



# Piezophone™

Contact microphone for string instruments

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# About Me

B.Sc. Electrical Engineering  
*Old Dominion University, 2011*

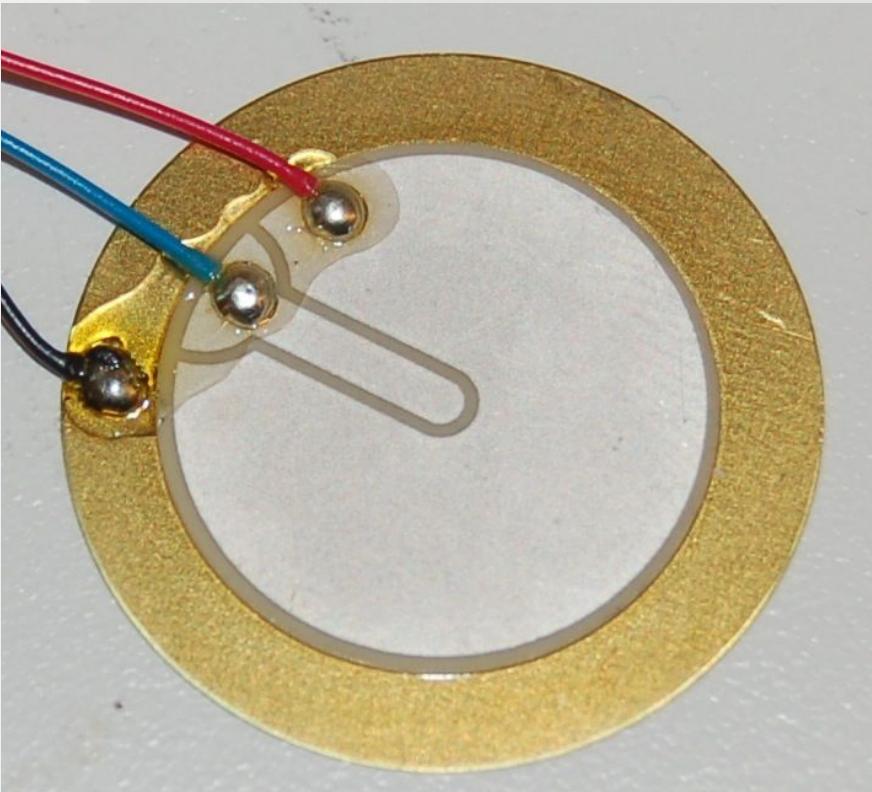
Mandolinist

Violist

Sound Engineer

*Lemongrass Acoustic Trio*

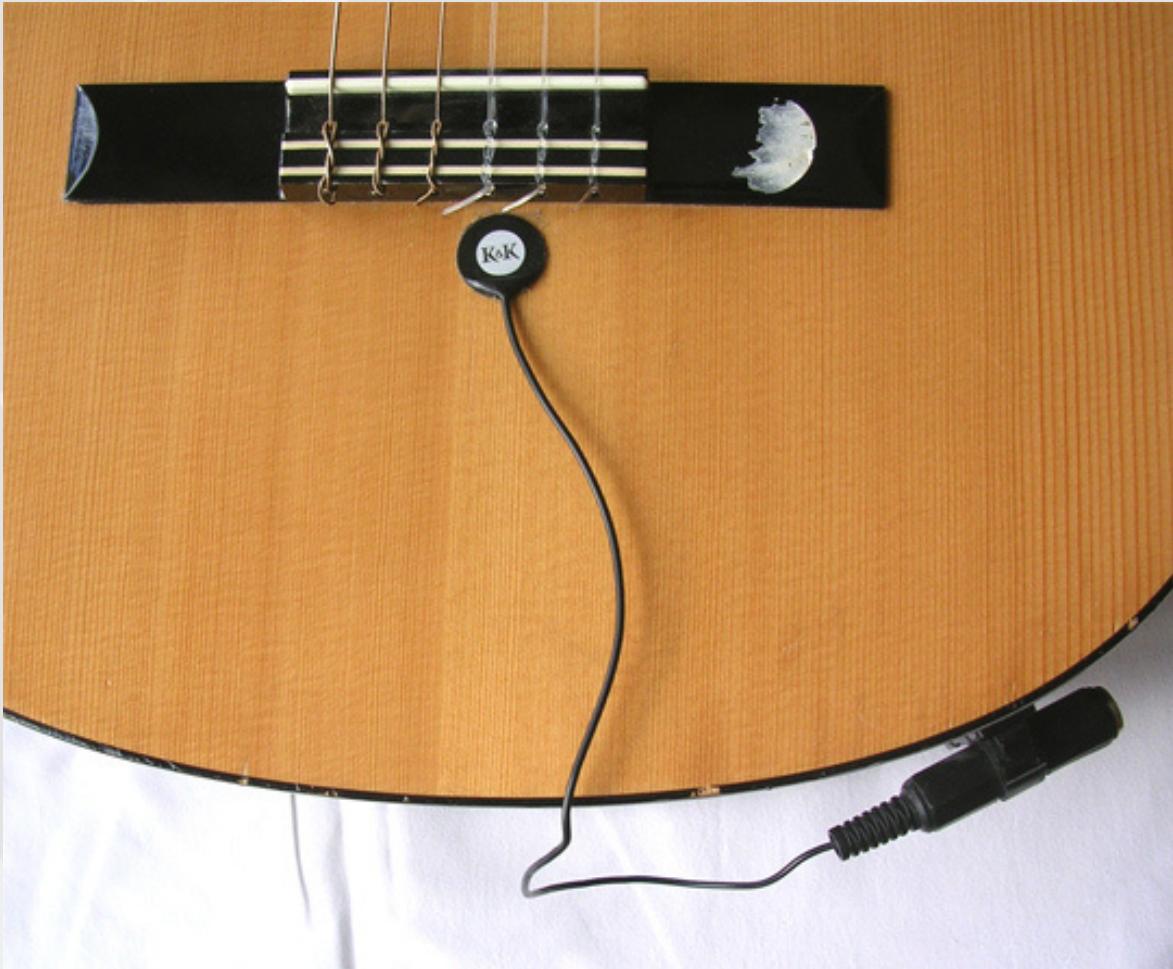
# The Problem



## Piezoelectric buzzer

- Cheap
- Readily available
- Fairly reliable
- normally used as a speaker, quite loud

# The Problem



# The Problem



# The Problem



# The Problem

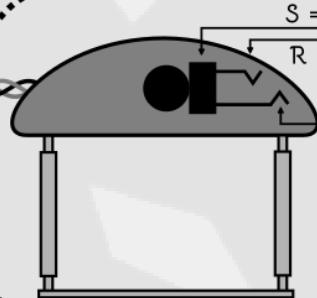
- Piezoelectric discs are typically tuned as speakers in the range of 1-10kHz
- Sold as-is with no information, common for DIY work
- When connected to common audio systems without a special pre-amplifier, this results in *impedance mismatch* which produces a very poor tone, reinforcing the stereotype that "piezos are bad"

