PAN ANTHEM

BY RAFAEL LOZANO-HEMMER

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GENERAL IMPORTANT INFORMATION

This short section must be read for proper operation

PAN ANTHEM (2014)

BY RAFAEL LOZANO-HEMMER

Technique

Speakers with built-in microSD card and sound playback and amplification, power distribution battens, ultrasonic proximity sensors, LED screens.

Description

Pan Anthem is an interactive sound installation where hundreds of national anthems are poised to play upon the approach of the viewer. Individual movable speakers are magnetically fixed across the wall at the front of the gallery, precisely arranged to visualize a set of national statistics; population, GDP, number of women in parliament, land mass, or year of independence, to name a few possible arrangements. For example, when the work is configured to show the spread of national military spending per capita, the speakers will manifest these statistics through the anthems played. On the far left of the wall, the public would hear the anthems of countries without military forces like Costa Rica, Iceland, and Andorra. As they walk to the right, they will hear Mexico 50 cm away, then Turkey 1.5 m away, the Russian anthem plays at 2.3 m, UK at 4.7 m, Saudi Arabia at 7.3 m, Israel at 8.7 m and finally the United States' *Star Spangled Banner* plays by itself at the far right of the room, 9m away. As a visitor approaches a particular set of speakers, the music starts playing automatically, creating a positional panoramic playback of anthems associated to specific metrics.

A separate set of silent speakers are hung on the side wall. They represent countries that have ceased to exist (Yugoslavia, USSR, Czechoslovakia) or countries that may exist in the future (Québec, Catalunya, Scotland). The curator or collector is free to rearrange the speakers to represent any set of national statistics and to keep updating, adding or removing countries as they wish.

Operation

Please refer to Appendix I - Installation for components emplacement and wiring diagram.

1. Connect the power supply coming from the bottom electronic casing to a power outlet.

2. The piece turns ON as soon as the power supply is connected. To activate the sound, step on the pressure-sensing mat in front of each speaker bank.

3. To turn the piece OFF, disconnect the power supply.

Maintenance

Some of the steel cables might need to be re-tensioned over time. Use the custom tool provided to pull the cables straight through the top casing and adjust the holding sleeve. See images below.

For cleaning, use a dry soft cloth or a duster. Be careful with the small display of the bottom casing and the speakers. The battens should be cleaned every week.

