

CORRECTION

In the Aug. '08 issue of *aX*, in a letter response from Dennis Colin (p. 45), *aX* incorrectly transcribed a word on his submission. The phrase "temporary stability" should read "temperature stability." We regret the error and extend our apologies to Mr. Colin. —Eds.

FIRST-TIME BOX BUILDER

I was originally an *Audio Amateur* reader with no interest in woodworking, which looked too messy to me. You published an article on one of my A75 projects and another on a Dynaco upgrade. When *audioXpress* came along, I was a bit disgruntled about sharing pages with speaker builders and vacuum tube aficionados. But I read on and I didn't let my subscription lapse. My interest in audio grew. Then, a month ago, I felt compelled to assemble a pair of those Bill Fitzmaurice Tubas (April '04, p. 34). They are a great addition to my PA system, and the glue is setting on a second pair as I write to you.

In response to your recent editorial ("Longevity," June, p. 6), I now have seven Plitron transformers in my house and I tick off *aX* every time they ask me how I found them. It's the same thing with Parts Express, DIY Cable (Hypex), and other suppliers who ask. I do \$3000 worth of business with companies which advertise in *aX*.

Julian Evetts
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WITCHES BREW

Having just received my July '08 issue, I was both impressed and depressed with the comments regarding PowerKords having any influence on the sound of equipment and the United Kingdom's response to the bogus claims (Xpress Mail, p. 46). Three cheers for someone or some institution finally saying that these kinds of claims are bogus and without any merit whatsoever. It's

about time. The same mysticism associated with speaker wire and interconnect cables should also be discounted. Being from the "if you can't measure it, you can't hear it" school, I think that most of the claims for esoteric wire and other gadgets used in high-end sound systems are fundamentally bogus or highly exaggerated.

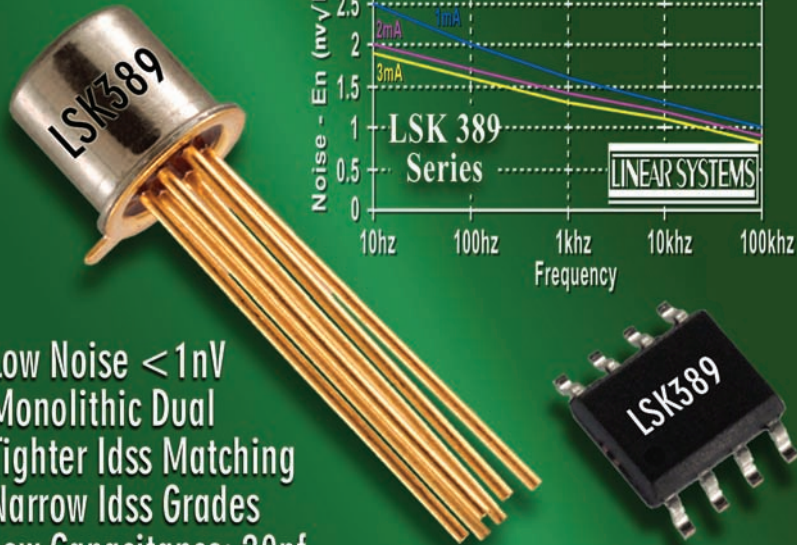
Oxygen-free copper, long grain copper, silver wire, cryogenic treatment, wire break-in periods, designer power cords, and little wooden rings to slide on vacuum tubes seem to be part of the mysticism we once ascribed to fairy tales where witches brewed up magic potions with bat wings, eye of newt, tail of rat, and so on. This was the good news.

The bad news is how the publisher

of this august journal tried to minimize the importance of this announcement saying that it is not important to tell the truth, but that we who putter in this last domain of the audio amateur need not question the technical merit of a specific product, but to base purchases on how the product makes you feel. And he says in closing that not all cable ads are guilty. Indeed! While there is nothing wrong with advertising a cable citing its quality of manufacture and durability, to heap on the ad a long list of euphemisms citing that it somehow will add sonic improvements to one's system is purely fallacious short of quantifiable measurements.

Bob Miller, KE6F
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1nV Low Noise Dual JFET



The image shows a cylindrical dual JFET component labeled LSK389 with four gold wire leads. To its right is a graph of Noise - En (nV/√Hz) versus Frequency (Hz) on a log scale from 10Hz to 100kHz. Three curves are shown for bias currents of 1mA (blue), 2mA (red), and 3mA (yellow). All curves show a decrease in noise as frequency increases. The 1mA curve starts at approximately 2.5 nV/√Hz at 10Hz and drops to about 1.0 nV/√Hz at 100kHz. The 2mA and 3mA curves start lower and also drop towards 1.0 nV/√Hz at 100kHz. The text 'LSK 389 Series' and 'LINEAR SYSTEMS' are visible on the graph.

