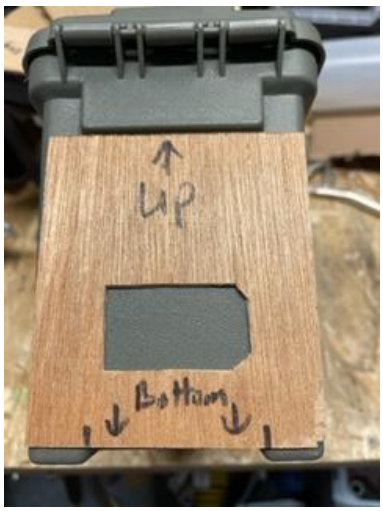
Ammo Can Controller

Tools Needed

- Pencil
- Drill and Drill bits: 15/64”, 3/8”, 9/64” (or 1/8”)
- Box knife (razor blade knife) with a good blade
- Dykes or side cutter for cutting wires
- Wire strippers
- Ratchet with 8mm socket
- 3mm or 1/8” (small) flat head screwdriver
- #0 or #1 (small) Phillips screwdriver
- Tape measure
- **Optional**: Small needle nose pliers. Helps with pulling wires out of outer sleeve.
- **Optional**: Multimeter for troubleshooting connections if necessary.
- **Optional**: Oscillating tool with cutting blade if desired but I think using the razor blade to cut the holes is easier and there is better control with the cut.

Trace Outlines for Holes **(Note: use a pencil or fine tip for tracing)**

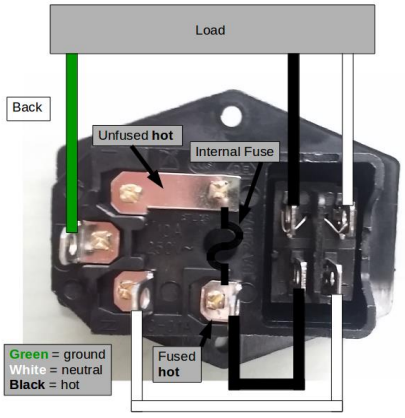


- Use smaller template to trace the outline for the power socket on the hinge end of the box.
- Use larger template to trace the outline for the gang box and electrical outlets on the broad side of the box. The hole for the gang box should be on the side closest to the power socket hole.

Cut and Drill Holes

- Using a box knife, **carefully** cut the holes making sure to cut to the outside of the trace. When you are done, you should no longer see the trace on the box. You may need to do a little shaving if you did not take enough off but do not take too much off either. I found that it is easiest to use light pressure and make multiple passes across the same cut to cut through the side wall. You will have more control, get a better cut, and best of all, you will not cut off any fingers. (An oscillating tool with a cutting blade could be used but I found it easier to control the cut by using a box knife.)
- Drill a 15/64” hole anywhere to the right of the gang box hole to receive the PIR (audio outlet). Remember, you will have an outlet cover over the AC outlets so do not drill the hole too close the gang box.
- **(Optional if using 5.5mm x 2.1mm DC outlet)** Drill a 3/8” + some rimming hole above or below the other hole you just drilled.

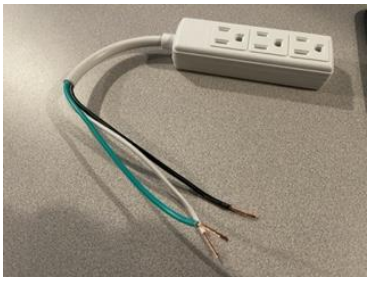
Power Socket



- Wire up the power socket by plugging in the short black and short white jumper wires onto the blades as diagrammed.
- Insert the power socket into the hole at the end of your box.
- Drill out a 9/64” hole (you can use 1/8” + some rimming) through the existing two holes in power socket.
- Insert screws and attach nylon lock nut to the inside using a Phillips-head screwdriver and an 8mm socket and ratchet.
- Strip 6” of the outer sleeve and braded rope from the 12” power cord that has the 3 electrical crimp connectors. Be careful not to cut too deep and cut the sleeves of the individual wires. Strip 3/4” from each of the separate wires of the power cord.
- Plug crimped connectors onto the blades of the power socket as diagrammed. White next to white, black next to black, and green is all alone to the far left. This can be left until you are ready to insert the gang box.

