Fireworks Controller

by systemf92 on July 9, 2008

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Intro: Fireworks Controller

This instructable is on a 12 channel fireworks controller that I built during the summer. It was a lot of fun to build, and is a blast (pardon the pun) to operate! I couldn't find a good quality instructable on building a complete fireworks controller like this one, so I decided to write my own.

DISCLAIMER:
The information contained herein is for the sole purpose of information and education. **Build this project AT YOUR OWN RISK.** I have NO responsibility whatsoever for any **injury, death, or damage to property** of anyone operating or involved with using this fireworks controller. **In no event will the author (Systemf92) be liable for any loss or damage including without limitation, indirect or consequential loss or damage, or any loss or damage whatsoever arising from the use of, or in connection with the use of this firework ignition controller.**

Fireworks are dangerous, so watch what you are doing and don't do anything stupid with this. Be careful when handling explosives. Clear the area before launching the fireworks, check to make sure your battery is disconnected while wiring up the fireworks. Once again, **build at your own risk** .

Okay, now that that's over, on to the fun part!

Step 1: Parts

Here is the parts list. I bought most of the electronics from Jameco , but also bought things from Parts Express , Radioshack, and Michaels.

From Jameco Electronics1- 12v Sealed Lead Acid Battery
1- SPST (Off-On) Keylock switch
1- SPDT (3 position On-Off-On) Toggle switch
24- LED mounting hardware
12- SPST (Off-(On) Momentary) Pushbutton switches
12 - Red LEDs
12- Green LEDs
48 - 470 ohm Resistors
12- Alligator clip pairs (24 total)
2- battery clips
1- 1/4" fuse (there is no specification on the fuse for right now, the original fuse value had not worked and I am currently figuring out what amperage fuse to use. Sorry for the inconvenience. You can still build the controller, since it still works without a fuse. Use a short piece of wire to bypass the fuseholder for now.)
From Parts Express6- Four conductor speaker terminal
Check out this page for different types of terminals. This controller's circuit is expandable, so it can have as many channels as you want it to have, so be creative!
From MichaelsOne 12 x 12 piece of wood panel - **must be 1/8" thick** - available at Michaels, possibly at hardware stores
Other Parts> A case to put it all in -I got mine at a thrift shop for $5.00. It was used as a carrying case for an old VHS video camera.

> 12 short wood screws (that fit inside speaker terminal mounting holes but can still reach the wood panel below them)

> **Also, you will need wire for connecting the panel components.** I used 22AWG solid wire, but any wire from about 22-18AWG should work fine.

> You will also need long speaker wire or any insulated 2 conductor wire. How much depends on how much you can afford or how far away you want to be from the fireworks. Both Lowes and Home Depot sell some cheap wire in bulk and in spools. Wherever you buy it, buy it in bulk to save money. We're not looking for audio quality here. I used 18 gauge lamp wire, which I bought in a bulk spool and cut into smaller lengths.
Not every one of these parts *has* to be used, feel free to experiment or use different switches, buttons, terminals, etc. Make yours unique to suit your needs, you don't have to build yours like mine, but you can.

Image Notes
1. 12 volt battery
2. speaker terminals
3. SPDT toggle switch
4. LED mounts
5. keylock SPST switch
6. Green LEDs
7. Red LEDs
8. 100 resistors
9. battery terminal connectors
10. Alligator clips
11. pushbutton switches
12. wood supports
13. not used
14. fuses
15. fuseholder

Image Notes
1. keylock switch
2. LED mounts
3. SPDT switch
4. speaker terminals
5. pushbutton switches
6. not used
7. fuseholder

Image Notes
1. battery
2. Green LEDs
3. Red LEDs
4. Alligator Clips
5. 100 pack of 470 ohm resistors
6. Battery terminal connectors
7. fuses

Step 2: Hardware needed

Woodworking Tools

- Drill (hand or power)
- Ratchet brace (or a bigger drill). I have one of these, so I used it. You don't *have* to use this.
- Auger bits (spiral shaped large drill bits)
- Drill bits - check with the place you bought your components from for hole diameters and dimensions.
- Dremel or other rotary tool
- Dremel bits (sanding)
- A small saw (for cutting the plywood)
- C-clamps
- Screwdriver
- Pencil
- Ruler

Notes:
A drill press would help to cut the holes in the panel, but I don't have one of those and you can still cut the holes with a regular drill.

If you don't have the right size drill bit for all of the panel-mounted parts you can use a dremel to widen the holes like I did.

Electronics Tools

- Soldering iron
- Rosin-core solder
- Electrical tape
- Needle nose pliers
- Wire cutters
- Scissors
- Helping hands (or buildyourown)

Image Notes
1. hand drill
2. pencil
3. sandpaper
4. c-clamps
5. drill bits (lots of sizes)
6. dremel bits (for sanding and widening holes if you don't have the right drill bit)
7. ruler
8. small saw
9. auger(brace) bits
10. rotary tool
11. ratchet brace

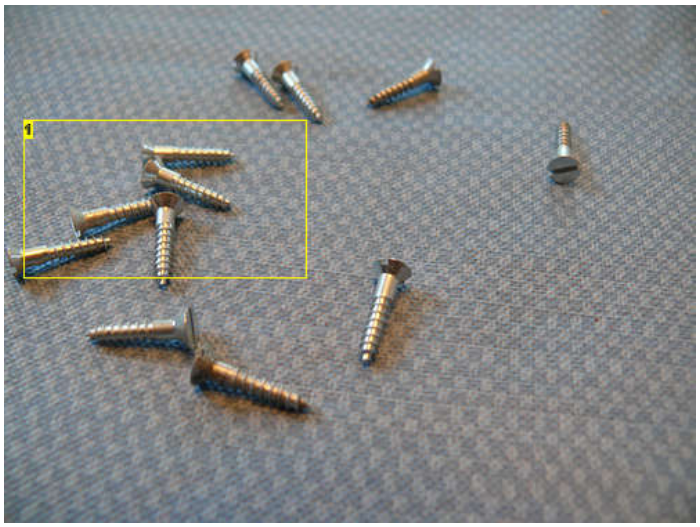


Image Notes
1. wood screws (for the speaker terminals)

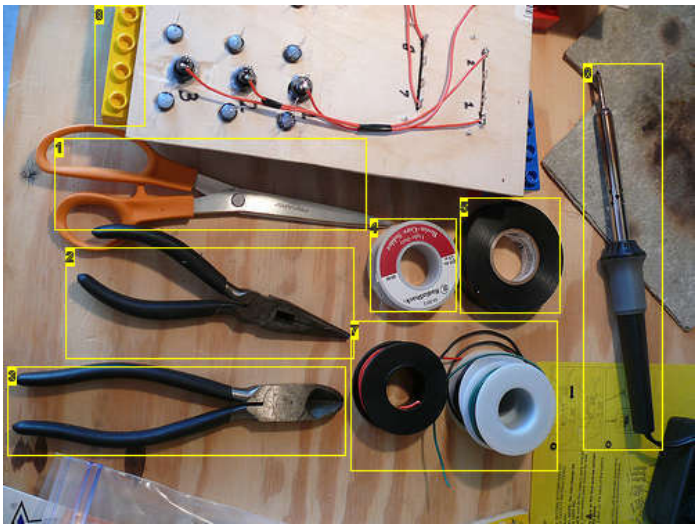


Image Notes
1. scissors
2. needle nose pliers
3. wire cutters
4. light duty rosin core solder
5. electrical tape
6. soldering iron
7. assorted 22AWG wire
8. something to keep the panel off of the table so it isn't resting on components while soldering

Step 3: Designing a template

I just sketched a template for the panel out on paper to start with. You can arrange things however you like on the board, depending on the size of the case you are putting everything in. I designed everything on a 8.5"x11" piece of paper and just centered it on the wood panel (12"x12") when it was time to start cutting.

Start with arranging the speaker terminals, which I put on top in two rows of three. They have an outside dimension of 2-3/4" x 15/16".

Next came the toggle switch, key switch, and fuse holder. I centered the toggle switch horizontally on the board right under the speaker terminals. The key switch is to the right of the toggle switch, and the fuse holder is to the right of the key switch.

Underneath these main switches are the pushbutton switches and LED status indicators.
The buttons I arranged in 4 columns of 3 buttons. Each button also has two LEDs; one on either side. I did not include the LEDs on the template, because I just eyeballed where to put them. You also might want to arrange them differently on yours, by putting the LED pairs under the switch or above them instead of on opposite sides.

Attached is a PDF template so you can print it out yourself. Print it and tape it over the panel you choose to use, and you can drill/saw through it to get everything properly lined up if you want to match my layout.

