

# Freedom is Fun!

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# A Little Context

- My first source code contribution was .. almost 40 years ago
- Contributions to BSD, KA9Q TCP/IP stack
- Appearance of RMS in my world
  - GNU Manifesto
  - 4 Freedoms
  - GPL
- Debian
- Open Source & Linux CTO at world's largest IT company
- Board member and/or officer for several organizations
- Altus Metrum



# Two Takes on “Fun”

A few observations about things we can do to keep Free Software a fun thing to work on

Things I’ve done over the years that were really fun and somehow involved Free Software



K. AUSTIN









**Mach 2.2 to 6km!**





# Collaborative Development Model

- A key attribute of Linux and many Free Software applications is that they are developed and supported “by the community” in a collaborative process
- What does that mean?
  - No one company in charge
  - A range of contributors with varied interests, abilities, and motivations

This yields a software “commons” that everyone benefits from, and we all share in the maintenance of



# Freedom of Choice

- Users (customers?) have more control, particularly over how they acquire support for Free Software
- Any user can become a developer, or pay someone to develop or support open source software on their behalf
- If “upstream” ever behaves unacceptably, developers have the power to “fork”



# The Grand Bargain

- A big part of what makes Free Software work is the sense of cooperation. I share something with you now, hoping you or others will share something with me later.
- While it is possible to build successful cooperation in many ways, Richard Stallman's implementation of the "share-alike" concept in the GPL is almost magical...
- Share-alike licenses help communities succeed
  - Provides an economic incentive for merging upstream
  - Ensures that once something is Free, it will remain Free
  - Maintains balance between large and small participants

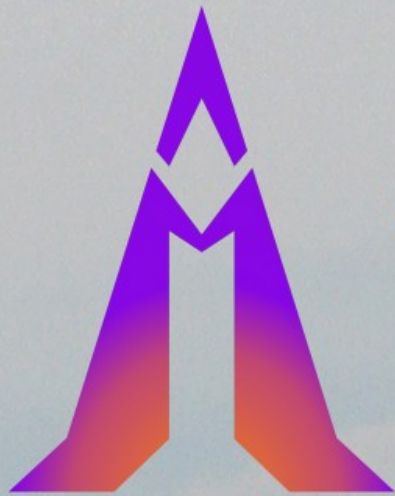
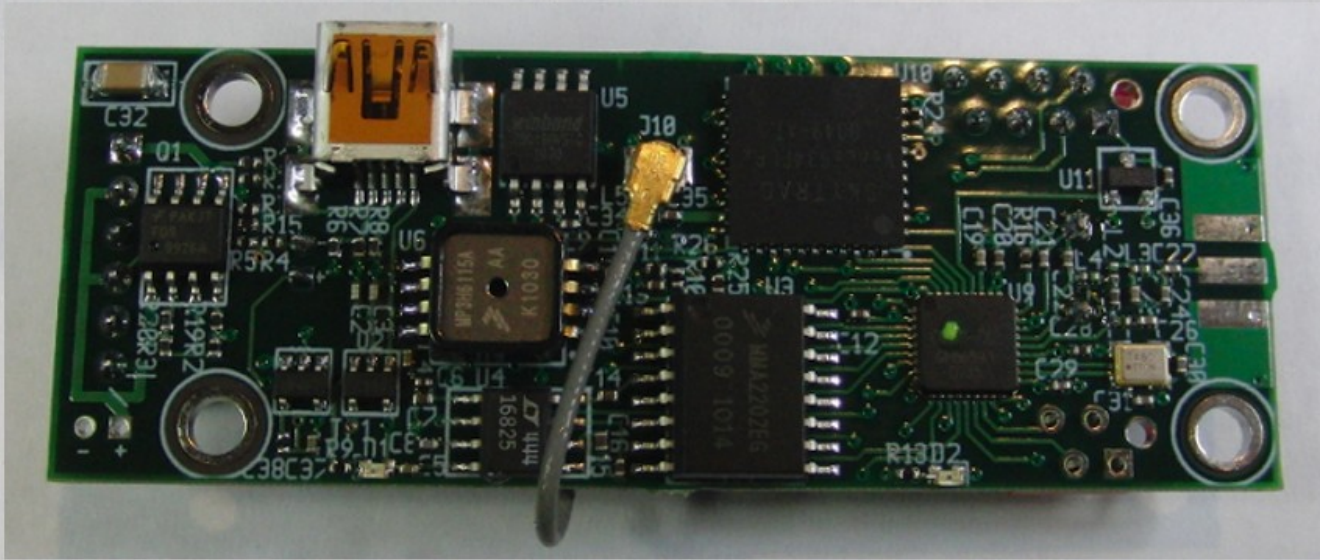
# Features of a successful community





