

Juniper: A Functional Reactive Programming Language for the Arduino

Hands-on Sound Visualization Project

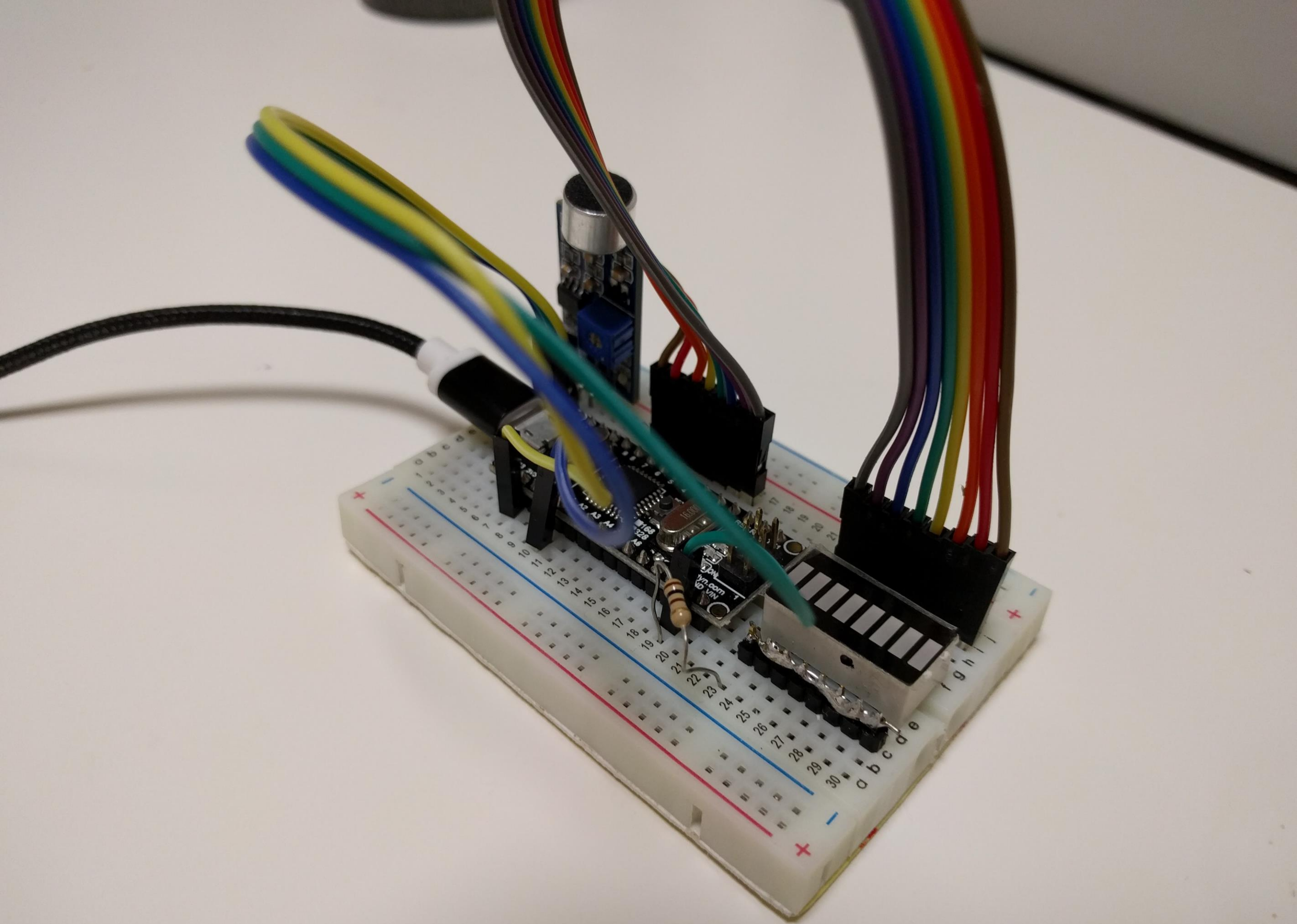
Please go to

<http://www.juniper-lang.org/>

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Workshop on Functional Art, Music, Modelling and Design (FARM)
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Parts List

