

# WavFace 2



This document describes my modifications to animation software called WavFace authored by Phillip Burgess for Adafruit Industries.

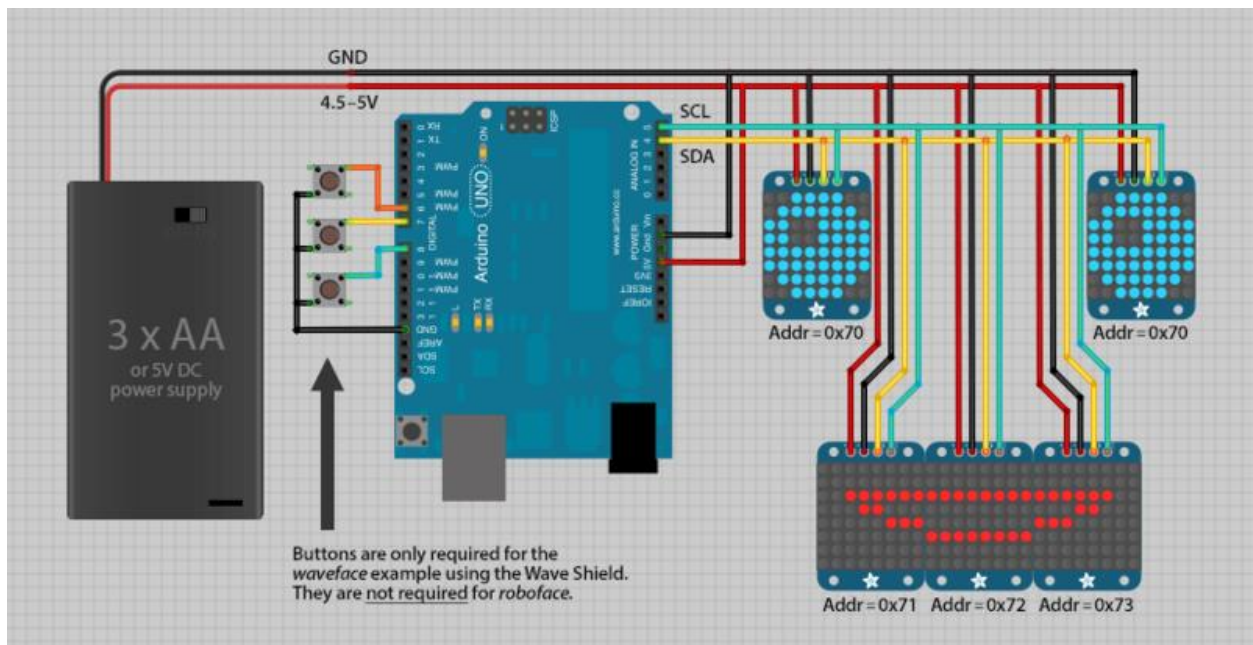
The original software used 5 Adafruit I2C driven 8X8 led matrix's that were animated to look like eyes and a mouth.

Two 1.2 inch (32mm) matrices are used for eyes while three .8 inch (20mm) matrices are used for the mouth.

