PHANTOM POWERED BALANCED PIEZOELECTRIC CONTACT MICROPHONE

DESIGNED AND BUILT BY ANAND LOBO

TYPES OF MICROPHONE

- Dynamic (unpowered, basically a speaker in reverse)

- Condenser (uses an “electret”, requires power for circuitry)

  Condenser mics can have a battery or use “phantom power”

BALANCED VS UNBALANCED AUDIO

- Unbalanced: requires 1 signal + GND wire, most common
  - any noise that affects the signal cannot be removed

- Balanced: also known as “differential signal”, requires 2 signal wires
  - rejects noise and (when properly implemented) boosts signal

PHANTOM POWER

- Most commonly 48V
- Only usable with balanced signal wires
- Avoid batteries
- 48V allows larger headroom (loudness before distortion)

MY MICROPHONE DESIGN

Three parts:

- Balanced piezoelectric disc (the actual “pickup” transducer)
  - the transducer alone can be used when phantom power is not available
  - however, without the preamplifier it will sound similar to cheap piezoelectric pickups
- TRS-XLR cable required (normal guitar cable will not work with preamp)
- Phantom-powered preamplifier

Specifically called a “microphone” to avoid association with commercially available instrument pickups

THE PICKUP

Clamp and mount for violin / viola

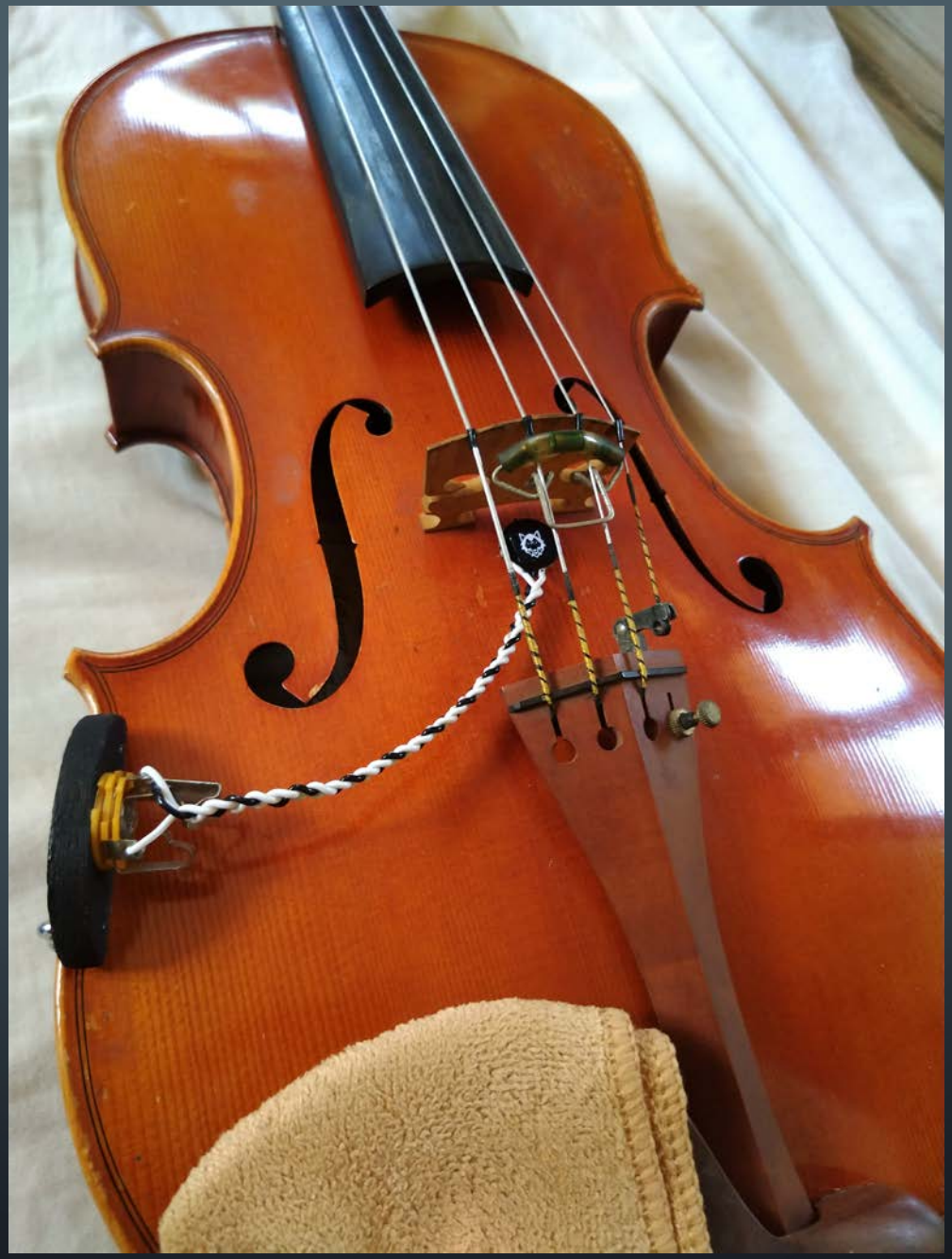
Model for “general” instrument use

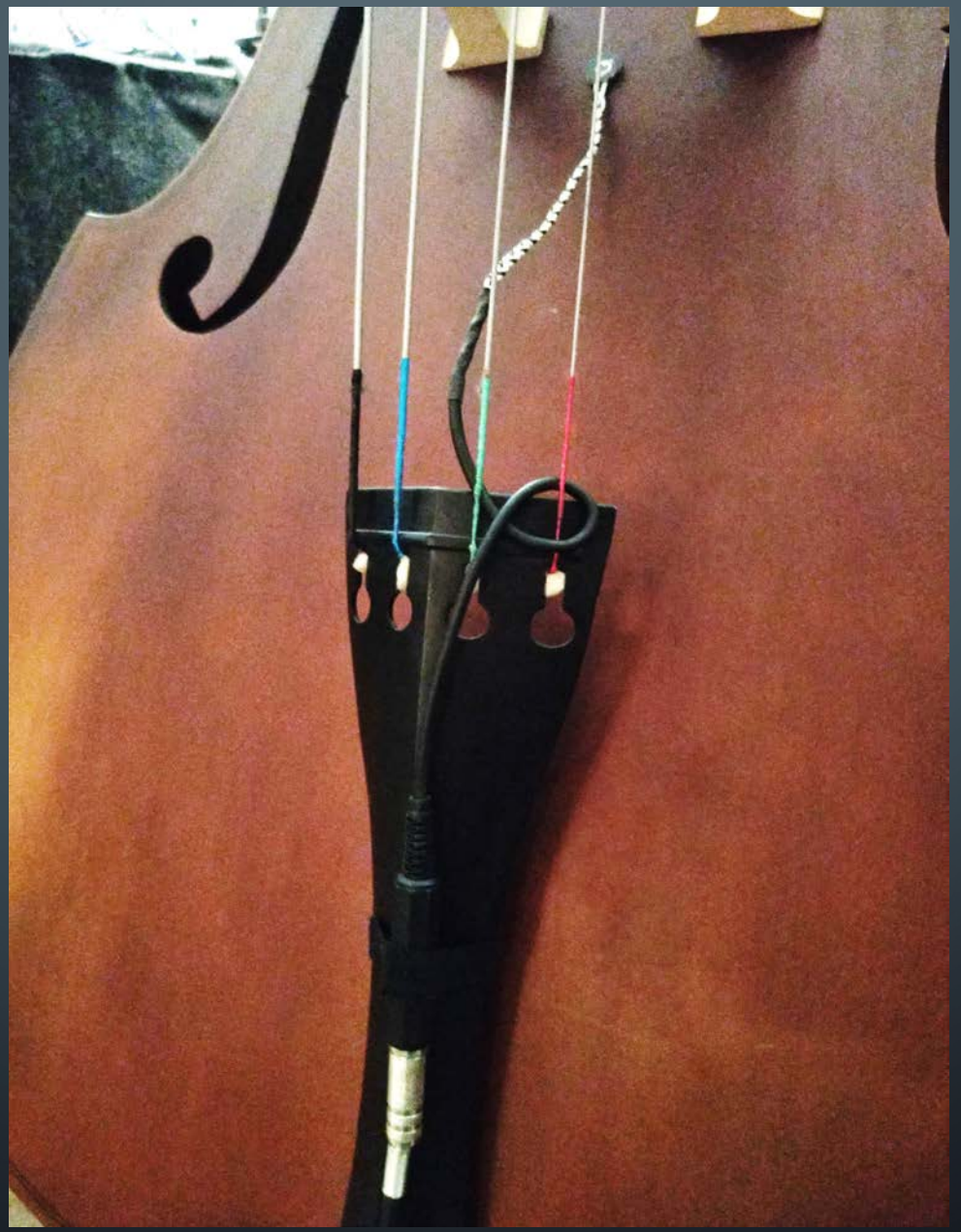
THE TRS-XLR CABLE

90-degree connector for violin/viola

Straight connector for other instruments

THE PREAMPLIFIER





MAIN COMPETITION

- AKG C-411: INR 10,000 - 20,000
  - actually a miniature condenser microphone
  - mounting solution known to leave blemishes/marks
- Fishman V-200: INR 15,000 – 25,000
  - mounts to bridge and can affect timbre
  - additional preamplifier required for best sound quality
- LR Baggs / Barcus Berry / similar
- cheap piezo mics available online and in stores (no preamp and no instruction)
- normal vocal / instrument microphones
  - Shure
  - Sennheiser
  - Neumann
  - AKG

USE CASES

- Can be used on any hollow-body resonating instrument
  - successfully tested with violin-family, guitar-family, piano, kalimba (see website)
- Indian instruments
- Nature recording
- ASMR / object recordings (e.g. tables, walls, appliances, etc)
- Seismometer (?)
- Industrial monitoring (?)
- Hydrophone (with suitable waterproofing)
- Throat microphone / body monitoring e.g. heartbeat

Preliminary recordings:

https://ohnoitsalobo.github.io/pickup