

# **HARDCHORD**

The logo consists of the word "HARDCHORD" in a bold, black, sans-serif font. The letter "O" is replaced by a circular saw blade graphic, which has a central hub and a serrated outer edge.

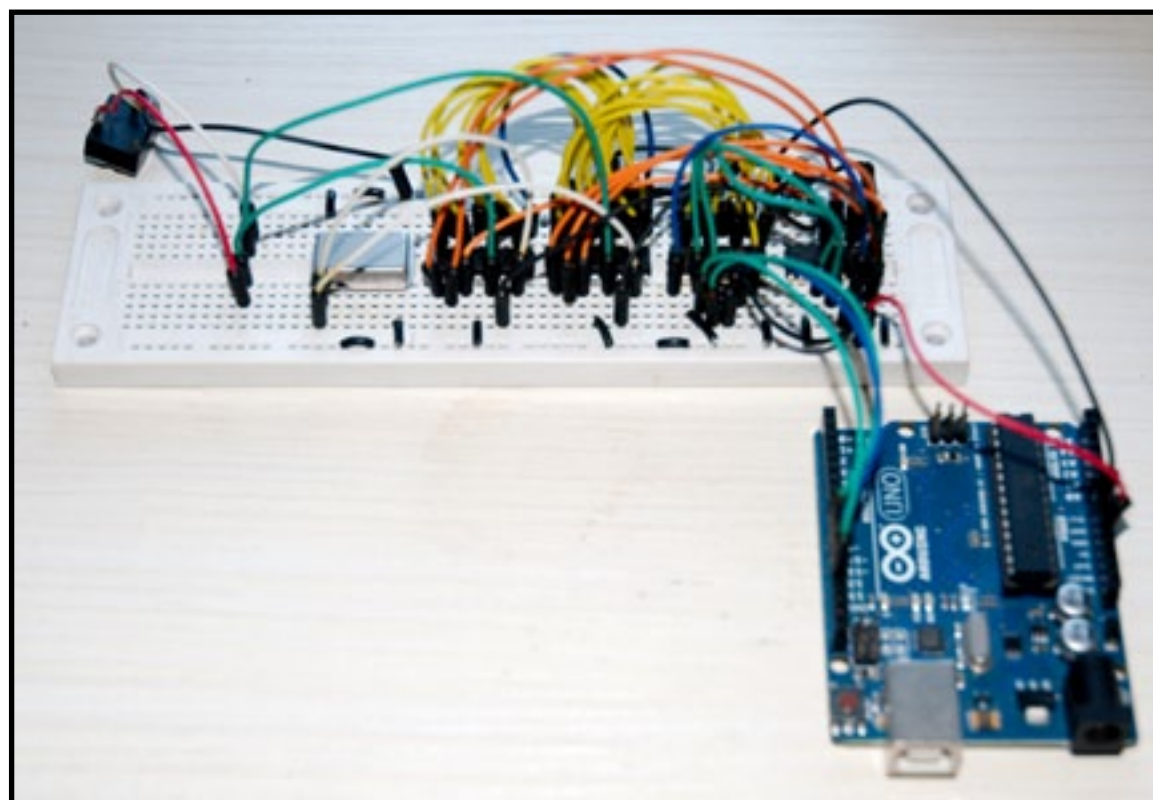
**MIDI-compatible, Arduino-powered  
hardware audio devices**

# Hardchord meets (usually) on Fridays to work on the following projects:

- Programmable Sound Generator (PSG) shield
  - » Pin compatible with Yamaha YMZ284/294
- FM synthesizer shield based on Yamaha OPN2
  - » Uses the YM2612 chip
- Acoustic instrument played by floppy drive motors
- MIDI-compatible pure Atmel synthesizer
- Basic MIDI controller