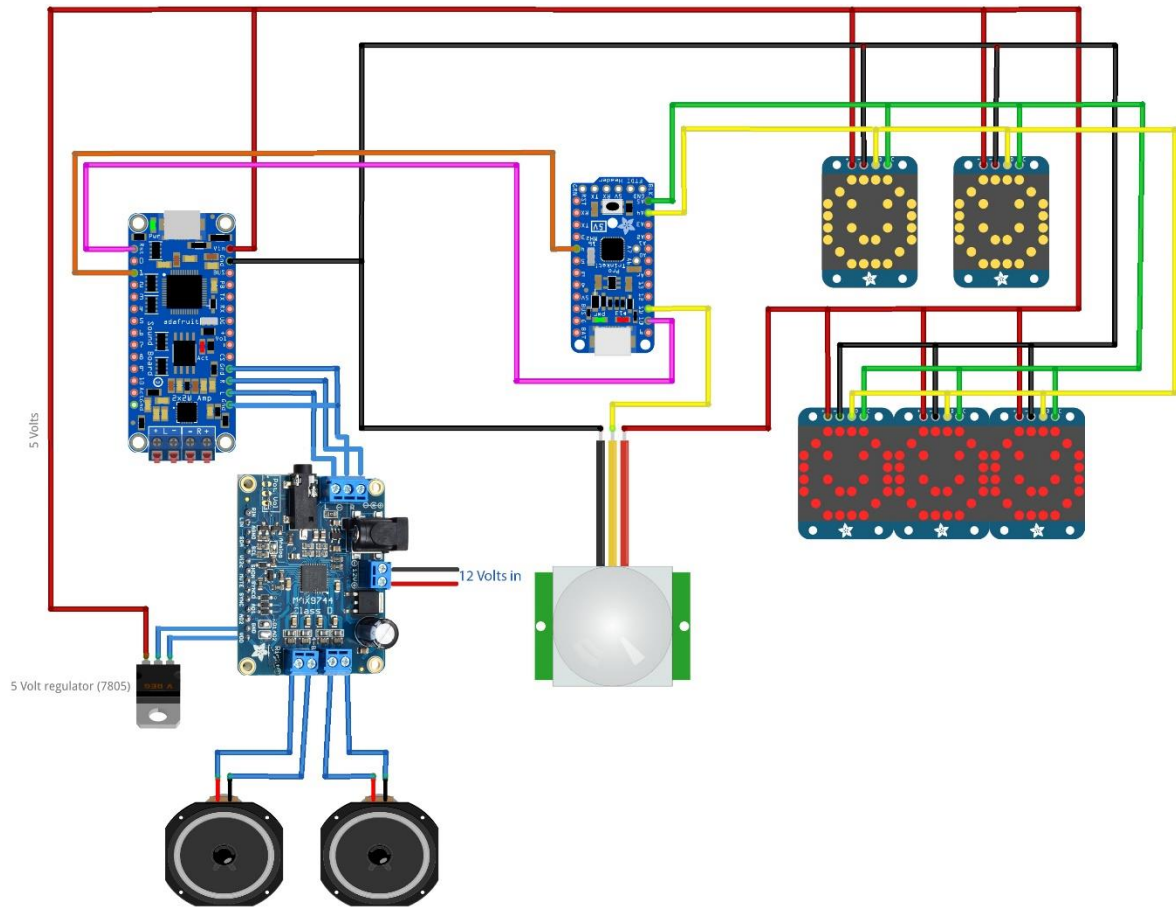
The processing and voice came from an Arduino UNO with a WAV shield connected to it.

The voices are placed on an SD card that resides on the Wave shield and the Arduino is programmed to drive everything. The output was sent to an Adafruit Stereo 3.7W Class D Audio Amplifier (\$8.95)

In this project 99.8 % of all the code is the Adafruit code written by Phillip Burgess. The hardware design is entirely that of Adafruit (or Mr. Burgess, I'm not sure).



My contribution is to use a 5 volt Trinket pro (\$9.95) in place of the Arduino UNO and an Adafruit Audio FX Mini Sound Board with 16MB of flash (\$19.95) instead of the Wave Shield (a 2MB version is \$14.95 and would probably work just fine.), and an Adafruit Stereo 20W Class D Amplifier (\$19.95). I also added a motion detector to detect if someone is approaching.



Using the newer parts buys you quite a bit. First, it costs less. This means you can buy even more stuff. I used the extra money to buy a PIR motion sensor. The Trinket Pro and the FX board are smaller, so you can put it into more stuff. Because it is smaller it is lighter and is less expensive to ship, and it uses a 20 watt amp so it is louder and easier to hear.

Arduino Uno (\$24.95)

Arduino Wave Shield (\$22.00)

Adafruit PIR Motion Sensor (\$9.95)