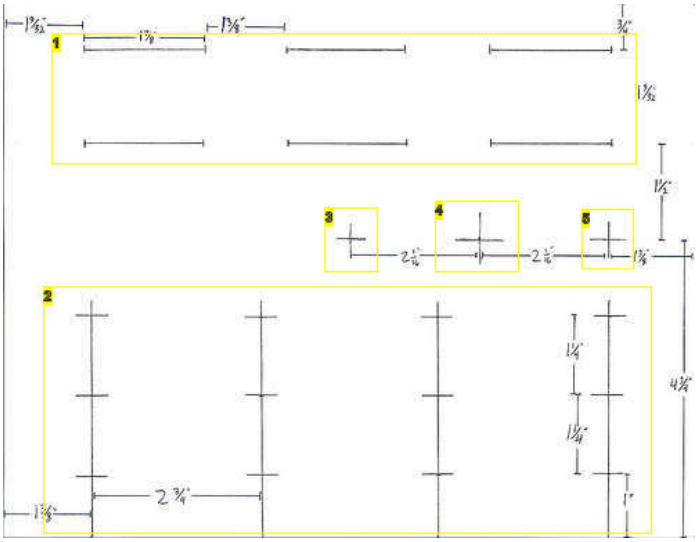


Image Notes
1. speaker terminal slots
2. push button switches
3. toggle switch
4. key switch
5. Fuseholder

File Downloads

controllertemplate.pdf ((612x792) 48 KB)
[NOTE: When saving, if you see .tmp as the file ext, rename it to 'controllertemplate.pdf']

Step 4: Cut the wood

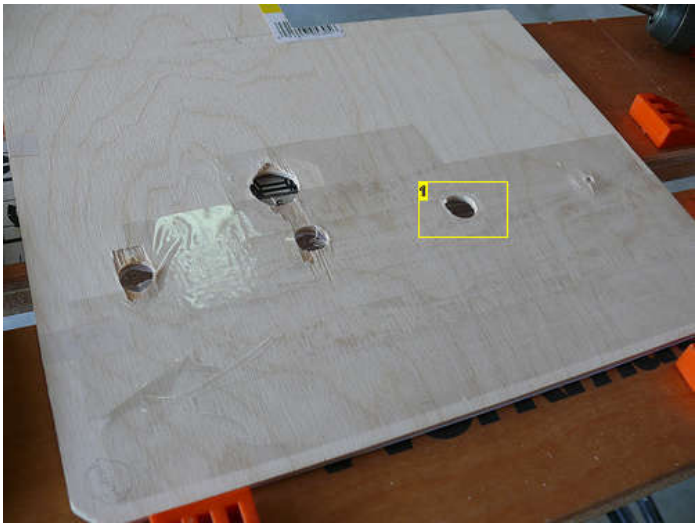
Now that you have your template designed, its time to start cutting the wood. I started out cutting the key switch hole, since it was in the middle. I then moved on to the pushbutton switches, then the speaker terminals, and then the toggle switch and fuseholder holes. You can do it in whatever order you like.

One thing I do suggest is to cover the back with tape to prevent splintering of the wood since you are working with such thin material. I also drilled halfway through one side and then flipped it over to drill all the way through the other side to keep it from splintering even more.

After that you should drill the toggle switch and fuse holder holes (I didn't do this in order, don't know why not). I don't have the correct size drill bit, so I used the dremel to widen these holes to the correct size.

After you get those holes drilled, start cutting the slots for the speaker terminals. I used a drill to drill pilot holes at each end of the line, then a small saw to cut the wood in between them. The saw cut a wide enough line to slip the thin metal tabs of the speaker connectors through them. Use a dremel sanding bit to smooth out all the holes and cuts and get rid of rough edges and splinters.

After this you can test fit the components to make sure everything is lined up well and fits. Take everything back out when you are done, because there's more to do.



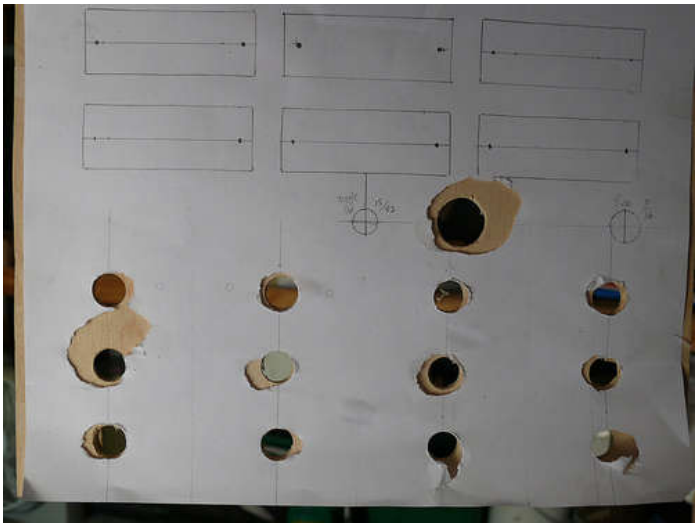


Image Notes
1. notice how the tape helps prevent splintering (sort of)

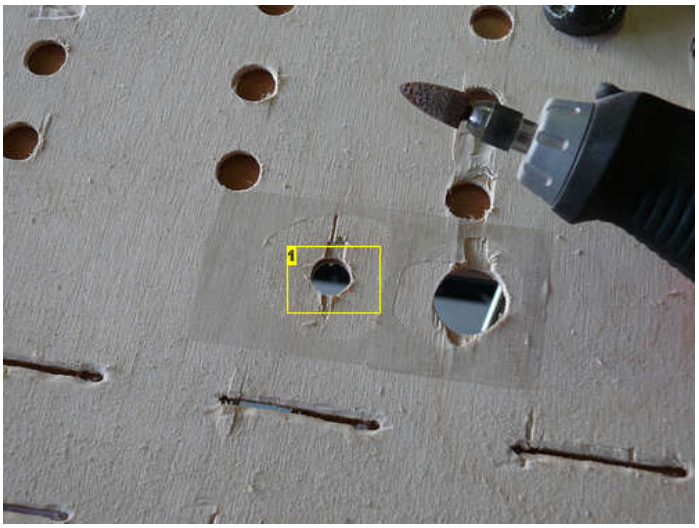


Image Notes
1. use the dremel to widen this hole if necessary.

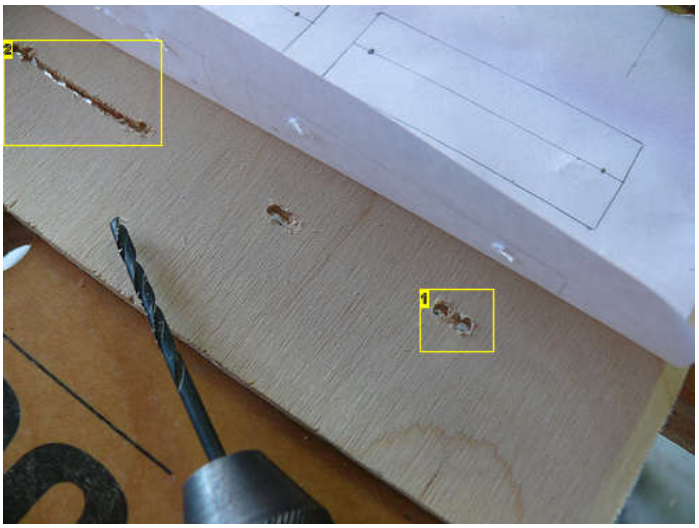


Image Notes
1. pilot holes
2. use the saw to saw between the holes

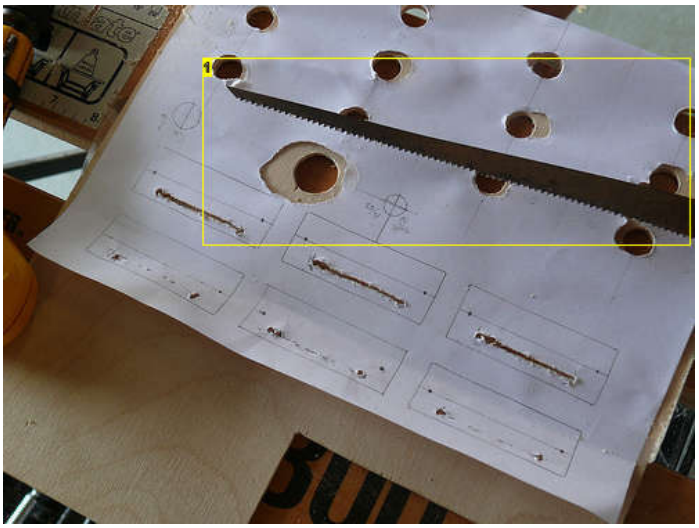


Image Notes
1. saw used to cut speaker terminal slots

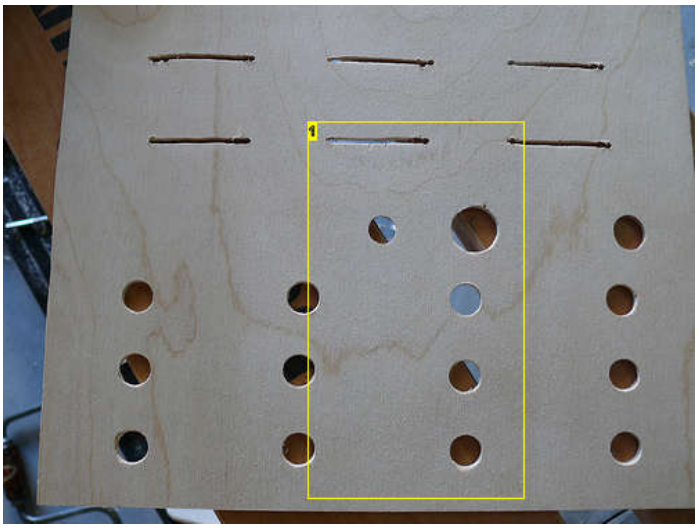


Image Notes
1. sand and smooth down the holes

Image Notes
1. workbench set up

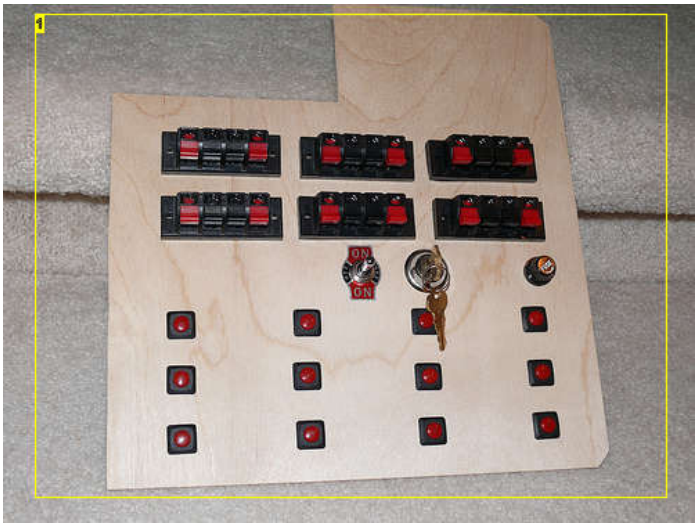


Image Notes
1. Test fit the components to make sure everything will fit well before continuing

Step 5: Drill the LED holes

Next we'll drill 48 holes for the LEDs. I did not use the template for them, I simply eyeballed their location. I used a 1/4" drill bit for them, and put them on either side of each pushbutton, slightly below center.