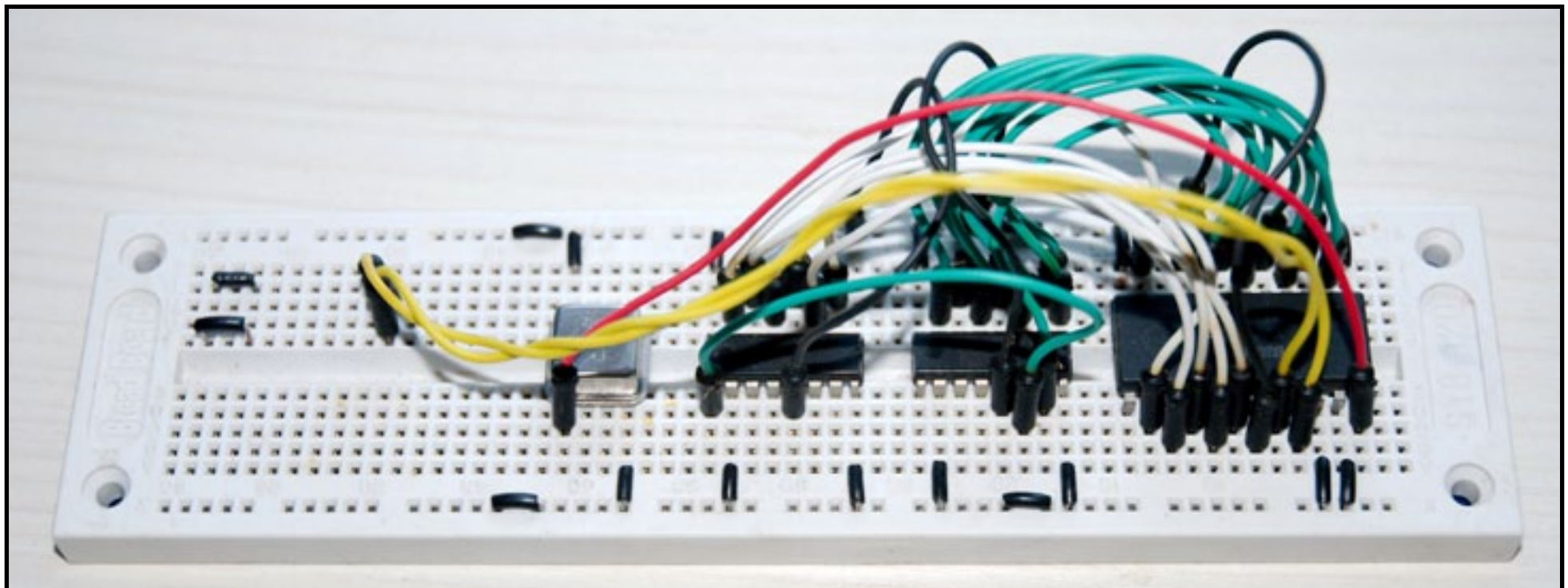
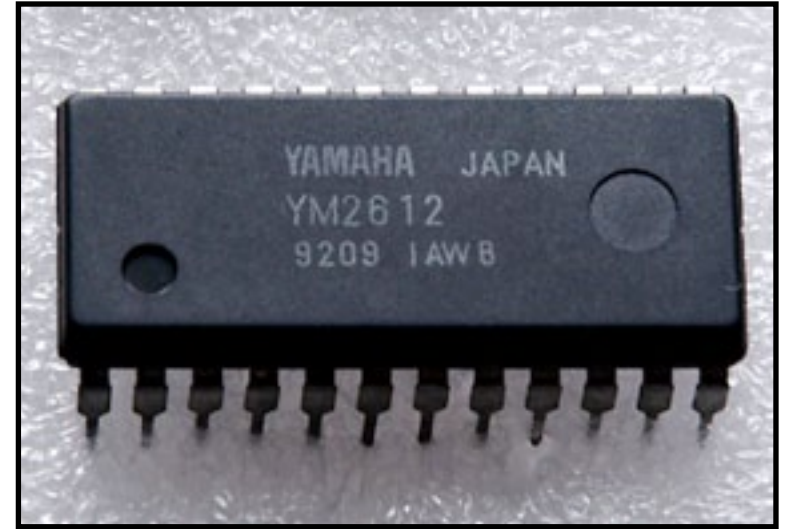
# PSG Shield:

- Uses two serial shifters and two PSG chips
- Plays up to six concurrent notes
- Programmed over the SPI bus



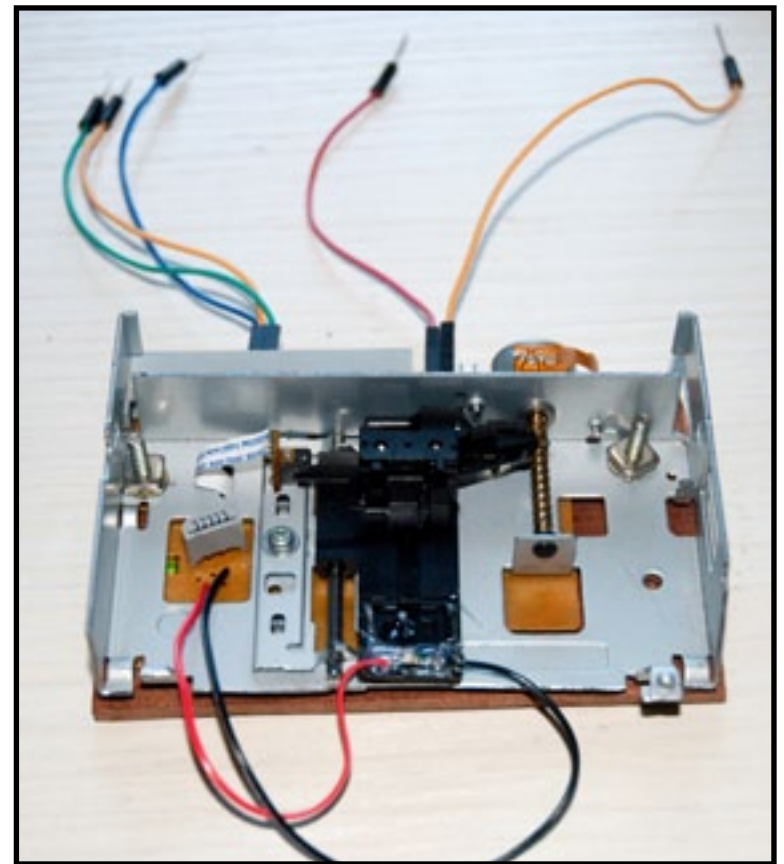
# FM Synthesizer Shield:

- Six FM channels and multiple programmable instruments
- Stereo analog audio out