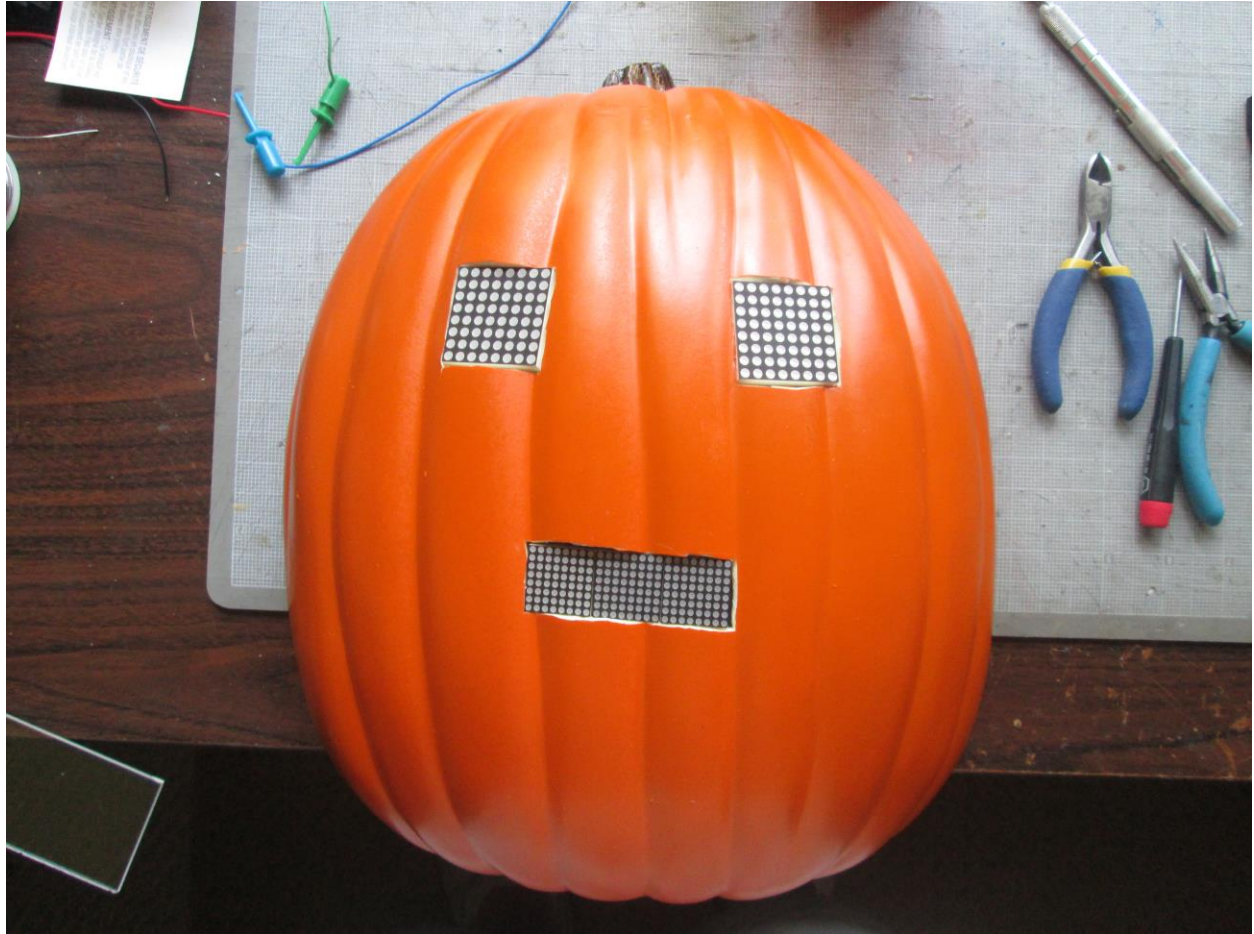
Cost of Arduino, Wave Shield and 3.7W amp is \$55.90

Cost of Trinket Pro, FX board and 20 W amp is \$49.85 or \$44.85 if you use the 2MB version of the FX board.

The addition of a motion sensor made it so that the face sits happily...looking around... and waiting for someone to approach. When someone does approach the face snaps into a big smile and begins to talk.

I recorded nine different Halloween phrases that I'm sure will delight someone in your family. I know my wife thought it was cute.

We decided to use a foam half pumpkin that we found at Michaels. The foam made it easy to cut out the eyes and mouth with an XACTO knife.