Arrange them however you want to on yours (below the buttons, above them, on one side of them, etc.)

After you have all the holes drilled, you'll have to sand down the backsides of them so that the back parts of the LED mounts can snap on to the front parts. The wood is too thick do do this without sanding it down. I used the barrel-shaped sanding bit for the dremel to do this, by pushing down on one side, rotating 180 degrees and doing it again (see pictures). If you can find a different way to mount the LEDs you might not have to do this.

Now that all the woodworking is done, we move on to mounting the panel's electronic components.

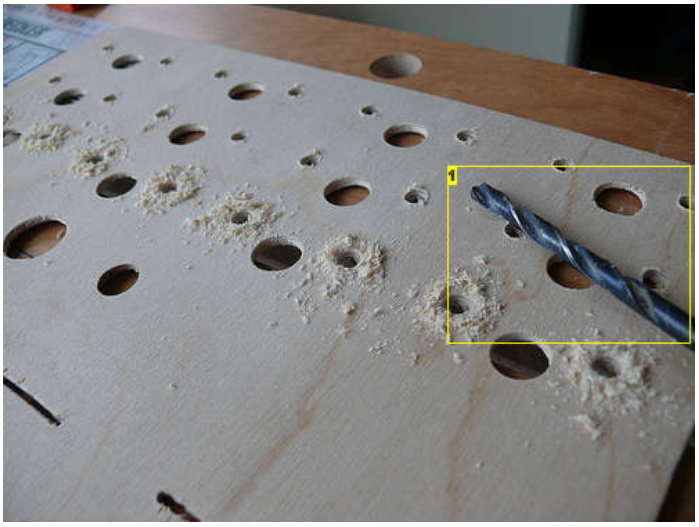


Image Notes
1. 1/4" drill bit

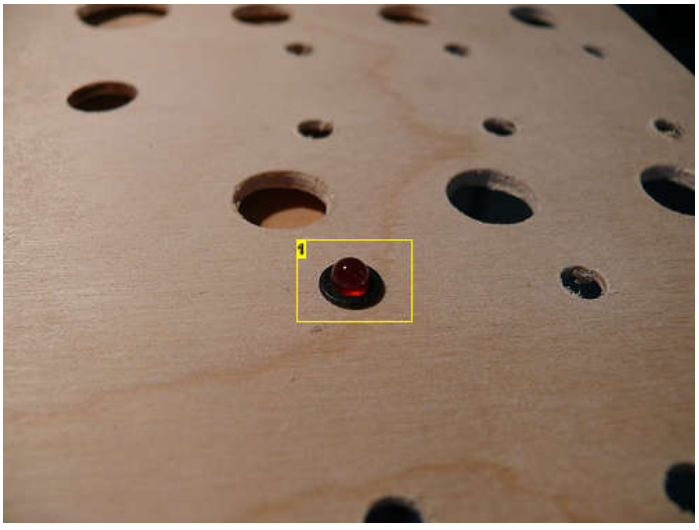


Image Notes
1. test fit an LED

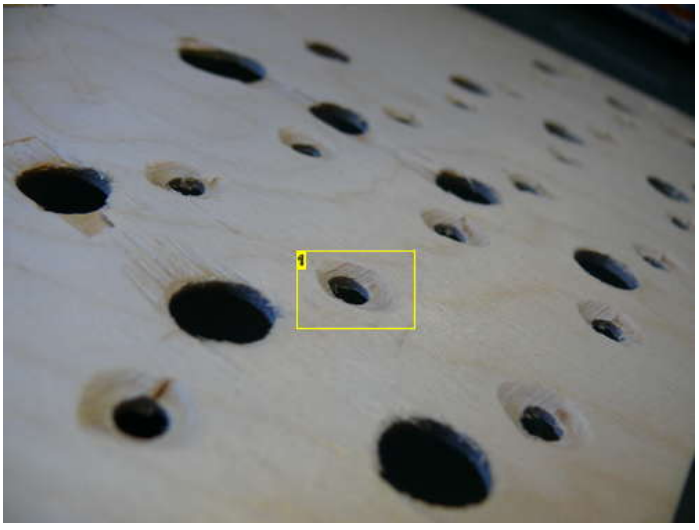


Image Notes
1. LED holes sanded down on the back

Step 6: Mount the components

Start out with the speaker terminals, since they are the biggest thing and they need to be screwed in.

Grab your 12 screws and your screwdriver, then place each speaker terminal block in each of the six slots on the top of the wood. If one or two don't quite fit through the slot, swap them out with another one. Some of the speaker terminal soldering tabs were more spread out than others on mine, and they all ended up fitting in one slot or another.

Screw in each speaker terminal with two screws, then use a dremel cutoff disk to grind down the part of the screw that sticks out on the other side so it won't cut through the wires that will be on the back.

After that, I installed the key switch, toggle switch, and fuse holder. All of these components had nuts on the back that would secure them through the mounting holes. Tighten them in with pliers or a wrench, but be careful not to splinter the wood; they don't have to be excessively tight, just tight enough to not spin when you turn the key or flip the switch, etc.

The pushbutton switches had tabs on the sides that put pressure on the sides of the hole and held them in. Reinforce them with hot glue on the back to better secure them and keep them from spinning in place.

Next, install the LEDs. Gather all the LED mounts and pair the tops with the bottoms. The tops are the ones with four tabs that come down, and the parts that go on the back of the panel are the plain rings of plastic.

To mount the LEDs:
1. Slide the top part of the mount over the top of the LED until it snaps into place with the four tabs past the bottom of the LED (not the leads, just the light)

2. Mount the LED on the board. Depending on the size of the hole it will snap through and stay there.

3. Flip the board over

4. Take the bottom part of the mount (the ring without tabs), and slide it over the LED leads and onto the top part of the LED mount. Due to the thickness of the wood, it won't completely snap onto the top part of the mount, so put a good dab of hot glue over the whole thing.
You also might want to label the back of the panel to help you remember what's what when you wire it.
Now that you have all the components mounted, we can continue on to the electrical wiring.

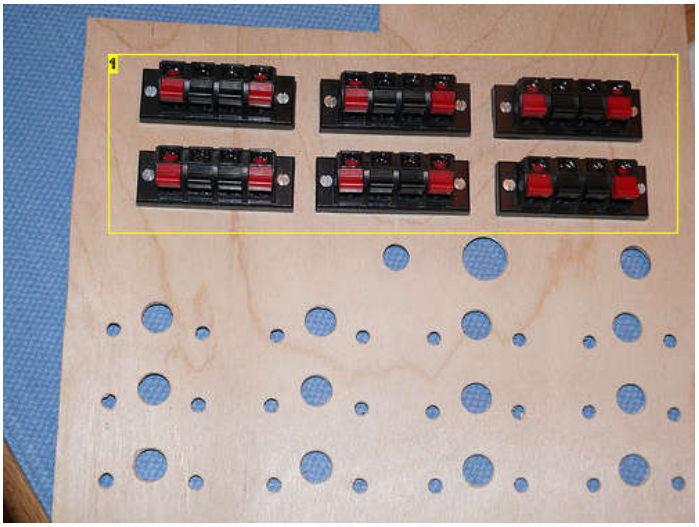


Image Notes
1. terminals mounted

Image Notes
1. wood screws used for the terminals

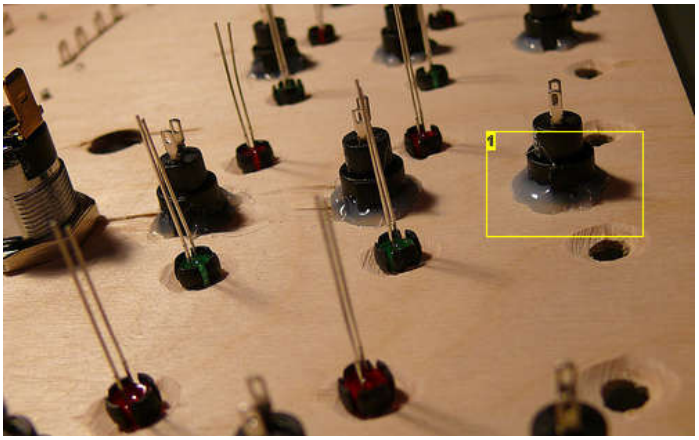


Image Notes
1. glue to hold push button switches in

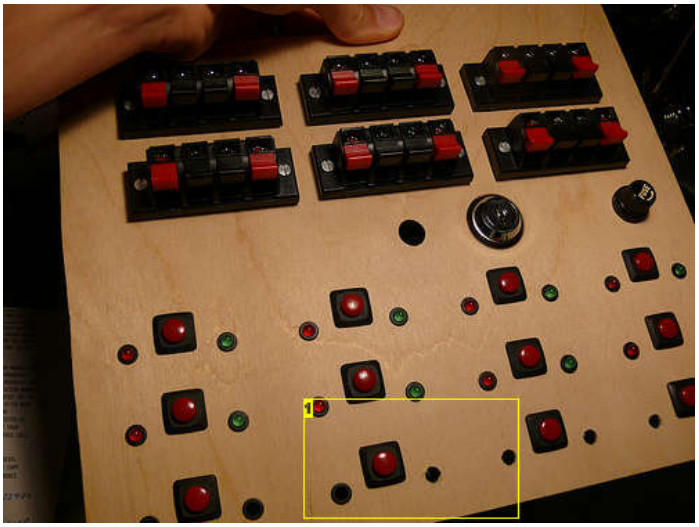


Image Notes

1. almost finished

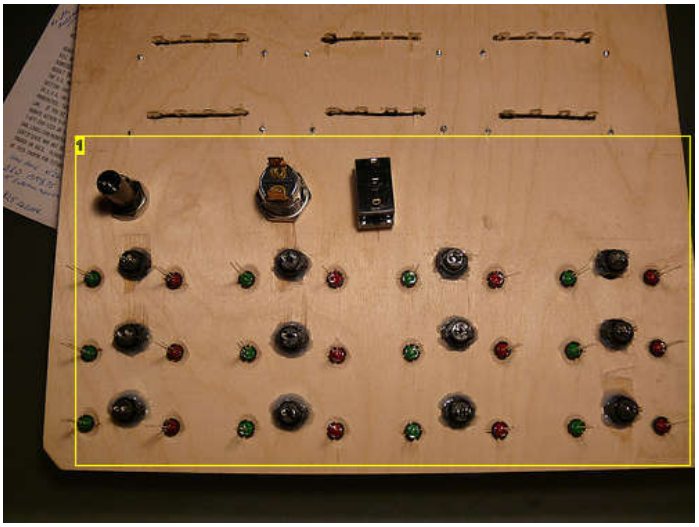


Image Notes
1. all the components mounted

Image Notes
1. everything mounted on the front (looks good!)

