



Session 1: the basics

Applied Electronics for Sound and Music
Aubery Lis / 2022



What? Where? When?

- Joint “lecture”+practice sessions
- A tiny piece of DIY audio gear built almost each session
- In this same room every time
- Each Tuesday, 17:45-19:15



How do I pass this course?

- Don't miss more than 3 out of 12 sessions (w/o a good reason)
- Successfully make a final project (details announced later on)
- Be involved!



Who am I

Aubery Lis

- 10+ years in cross-genre electronic music
- 5+ years in hardware synthesizers
- Designer+maker of SYNTHFOX eurorack modules
- Webmaster of sfcs.neocities.org
- Likes doing stuff



Who are YOU?

Let's get to know each other (a bit)

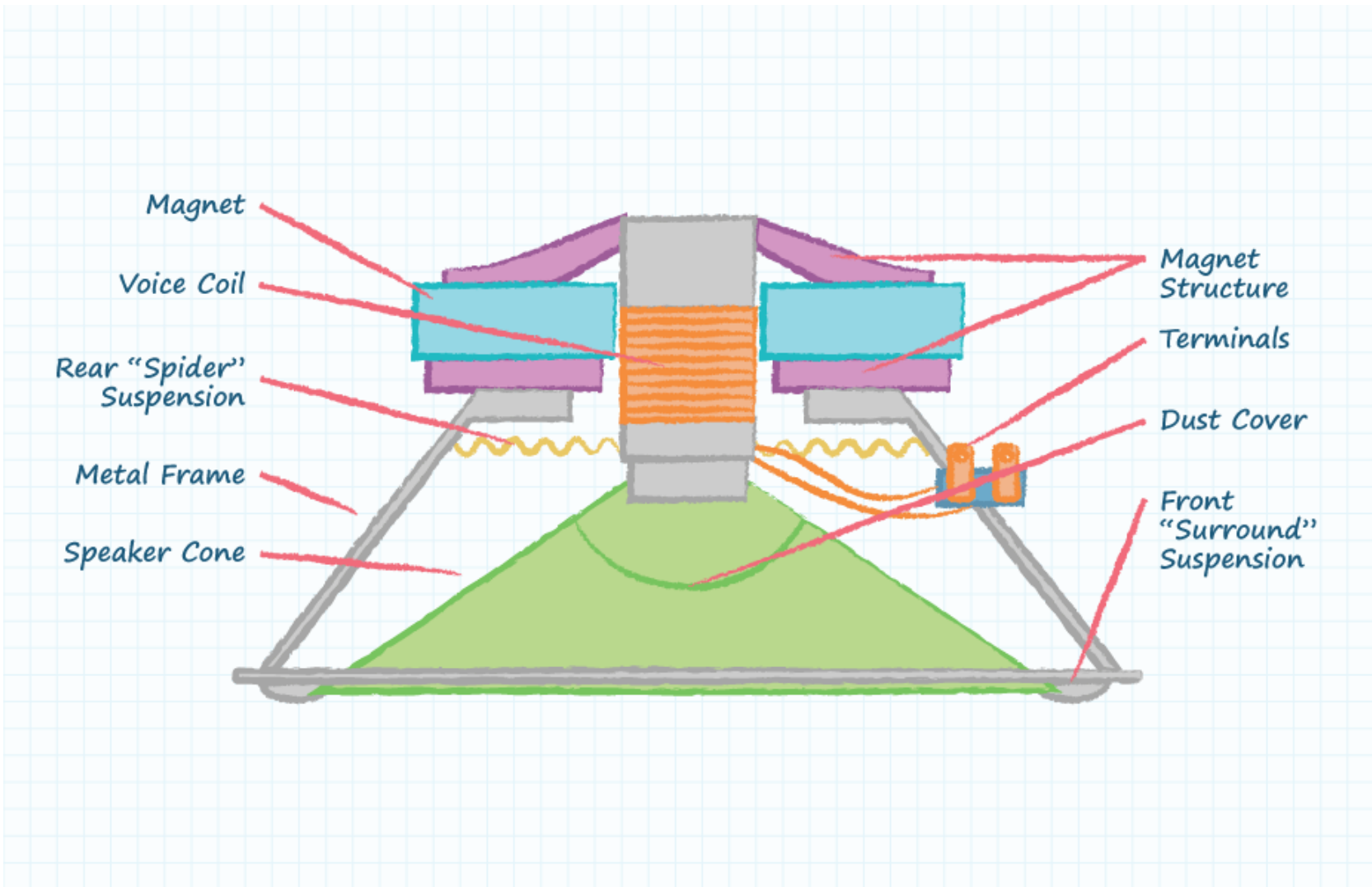
- How should we address you?
- What do you do?
- Why are you in this course?
- Previous experience in SDIY?



Sound basics

- How do we hear sound? What is sound, physically?
- What and how emits sound around us?
- How are those emitters different?