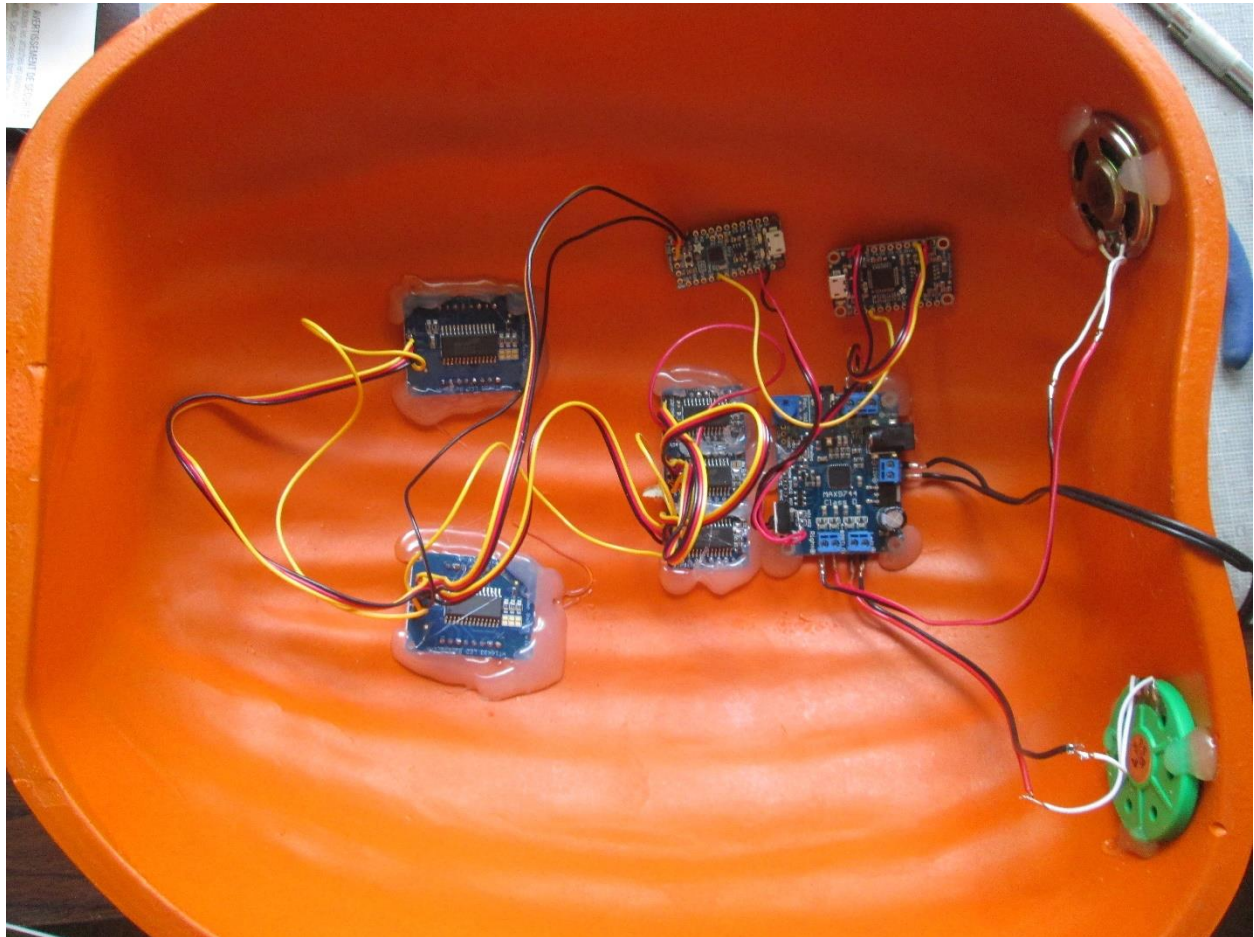


I wired it all up using "Servo wire" I believe it is 24 AWG. Stranded wire. I used header connectors I found at Adafruit.

I love the greeting cards that sing or talk. I get them for my birthday. When I am finished playing with them I cut out the electronics and save them. I used two of the speakers from those cards for the project.

If you don't have any speakers no problem Adafruit has them.

All of it is held in using hot glue.

