

Home HAL9000

by [joe](#) on July 11, 2009

Table of Contents

intro: Home HAL9000	2
Video	2
step 1: Parts	2
step 2: Tools	3
step 3: Get the lens	3
step 4: LED Switch	4
step 5: Code	4
File Downloads	5
step 6: Breadboard it out	5
step 7: the box	6
step 8: Hole saw	6
step 9: Hole for the eye	6
step 10: Power an on/off	7
step 11: Glue the PIR	7
step 12: Glue the lens	8
step 13: Reflector	9
step 14: 3 Pin Plug	10
step 15: LED	10
step 16: Solder the power jack	10
step 17: Solder the switch	11
step 18: Hook up to breadboard	11
step 19: View it	12
Video	12
Related Instructables	13
Advertisements	13
Comments	13

intro: Home HAL9000

After watching 2001 A Space Odyssey I decided I needed my own HAL 9000- except less evil.

This uses a BS2, PIR and will pulse when it detects motion.



Hopefully this has a positronic brain which will observe the 3 laws of robotics and not turn on me.



step 1: Parts

- BS2
- PIR
- Aluminum Project Box
- Solderless Breadboard
- DC Power Jack
- 3 Pin plug, I got one from a CPU fan
- Switch
- Old flashlight for the lens.
- Red LED
- 470 Ohm resistor



step 2: Tools

Tools:
Soldering Iron
Drill
Screwdriver
Wire Stripper
Glue Gun



step 3: Get the lens

I had a broken led-shake-no battery flashlight. I pulled it apart for the lens and reflector.

I cut the top off with a dremel and kept the lens and reflector assembly.



step 4: LED Switch

I removed the white led and replaced it with a red led.



step 5: Code

I use Mac BS2 to program my stamp. Its free and works really well.

Load the code on your stamp.

The code I used is attached.

```
hal9000.bs2
Project Files ID Stamp PBasic Check Syntax Run Lookup Serial Port
Couldn't open serial connection. Serial adapter plugged in? Port selected? PBasic tokenizer version: 1.23
O: hal9000
(SOFTAMP BS2)
(SPMARIC 3.5)
-----[ I/O Definitions ]-----
PIR PIN 15      * I/O Pin For PIR Sensor
LEDONE PIN 0    * I/O Pin For Red LED
counter VAR BYTE * Trip Counter
'-----[ Initialization ]-----
DEBUG CLS      * Clear DEBUG Screen
FOR counter = 10 TO 0
  HIGH LEDONE  * Turn LED on
  DEBUG HOME, "Warming up:", DEC3 counter
  PAUSE 1000
  LOW LEDONE   * Turn LED off
  PAUSE 1000   * Display Counter Every Second
NEXT
counter = 0   * Clear Counter Variable
DEBUG HOME, "Waiting"
'-----[ Program Code ]-----
Main:
DO
  IF PIR = 1 THEN * Motion Detected
    counter = counter + 1 * Update Trip Counter
    DEBUG HOME, "TRIPPED...", DEC3 counter
    FOR B2 = 0 TO 250 STEP 10
      PWM LEDONE, B2, 20
    NEXT
    FOR B2 = 250 TO 40 STEP 5
      PWM LEDONE, B2, 20
    NEXT
<debugger pane>
Clear Pause Mark
```



File Downloads



hal9000.bs2 (1 KB)

[NOTE: When saving, if you see .tmp as the file ext, rename it to 'hal9000.bs2']

step 6: Breadboard it out

The LED will get hooked up to pin 0, run a 470 ohm resistor from pin 0 to the positive of the LED.

Run the signal from the PIR to pin 15, and positive and negative to the + - terminal on the PIR.



step 7: the box

Now we'll start on the enclosure.

On the top find the center and mark it.