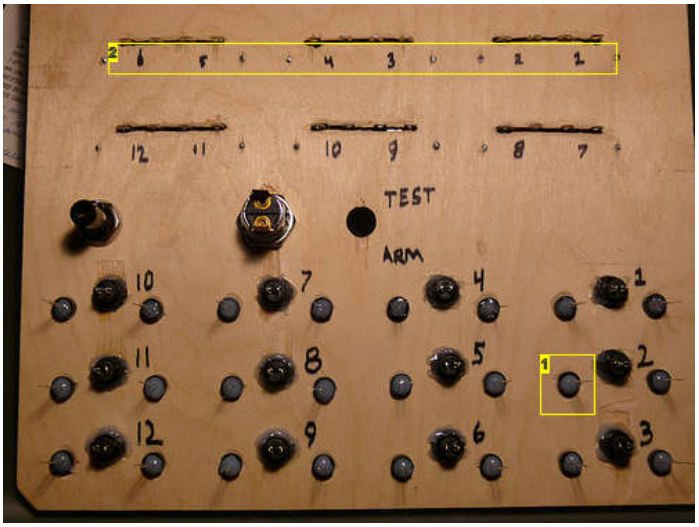


Image Notes
1. glue to hold in LEDs
2. labels - very important when wiring

Step 7: Wiring the components: part 1

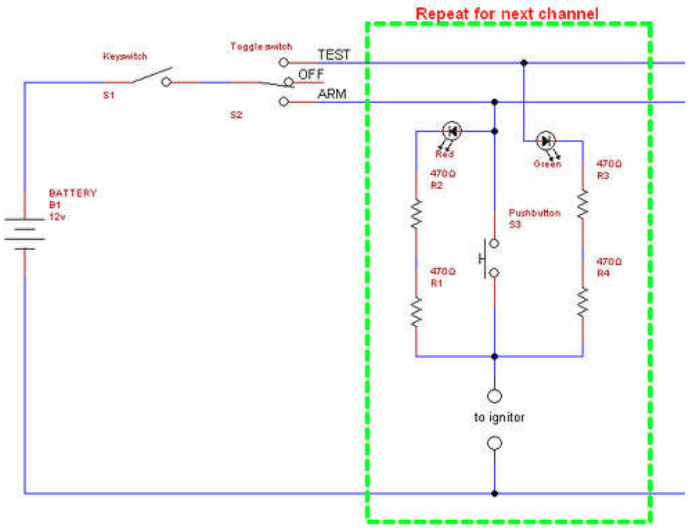
Connecting the components is probably the most daunting task of building this fireworks controller, but don't be afraid! Just follow step by step and watch what you are doing. Everything you have to do is covered here. Also, print out the schematic to double check your wiring after each step. It also helps to know how to solder. Search " how to solder " for more info.

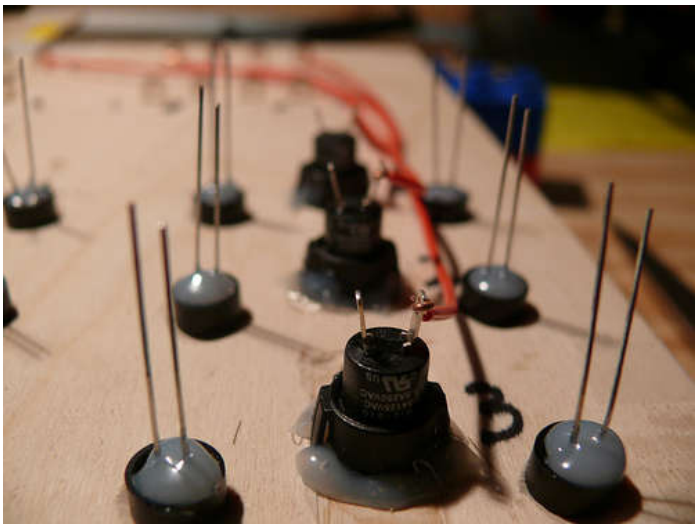
I wired the push button switches to the speaker terminals first, running wire from one side of the pushbutton switches to each of the corresponding speaker terminal tabs. See the schematic for details.

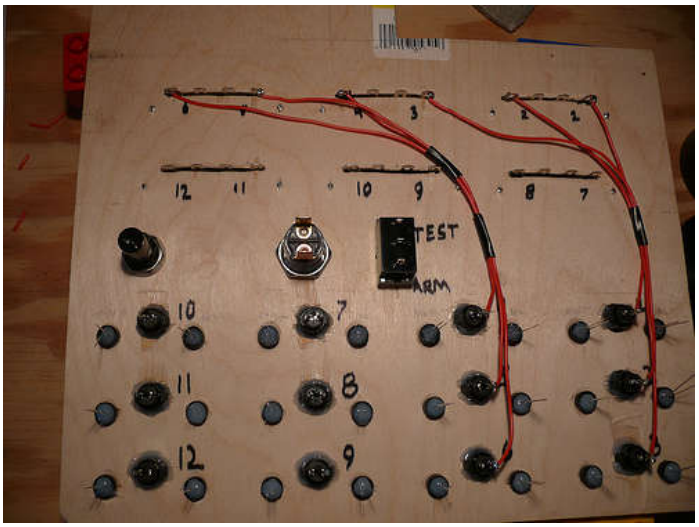
After wiring these, I connected the fuseholder to the keyswitch and the keyswitch to the middle pole of the toggle swtich.

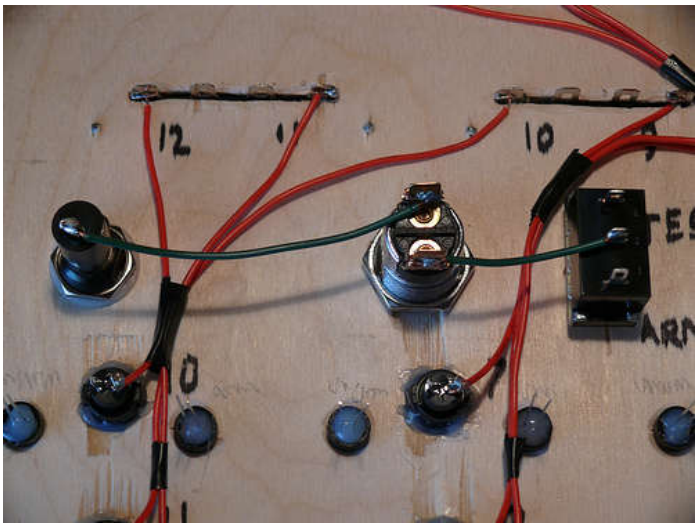
Next, connect all of the negative tabs of the speaker terminals (the pair in the middle) to each other and then together to a single wire leading to the quick connect tab that will later attach to the battery.

See the photos for more detail (they are in order). There is also the schematic file that made the image below. It was made in TinyCad .









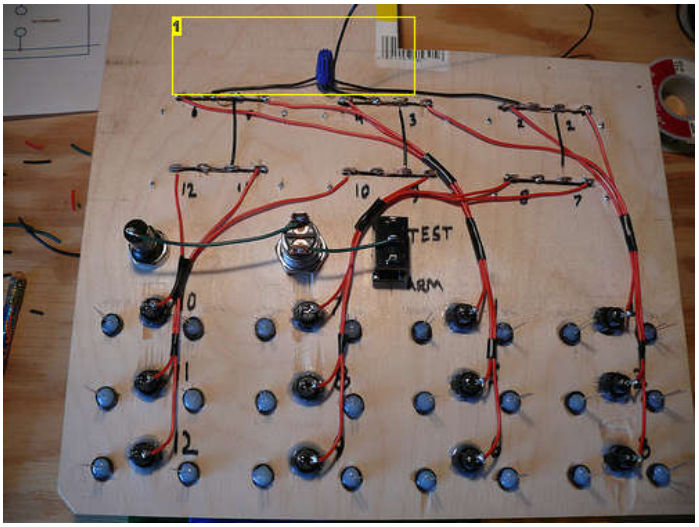


Image Notes
1. negative wires from the terminals are all connected together and to the wire nut, then to one main negative line to the battery.