Nano microcontroller

Sound sensor

100 ohm resistor

8 LED Bargraph

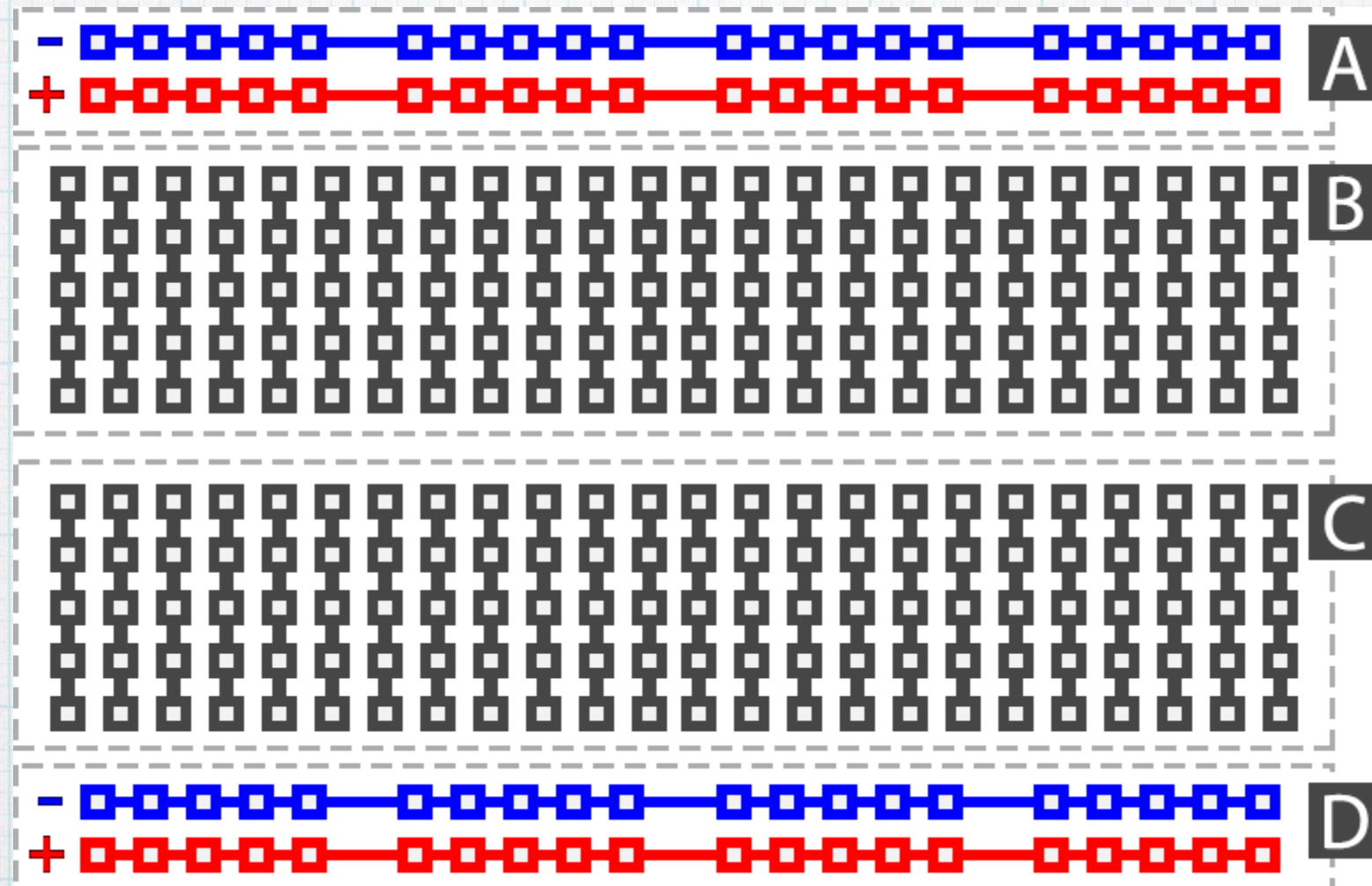
Bridged 8 pin header

8 pin jumper wire

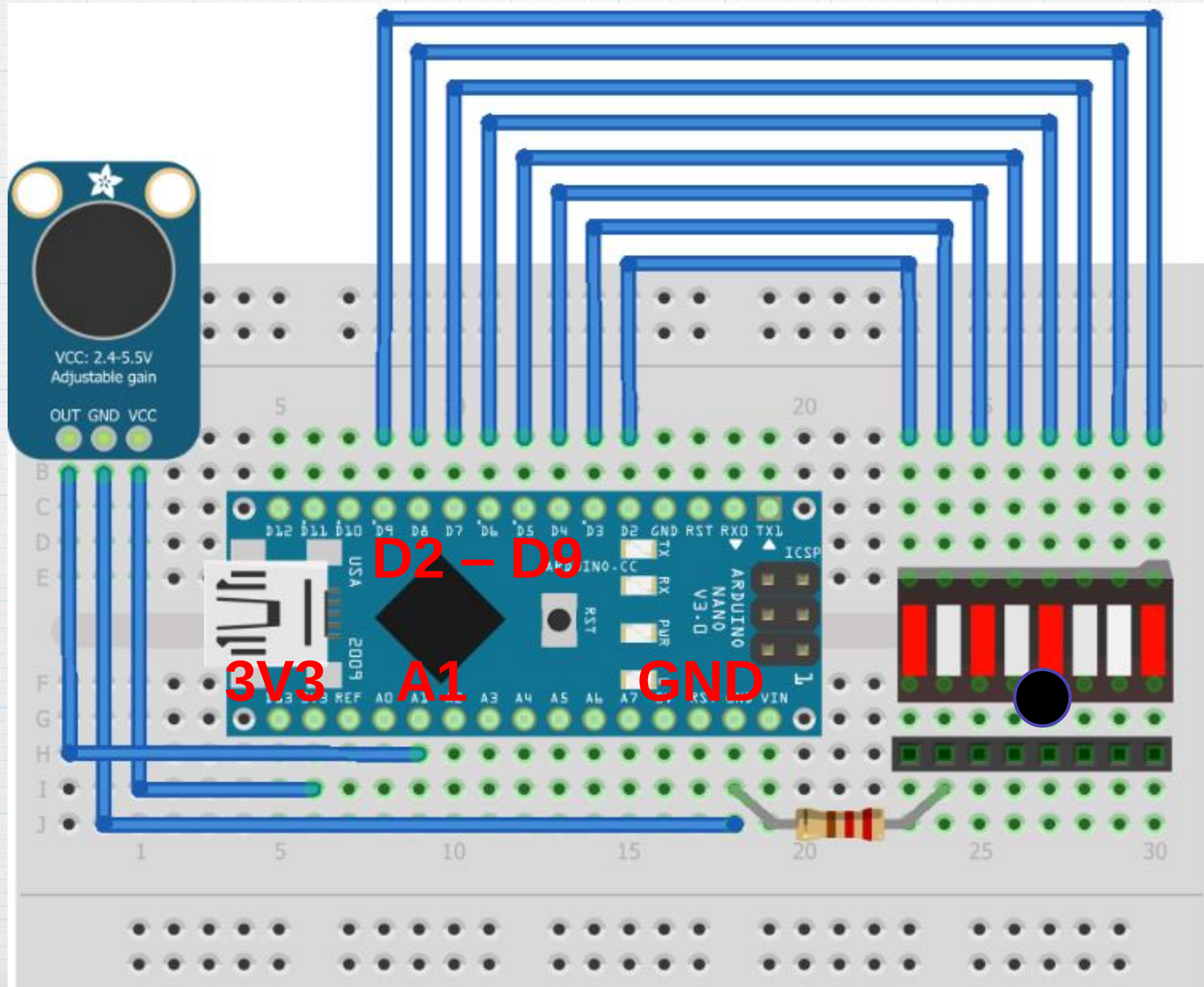
3 pin jumper wire