Placement Instructions

Please consult the image below outlining the dimensions and placement instructions for the steel cables.
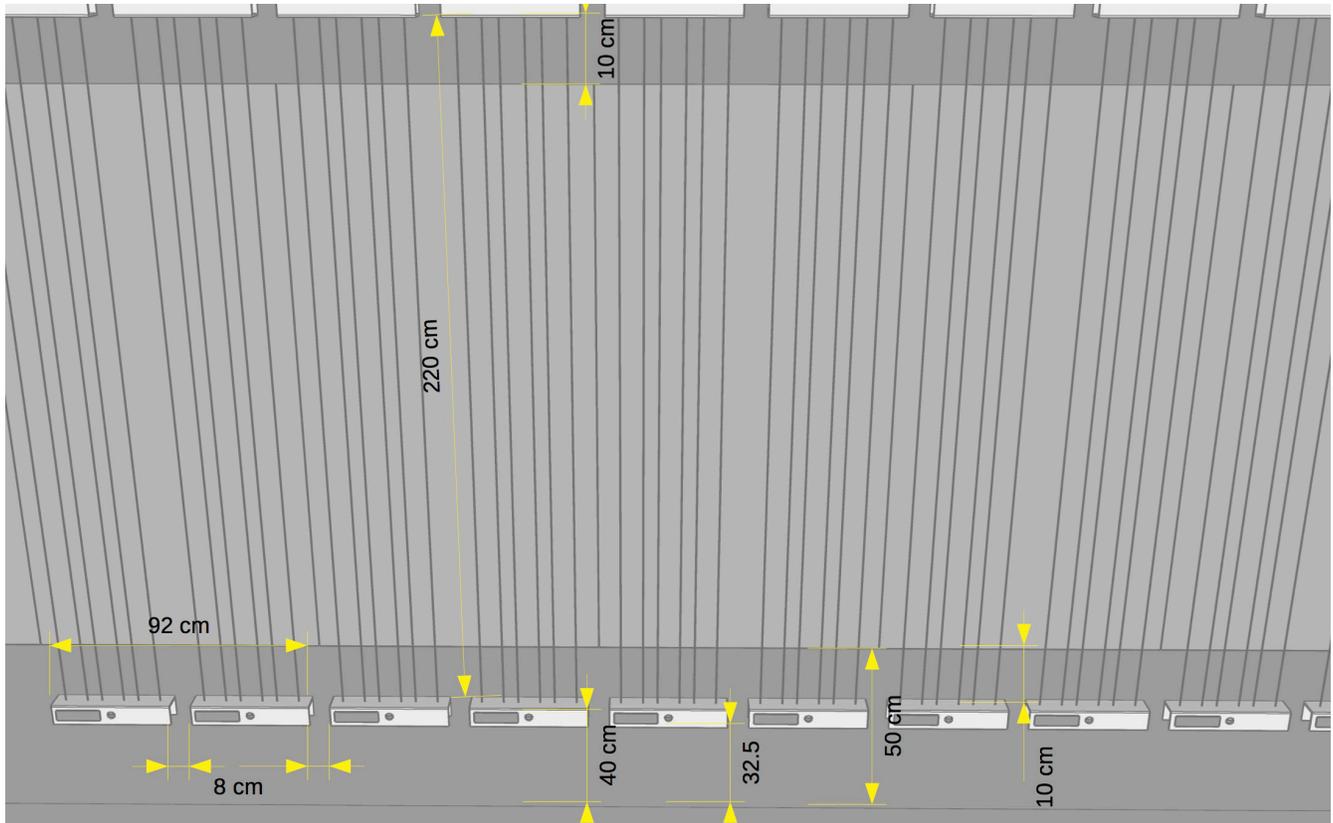
DETAILED TECHNICAL INFORMATION

Software

The software of this piece is integrated within the electronics, but there are some settings that you can manually adjust on the speakers themselves.

On the back of the speaker, you can adjust the volume of the anthem and the fade out time of both the display and the audio. You can do this by looking at the back of the speaker, and turning the dials counterclockwise to increase the volume or the fade out time. You can access and adjust the volume control from the front of the speaker. See the images below.
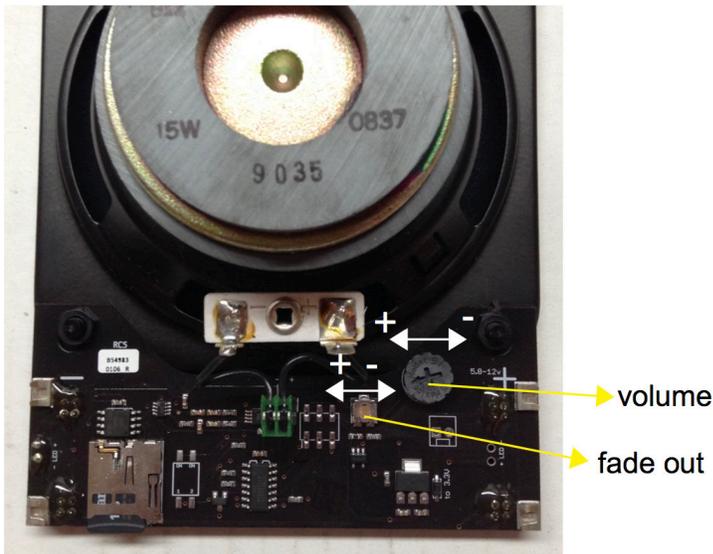
Preliminary Troubleshooting Steps

One of the speakers is noisy or does not play any sound.