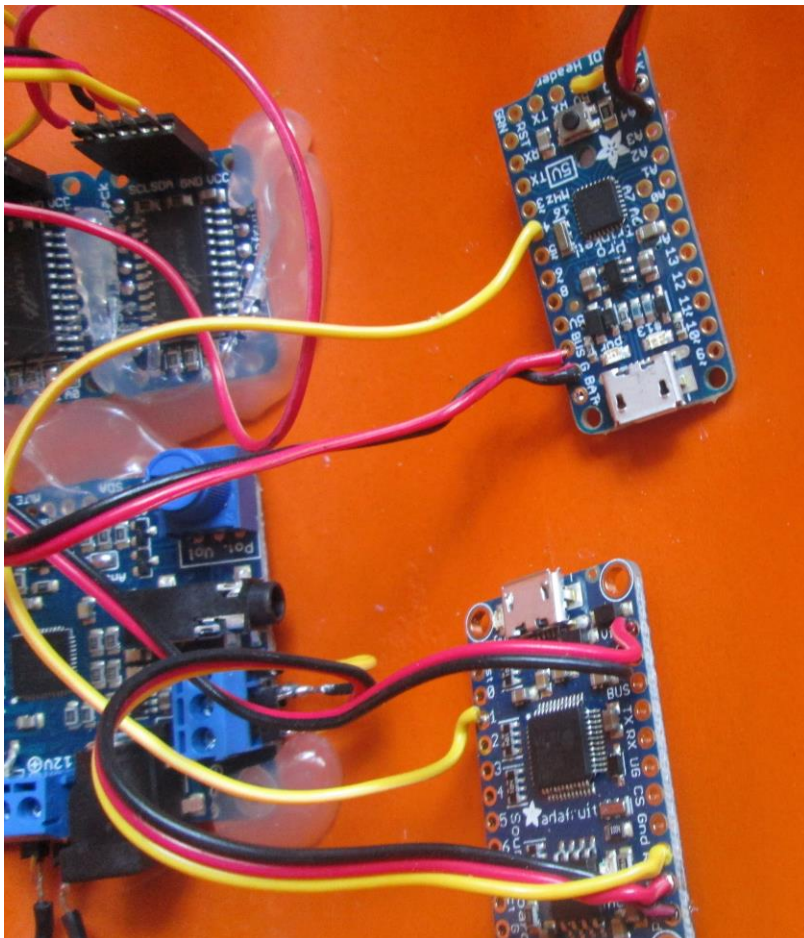
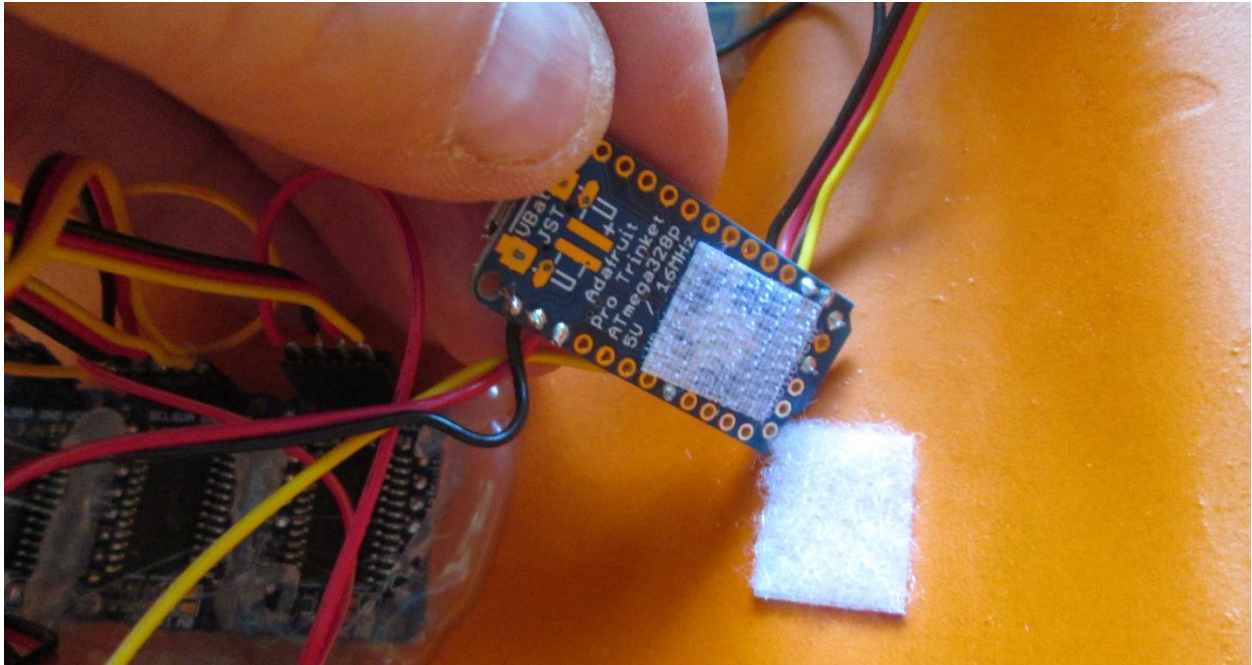


I drilled small holes at the bottom for the speakers.