I used a punch so my drill bit wouldn't walk on the metal box.



step 8: Hole saw

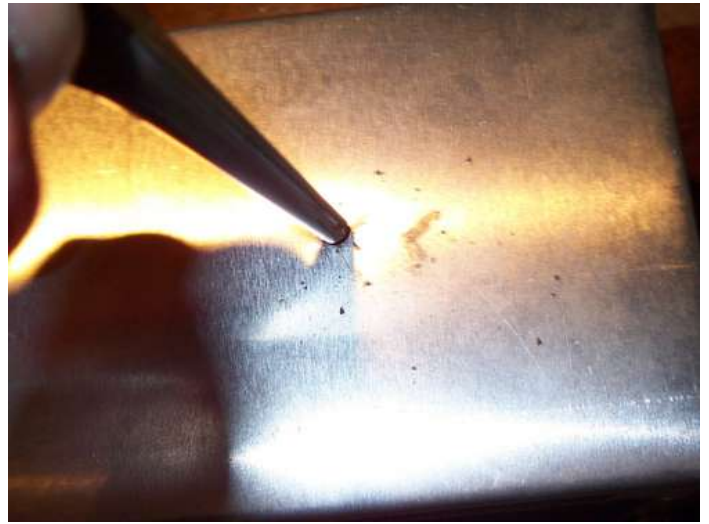
I used a hole saw to make the hole in the box.

I also used cutting oil to make the whole cutting easier.



step 9: Hole for the eye

To make the hole for the lens or HAL 9000s eye, measure the center, mark and again tap with a punch so the drill bit doesn't walk.



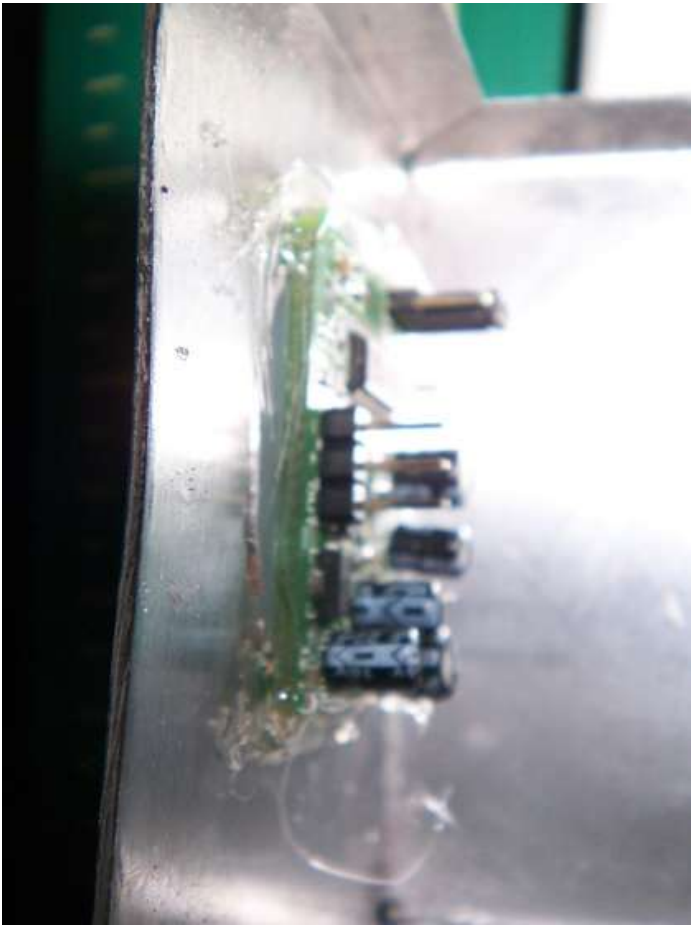
step 10: Power an on/off

On the back, make two holes, one for your power and one for your on/off switch.