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LOW-POWER AMP

Here is a question for Aren van Waarde regarding the G40EP headphone amp (March '08, p. 36).

I built the amp on a Velleman VM114 K4001 audio amp circuit card, which is based on using the TDA2003 as a 4W amplifier. Of course, I changed the com-

ponent values to what you listed in the article. As per your schematic, I routed the leg containing C5 and R3 from Pin 4 to the juncture of R1 and R2 and *not* back to Pin 2. The TDA2003 datasheet has that leg going from Pin 4 to Pin 2. I just wanted to verify the correct schematic.

The amp works, but does not sound good.

*Carl Pendola
Houston, Tex.*

Aren van Waarde responds:

Mr. Pendola asks how I have connected the C5 and R3 leg: From Pin 4 to the juncture

CONTRIBUTORS

Joseph Norwood Still ("A \$450 Triode/Ultralinear Integrated Stereo Amp," p. 8), retired from the electronics industry, is designing affordable high-quality amplifiers for the dedicated audiophile. He lives in Towson, Md.

Ed Simon ("A Line-Cleaning Filter, Pt. 2," p. 14, and Elektor's Component Database CD review, p. 46) received his B.S.E.E. at Carnegie-Mellon University. He has installed over 500 sound systems at venues including Jacob's Field, Cleveland, Ohio; MCI Center, Washington D.C.; Museum of Modern Art Restaurants, New York; The Coliseum, Nashville, Tenn.; The Forum, Los Angeles; Fisher Cats Stadium, Manchester, N.H.

Joseph D'Appolito ("Testing Loudspeakers: Which Measurements Matter, Part 1," p. 17), regular contributor and author of many papers on loudspeaker system design, holds four degrees in electrical and systems engineering, including a Ph.D. Previously, he developed acoustic propagation models and advanced sonar signal processing techniques at an analytical services company. He now runs his own consulting firm specializing in audio, acoustics, and loudspeaker system design. A long-time audio enthusiast, he now designs loudspeaker systems for several small companies in the US and Europe.

Dick Crawford ("Tweeter Setback," p. 26) has been building hi-fi amplifiers since the Williamson, which was a Class A design of the '50s. In the interim, he has earned a BSEE from Cal Poly (SLO), and an

MSEE from Stanford. He works as an analog design engineer in the San Francisco area.

Mark Rumreich ("More Box, Less Sawdust," p. 30) has been designing audio gear and building speakers since the days of 8-track tape players. He's the author of the *Car Stereo Cookbook*, published by McGraw-Hill, now in its second edition. By day, he's an electronics design engineer with over 40 US patents.

Jan Didden ("AES Nuggets from Amsterdam," p. 34) lives in The Netherlands and is a long-time contributor to Audio Amateur publications.

Darcy Staggs ("Portable Loudspeakers," p. 38) has been interested in electronics and its magic since building a crystal set in grammar school. This elementary model was later equipped with the first commonly available transistor amplifier, a GE 2N107. A college education (MS, engineering) was followed by work on the Apollo Lunar project (simulation of the electrical power system), war gaming, management software for Swedish IBM, weapons system simulation, and successfully raising two sons, who also love good music.

Edward T. Dell, Jr. (Review: Jena Mystery Cream, p. 44) is editor/publisher of *audioXpress*, *Voice Coil*, and *Multi Media Manufacturer* magazines.

John Sunier ("Super Fidelity," p. 54) is a CD reviewer for *Australian HiFi and Home Theatre Technology*. His website is www.audaud.com.

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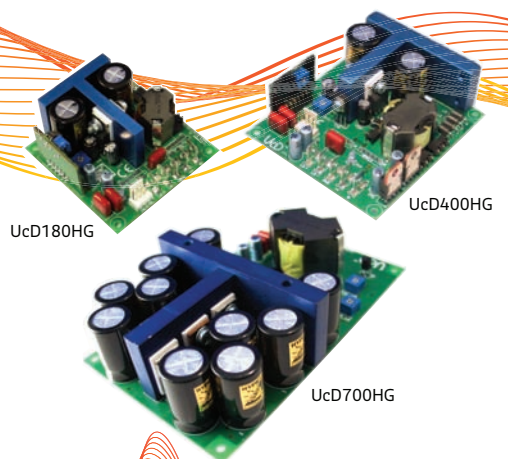
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of R1 and R2, or to Pin 2? I re-checked the G40EP website, the original article in *SPRAT*, and my own PC boards. In all cases, the C5 and R3 leg is connected to the juncture of R1 and R2, as shown in the *audioXpress* article. Both the original G40EP and my own copy sound very good. THD measured by G40EP is 0.006% at 1V peak (1kHz) in a Sennheiser HD25SP. G40EP indicates that the 2nd harmonic is at -90dB and the 3rd at < -88dB under these conditions. Square wave reproduction (measured both by G40EP and by yours truly) is excellent.