Most of the time, this problem comes from a corrupted SD card on the speaker player. To verify that the SD card is faulty, exchange the card from the problematic speaker with a working one. To release the card from the slot, push gently on the card and release it. Do the same to put the card back into the socket. If the speaker plays the other card normally, it means that the faulty SD card needs to be replaced. Follow the procedure outlined in Appendix III to make a new card. If trying a new, working SD card still does not produce sound, ten the the player is the problem. Replace the whole speaker with a spare one.

The display on the speaker is blinking.

Move the volume potentiometer on the back of the speaker slightly until the light stabilizes.

One bank of speakers plays continuously.

If one set of speakers (all speakers linked to one casing) will not stop playing, it means that the sensing mat is broken. Replace it.

One bank of speakers never plays.

If one set of speakers is not playing sound, even when standing in front of it, then you must follow the following steps to determine the problem. First, measure the voltage between the pair of wires that power the speakers. See the below images.


Voltage when the speakers don't play.

Voltage when the speakers are playing.

When the electronics are working correctly, you should see a voltage number change from approximately 6V to 12V every time the speakers are activated. If you do not see any change, you will need to verify the connections inside the bottom casing. To open the bottom casing, unscrew the hex drive flathead screw on top of the bottom casing and pull carefully on the casing, as shown in the images below.
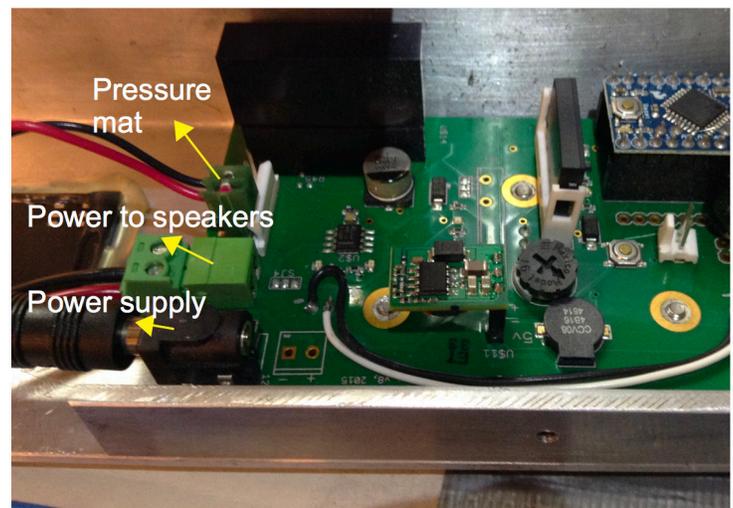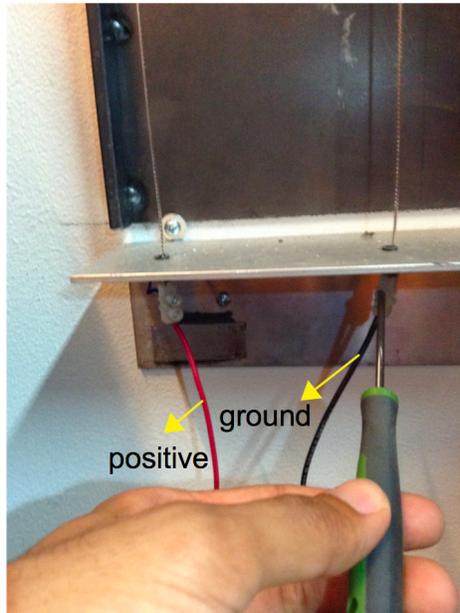
Troubleshooting Assistance

Prior to contacting Antimodular Studio with a problem about your artwork, please ensure you went through the preliminary troubleshooting steps outlined in the previous section.

The troubleshooting process will vary depending on the problem. In order to make the process easier, please collect and send the following information to the studio:

- Date and time when the problem first happened;
- Description of the problem;
- Actions taken so far and conclusions;
- Detailed photographs (or videos) displaying the problem;
- Detailed photographs (or videos) of the suspected faulty component;
- Detailed photographs (or videos) of the whole artwork and its surroundings;
- Personnel involved;
- Other relevant details, such as any changes in the surroundings, etc.