# How Can We Have More Fun?

- Push for more adoption and use of Free Software everywhere
  - Many of the talks here should have given you ideas!
- Don't hoard improvements .. share them!
- Lower barriers to entry, provide positive feedback
- Make an extra effort to help someone new feel appreciated
  
- Look for ways to participate / contribute in your personal life outside of work or school assignments...
  - Do something that is interesting to *you*
  - Document it, communicate it, share your enthusiasm!



Altus  
Metrum

<http://altusmetrum.org/>

# Altus Metrum, LLC

- Hardware designs use Open Hardware License
- Firmware and ground software is all GPL
- All software we use is Free Software!
  - Lepton-EDA for schematics and pcb-rnd for PCB designs
  - gcc / gdb
  - OpenJDK with Swing & Android UIs for ground software
  - FreeCAD, LibreCAD, and OpenSCAD
  - Magento for our web store
  - ledger-cli for accounting
- Learn more at <http://altusmetrum.org>



chaoskey.org



# Software Defined Radio



# EME

Bouncing radio signals off the moon...

Dish pointed with predict + python

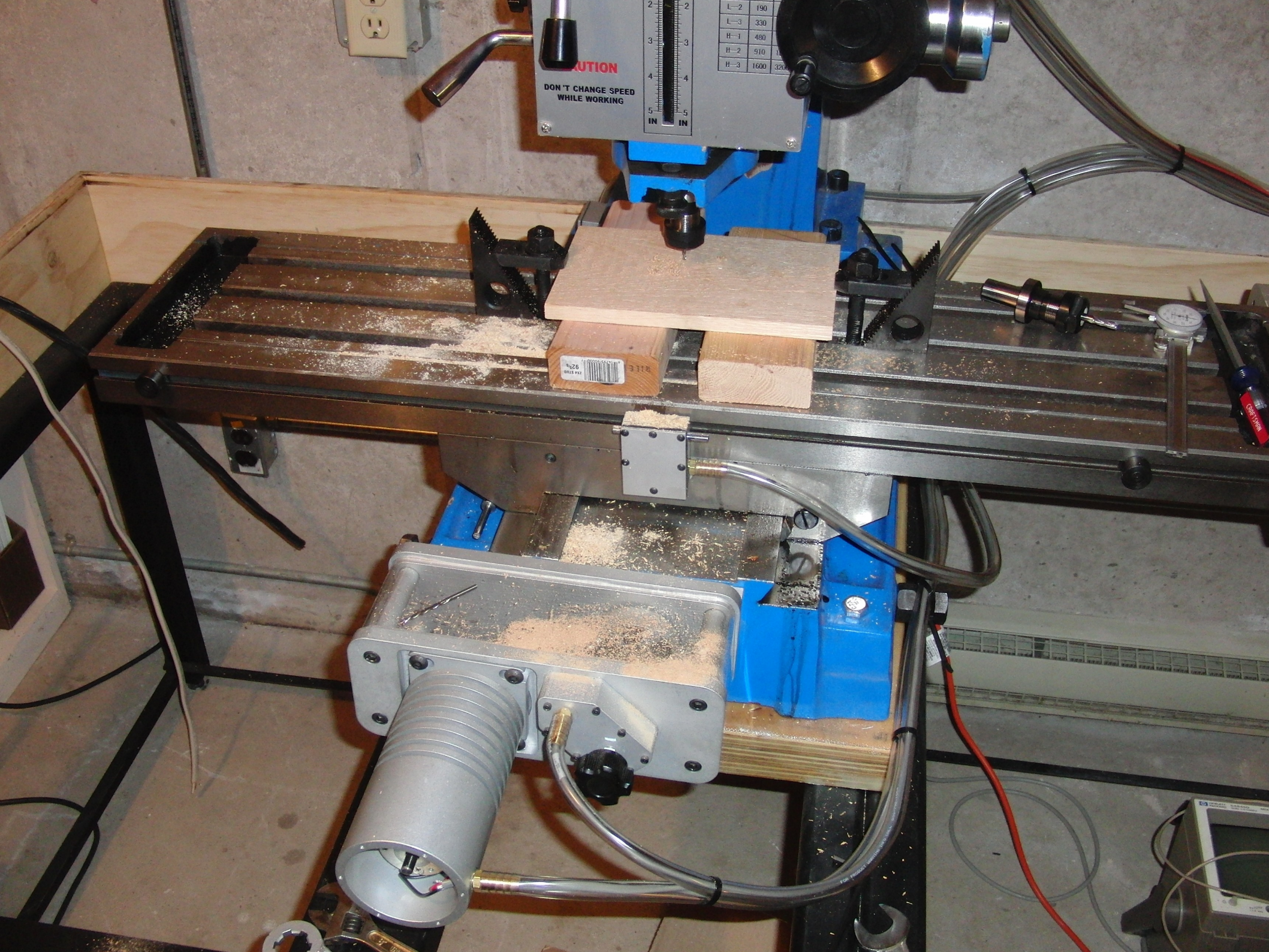
Ettus Research USRP

Signal processing with GNU Radio



# Making (Physical) Things





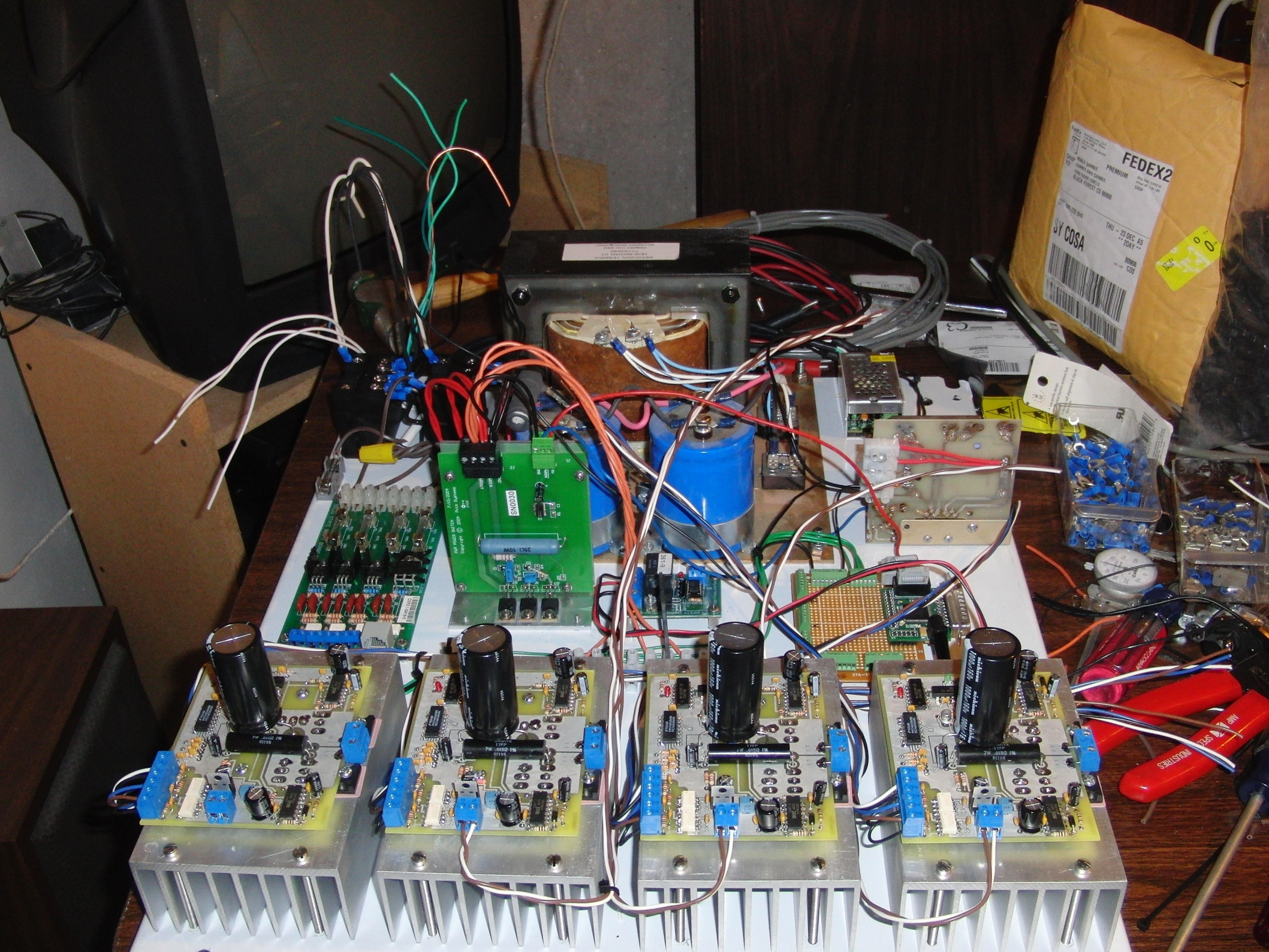
CAUTION  
DON'T CHANGE SPEED  
WHILE WORKING

L-2	190
L-3	330
H-1	480
H-2	910
H-3	1600

1/2" x 2" x 6"  
MILLE  
92%

1/2"