# The Product

Piezoelectric disc



Clamp and low-profile plug  
for violin / viola

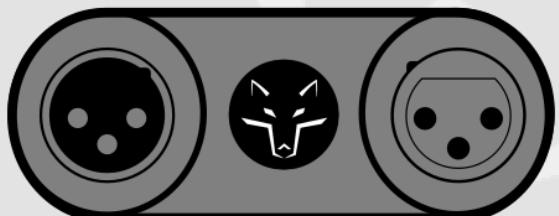


$S$  = Sleeve  
 $R$  = Ring  
 $T$  = Tip

TRS - XLR cable



Generic connector  
for general purpose



Preamplifier

# The Product



Piezo disc + custom cable + preamplifier

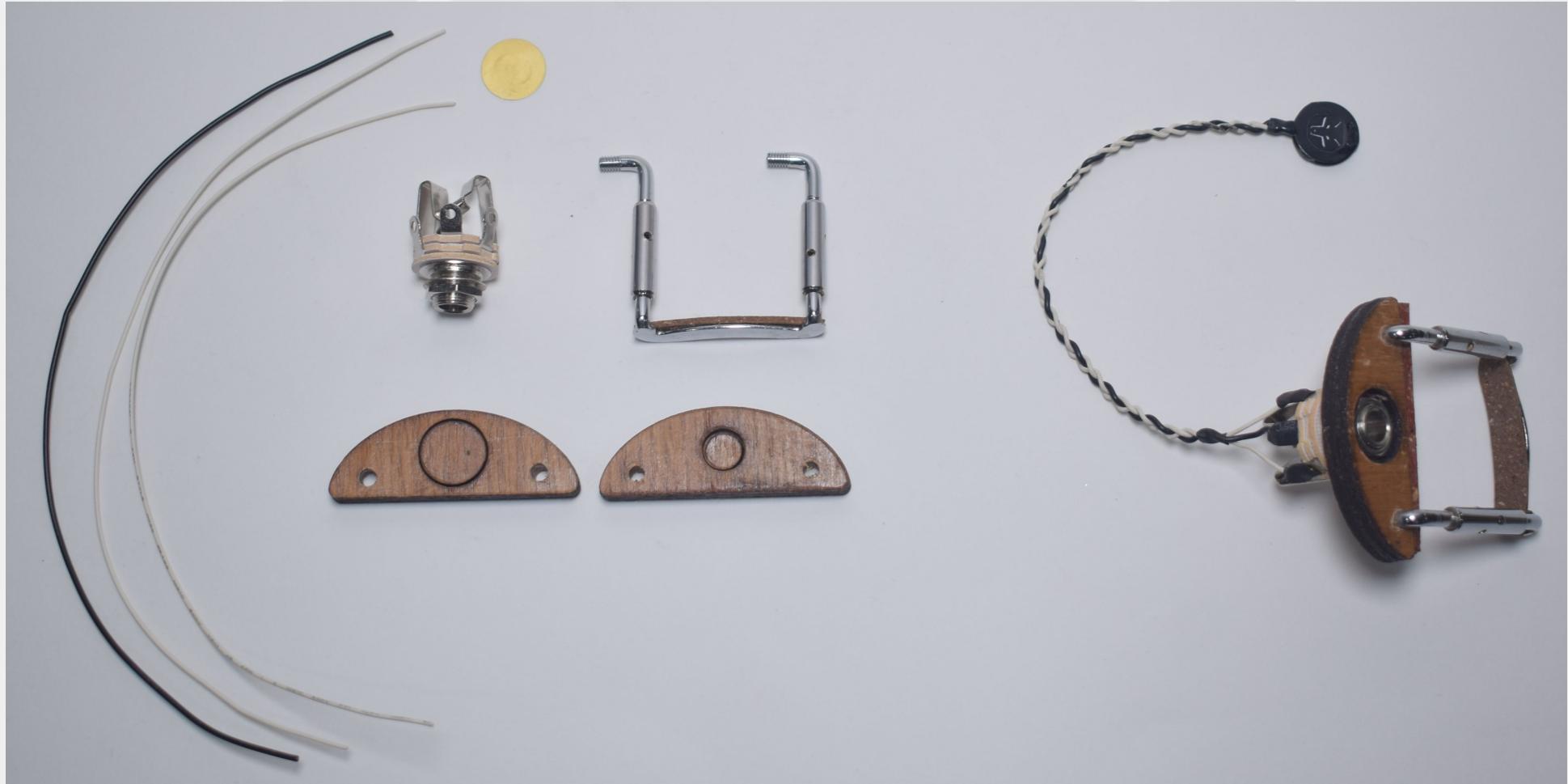
# The (Old) Product







# The Product



Violin mounting clamp

# The Product



Violin clamp + low-profile plug

# The Product



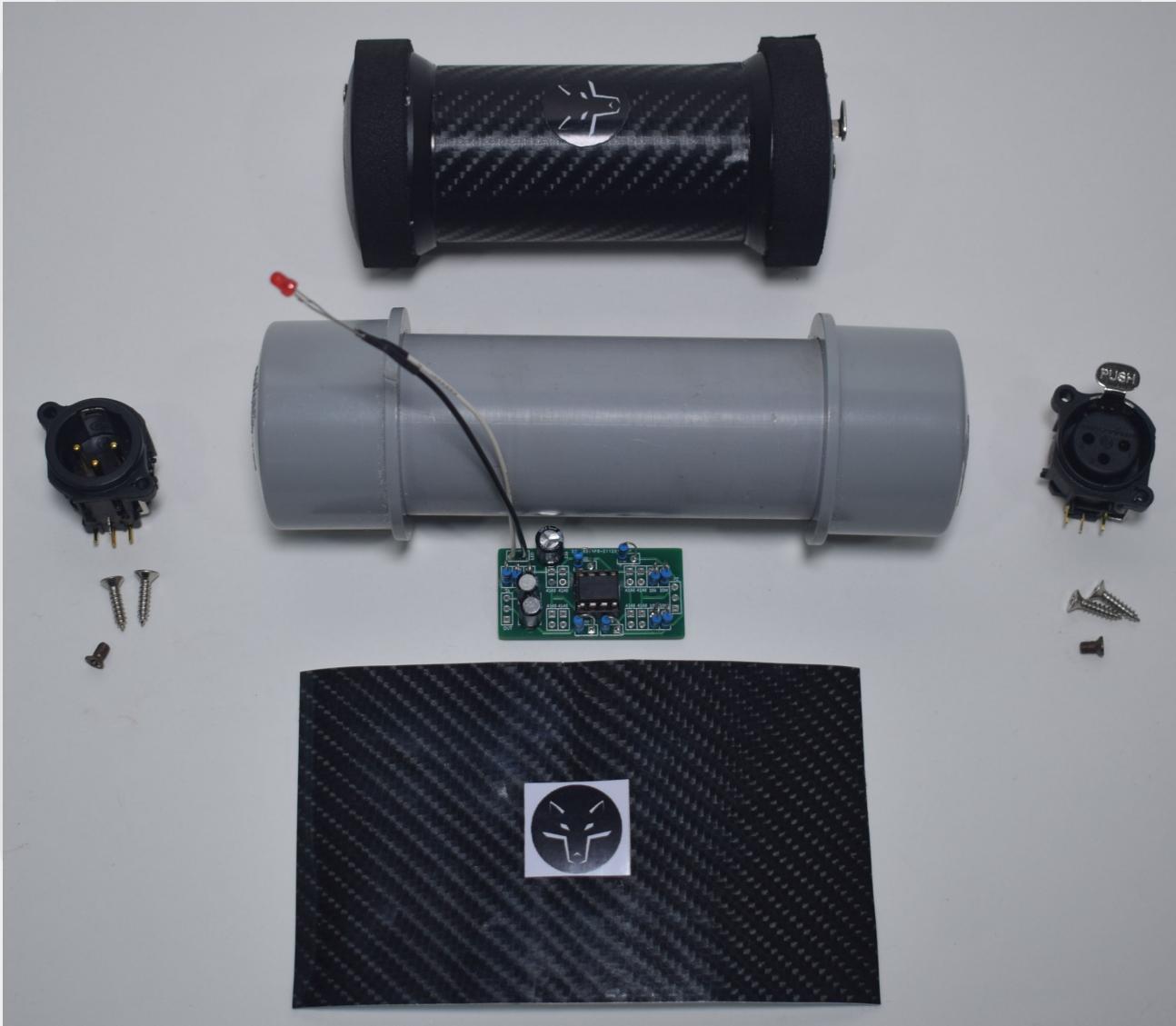
"Generic" piezo attachment

# The Product



"Generic" piezo + straight plug

# The Product



# The Product



Violin mounting clamp

# The Product



Violin mounting clamp

# The Product



Violin mounting clamp

# The Product



"Generic" piezo attachment

# The Product



"Generic" piezo attachment

# The Product

Unit price: ₹16,000

Included:

- 1x piezoelectric disc (choice of violin or 'generic')
- 1x TRS - XLR cable (choice of straight or low-profile)
- 1x preamplifier

Phantom-powered preamplifier module requires no batteries; powered from the audio interface directly.

"Balanced signal" (differential signal) is highly resistant to EMI.

# The Product

Advantages compared to competitors:

- attaches to instrument body rather than bridge, preserving acoustic tone; this also provides a better-sounding audio
- Faber-Castell™ *Tack-It* putty holds securely, leaves no residue, and can be re-used many times
- suitable for bass instruments e.g. cello and double-bass
- preamplifier included in price
- no batteries required, only 'phantom power' which is available on all modern interfaces

# Frequently Asked Questions / Challenges

## **Volume / tone control?**

Similar to common vocal / instrument microphones e.g. Shure SM-58.  
Adjustment done at mixer.

## **Wireless?**

Parts cost and fabrication time more than double, plus additional cost / special qualification for wireless design and certification.

# Frequently Asked Questions / Challenges

## **Battery?**

Option may be added in future; reduced quality due to lower 'headroom'.

## **Percussion?**

Not recommended.

Parts supply; PCB and certain plugs have to be imported to ensure quality.