Support (Contact Us)

If you would like support for the piece please feel free to call Lozano-Hemmer's studio in Canada:

Antimodular Research
4060 St-Laurent, studio 107
Montréal Québec H2W 1Y9 Canada
Tel 1-514-597-0917 Fax 1-514-597-2092
info@antimodular.com
www.antimodular.com

APPENDIX I - INSTALLATION

Description of Components

This artwork requires the following components:

| Component	Description
Metal sheets	Steel metal sheets screwed to the wall to hold speakers
1 × 7-Strand Core 18-8 stainless steel wire (with 0.047" diameter)	Steel wire to carry power and hold the speakers.
Custom speakers with display	8 Ohm 15W speakers with integrated sound player
Aluminium casings with electronics	Custom casings to adjust the tension of the steel wire and hold the electronics controlling the speakers.
Sensing mats	When people step in front of the speakers, their presence is detected by pressure-sensing mats, which trigger sound.

Wiring Diagrams and Connections

Pressure mat

Power to speakers

12v 3.3amp power supply
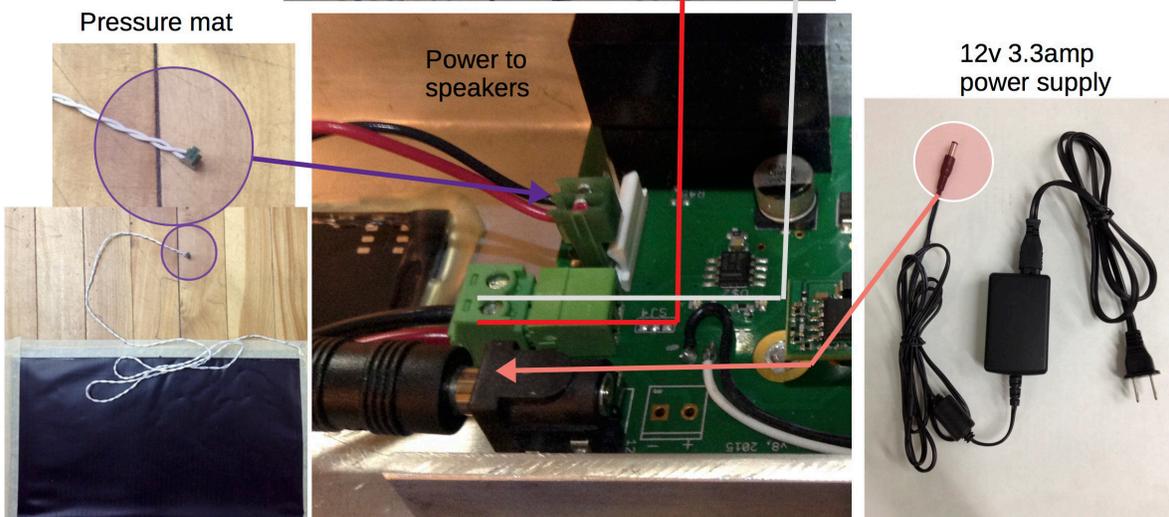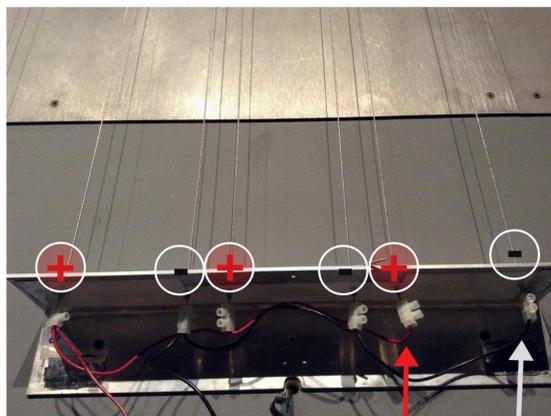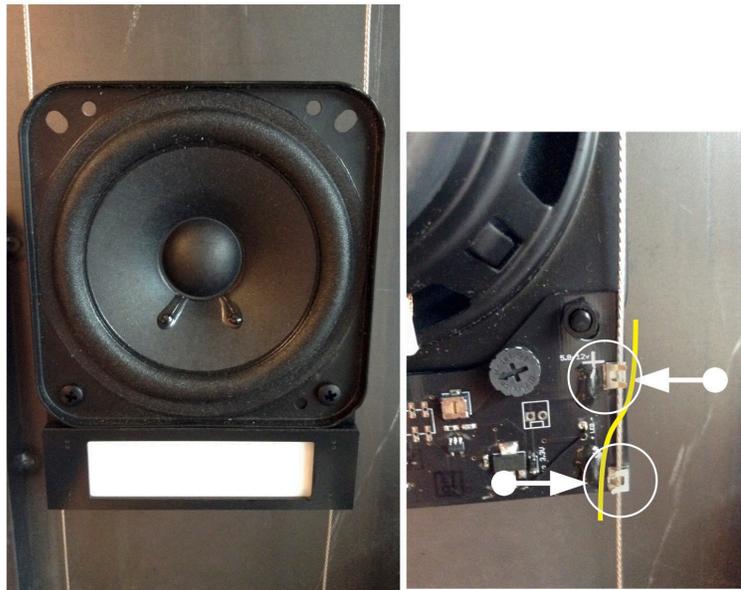
Important Note for Installation