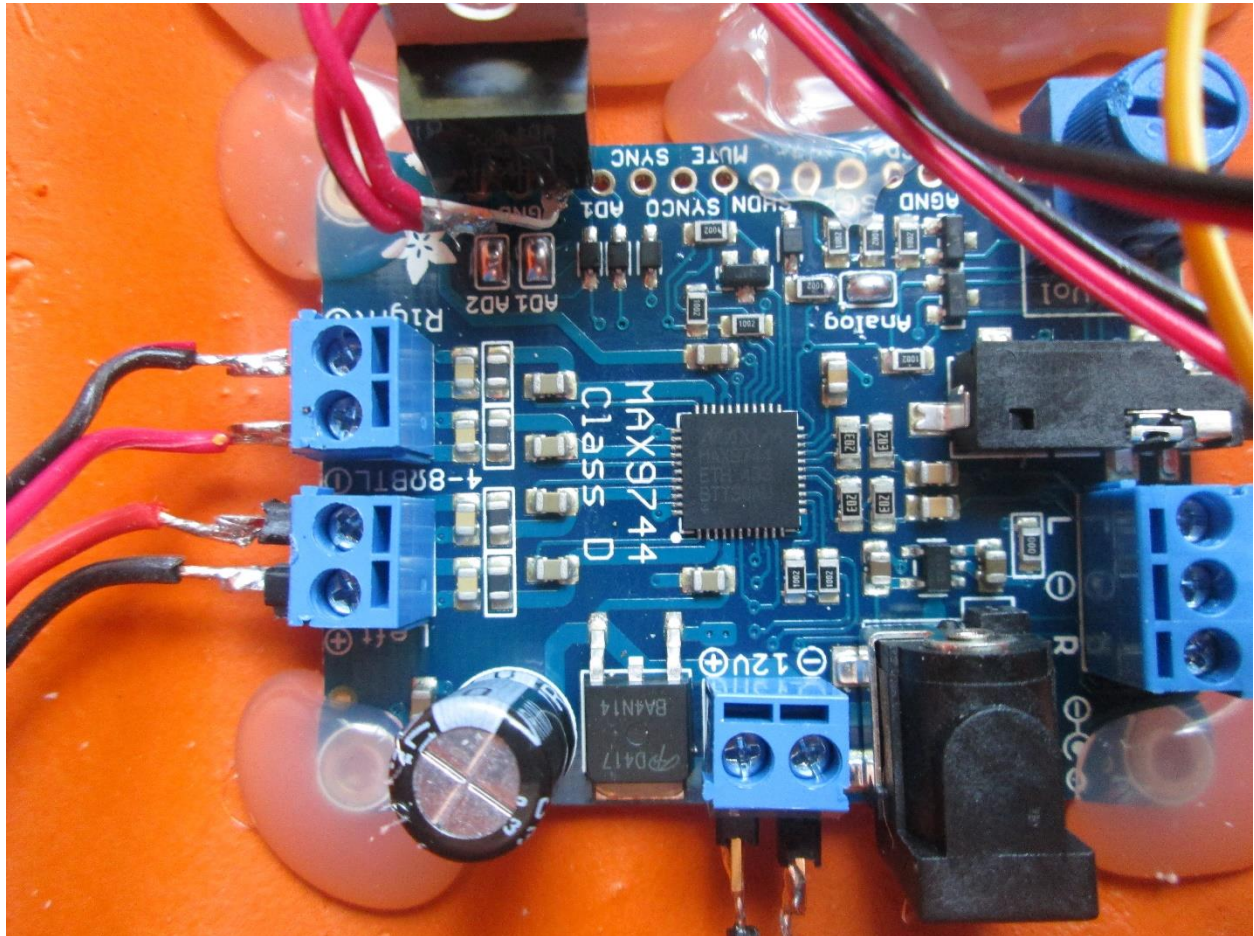


I held the Trinket and the FX board in place using Velcro. This is so I can connect a USB wire to them in case I want to change the programming or the voices on the FX card.



The audio level is controlled by a 20 watt stereo amplifier. It has a volume control on it so you can adjust the audio level.

