Randomness

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Places to buy stuff (in no particular order):

1. MCM Electronics
- Turntable belts!, Tools, Kits, Power supplies, Electronic parts, hobby supplies:
- http://www.mcmelectronics.com/

2. Mouser Electronics
- Wide variety of electronic parts, Tools, test equipment, kits, hobby supplies
- http://www.mouser.com/

3. Large Parts houses:
- http://www.digikey.com/
- http://www.newark.com/
- http://www.alliedelec.com/

4. Tools, tools, tools
- http://www.techni-tool.com/
- Including some you never heard of: http://www.techni-tool.com/Search?search=pyro+pen

5. Radio Shack, Home Depot, Lowes, ebay…..

Places to buy stuff Amp and Tube Specific Stuff (in no particular order):

1. http://www.mojotone.com/
- Fender Authorized Parts Distributor, Tubes and tube Amplifier Kits

2. Tubes
http://www.tubedepot.com
http://thetubestore.com/

3. Antique Radio Supply - Tubes and Stuff
http://www.tubesandmore.com/

4. An interesting place for tubes, kits, and parts EXPERTS ONLY
- Tubes, assembly parts (knobs, switches, pots), chassis, low capacitance guitar cable, kits, bicycle lights…..

http://www.hoffmanamps.com/

5. Parts express – tubes, speaker building parts – hole cutting fixtures….
- http://www.parts-express.com/

6. Michigan speaker repair shop
- http://www.circuitshop.com/

Miscellaneous:

1. An interesting custom amp shop in Baton Rouge La.

- http://www.theairtightgarage.com/
- High quality, beautiful cabinets……

2. Advice I can give

- Keep a notebook or files on your projects. I have file folders for amps and projects. This information will help you track changes, issues, problems for years.
- Remember that tube amplifiers are high impedance circuits that run at high voltages. The circuits can contain stored energy long after they are unpowered.
- Learn how to solder correctly. Connections are very important in terms of the quality and reliability of your creations.
- Lead is a toxin. If you can, dispose of lead solder properly. Find if it can be recycled.

Interesting Stuff:

http://www.dataq.com/

- PC based data acquisition hardware

http://www.caig.com/

- Miracle spray! Improves connections, useful for tube amplifiers

http://www.spectraplus.com/

- PC based audio analysis software

http://parts.digikey.com/1/parts/2408244-tgard-k52-1-0505-a1-11-x-18-a15750-00.html

- Miracle product! Heat sink material for transistors, replaces mica or plastic insulators and conductive grease compound.

Discussion:

1. What is the difference between an Objective and Subjective Measurement?

- Subjective - Based on or influenced by personal feelings, tastes, or opinions.
- Objective - Not influenced by personal feelings or opinions in considering and representing facts.

Examples:

- “I like the way this amplifier sounds”
- “I hate the way this amplifier sounds”
- “I measured 10 Watts into 8 ohms”
- “It sounds muddy”
- “I measured 1% THD 10 Watts into 8 ohms, with a 1V PP 1kHz sine wave input”

More Discussion:

1. From the Airtight Garage Website – Tube Thoughts:

Short story: I used to own a very high end tube audio amplifier, I purchased it used right after it had been back from the factory (my friend had a cap job and had it re-tubed, then sold it due to finances). After about two years, I needed to change the tubes. I called the factory for their opinion, and they recommended a tube company known to me to be pretty bottom of the line. I thought they were nuts, so I ordered the top-of-the-line tubes, matched. I installed them and set the bias. It sounded really bad, compared to what was in it previously. I could not believe it. I double checked the bias and let them burn in. I then set the bias again after about 100 hours. No difference, these new tubes really sounded dead compared to the old ones (which were house labeled from the company). I then decided to use the suggestion from the factory and put the cheapies in... they sounded great. My lifeless soundstage was now wide open and had depth. It was freakish, my friends were tired of me telling the story, but it does bring up an interesting notation, that is, some tubes are much better in some circuits than others, regardless of who made them.

Even More Discussion – What measurements can we make?:

- In real life, amplifiers – circuits in general don't do *exactly* what we want them to do – they aren't perfect. What parameters can we measure so we can characterize amplifiers *objectively*?

1. Noise
2. Total Harmonic Distortion
3. Intermodulation Distortion
4. Power level
5. Gain/phase (transfer function)
6. Transient response

- http://en.wikipedia.org/wiki/Intermodulation

- From wiki:
- *(**IMD**) is the amplitude modulation of signals containing two or more different frequencies in a system with nonlinearities.*
- *In audio, the intermodulation products are nonharmonically related to the input frequencies and therefore "off-key" with respect to the common Western musical scale.*

Lots More Discussion – component variations:

- Real components – how do they affect amplifier sound/response? Many old school guitar amplifier builders say they prefer the "sound" of amplifiers made with carbon resistors over metal film resistors. Coupling capacitors carry the signal from one stage to the next. The type and quality can have a huge impact on the sound of an amplifier.

1. Resistors come in many varieties:

- http://en.wikipedia.org/wiki/Resistor - Good reference for resistor types
- http://www.aikenamps.com/ResistorNoise.htm - describes the performance of resistors in guitar and tube amplifier circuits

2. Op-amps 4558 vs OPA27

- http://www.ti.com/lit/ds/symlink/opa27.pdf
- http://www.ti.com/lit/ds/symlink/rc4558.pdf

Future Randomness Discussions:

1. Guitar amplifiers I own….
2. Guitar amplifiers I have fixed….
3. Guitar amplifiers that were working until I fixed them now they're broken….
4. *SOLID STATE AMPLIFIERS*
5. Future projects…….