You will need to make a hole in the wall behind each one of the bottom casings and at the very bottom of the wall to hide the cables from the sensing mats and the power supply. These cables cannot be visible from the front of the installtion. The following image illustrates this.
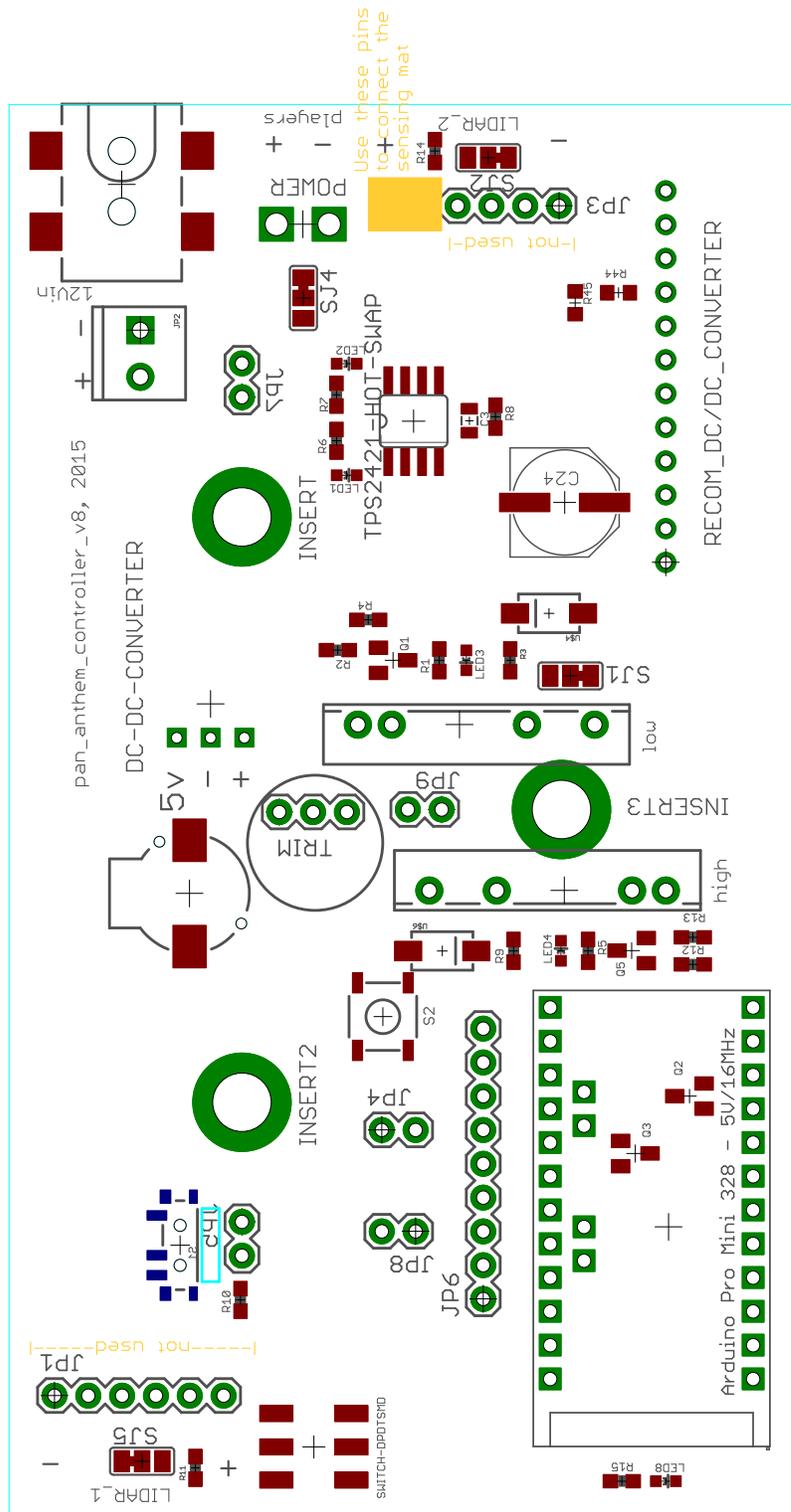
wall