FEDEX2  
PREMIUM  
THU - 23 DEC '05  
SY COSA  
9098  
COS

7410-0204  
Pico Systems  
Copyright © 2004  
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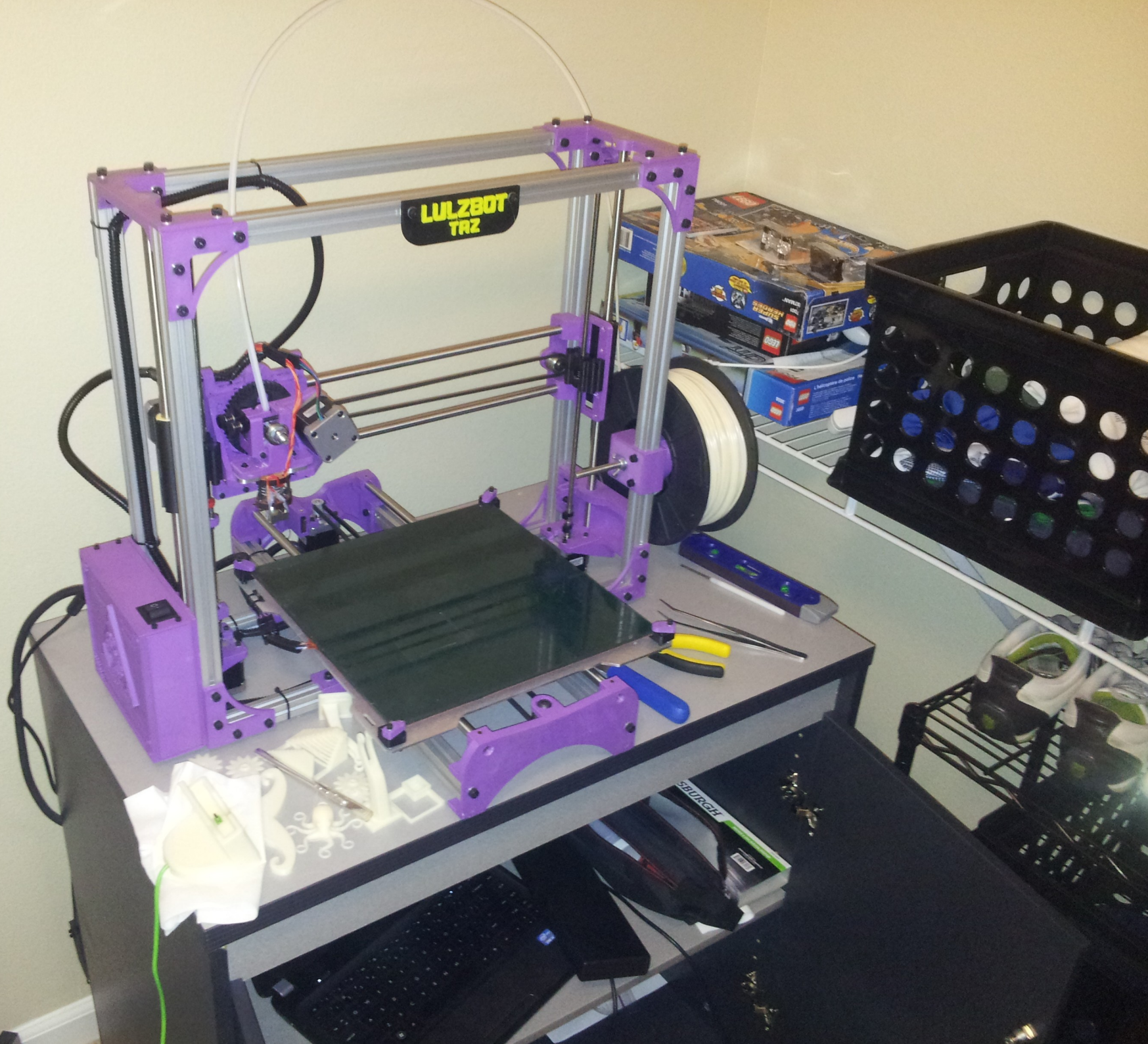












# Whole-House Audio







# The Original Plan

- Our builder proposed including a whole-house audio distribution system in the new house...
  - Speakers in “each room”, 9 different zones
  - Hard-wired volume controls in the room
  - Wiring (4 heavy conductors for audio plus CAT-5) from each zone to central mechanical room
  - 3 proprietary audio servers driving 3 zones each
    - Network-attached, Spotify, Pandora, etc
    - Web, Android, and iOS control clients

# The Problem...

Due diligence on the audio servers exposed a probable GPL violation!

- Admin interface uses Linux kernel terminology, etc
- No user-downloadable firmware, much less sourcecode!
- No mention of software licenses in pdf manual