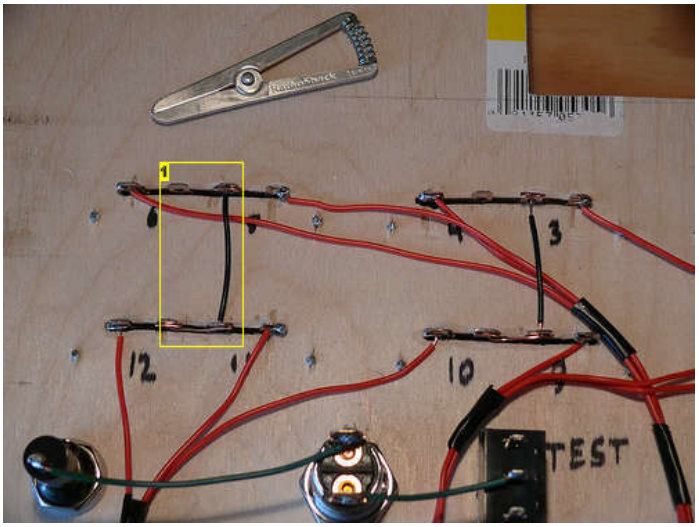


Image Notes
1. attach the middle two tabs to each other and the terminal block above it.

Im
1.

File Downloads

controllerschematic.dsn (12 KB)
[NOTE: When saving, if you see .tmp as the file ext, rename it to 'controllerschematic.dsn']

Step 8: Wiring the components: part 2

Before connecting the LEDs, we first have to solder together 24 pairs of the resistors. Remember that for resistors, direction doesn't matter. To make things easier, cut about half the length of of one side of each resistor before you solder them together so the whole assembly takes up less space.

Once all 24 pairs of resistors are soldered together, you can solder them in between the negative side of the LEDs (the shorter lead) and the side of the pushbutton switch attached to the speaker terminal for each channel. We'll be doing both the green and red LEDs in the same step, since they both connect to the same place.

To make things easier when soldering the resistors to the LEDs, where they connect to the pushbutton switch, you can solder the resistors for the red LED to the switch tab, and then solder the green LED resistors to the red LED resistor lead so they are not both attached directly to the small pushbutton switch tab. A diagram is included in the photos below to help clear this up since it is a bit confusing.

Image Notes
1. finished resistor pairs
2. solder

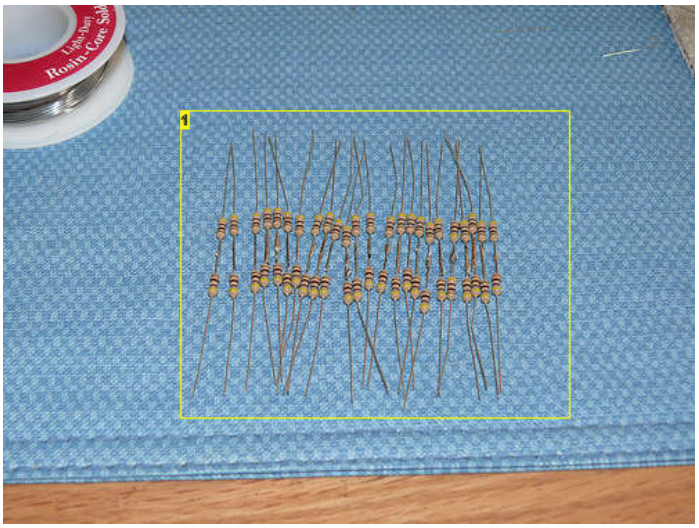


Image Notes
1. All 24 pairs of resistors finished

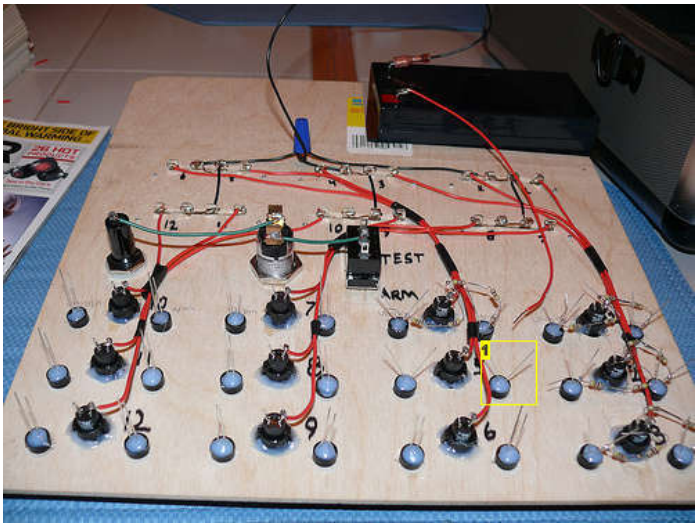
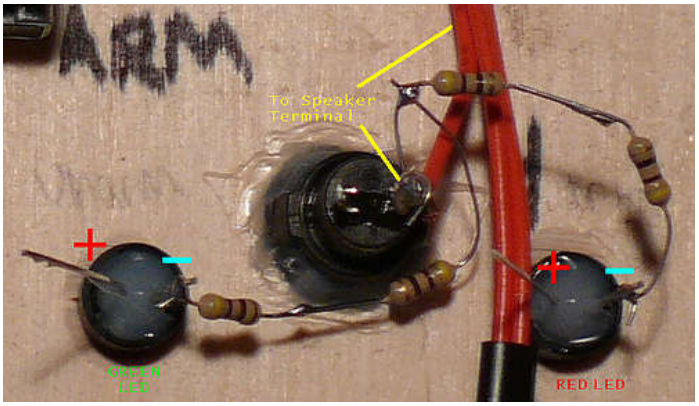


Image Notes
1. spread out LED leads



Step 9: Wiring the components: part 3 (Armed circuit)

After you have the negative sides of both LEDs connected, we need to attach the positive side of the red LED to the armed circuit.

This will be achieved through the use of a short jumper connecting the currently unused tab on the pushbutton switch to the positive lead of the LED. The negative side of the LED is already connected to the speaker terminal via the resistors to the wire leading to the terminal blocks.

Cut 12 short lengths of wire, stripping each end about 1/4". Slide one end all of the way through the hole in the pushbutton switch tab, and lean the other against the positive lead of the red LED. Solder the jumper to the pusbutton switch tab and the positive lead of the LED, then snip off the extra wire on the **LED side only** . Leave the extra sticking out through the switch tab, since we will be connecting the main armed circuit to it. Do this for each of the 12 channels.

Now it's time to connect all of the individual channels to each other and to the armed circuit. Cut 8 more wire jumpers, once again stripping 1/4" off of each end. Use red wire if you want to keep things visually organized. The red jumpers will be connected between the extra wire on the black jumpers so that the left sides of the pushbutton switches are all connected to each other.

Connect all of the channels to each other in each column, then bridge each half of the columns together. The middle two will have a second jumper on the top channels (4 and 7) in each column that will run directly to the toggle switch. See the last picture below to clarify this.

Now the armed circuit is complete.