bottom casing

power supply

sensing mat
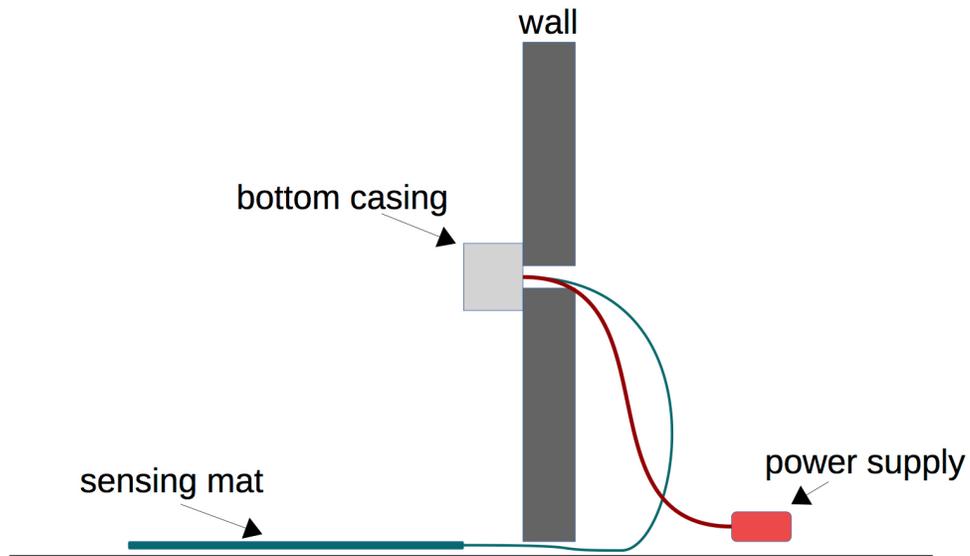