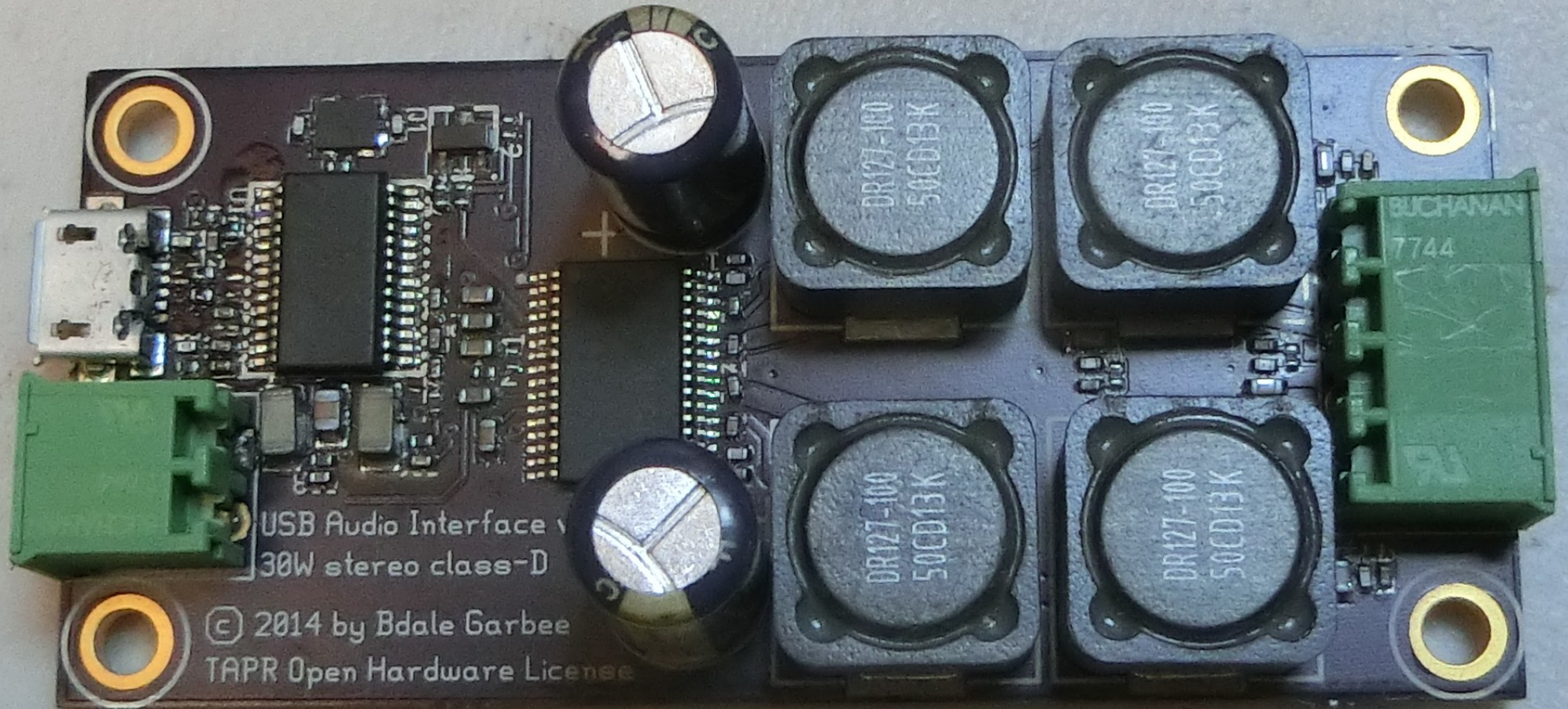
To be clear, I did **not** purchase these products, so the manufacturer had no obligation to provide me anything!