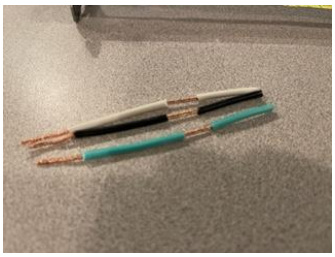
Prepare Other Wires

- **1’ extension cord with 3 connectors**



  - Cut the plug end from the extension cord so that you preserve as much of the extension cord connected to the 3 plug outlet as possible.
  - Strip 6” from the outer sleeve (be careful not to cut too deep and cut the sleeves of the individual wires), strip 3/4“ from each of the 3 wires, and twist the copper strands

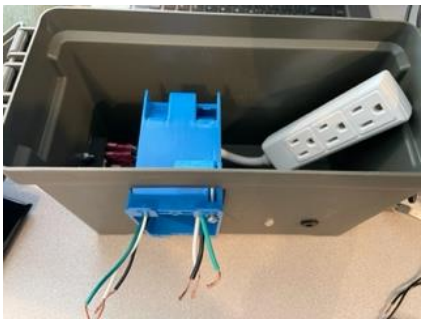
- **2’ extension cord**



  - Make outlet jumper wires: Cut 3” from of the cord, pull the individual wires out, strip 3/4“ from one end of each of the 3 wires and twist the copper strands, carefully cut the wire sleeve 1” back from the other end and carefully pull to expose 1/2“ of the wire leaving the sleeve connected the other 1/2“ of the wire and finally hold the 3/4" end of the wire in your left hand and twist the exposed wire strands counter clockwise with your right hand.
  - **If you have a dual gang box**: Make another set of outlet jumper wires by repeating the prior step.
  - **If you will be using the relay controller for switching 1 or more of your AC outlets:** Cut 12” from the cord, pull the individual wires out, strip 3/4“ from one end and 1/4“ from the other end of each of the 3 wires and twist the copper strands on each end.
  - **If you will be using the relay controller for switching the 5.5mm x 2.1mm DC outlet:** Cut 3” from the cord, pull the white wire out, strip 1/2“ from one end and 1/4” from the other end twist the copper strands.
  - You should end up with an extra 3-12” of cord depending on your application. You may or may not use the rest depending on how you want to wire things up.

- **PIR cord with 3.5mm stereo jack outlet**
    - Strip 3” from the outer sleeve. Be very careful not to cut the sleeve too deep because the wires inside are very thin.
    - Strip 1/2“ from the red wire and twist the copper strands.
    - Strip 1/4" from the white wire and twist the copper strands.
    - Cut 2” from the copper ground wire and twist the copper strands. You should have 1” of ground wire remaining
- **Speaker cord with the 5.5mm x 2.1mm DC outlet**
    - Make a 2” separation between the red and black wires, strip 1/2” inch from each wire and twist the copper strands.
- **3” red and black speaker wire**
    - Separate the red and black wires, strip 1/2" inch from one end of each wire, strip 1/4" inch from the other end of each wire.
- **5VDC wall wart (you must supply your own power supply)**
    - The wiring configuration for wall warts vary so you will need to determine how to prepare it for the final wiring. Your positive and negative wires will need to have 1/2" stripped from the ends.