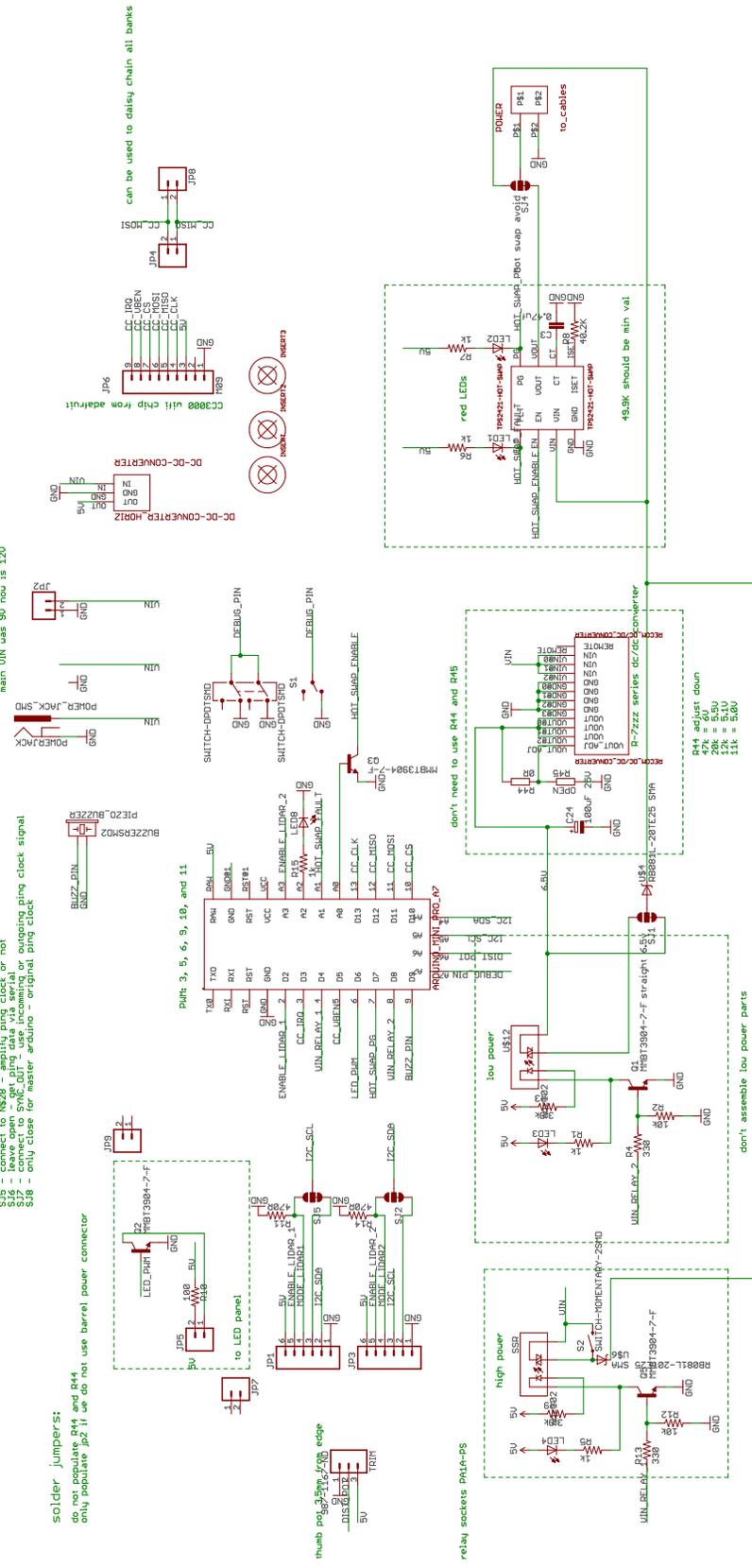
APPENDIX II - TECHNICAL DATA SHEETS