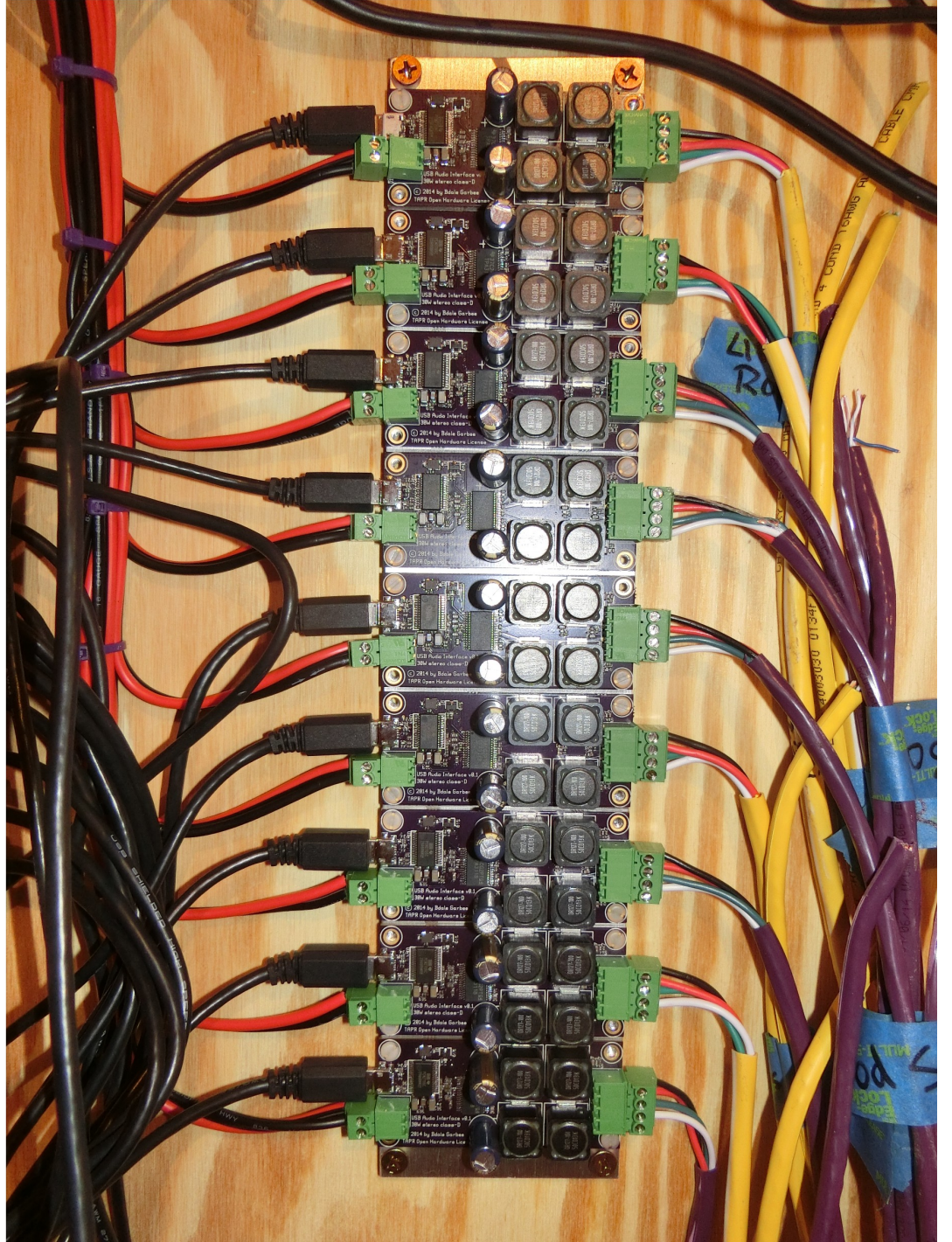
# The Revised Plan

- Let our builder install everything except the central audio servers
- Designed a USB to stereo speaker module capable of driving one zone
- Combine a low-power Linux server driving 9 such modules over USB, running Mopidy, with web browser and Android client controls