Installing the Gang Box



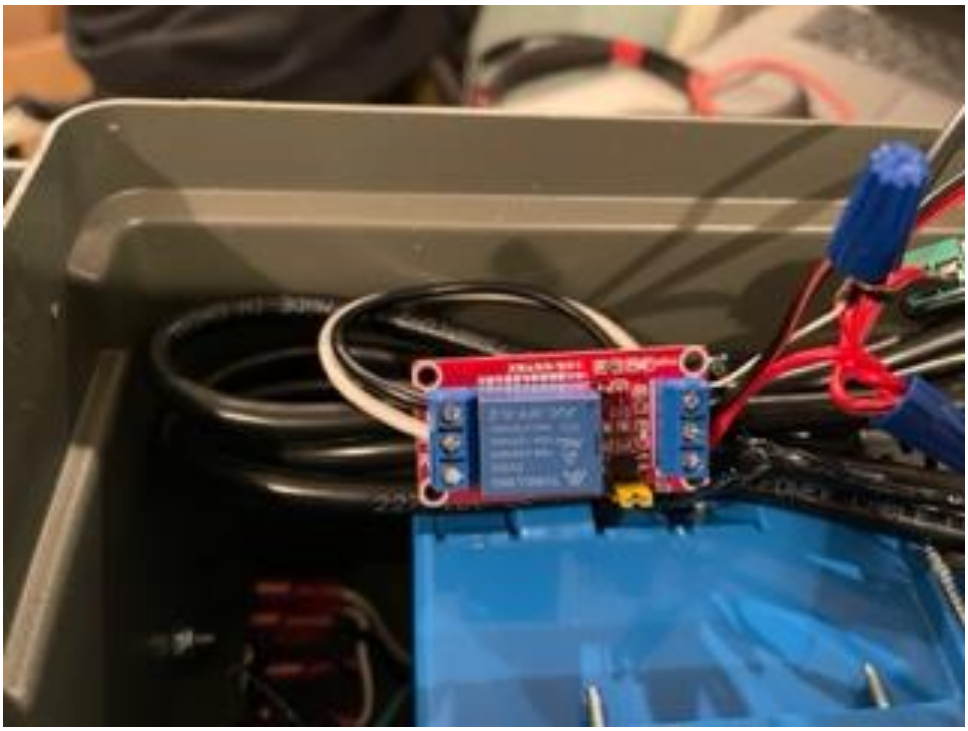
- Push in the tabs on the back of the gang box to allow for the wires to be fed through the box.
- Do not install the gang box in the ammo can until after you feed the wires. It is a little easier to work with while the gang box is outside of the ammo can.
- Feed the cord from the power socket through the closet bottom tab until the main outer sleeve is through the tab between1/4-1/2”.
- Feed the 3 plug outlet cord through another bottom tab (You could also use a top tab if you would like. I prefer one of the bottom tabs.) until the main outer sleeve is through the tab to where it is at least 1/4". You may want to push it through more depending on how you want the 3 plug outlet to fit within your ammo can with your wall wart plugged into it.
- **If you will be using the relay controller for switching 1 or more of your AC outlets:** Run the black and white 12” wires with the 3/4” stripped end through one of the top tabs.
- Insert the gang box into the ammo can by feeding the wires through the hole in the ammo can. If you did not plug the connector end of the power socket cord in the power socket, then do that before fully inserting the gang box.
- Push the gang box all the way into the ammo can and make sure you like where your 3 plug outlet sits. Be sure to see how it sits with the wall wart plugged in. You may need to adjust for your desired fit within the free space of the box.
- Secure the gang box by screwing in the two corners of the box until tight.

Wiring the AC Outlets


- **If you have a single gang box**:
  - Twist the 3/4" end of the 3 white wires from the power socket cord, 3 plug outlet cord, and 3” wire together with your fingers and then twist on a yellow wire nut allowing the wires to twist around each other below the wire nut.
  - Twist the 3/4" end of the 3 green wires from the power socket cord, 3 plug outlet cord, and 3” wire together with your fingers and then twist on a yellow wire nut allowing the wires to twist around each other below the wire nut.
  - **If you will NOT be using the relay controller for switching your AC outlets:**
    - Twist the 3/4" end of the 3 black wires from the power socket cord, 3 plug outlet cord, and 3” wire together with your fingers and then twist on a yellow wire nut allowing the wires to twist around each other below the wire nut.
  - **If you will be using the relay controller for switching your AC outlets:**
    - Twist the 3/4" end of the 2 black wires from the power socket cord, 3 plug outlet cord, and 12” **white** wire together with your fingers and then twist on a yellow wire nut allowing the wires to twist around each other below the wire nut.
    - Twist the 3/4" end of the 12” black wire and 3” black wire together with your fingers and then twist on a yellow wire nut allowing the wires to twist around each other below the wire nut.
  - Wrap the partially exposed green wire clockwise around the green screw and tightly hold the sleeve of the wire on both sides while tightening the screw.
  - Wrap the partially exposed white wire clockwise around the silver screw and tightly hold the sleeve of the wire on both sides while tightening the screw.
  - Wrap the partially exposed black wire clockwise around the brass screw and tightly hold the sleeve of the wire on both sides while tightening the screw.
  - Push wires into gang box and screw outlet(s) into the box.
  - Install outlet cover.