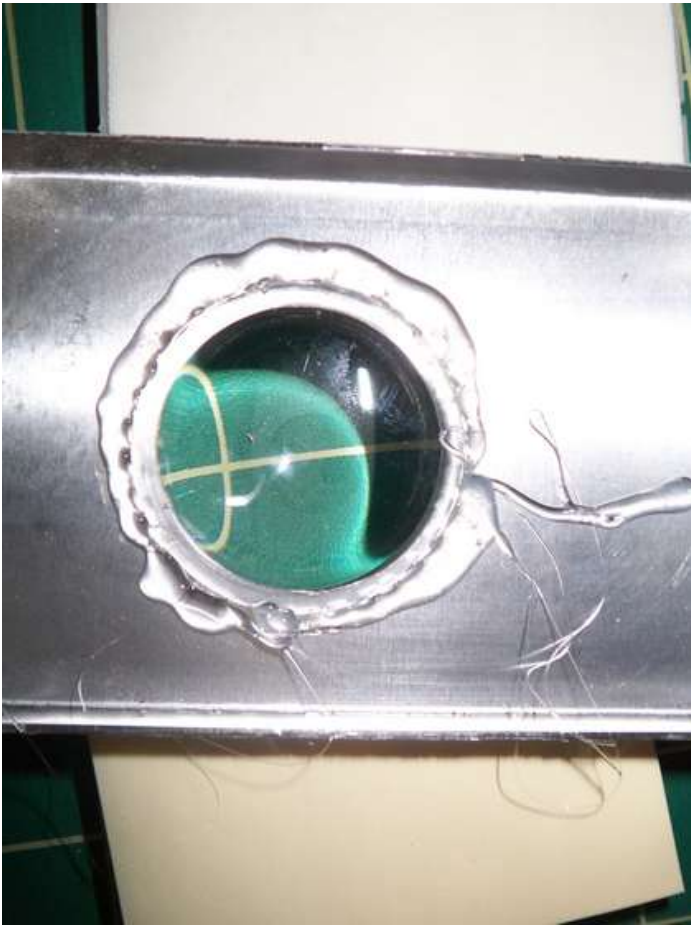
step 11: Glue the PIR

Glue the PIR in to place with a hot glue gun.



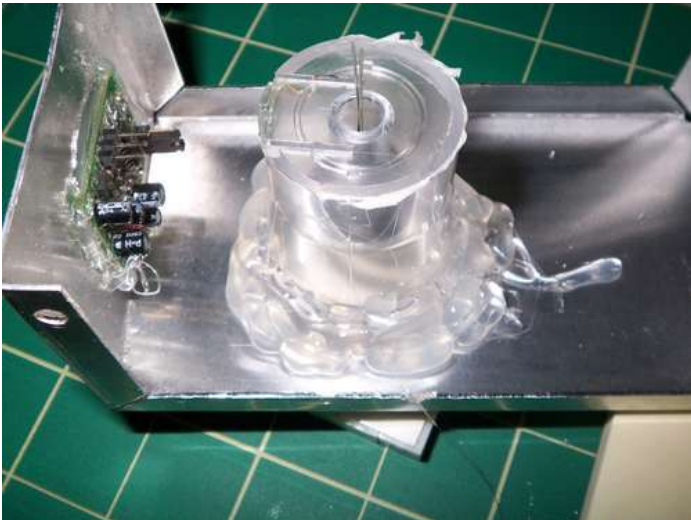
step 12: Glue the lens

Glue the lens in to place again using hot glue. You could use some other glue if you have it... I had hot glue so I used it.



step 13: Reflector

Glue the reflector on to the lens.



