David takes you step by step in building this awesome free energy device! Loaded with color photos, professional drawings and illustrations. Our free energy video shows our motor's running inside and out. Many clear and crisp close ups! David demonstrates our large hp motor and at the end of the video he demonstrates one of our smaller free energy motors, input energy versus output energy! By viewing this video you will see that our motor clearly demonstrates more output than input energy!

MANY MAGAZINE ARTICLES HAVE BEEN WRITTEN ABOUT OUR ENGINE! You may have read about us in the 1996 July Issue of Exotic Research magazine. Popular Science has also done a few articles on free energy in the early 1900's and then they suddenly stopped? See our website for more details.

Plans and videos are available on download or on computer CD. Download links can be sent by E-mail. Cds can be sent by air mail. Plans show you how to build a smaller HP motor and explains how you can scale our design up to achieve higher horsepower levels. Using our design, any horsepower can be possible. See our website for the latest prices, Updated news and for more details which are not included in this catalog.



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Designed for our Fuelless Engine Motor!

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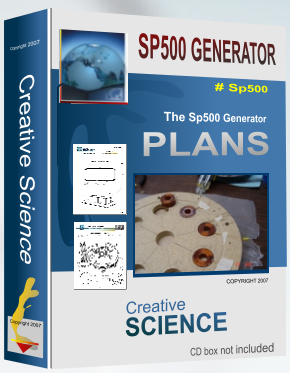
This generator design is very high efficient, unlike any other generator I have seen today! Can easily be designed to operate at much higher voltages than 120 V AC. Great for many high voltage projects. Our prototypes can be scaled up to run at any voltage or amperage output needed. We think we have made these plans easy for just about anybody to build in the privacy of their own home. You do not have to be an electrical engineer to build this.

" I discovered this new type of energy when I was working on another project many years ago. I placed a special coil and aluminum configuration next to a moving N38 Neodymium magnet and what I saw on my volt meter just blew me away! I could not believe what I was seeing! The voltage output was like nothing I had ever seen before. From there I designed the Sp500 generator! I don't think there is a generator like this anywhere in the world!

I personally Guarantee The SP500 to work or your money back!

Thank you
" David Waggoner "



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THE AIR ENGINE

AS SEEN ON Headline News

Jan. 1998

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These plans are loaded with information. But, you may also want to consider building our Fuelless Engine motor and SP500 AC Generator. They are much more high efficient than air motors, will last longer and are easier to build using our step by step plans.

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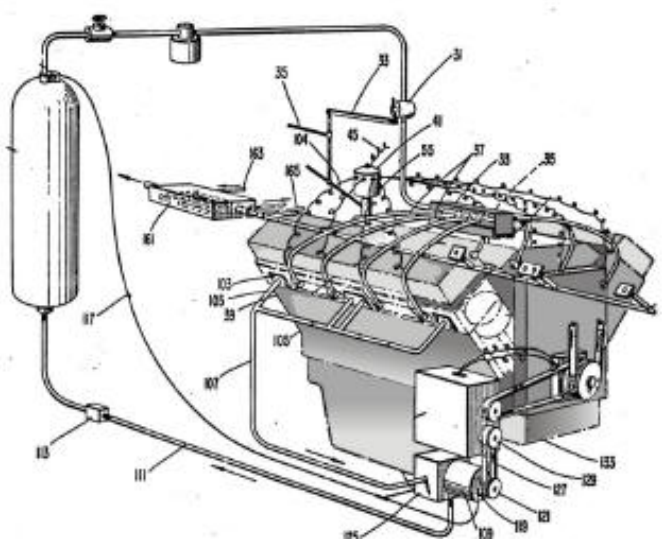

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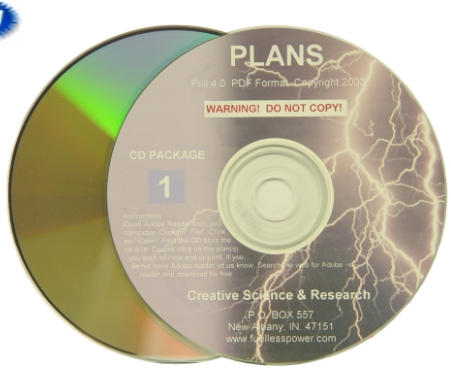

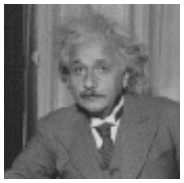

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