# Market

- String instruments
- Indian instruments
- Foley artists
- Recording studios
- Nature recording
- Hydrophone (underwater mic)
- Laryngophones (throat mic)
- Industrial monitoring (?)
- ASMR

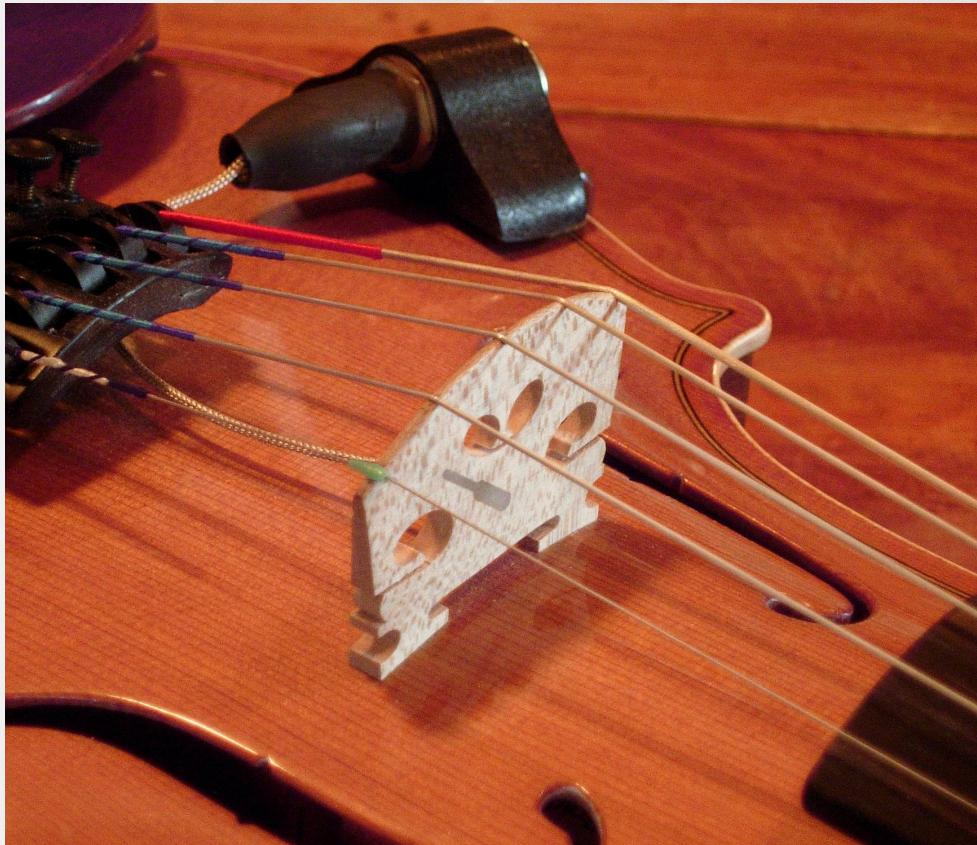
# Thanks to FiiRE

- Maintain a stock of parts
- Prototyping lab (laser cutting) and Don Bosco machine shop (lathe and drill press)
- Design suggestions
- Connect with musicians

# Roadmap

- Partner with studios
- Music stores
- Alternative industries
- Wireless

# The Competition



**Barcus Berry 1320**  
\$120 (₹9600)

Replaces original bridge, which  
changes the sound

Bridge must be fitted by professional  
luthier at personal expense

Jack connector not included

Preamp provided at additional  
expense

# The Competition

Barcus Berry 3110

\$350 (₹ 28,000)

Comes with passive preamp (does not require power)

Clamps on to existing bridge with screws

- additional weight changes the acoustic tone
  - screws cause physical damage



# The Competition



**Fishman V-200**  
\$160 (₹12,800)

Attaches to bridge without damage

Changes acoustic tone

Preamp provided at additional expense

# The Competition

**AKG C-411**

\$200 (₹ 16,000)

Preamp not required;  
electret mic, not piezoelectric

Attaches with black putty that leaves  
residue on instrument surface

Thin wire prone to damage



# The Competition



**DPA 4099**  
\$600 (₹48,000)

Attaches to body without damage

Can be used with wind instruments

No preamp required

Prone to "feedback" at lower volumes

# The Competition

Cortado MkIII

\$159 (₹ 13,000)

Mic, preamp, cable as single integrated unit

Phantom-powered

Simple volume and EQ adjustment