- **If you have a dual gang box**:
    - Twist the 3/4" end of the 4 white wires from the power socket cord, 3 plug outlet cord, and 2 3” wires together with your fingers and then twist on a yellow wire nut allowing the wires to twist around each other below the wire nut.
    - Twist the 3/4" end of the 4 green wires from the power socket cord, 3 plug outlet cord, and 2 3” wire together with your fingers and then twist on a yellow wire nut allowing the wires to twist around each other below the wire nut.
    - **If you will NOT be using the relay controller for switching your AC outlets:**
        - Twist the 3/4" end of the 4 black wires from the power socket cord, 3 plug outlet cord, and 2 3” wires together with your fingers and then twist on a yellow wire nut allowing the wires to twist around each other below the wire nut.
    - **If you will be using the relay controller for switching 1 set of your AC outlets:**
        - Twist the 3/4" end of the 3 black wires from the power socket cord, 3 plug outlet cord, 3” wire, and 12” white wire together with your fingers and then twist on a yellow wire nut allowing the wires to twist around each other below the wire nut.
        - Twist the 3/4" end of the 12” black wire and 3” black wire together with your fingers and then twist on a yellow wire nut allowing the wires to twist around each other below the wire nut.
    - **If you will be using the relay controller for switching both sets of your AC outlets:**
        - Twist the 3/4" end of the 2 black wires from the power socket cord, 3 plug outlet cord, and 12” white wire together with your fingers and then twist on a yellow wire nut allowing the wires to twist around each other below the wire nut.
        - Twist the 3/4" end of the 12” black wire and 2 3” black wires together with your fingers and then twist on a yellow wire nut allowing the wires to twist around each other below the wire nut.
    - Wrap the partially exposed green wire clockwise around the green screw and tightly hold the sleeve of the wire on both sides while tightening the screw.
    - Wrap the partially exposed white wire clockwise around the silver screw and tightly hold the sleeve of the wire on both sides while tightening the screw.
    - Wrap the partially exposed black wire clockwise around the brass screw and tightly hold the sleeve of the wire on both sides while tightening the screw.
    - Push wires into gang box and screw outlet(s) into the box.
    - Install outlet cover.