The audio board runs on 12 volts and everything else (trinket, FX board, eyes etc.) all run on 5 volts. So, I added a 7805 (5 volt regulator). It gets a little warm (I measured it a 130 degrees) so be careful when you stick your hand in there to turn up the volume.

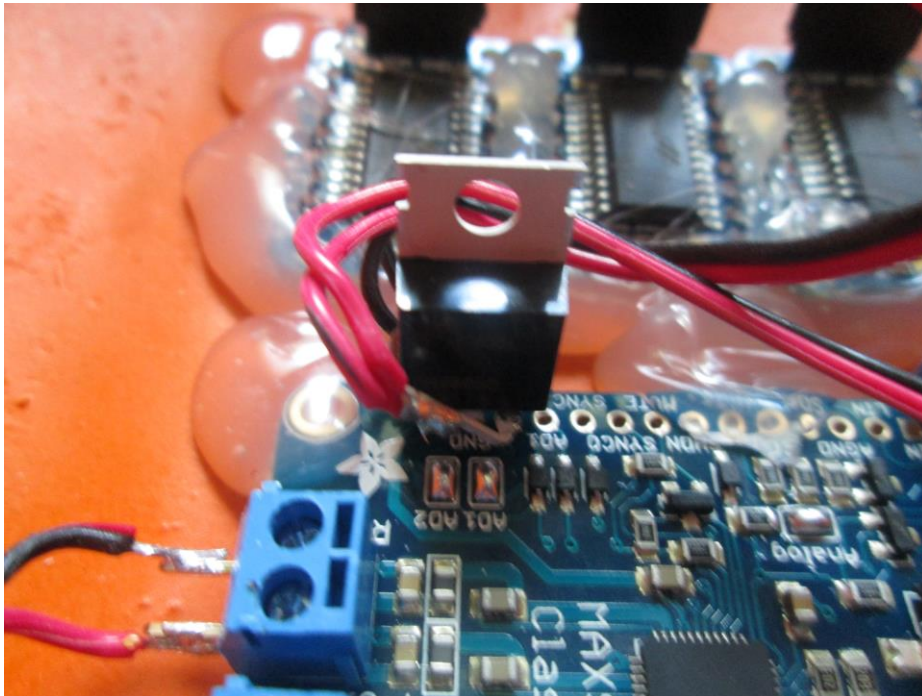


The 12 volts is supplied by a wall wart that is rated at 12V 500ma.

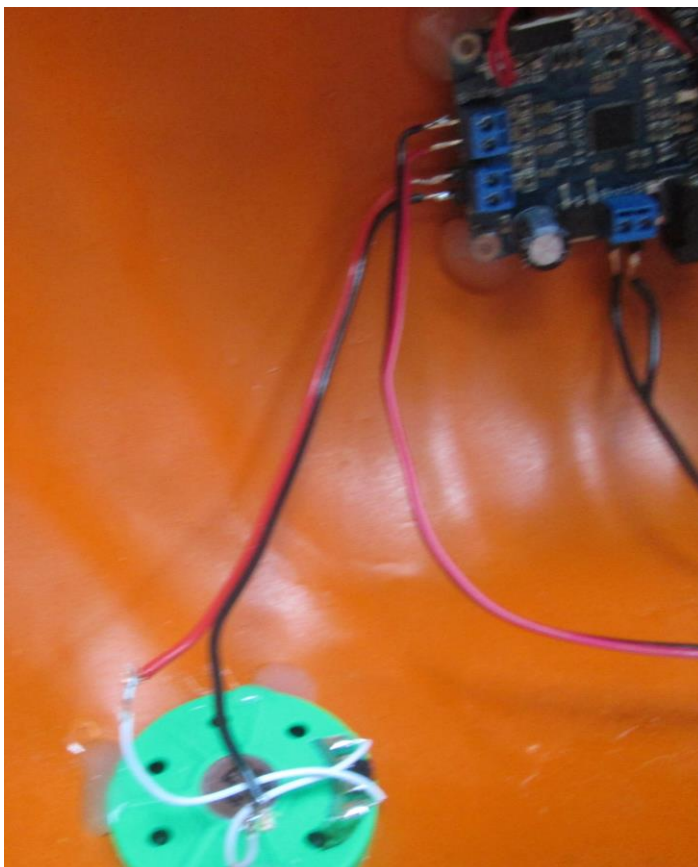
Here are a few more shots of the back of the pumpkin.