Micro-usb cable

Internal Breadboard Layout



Putting the “work” back in workshop



NANO PINOUT

1
0

2

3

4

5

6

7

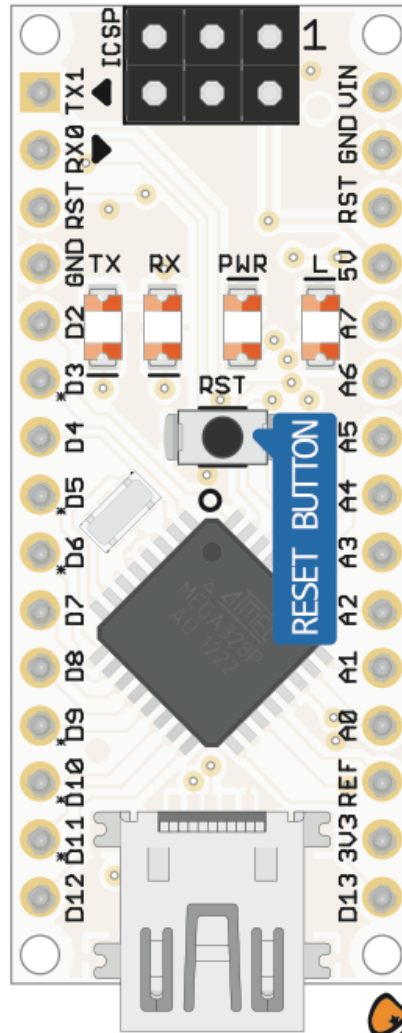
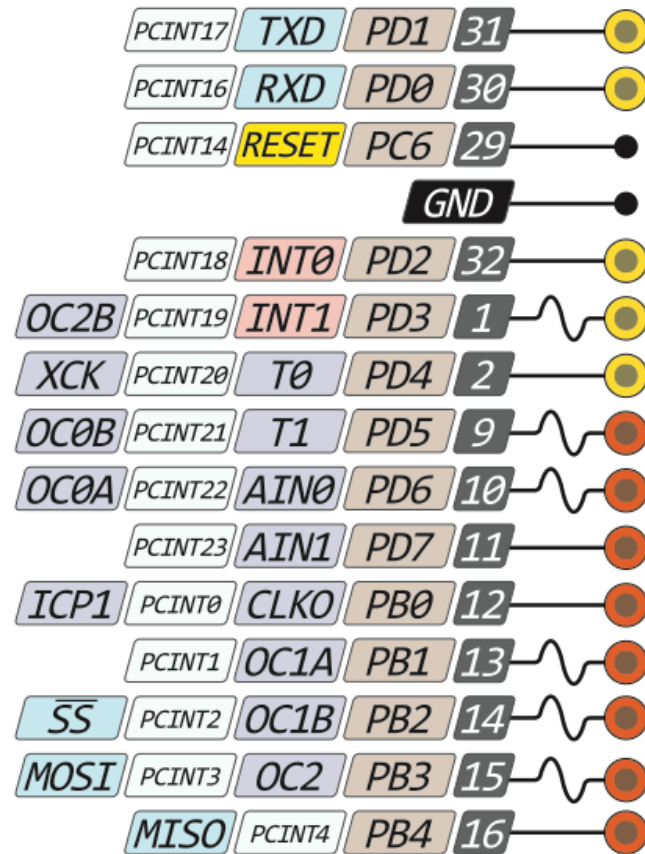
8