Wiring the Relay Controller Board



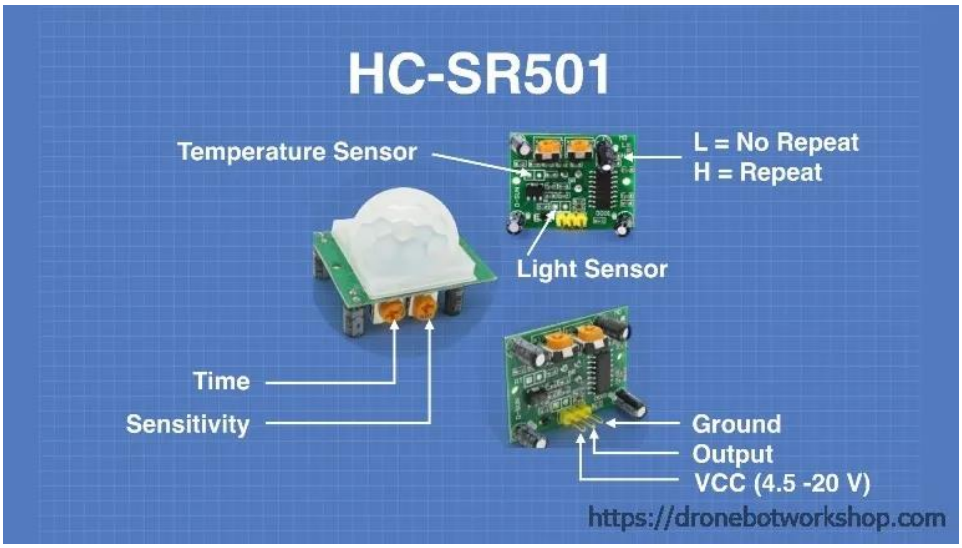
- **If you will be using the relay controller for switching 1 or more of your AC outlets: (Important note: There will be AC power at the relay board so handle carefully if the power is turned on.)**
    - Insert the 12” white wire into to **COM** outlet of the relay and tighten the screw.
    - **To turn on outlet when motion is detected:** Insert the 12” black wire into to **NO** outlet of the relay and tighten the screw.
    - **To turn off outlet when motion is detected:** Insert the 12” black wire into to **NC** outlet of the relay and tighten the screw.
    - Twist the 1/2” end of the 3” black speaker wire, negative wire from the wall wart, bare copper wire from PIR cable, and optional black speaker wire from the DC outlet (always on 5V power) together with your fingers and then twist on a blue wire nut allowing the wires to twist around each other below the wire nut.
    - Twist the 1/2” end of the 3” red speaker wire, positive wire from the wall wart, red wire from PIR cable, and optional red speaker wire from the DC outlet (always on 5V power) together with your fingers and then twist on a blue wire nut allowing the wires to twist around each other below the wire nut.
    - Insert the other end of the 3” red speaker wire that is connected to the blue wire nut into the DC+ outlet of the relay board and tighten the screw.
    - Insert the other end of the 3” black speaker wire that is connected to the blue wire nut into the DC- outlet of the relay board and tighten the screw.
    - Insert the white wire from the PIR cable into the IN outlet of the relay board and tighten the screw.

- **If you will be using the relay controller for switching the 5.5mm x 2.1mm DC outlet:**
    - Twist the 1/2” end of the 3” black speaker wire, negative wire from the wall wart, bare copper wire from PIR cable, and black speaker wire from the DC outlet together with your fingers and then twist on a blue wire nut allowing the wires to twist around each other below the wire nut.
    - Twist the 1/2” end of the 3” red speaker wire, positive wire from the wall wart, red wire from PIR cable, and 3” white wire (cute earlier) together with your fingers and then twist on a blue wire nut allowing the wires to twist around each other below the wire nut.
    - Insert the other end of the 3” red speaker wire that is connected to the blue wire nut into the DC+ outlet of the relay board and tighten the screw.
    - Insert the other end of the 3” black speaker wire that is connected to the blue wire nut into the DC- outlet of the relay board and tighten the screw.
    - Insert the white wire from the PIR cable into the IN outlet of the relay board and tighten the screw.
    - Insert the 3” white wire into to **COM** outlet of the relay and tighten the screw.
    - **To turn on DC outlet when motion is detected:** Insert the red speaker wire from the DC outlet cable into to **NO** outlet of the relay and tighten the screw.
    - **To turn off DC outlet when motion is detected:** Insert the red speaker wire from the DC outlet cable into to **NC** outlet of the relay and tighten the screw.

Testing the Ammo Can

- Find the 3 pins on the back of the PIR circuit board and orient it so that the pins are at the top. Plug the flat end of the PIR cable 3 pins making sure the copper wire on the cable is on the left side.
- Plug the stereo plug end of the PIR cable into the stereo jack.
- Plug in AC power and flip switch.
- The relay circuit should power on and you should see a green power light. The relay will probably click on and there will be a red relay light. The relay light should turn off after a short period of time.
- When the PIR senses motion, you should hear the relay click and the red relay will turn on. It will then turn off until the PIR senses motion again.
- Depending on how you wired up your ammo can, you will either have power to the AC plugs or the DC plug when the relay is energized. Or if you connected to the NC of the relay, the power will be off when the relay is energized and on when not energized.
- If the relay never turns off, try turning the stereo plug in the stereo jack. I seemed to have received a bad batch of stereo jacks. When building the kits, I tested and matched all plugs and jacks so you should see this issue but over time, the connections might loosen up and turning the plug should fix it.