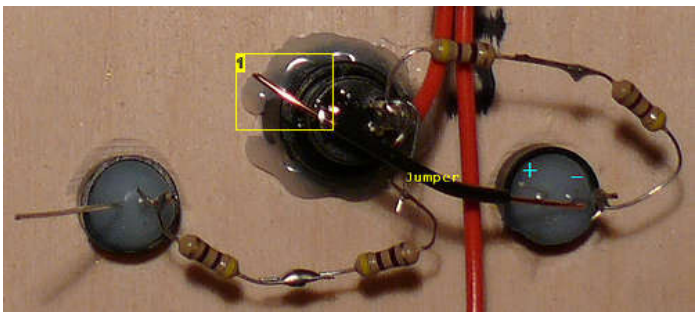


Image Notes
1. leave excess wire

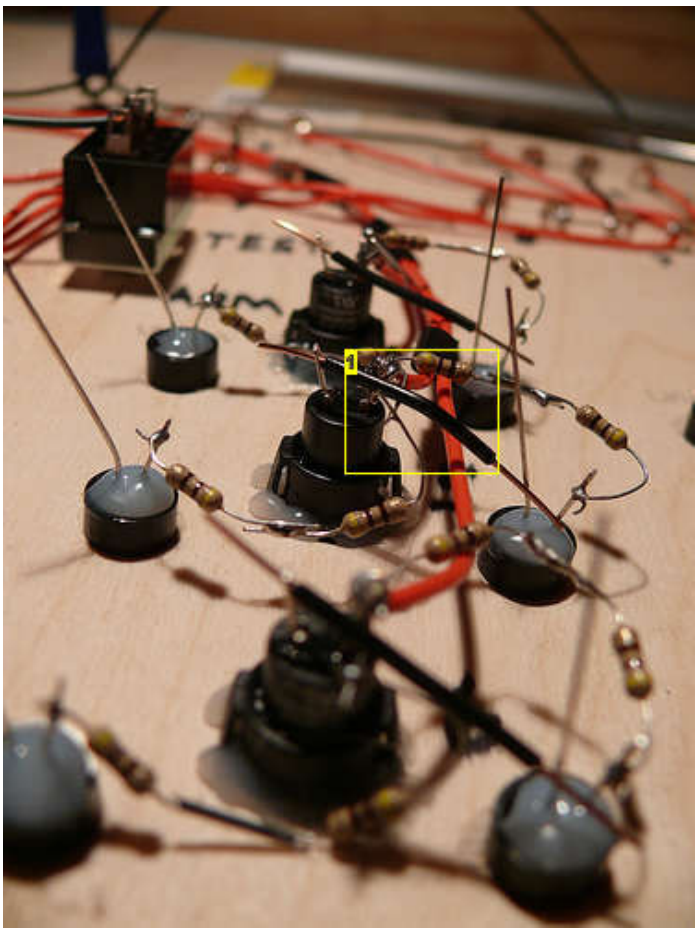


Image Notes
1. jumper

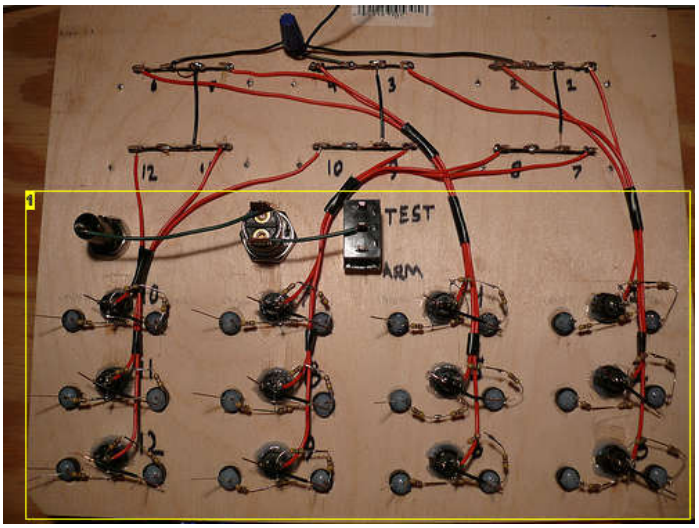


Image Notes
1. all jumpers in place before soldering

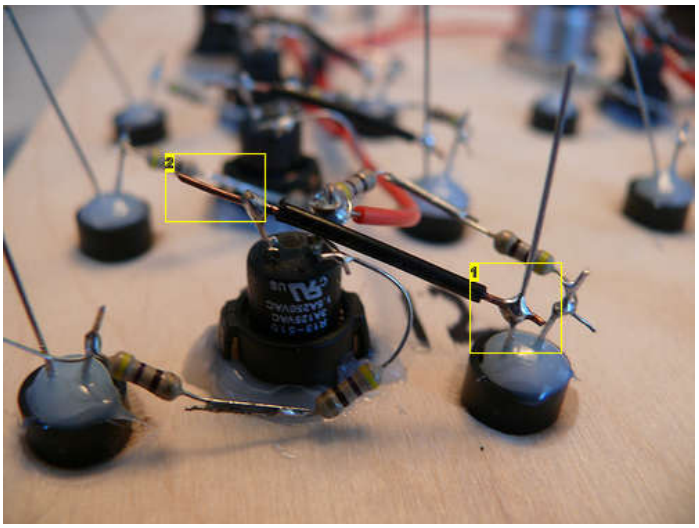


Image Notes
1. soldered with extra cut off
2. leave extra wire on this side

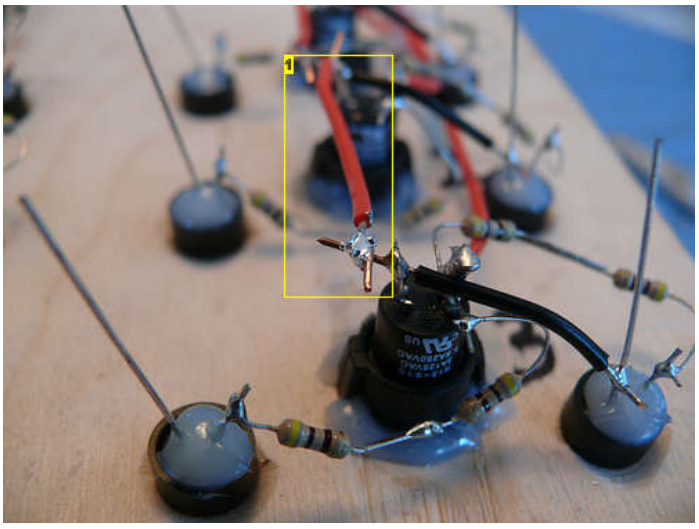


Image Notes
1. ARMED circuit jumper

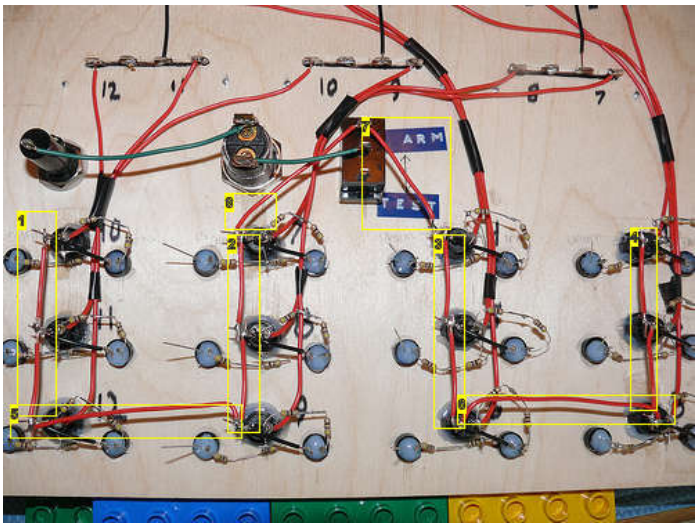


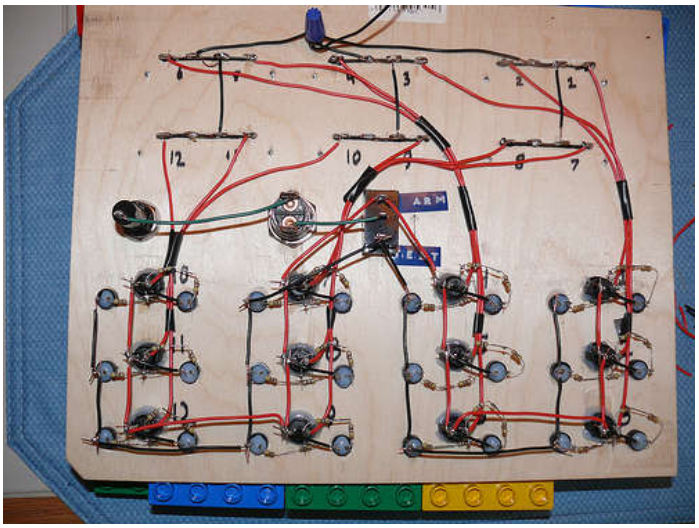
Image Notes
1. armed channels connected to each other on the left side of switch
2. armed channels connected to each other on the left side of switch
3. armed channels connected to each other on the left side of switch
4. armed channels connected to each other on the left side of switch
5. connect the first two columns together
6. connect the second two columns together
7. connects second two columns to toggle switch
8. connects first two columns to toggle switch

Step 10: Wiring the components: part 3 (Test circuit and final wiring)

Now we will wire the test circuit, which will be pretty straightforward.

Cut 8 short jumpers out of black hookup wire, stripping 1/4" off of each end, and solder them between the positive leads of the green LEDs in each column. Connect the first two columns together and the second two columns together using a longer jumper along the bottom of the columns. Then use jumpers to connect each half of the channels to the lower, unused tab on the toggle switch. This is the same arrangement as the armed circuit.

The last thing to wire is the positive connection to the battery. This will go directly from the fuseholder to a quick connect terminal and then to the battery, since everything past the fuseholder is already wired and ready to go.



Step 11: Testing your wiring

After you have everything finished, connected, and soldered, it is a good idea to test each channel to make sure everything is wired right and there are no shorts.

Install a fuse in the fuseholder and attach the negative lead (that goes directly to the speaker terminals) to the negative connection on the battery and the positive lead (that goes to the fuseholder) to the positive connection on the battery.

To test my panel, I hooked up a short length of 2 conductor wire (2 ft or so) to the board, and on the other end just wrapped a strand of steel wool between the wires to use as a test. This way I could make sure the resistor values were correct for the LEDs (to not ignite the wire in test mode, but do so in armed mode) and that the steel wool burned up when the button was pressed.

Once you have verified that all LEDs operate properly and each channel successfully burns the steel wool **in Armed mode only** , disconnect the battery and flip the panel upside down. Cut off all excess LED lead sticking up past the solder connection on the jumpers and check to make sure there aren't any wires crossed that shouldn't be.

Find a good spot to place the board in the metal suitcase, or whatever you have decided to place the controller in, and make sure the battery is securely attached inside of the case.

The final step is to label it, and you're ready for some remote fireworks detonation action.

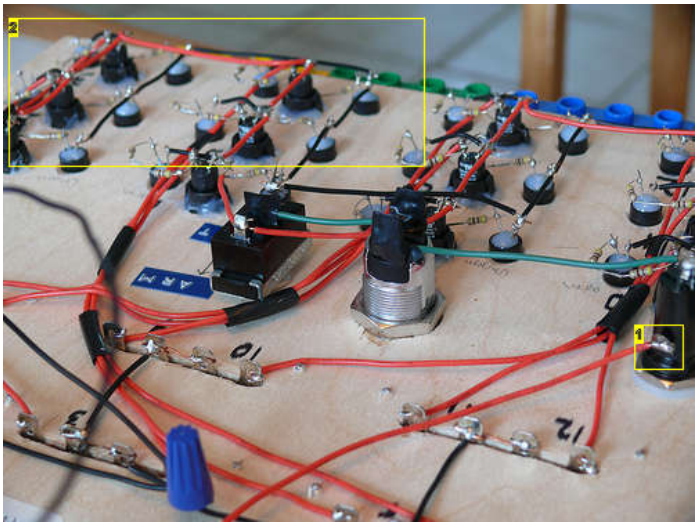
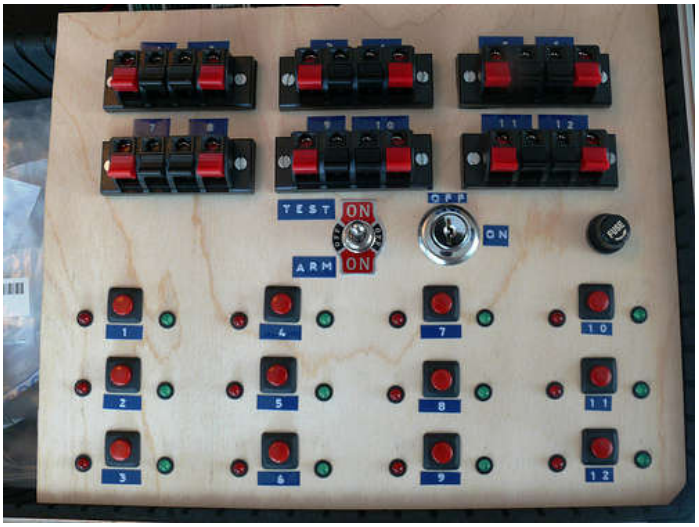


Image Notes
1. connection to positive lead to battery
2. trim off excess wire

Image Notes
1. install a fuse in the fuseholder

Step 12: Label the front panel

Labeling the front panel is important so that you don't accidentally arm the circuit instead of put it on test, etc.
I just used a Dymo embossing label maker , but you could also write it on the wood with a marker if you want to. I labeled each speaker terminal pair, each pushbutton switch, and the main switches (Toggle and keylock). See pictures below for layout.