Sound basics





Sound basics

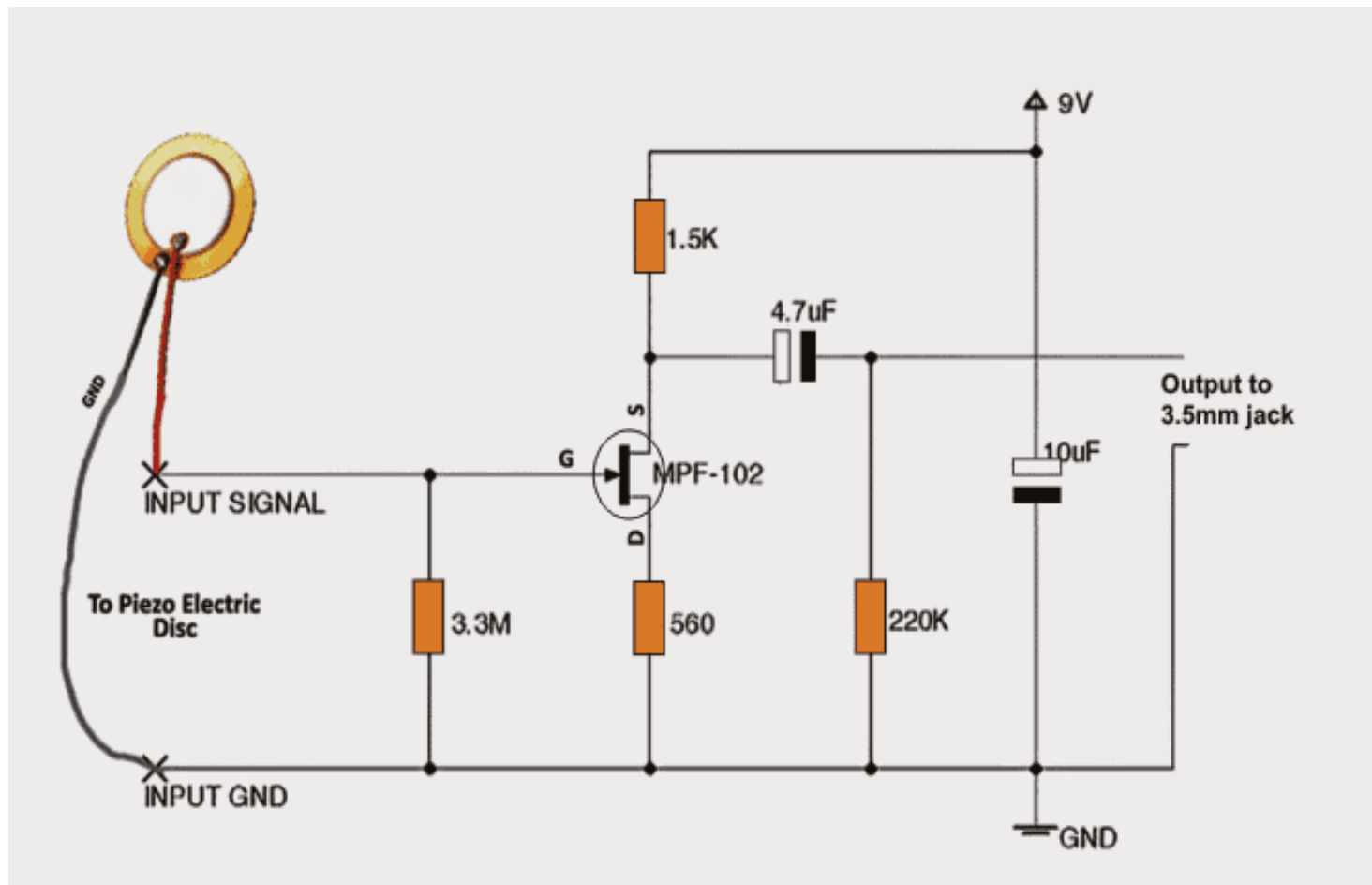
- Speakers (in headphones, sound systems – any speakers) need a changing voltage in order to produce sound.
- Sound sources (guitar, your phone's headphone out, synthesizer output, microphone) produce that changing voltage
- Wires carry the voltage from the source to the speaker → sound!