Speaker Player
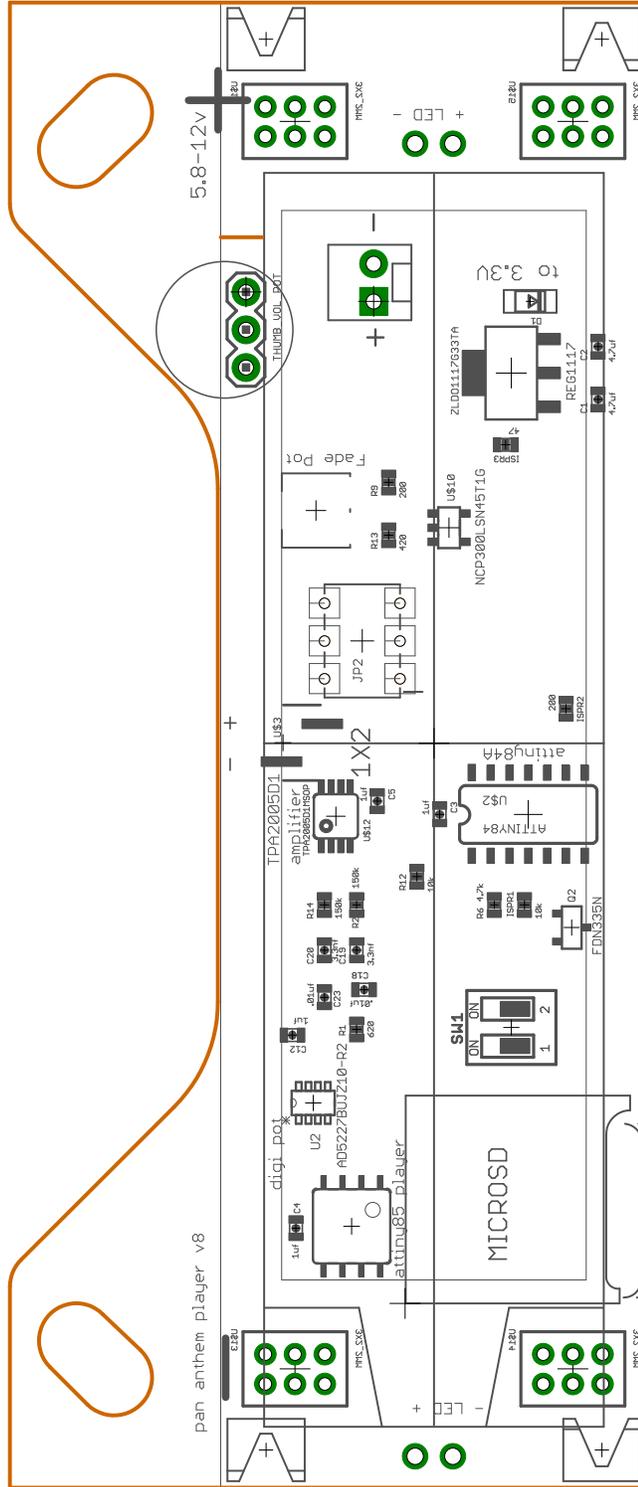
Controller Board

solder jumpers:

SJ1 - connect to NS15 - if we use relay for 6.5v or circumvent this relay
SJ2 - connect to PIN_2 - if we use panasonic motion sensor
SJ3 - connect to GND - if we want arduino to set ENABLE on hot swap ic or always enabled
SJ4 - connect to NS3 - if circumvent hot swap IC or not
SJ5 - connect to NS20 - amplify ping clock or not
SJ6 - leave open - get ping data via serial
SJ7 - connect to SYNC_OUT - use incoming or outgoing ping clock signal
SJ8 - only close for master arduino - original ping clock

solder jumpers:

do not populate R44 and R44
only populate jp2 if we do not use barrel power connector

main UIN was 9V now is 12V

PWM: 3, 5, 6, 9, 10, and 11

ARDUINO_MINI_PRO_A7

voltage 12V - current low

49.9K should be min val

R-7zzz series dc/dc converter

R44 adjust down
47k = 6V
20k = 5.5V
12k = 5.1V
11k = 5.0V

don't need to use R44 and R45

don't assemble low power parts

low power

high power

relay sockets PA1A-PS

thumb pot 3.5mm from edge

to LED panel

to cables

CC3000 wifi chip from adafruit

DC-DC-CONVERTER

DEBUG_PIN

HOT_SWAP_ENABLE