# Acoustic Floppy Box:

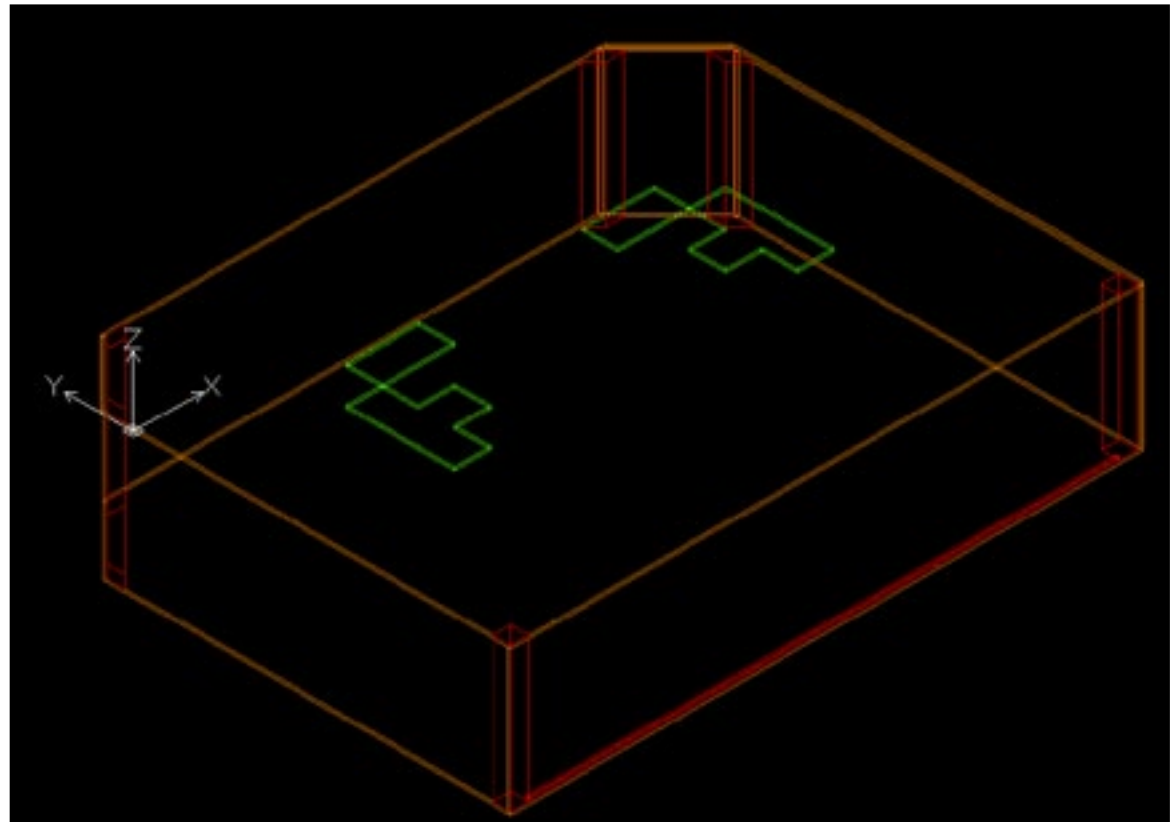
- Uses six floppy drives for six concurrent notes
- Stripped down to reduce weight and isolate vibrations