Step 13: Ignition wires

Get the cheap 2-conductor wire, and cut it into 12 equal lengths depending on how far away you want to be from the fireworks. I cut mine at 20 feet each, but later realized that that is a little too short. The wires should be as long as you want them to be to feel safe about being at the controller and launching the fireworks from that distance.

Strip off about 1/2" on each end of the 12 wires, and solder the alligator clips on one end, or wrap the wire around the screw on the alligator clip. Make sure this connection is secure and wrap it in electrical tape. Polarity does not matter for the ignition wires, neither does the color of the alligator clip, it just has to complete the circuit with the ignitor.

Image Notes
1. wires attached to alligator clips, hot glued, and wrapped in electrical tape
2. leave opposite end stripped

Image Notes
1. one pair per wire, colors don't matter.

Step 14: Finished board

To operate the board:

- make sure battery is disconnected and all switches are on the **off** position
- **connect all of the ignition wires, one per channel:**

1- Plug in each ignition wire pair to one black and one red speaker terminal. Use the side that is stripped, but doesn't have an alligator clip.
2- On the other side connect an igniter using the alligator clips, one on each wire.

- connect the battery
- insert key into the main on/off keyswitch and turn to **on**
- turn toggle switch to **test**, make sure green lights are turned on for each channel that you have something connected to, if not check your connections and make sure the ignitor is securely attached to the launch wires.
- clear the area around the fireworks and make sure you are at a safe distance from people, animals, cars, houses, trees, dry grass, etc. (the normal precautions)
- once all connected channels have green lights, flip the toggle switch to **arm**
- the red LEDs will turn on, and **at this point pressing a pushbutton will supply full power to the ignitor, setting off the firework**.
- once a firework is detonated, if the ignitor burned completely, the red light will turn off and you will know that that firework has already been used.

Shutting down:

- Turn the toggle switch to the **off** position
- Turn the keyswitch to the **off** position and remove the key (put it in your pocket)
- Disconnect the battery
- Unplug each of the long wires from each channel that lead to the fireworks
- Dispose of burned ignitors

Step 15: Acknowledgements and notes

You may notice that there is no specification on the fuse for right now, the original fuse value had not worked and I am currently figuring out what amperage fuse to use. Sorry for the inconvenience. You can still build the controller, since it still works without a fuse. Use a short piece of wire to bypass the fuseholder until we get the right fuse working.

Also, the construction of the actual igniters is covered in a separate instructable located here.
I would like to thank the following people for their answers, explanations, and contributions to this project:

- Jon Witucki for the inspiration to make this controller and info on speaker terminals
- everyone at electro tech online, especially eblc1388 for his schematics and electronics knowledge
- tobyfan57 for making me realize what wasn't clear on the instructable to start with and finding a few inconsistencies in the steps
- Also, thanks to TinyCad for keeping their program open source and easy to use so I could make my schematic

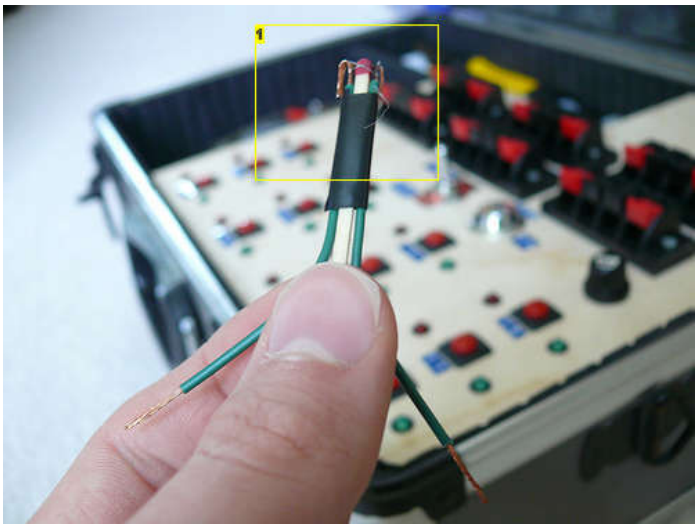


Image Notes
1. an ignitor - check out my other instructable on how to make one!

Related Instructables

Underwater Fireworks Detonator by iglorioussupyro

Detonator box Ignition Fireworks Pyro box electronic igniter by larsjet

.50 CAL Ammo Box Firework Controller Build (Photos) by Rob K

DIY RC Fireworks Ignition System by angelo10

Fireworks Igniter by systemf92

how to build a cheap wireless fireworks detonator and electric match by jpoopdog

Comments

50 comments **Add Comment** **view all 297 comments**

ak47bobbarke says: Apr 18, 2010. 3:31 PM **REPLY**
How do you make the actual igniter? and how do you attach it to the electric igniter?

systemf92 says: May 4, 2010. 8:59 PM **REPLY**
Check out my other instructable designed to use with this one: Fireworks Igniter
Attach the controller to the igniters using two conductor speaker cable. This is described in step 5 of the above instructable, Using the igniters .

pittu says: Mar 9, 2011. 2:11 AM **REPLY**
how much can you ignit in series in a single channel.

henryplumb says: Mar 2, 2011. 2:26 PM **REPLY**
How come when it is in test displaying green LED's for connected circuits it doesn't ignite the ignitor because it has power running through the igntior? Thanks.

systemf92 says: Mar 2, 2011. 3:15 PM **REPLY**
In test mode, the power running through the ignitor is not enough to ignite it. It is dropped down with the resistors to just be enough to light up the LED. Once it switches over to the armed circuit, the full power of the 12v battery goes directly through the circuit and to the ignitor when the button is pressed.

henryplumb says: Mar 2, 2011. 11:37 PM **REPLY**
Oh, I see! I am making my own one of these at home and plan on having DPST Switches so that I can have power and armed lights that run from a separate power supply so they down run down the ignition battery! :-) Thanks for replying.

systemf92 says: Mar 3, 2011. 9:28 AM **REPLY**

Sounds like a good plan. No problem. I'd love to see pictures of it when you finish, send me a link!

henryplumb says: Mar 3, 2011. 1:28 PM **REPLY**

Will do when I have finished, think I am going to mount it all kin one of those old cigar boxes! :-)

mistercow.pnoy says: Jan 24, 2011. 1:58 PM **REPLY**

Do you think that it would be possible to use 1/4" audio jacks instead of the raw wire speaker connectors? Or maybe even RJ-45's to run multiple channels through 1 wire?

systemf92 says: Mar 2, 2011. 3:11 PM **REPLY**

I believe both of these options would be feasible.

pdionne says: Feb 3, 2011. 1:22 AM **REPLY**

Why are you running individual pairs of wires, when you could have used a common ground and built the box to fire up to 31 shots? Seems like a waste to do it like you did. The design of the box is nice and efficient.

Mikey8567 says: Dec 27, 2010. 8:44 PM **REPLY**

Instead of removing wood to thin it out to allow the LED holders to snap into place you can use a simple method of hot glue. Yes it sounds cheesy but really it's not, if you open a lot of stuff you find that manufactures use hot glue on a lot of stuff, this includes holding panel face components in (LED's, ect), they use it to hold small wires in place where a clamp or fastener can't be installed, providing support and clearance for displays, and many other things. By pushing the LED thru the front face of the panel and then applying hot glue to the back side your doing two things. #1 Holding the LED (and sockets) in place. #2 your providing strain relief on the small 22AWG wiring that is attached to the LED's. No hot glue isn't the answer for every thing and should not be used in some cases. But it has many uses and is a very cheap alt to a lot of support and fastening.

molyneaux says: Dec 8, 2010. 2:35 PM **REPLY**

can you send me a list of all the parts and where you get them

suckafish says: Dec 15, 2010. 9:31 PM **REPLY**

Try Radio Shack..... also http://www.alliedelec.com/ is a good place to try but if you don't live in the United States idk where to send you

geekman101 says: Oct 19, 2010. 10:18 PM **REPLY**

what exactly do the leds, do i thought red meant that chenal worked and green meant the button was pushed.

theatrepyro2112 says: Oct 3, 2010. 8:46 PM **REPLY**

So I am obviously late to the party, but how many detonators could you fire at once from a 12 volt battery? It has already been said that you couldn't fire all at once.

belldrakejared says: Jul 20, 2010. 9:47 AM **REPLY**

what is the arm function for?????

thepaul1993 says: Sep 30, 2010. 5:18 PM **REPLY**

When you switch to arm, you can set off fireworks.

rrrmanion says: Sep 2, 2010. 1:58 PM **REPLY**

using a motherboard connector would be good instead of lots of speaker cables, because it would mean you had one cable going to the launch site, then splitting into several separate cables, and a common negative can be used, so a 20 pin connector can branch out to have 19 ignition units. (or more if several are connected in parallel to fire simultaneously or with a delay if some form of timer is used.

MajorBromley says: Aug 27, 2010. 2:49 PM **REPLY**

i cant get the stdt switch from link

pryokid217 says: Aug 17, 2010. 12:15 AM **REPLY**

When is your v2.0 coming out as i would like to make a reliable and safe controller??

G-force777 says: Aug 15, 2010. 4:37 PM **REPLY**
what are the dimensions of the battery? also what is the purpose of the speaker terminals? and why are the fuses neccesary

Arduino Guy says: Jul 11, 2010. 7:05 AM **REPLY**
you can reuse the wire in the ignitor, just sand off the black stuff. and rewind on another match.

nl82 says: Jul 7, 2010. 3:02 PM **REPLY**
Is there a reason why a lead-acid battery is necessary? Or would a cheaper 12v battery such as the ones shown at this link do just fine? The voltage is the same, the amp-hours greater. Thanks.