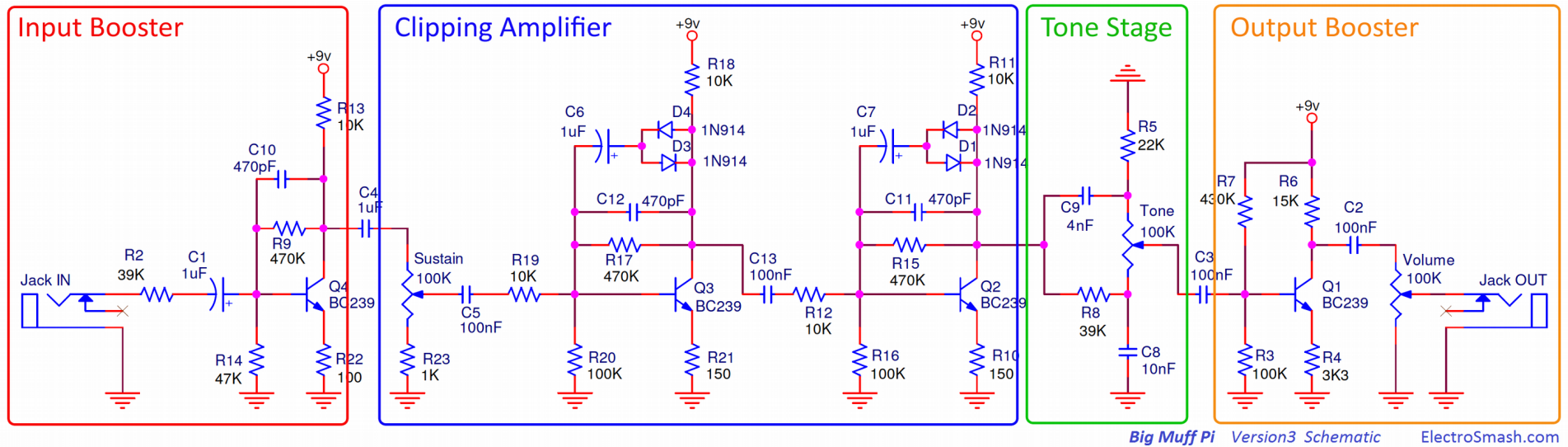
Voltage?

- What is voltage?
- How many wires (conductors) have to exist for the voltage to exist?
- How many wires are there in your headphones (if they are not the fancy wireless ones)?
- Let's try putting voltage to a speaker, from a source, through wires! But first...

Schematics!



Schematics!



Schematics

- Are made out of symbols that represent actual physical elements (e.g. speaker, battery, wire, ...)
- Are abstract blueprints for actual working devices
- Show how the elements' pins/legs/terminals are connected with conductors (wires/copper traces/etc)
- Look scary at first, but gradually become clear with experience



Elements

- Let's study the schematic elements we will need for the experiment
- Next, draw a schematic for our experiment
- Finally, try and create what's on the schematic in real life!

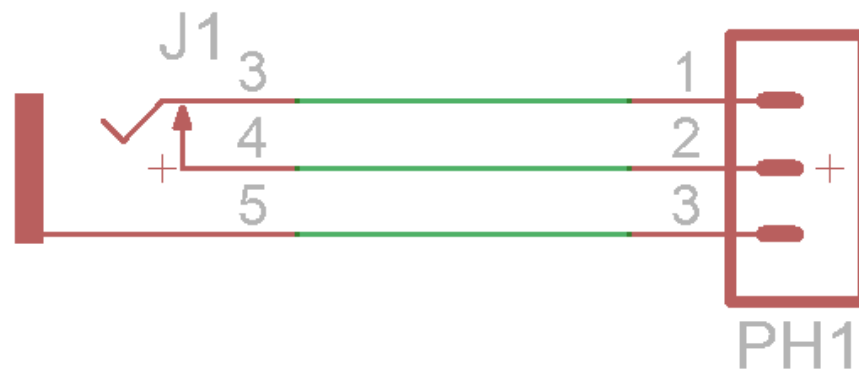


Building sound devices

- Can be done in many ways and forms
- Some are harder to pull off as an SDIYer than others
- The two simplest ones will be used throughout this course: breadboarding (to test) and veroboarding (to build)

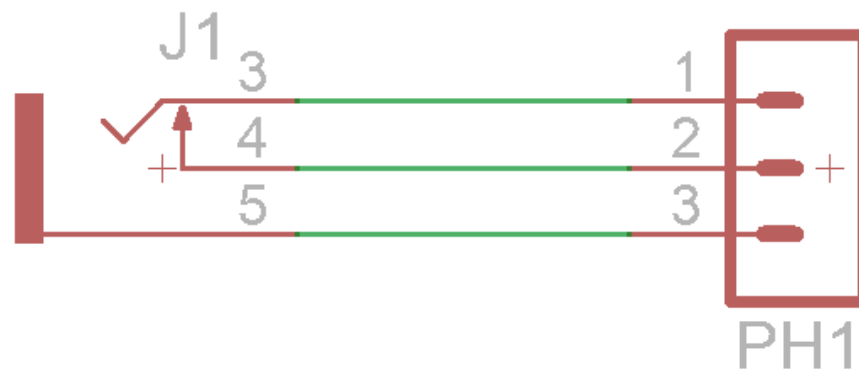
Session 1 build

- A simple, but most useful module
- Allows easy interfacing of modules/breadboards to amplifiers and speakers, etc.



Session 1 build

- Cut a 5x8 (5 rows) veroboard piece
- Solder leads to all 3.5mm jack pins
- Solder the pin header to the veroboard edge



Session 1 build

- Position the leads through the veroboard holes
- Check that they connect to one PH pin each
- Solder up
- Done!