# “usbclassd” board









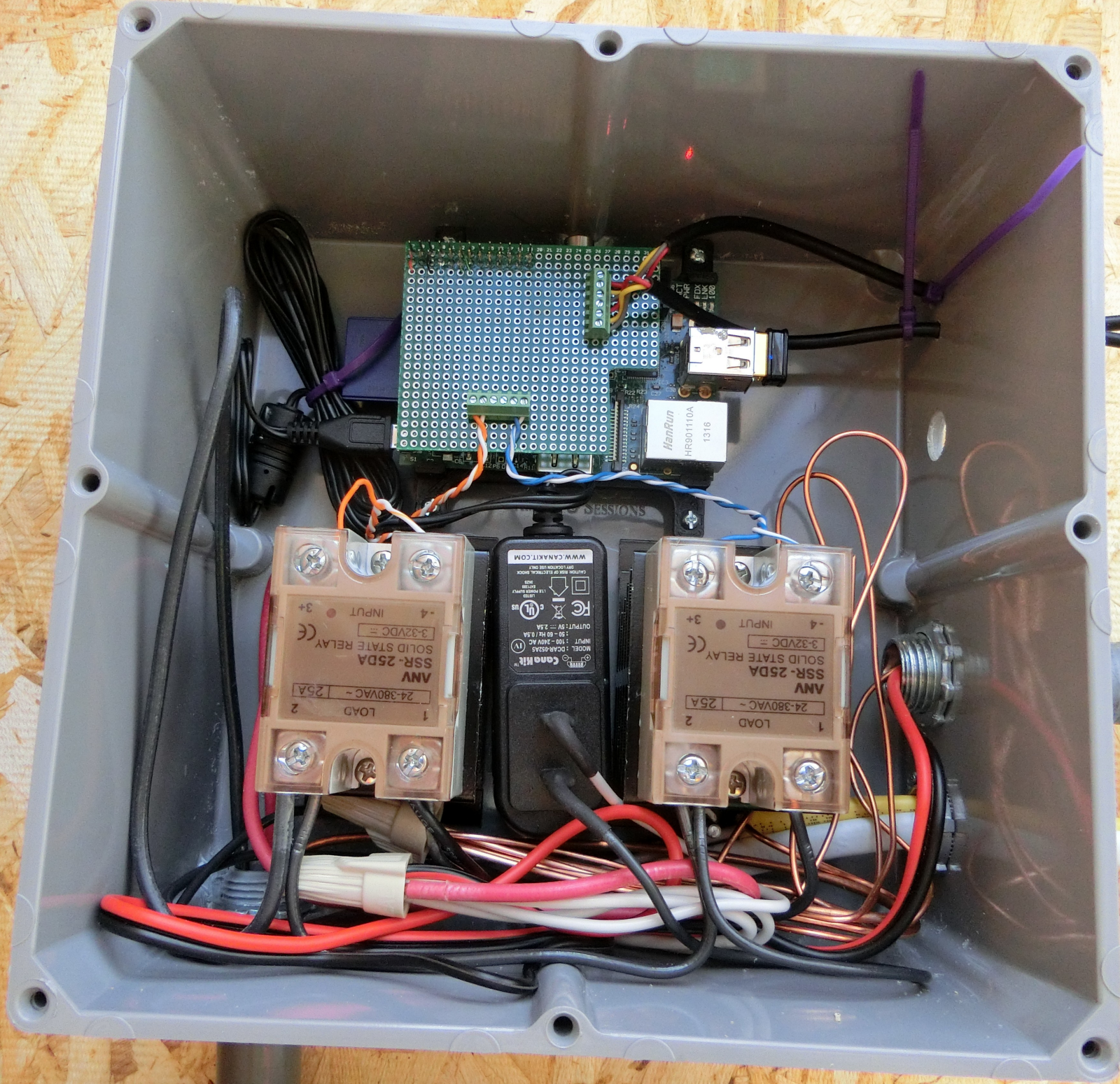
# To Learn More

- <http://gag.com/electronics/audio/wholehouse>
- <http://mopidy.org>



# Greenhouse Control















# More Rockets

# Meh-ga Nuke

310 mm diameter

3.7m long







"O"-class motor  
76kg at launch



3km+  
apogee!









# Race Cars





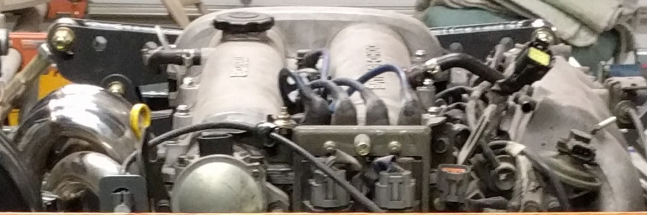
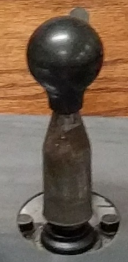
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# In Summary: It's Fun to Share!

- Above all else, have fun!
- Almost everything humans do is more fun when we do it together with others...
- A good way to know if you've learned something is to teach it to someone else
- Be kind to others. collaboration >> competition
- Contribute to Free Software any way you can
  - You do not need to ask permission!
  - Scratch your own itches .. then share your patches
- Living free and collaborating, we can build a better world



# Questions?



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