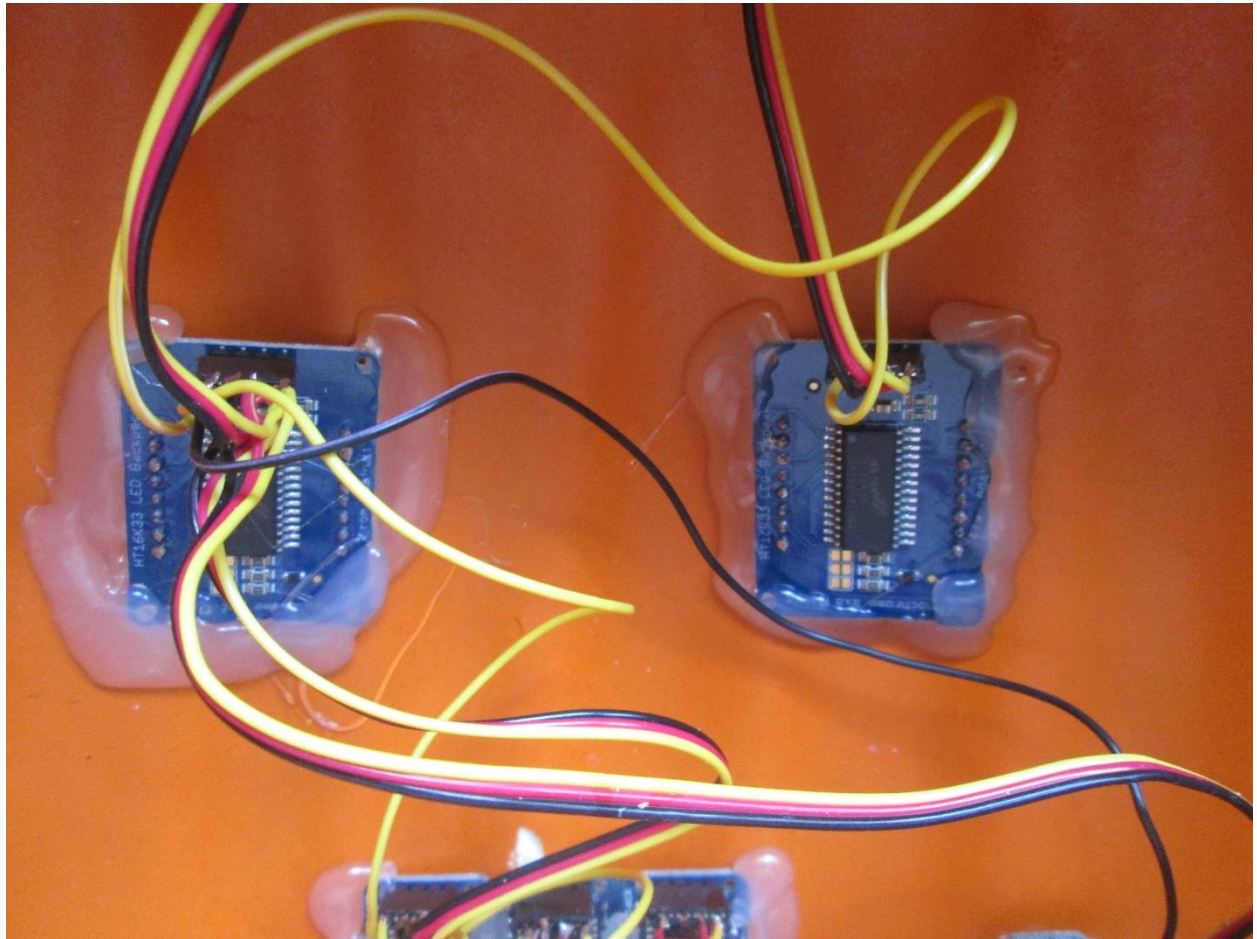
5 volt regulator



Speaker



The eyes and the mouth.





The final product. Note the motion sensor



So, What does it do ?

It stands in the corner without a smile, but with its eyes moving

When someone approaches the motion sensor triggers the face to snap into a smile and say nine Halloween phrases.

When the ninth phrase is complete it goes back into its silent stage.