9

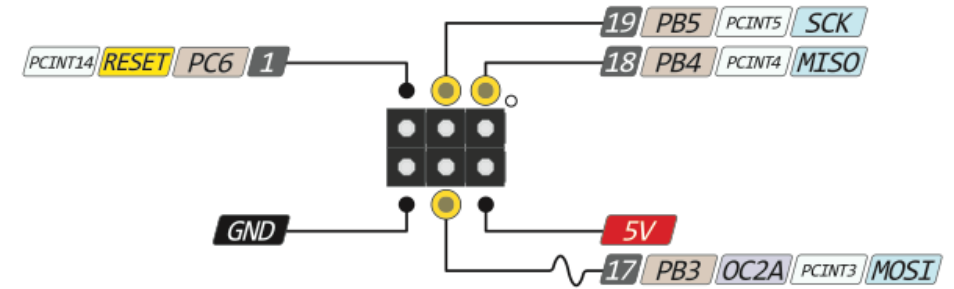
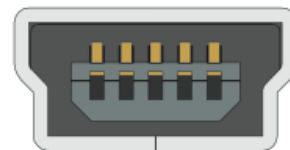
10

11

12



USB JACK
Mini Type B



The input voltage to the board when it is running from external power. Not USB bus power.



A7

A6

19A5

18A4

17A3

16A2

15A1

14A0

13

- Power
- GND
- Serial Pin
- Analog Pin
- Control
- INT
- Physical Pin
- Port Pin
- Pin function
- Interrupt Pin
- PWM Pin
- Port Power

The power sum for each pin's group should not exceed 100mA

Absolute MAX per pin 40mA
recommended 20mA

Absolute MAX 200mA
for entire package



Analog exclusively Pins

bq

www.bq.com

19 AUG 2014
ver 3 rev 1

```
module SoundBar  
open(Prelude)
```

```
let microphonePin = 15
```

```
let barPins = [9, 8, 7, 6, 5, 4, 3, 2]
```

```
let numBarPins = 8
```

```
fun setup() = (  
    Io:setPinMode(microphonePin, Io:input());  
    for i in 0 to numBarPins - 1 do  
        Io:setPinMode(barPins[i], Io:output())  
    end  
)
```

```
...
```


...

```
fun drawBar(level : uint16) = (  
    for i in 0 to level do  
        Io:digWrite(barPins[i], Io:high())  
    end;  
    for i in level + 1 to numBarPins - 1 do  
        Io:digWrite(barPins[i], Io:low())  
    end  
)
```

...


```
...
let state = ref List:replicate<uint16; 5>(0, 0)
fun main() = (
  setup();
  while true do (
    let micSig = Io:digIn(microphonePin);
    let barSig = Signal:map(
      fn (digVal) ->
        case digVal of
        | Io:low() => 7u16
        | Io:high() => 0u16
        end
      end,
      micSig);
    let pastBarSig = Signal:record(barSig, state);
    let meanBarSig = Signal:map(List:average, pastBarSig);
    Signal:sink(drawBar, meanBarSig)
  ) end
)
```


Thank you!

<http://www.juniper-lang.org/>