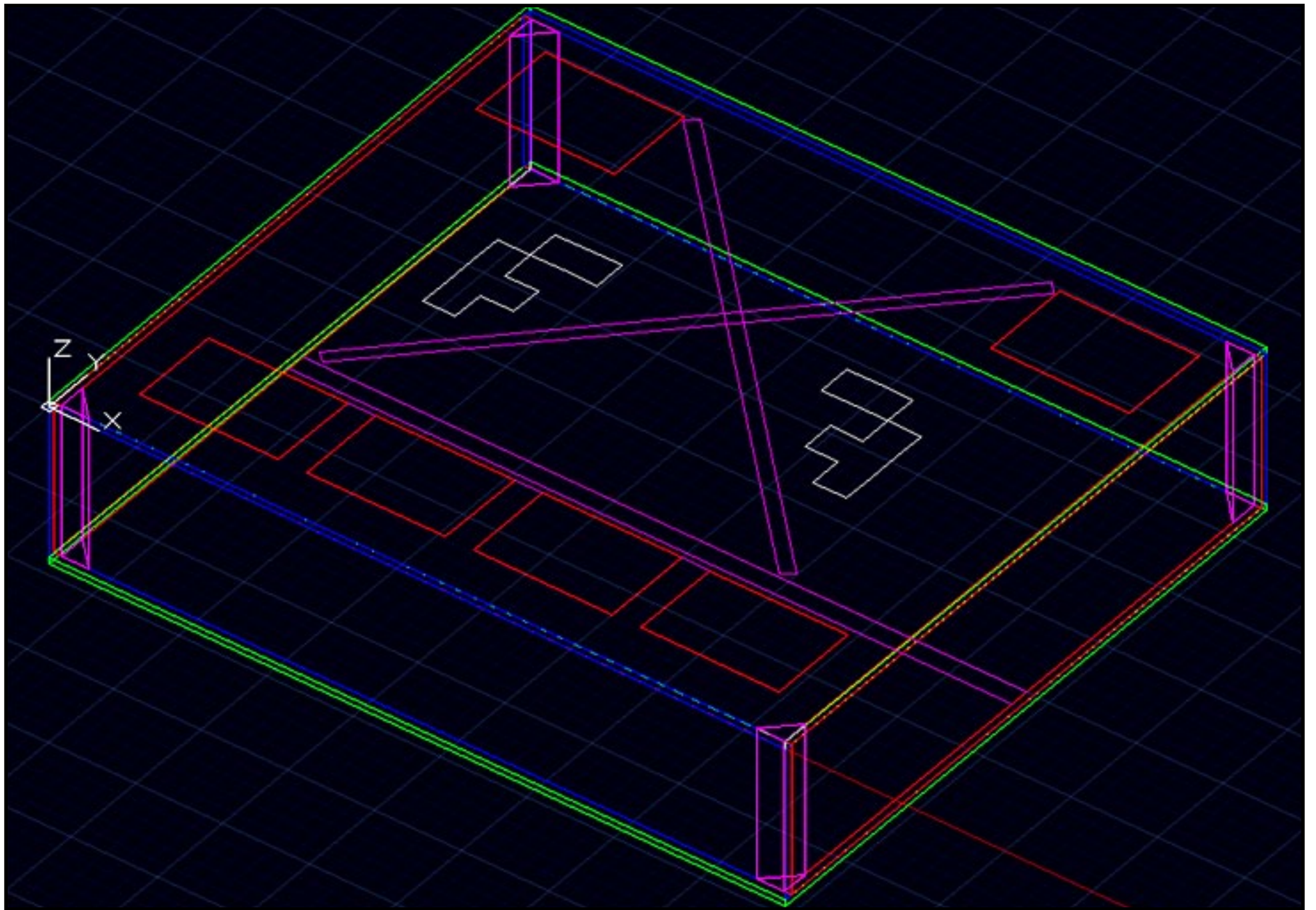




The first sound box design was large and piano like, but based on the faulty idea that each floppy would play only one note.

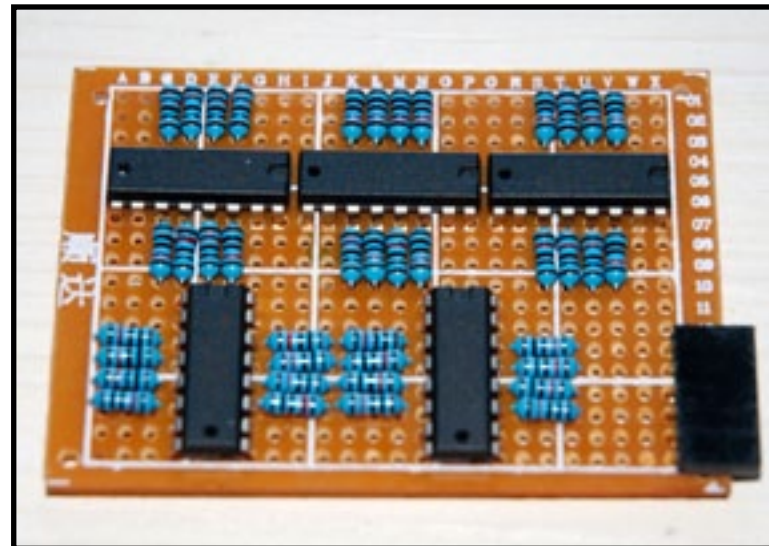
The second design was more boxy (like a hurdygurdy), but too large to be built using the wood available in China.





# Basic MIDI Controller:

- Two full octaves with octave +/- switches and six spare switches
- Passed to Arduino via HC165 shifter brigade





# What is MIDI?

MIDI is an old serial protocol created in the 1980s for exchanging commands between an audio device and a controller.

A MIDI controller must be able to send seven voice messages and one mode message to be able to program a compatible audio device.

Most messages are between two and three bytes in length. Messages set and release notes on the target device.

More information is available at  
**<http://www.hardchord.org/>**

Join our discussion list by sending an email to  
**Majordomo@hardchord.org**  
with the text “subscribe list”