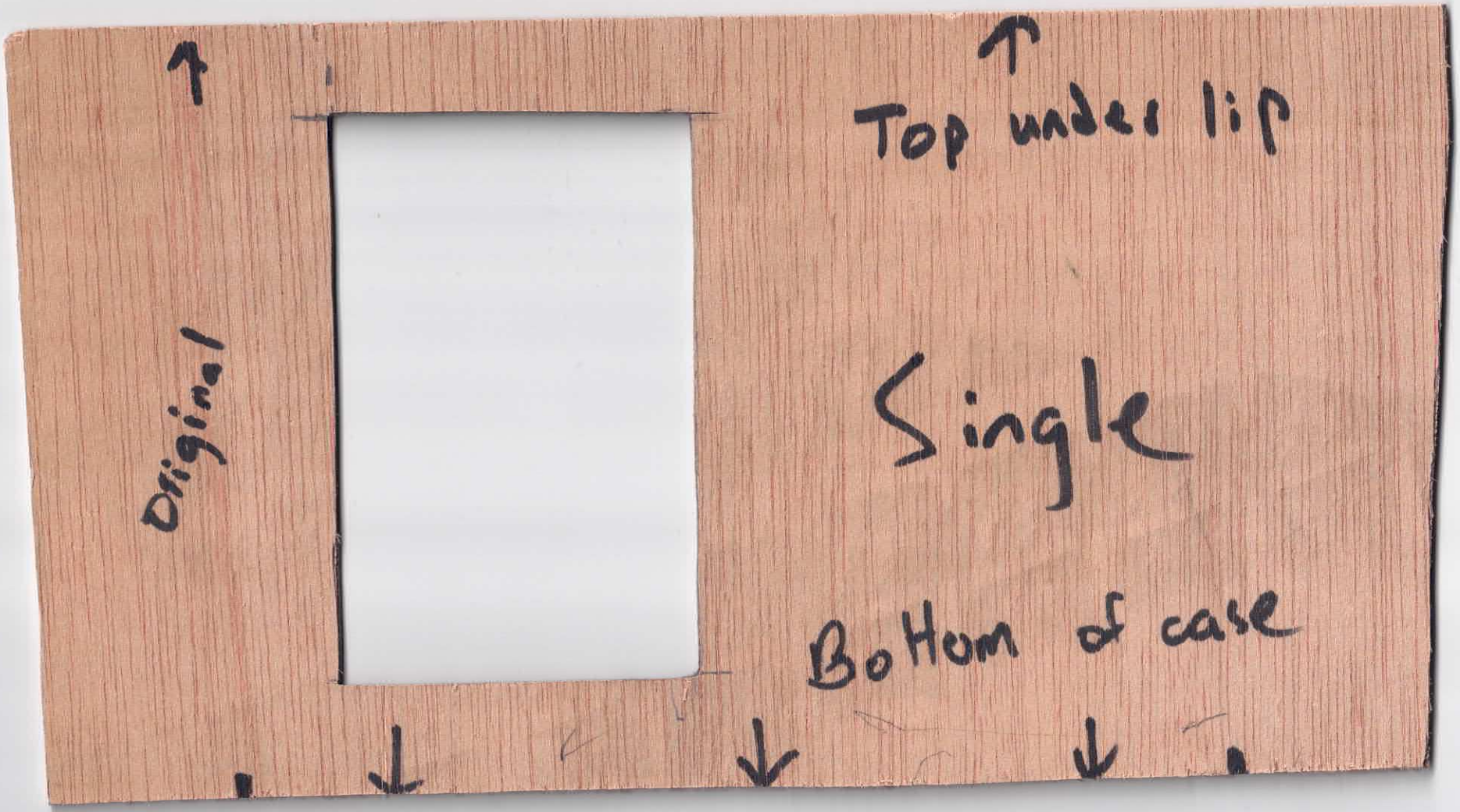
Adjusting the PIR

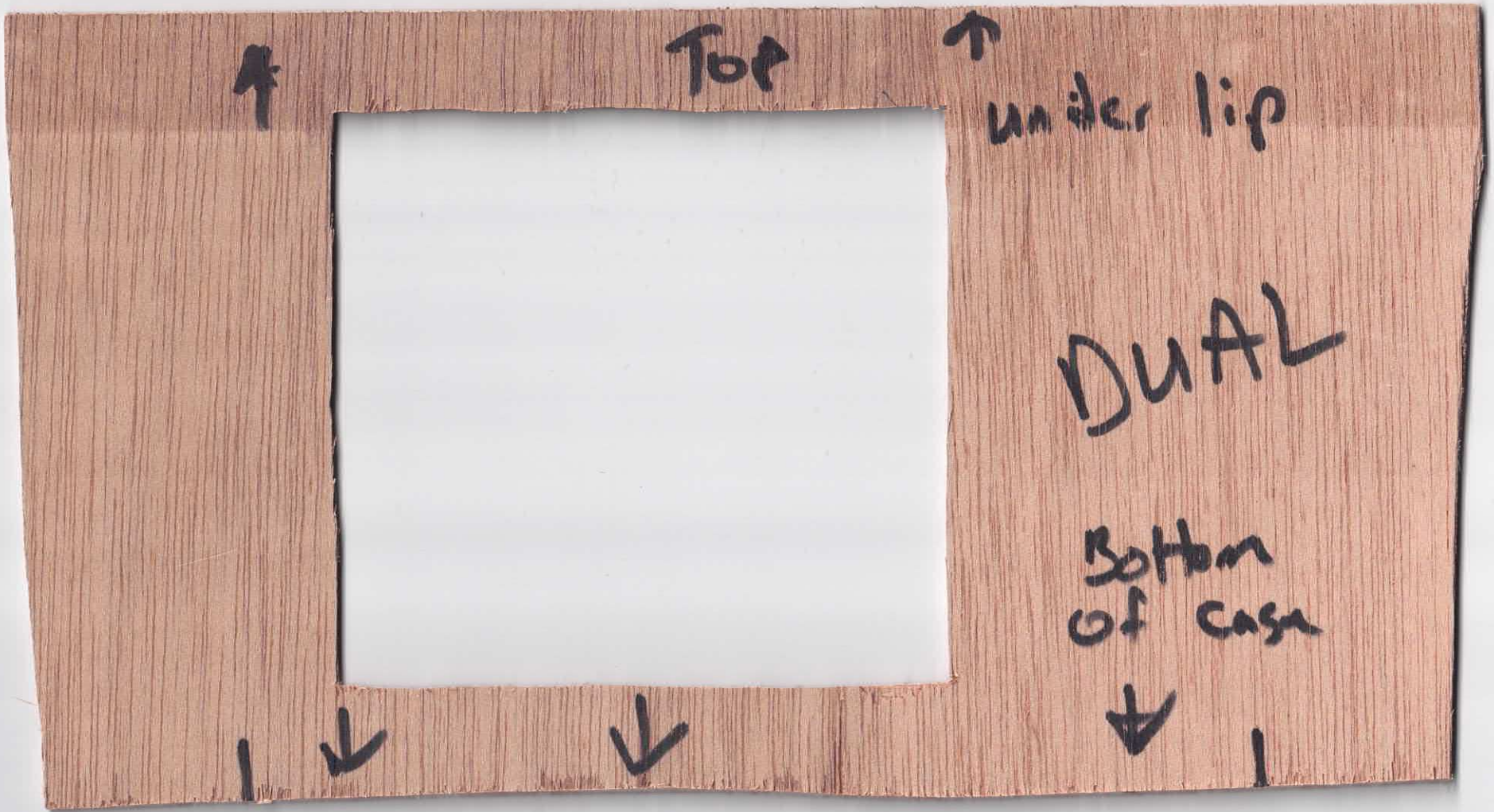


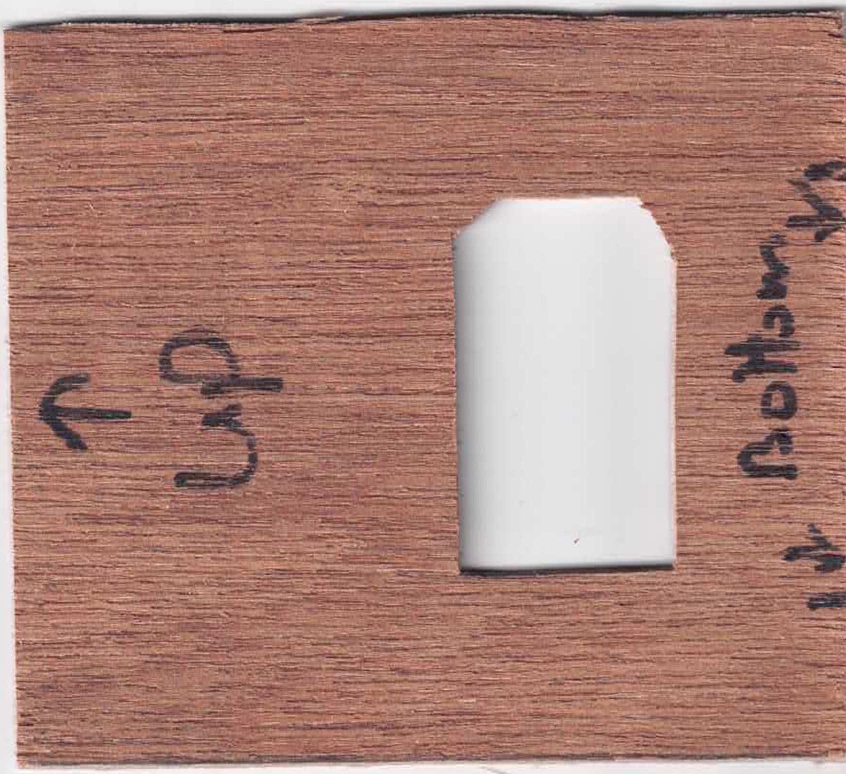
- You can adjust the PIR sensitivity and the duration of how long the relay remains active by adjusting the potentiometer (pot).
    - The left pot controls how long the output remains energized. It can be adjusted from about 3 seconds to 5 minutes
    - The right pot controls the sensitivity which ranges from 3 to 7 meters.
    - There is a jumper on the back of the board that allows for some additional control. But it did not seem to get the same results as what is explained below.
        - H – This is the Hold or Repeat setting. In this position the HC-SR501 will continue to output a HIGH signal if it continues to detect movement.
        - L – This is the Intermittent or No-Repeat setting. In this position the output will stay HIGH for the period set by the TIME potentiometer adjustment.

Other wiring options

- The AC sockets can be powered individually meaning that you can switch the power to one using the relay while the other will always be hot. To do this, you break the brass tab between the top and bottom plugs and the wire the black power source to one brass screw and wire the black relay return wire to the other brass screw.
- You can use the DC socket more like a powered push button to a separately powered device like a fog machine. You will need to understand the pins to the fog machine and how the manual push button works to wire this up. Essentially, you will need to connect the red and black speaker wires from the DC socket to the COM and NO or NC sockets on the relay. You will then need a 2-wire cord that plugs into the DC port that either connect to each side of the push button on the manual fog machine trigger (yes, you will have to open it up) or figure out what the pinout is to the fog machine and make a wire that connects to the correct pins.
- You can have an additional 12V or other voltage wall wart inside the ammo can and run the positive end to the COM socket of the relay, connect the red wire from the DC socket to the NO/NC socket of the relay, and run the negative wire from the wall wart to the black wire from the DC socket.


Original
Top under lip
Single
Bottom of case


Top
under lip
DUAL
Bottom of case


Up
Bottom