PyromanX says: Jul 9, 2010. 1:42 PM **REPLY**
This battery is cheaper (as long as you ship it with something else to get free shipping) and is 5Ah. The batteries at your link have fewer Ah (they are measuring in mAh) and cost about as much.

WDMJin says: Jul 8, 2010. 5:40 PM **REPLY**
would I be able to use a power supply instead of a battery? Haven't taken electronics in a while but I have a power supply that can output 5v DC at 3amps or 1.5-15v DC at 1amp. does anyone know if this would work well enough to make it work? if not what could I modify to make it work?

jthomas316 says: Jul 6, 2010. 6:56 AM **REPLY**
I would like to thank you for your work. I built a controller modeled after yours but I used Cat6 cable for the wiring. I made a 4 port 24 shot controller. It was awesome to see it in action. I used a couple of tweaks from reading the comments here and it really made for a fun project. On the cat5 I used two of the wires for ground and the other six for 6 push buttons. We were firing from 140 feet no problem. Thanks again!

PyromanX says: Jul 5, 2010. 4:17 PM **REPLY**
Ok, so I've thought some more on this, and I've got a few questions.

Can and should the battery be recharged, or will it drain so slowly as to be negledgible?

Can the battery stay inside the box while not in use, or is there a reason it must come out?

If it can stay inside, should it be hooked to a maintainer?

Or are the batts so cheap they should be replaced?

This battery would work as well (better, actually, 5 Ah as opposed to 3Ah) for half the cost, right?

Thanks!

This comment is a bit repetitive of one of my previous ones.

PyromanX says: Jul 5, 2010. 5:24 PM **REPLY**
Also, I think I'll add connections at the top to test, arm, and neutral wires, so that it will be expandable. If I need more channels, I'll install them in another box and connect the three wires. Voila, more channels.

a16duvall says: Jun 28, 2010. 12:08 AM **REPLY**
Put a scrap piece of wood under your panel while you drill to avoid the splintering. Clamp it if you can or just make sure there is no gap between them and drill through both pieces. It'll make a big difference.

systemf92 says: Jun 28, 2010. 10:02 PM **REPLY**
convenient! as duckythescientist mentioned, you might want to find out if a wall wart adapter would supply enough current to burn the igniters first.

systemf92 says: Jul 2, 2010. 7:49 PM **REPLY**
umm, disregard the previous comment I guess? haha, I think instructables pooped this random comment of mine on yours, it's actually a reply to a different comment. Anyway: I hadn't thought of that before, I'll be sure to try it sometime. Thanks!

Jaxoat says: Jun 28, 2010. 10:58 PM **REPLY**
Another option would be to use 2 different Forstner bits. Forstner bits make really nice flat bottom holes. Drill from the front for the smaller "through" hole and then from the back with a larger. Secure your work and if possible, use a drill press to keep the 2nd bit from wandering.

systemf92 says: Jul 2, 2010. 7:46 PM **REPLY**
I will be sure to get ahold of some, next time I need to drill holes. Thanks! Wish I had a drill press, though... haha

T-Rave says: Jun 29, 2010. 10:02 AM **REPLY**

Any plans on making a demo video for this awesome device? Would love to see it in full action

systemf92 says: Jul 2, 2010. 7:44 PM **REPLY**

As of right now, no. Sadly, I won't be doing fireworks for the Fourth this year :/ I will let you know if I do though.

MasterChief1517 says: Jun 29, 2010. 7:30 PM **REPLY**

This may seem like an odd comment, but I like your choice of case! I used a case exactly like the one you used-except it was silver-to build a prop bomb controller for a school stage production just a few months back. I built it as a simple one-channel controller that would set off some spot lights set behind stage, which would blink on and off rapidly (with the aid of a PICAXE and a couple relays...) to simulate an explosion. Sure was a fun project....I may just have to try out your instructable to give that case new life and a much more "meaningful" purpose. I'll be sure to report back if I try it out!

systemf92 says: Jul 2, 2010. 7:44 PM **REPLY**

Thanks! haha. That sounds like some nice props workmanship! I myself am involved in theatre, I do lights/sound and set design at my school, which is the reason I don't have time to update this instructable, or start on the next version of the fireworks controller haha. That project sounds like fun indeed. Sounds good, I'd appreciate that! Best of luck on the build.

PyromanX says: Jul 2, 2010. 9:35 AM **REPLY**

Something interesting, I put all the Jameco electronics in a cart with the minimum purchases with one small modification, that I used bipolar red/green LED's instead of seperate LEDS. The total is $53:79. The circuit would be easy to modify to accept bipolar LED's and it'd probably make a prettier board. I'd also rig up a light that turns on when I open the case.

systemf92 says: Jul 2, 2010. 7:41 PM **REPLY**

Sounds like a plan! Bicolor LEDs will definitely be used in v2.0. I agree on making the board prettier.

camden s says: Jul 2, 2010. 12:55 AM **REPLY**

great idea i made a 6 chanel version my self lots off fun for my igniters i used nichrome wire so you can put it straigt on the the fuse.

systemf92 says: Jul 2, 2010. 7:40 PM **REPLY**

Thanks! Nichrome works well I have heard, I don't have any though, but I'll have to try it sometime.

Maverick_TN says: Jun 30, 2010. 11:18 AM **REPLY**

I'm getting the materials together to build this, I'm thinking about a few changes though... Still cooking up a few ideas in my head, but the first one is circuit protection. I'm going to use this instead of a fuse. http://www.amazon.com/gp/product/B001TXJ9XQ/ref=pd_luc_mri?ie=UTF8&m=A1KF2V3FQHNS87 I like the idea that was mentioned before by someone about using a dual color led. But I'm thinking perhaps a tri-color led, and modifying it so that it's green, red, and blue. blue would be if the channel is open after firing, I'll post a update when i get more ideas and get to moving along with the project. Thanks for the wonderful idea.

Maverick_TN says: Jun 30, 2010. 12:47 PM **REPLY**

Okay, this is a list of what I have in mind, and I know it makes this project a bit more complex, but it does address a few issues that have been mentioned in other comments plus a few changes/additions of my own.

Open circuit detection per channel with Tri-Color LED "Red", "Green" being used as previously defined, and "Blue" for open circuit.

Someone mentioned fusing each channel for protecting the led's and the push button switches from overload. I have a modified solution, use automotive relays per channel to handle the load with larger wire and use the push button as a trigger.

Push button circuit breaker instead of fuse. Keyed arm/test switch.

I'm thinking of options on moving the terminals away from the top of the console. I think they would get in the way if you had the lid on it and wanted to just prop it open.
Perhaps moving it inside the case with sticking a plug slightly recessed out of the edge of the case to piggyback a small project box with the terminals on it that can be plugged in and then removed and stored inside the case.

This way you can also isolate all of your terminals until the last minute when you are ready, just plug in all of them at once.

I'm using an alu case, so i'm going to ground the case and put a lug in it for an external ground. We setup every year at my cousin's house at this little table which is at the edge of a lot. I may just drive me in a ground rod there at one of the table legs and run a wire up from it.

Thinking about adding second keyed switch to ground the outgoing leads as an added safety.

Any comments or suggestions?

systemf92 says: Jul 1, 2010. 11:03 PM

(removed by author or community request)

systemf92 says: Jul 2, 2010. 7:38 PM **REPLY**

That push button circuit breaker looks like it's a much better option! I like the idea of having a separate color for open circuit after firing. Sound like relays would do the job, I have heard about there being a possibility of unintentional activation of the relay though, look into that just to make sure it will be safe. Moving the terminals away from the console would be a much better approach. This is something I have planned in the new version I hope to make at some point. And yes, that would add another level of safety to have the firing circuits able to disconnect completely from the rest of the controller. Everything sounds good to me! I am very glad you are making improvements on version 1.0 of mine, and your ideas help me brainstorm for v2.0! Best of luck building it!

PyromanX says: Jul 2, 2010. 10:30 AM **REPLY**

I've been thinking and I've got a few Q's

1. Where can I find a battery charger for the battery? How much does one cost?

2. Why must the battery be removed as reccomended? Will it damage the battery somehow or is it just for safety concerns (If it's safety concerns, I believe that with the keyswitch, they'd be unnecessary, but if it's still concerning, I'd add a lit on/off pushbutton or toggle between the battery and all other components) ?

3. If the battery is able to stay in, how about an integrated port to plug the charger into?

4. Maverick, are you sure a 10A breaker would work? I like the idea of a breaker way better than a fuse, since it is reasonably inexpensive.

Also, here is a link to some cheap tri-color LED's. The caveat is that they do not come with data sheets, and so I'm not certain that they'd work. It's also worth noting that there's a $10 minimum order.

Sadly, I'll be out of town for the Fourth, so I guess I'll have to double up on New Years.

dema12co says: Jun 30, 2010. 8:50 PM **REPLY**

Just looked at this and thinking of making my own, I saw you used two 470 Ohm resistors on the LEDs though, the Lite-on spec pages call out 2.6V and 30mA max, which would be a 330 Ohm max resistor. Was your LED circuit setting off your charges or was this just a mistake in the calcs?

systemf92 says: Jul 1, 2010. 10:59 PM **REPLY**

Right, I decided to not run the LEDs at max output all of the time, so made the calculations based on them running at 20mA. Also, just to be safe and reduce the chance of there being enough power running through the ignitor. It was just a precautionary measure, and I do not know whether using 300 Ohm resistors would set off the charge or not.

airsoftjunke says: Jul 1, 2010. 9:57 PM **REPLY**

does it matter what side the resistor is on the LED? also, i would have thought the resistor would go on the positive side if it did matter.

view all 297 comments