step 14: 3 Pin Plug

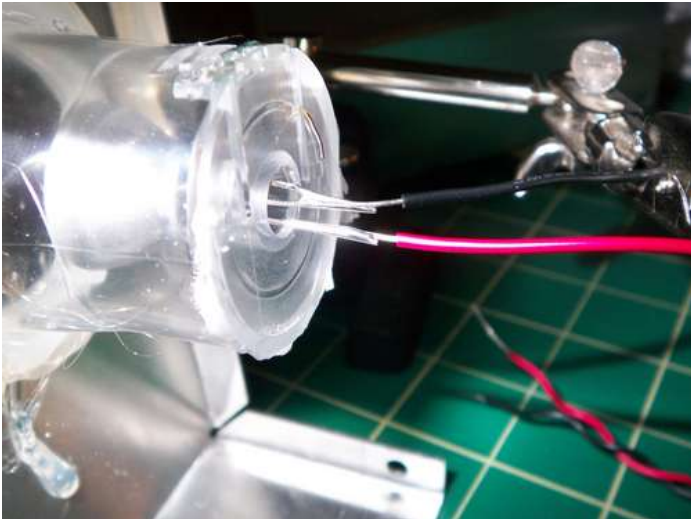
I grabbed a 3 pin plug from a cpu fan to connect the PIR to the BS2.

The plug had braided wire, which does not fit in a solderless breadboard very easily. So I soldered on some solid core wire to the end to make it easier.



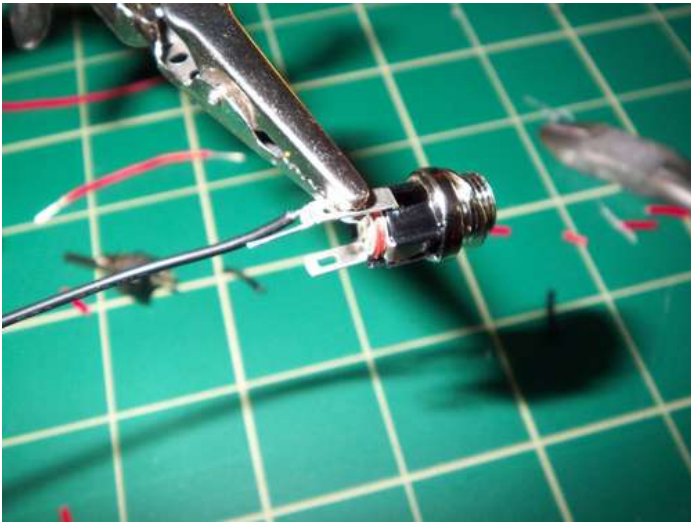
step 15: LED

Solder wire to the end of LED to connect to the breadboard.



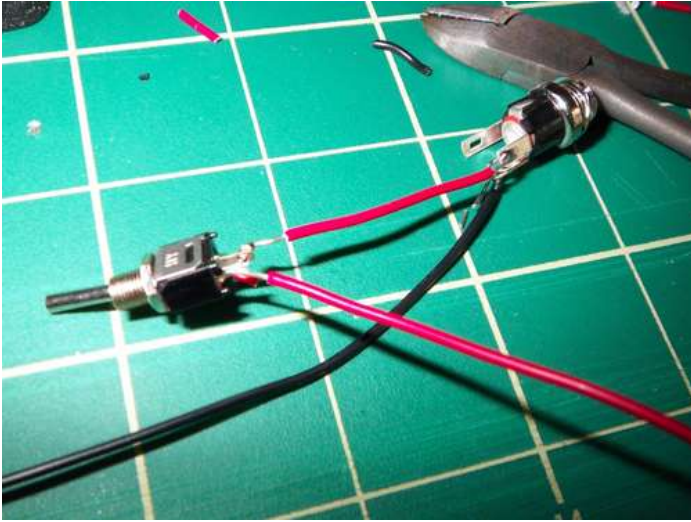
step 16: Solder the power jack

Solder wire to the power jack. Use a short piece for the positive as it is only going to go an inch or so to the right for the power switch.



step 17: Solder the switch

Solder the positive from the switch to the power jack. And then one more wire that you will plug in to the breadboard.



step 18: Hook up to breadboard

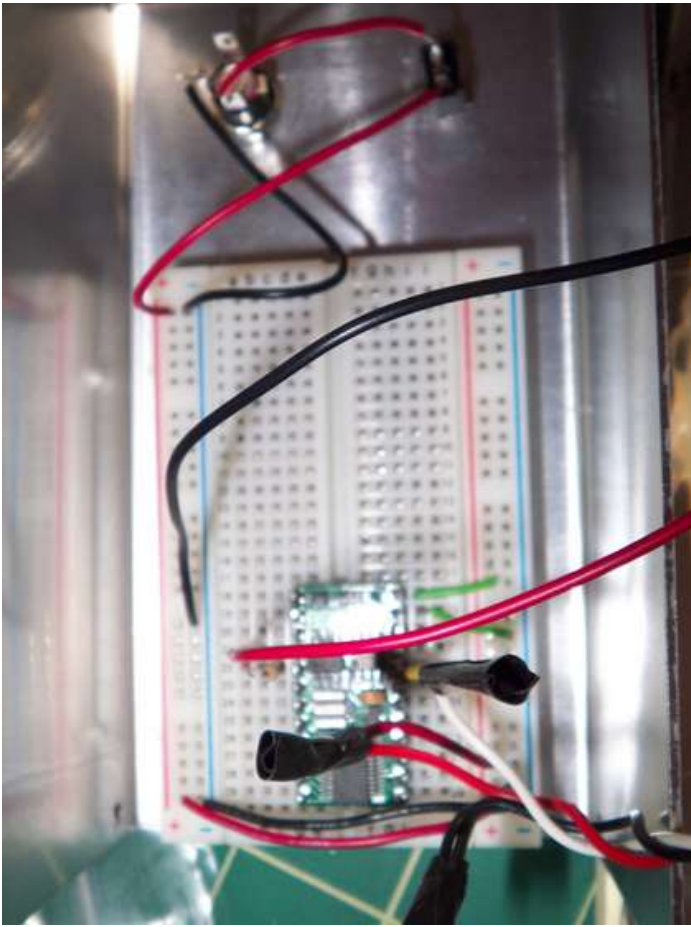
Now that everything is in the project box, hook everything back up.

Positive to pin 24
Negative to 23

Resistor to pin 5
PIR Signal to pin 20

LED + to resistor
LED - to negative

PIR + to positive
PIR - to negative



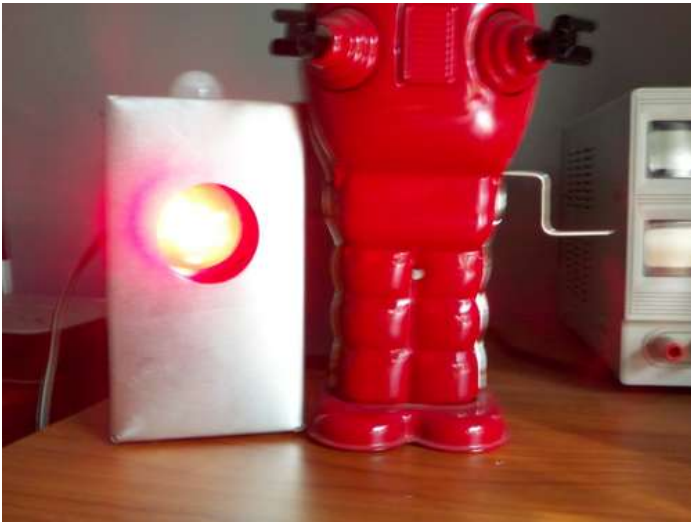
step 19: View it

Check it out.

The LED will pulse when the detects movement.



CLICK TO PLAY VIDEO 



Related Instructables



simply build your own HAL 9000 by tollef



Simple Solar Cooker by yaaaay



Homemade Guitar Slide by HAL 9000



HAL 9000 - Analog Bulletin Board by caitlinsdad



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SWEET HEART PANCAKES (now with more puns!) by HAL 9000



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The \$2 Camera Strap by HAL 9000

Comments

1 comments

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baken411 says:

wow extensive hal 9000. better than the plain old im gonna put a red light in a box. good work 5/5

Jul 12, 2009. 7:10 AM [REPLY](#)