If Mr. Pendola's amp has a poor sound, I suspect something else is wrong. I can think of three possible explanations (assuming the headphones are themselves OK):

1. One (or more) of the electrolytic coupling capacitors may be leaky or have been connected with the wrong polarity. I made this mistake once in the audio section of a shortwave receiver, and it ruined the sound completely, until I discovered my error. After I had turned the cap the other way around, everything was OK. When Mr. Pendola's amp distorts, this could be the reason.
2. The TDA2003 IC may have been damaged by static electricity or by overheating.
3. The TDA2003 may oscillate because of a poor layout of the PCB.

I hope Mr. Pendola can get the circuit working. I have myself used the amp for more than one year now and it still operates without any flaw.

OTL FOLLOW-UP

As I mentioned in my article ("Build a Hybrid SE OTL Amp," p. 34, May '08), this amplifier has been made of parts that I had on hand, but if you start from scratch you can make it differently, enhancing its performance. In most cases, people who make an OTL have high-efficiency speakers, and a maximum output of 32W will be fine, so you can reduce the voltage of the power supply for the TDA 7294 op amp to $\pm 25V$ DC as well as the input to the TDA by changing R6 to 22 Ω . Now the power for the filaments of the PL509, which need 40V AC/DC at 300mA DC, can be taken from this supply as well. I increased the plate

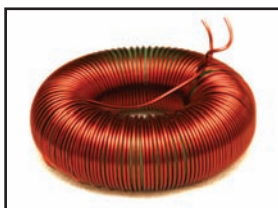
current through the PL509 to 250mA and the 3rd harmonics almost disappeared. For this higher current simply increase the plate voltage on the tube to about 120V DC.

In principle, the power delivered by the tube is not very large, but because the TDA is slaved to the tube it sounds like one big tube. If you mount the TDA somewhere out of sight, nobody will know about its existence and will just admire the good sound of your OTL amp. Personally, I don't care what is in an amplifier and how it is built, as

long as it performs my way. The tube works all the time in class A, hence the amp gives a big triode sound.

Other high current tubes exist, but they need a lot more electronics to drive them. If you want to know all about this, just look at Mr. Broskie's website, glass-ware.stores.yahoo.net. He explains in detail how the circuit is working, but doesn't seem to see that in accordance with the law of Kirchhoff, both tube and TDA see a different load depending on how they share the current to the load.

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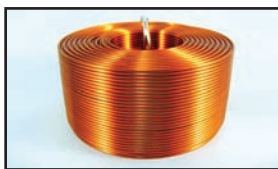


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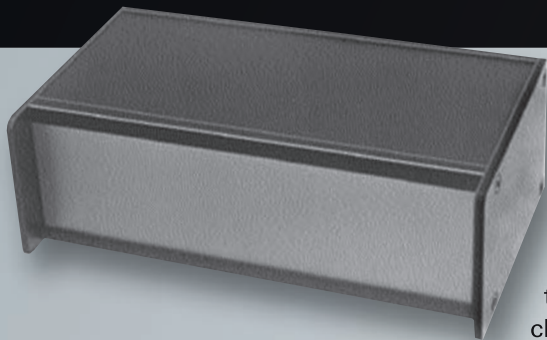
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Say the speaker gets a current of 1A; that means the output is 8V and 8W as well. If the tube delivers 100mA, it sees a load with an impedance of 80Ω and thus the TDA, delivering 900mA, sees a load of about 9Ω . Don't think, as Mr. Broskie suggests, that a small tube will do the same or even better. I've made quite a few hybrids that way; it isn't the same at all. Period. I made tube tracking systems, all of which have in common that the triodes work in class A and the pentodes in class B. In this configuration the power delivered by the pentodes is two to three times the power from the triodes. It would be polite if people informed the author of an article when comments about that article have been published.

AJ van Doorn
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RESISTOR CODE

I'm writing on behalf of my friend, Max Carter, who doesn't have e-mail capability. Terry Bicknell's article in the May 2008 *aX* looks very interesting and Max is going to build the Figure 5 circuit ("Valve Regulated Power Supplies," p. 26).

In the schematic, R2, R8, and R10 are identified as "HS." Does the "HS" stand for "Heat Sunked," or something else? If it's to be heat-sunked, we're curious as to the reason for that. Can you be more specific about these resistors? For example, would 1 or 2W 1% non-heat-sunked resistors be adequate?

Greg Burnett (for Max Carter)
gbusg@comcast.net

Terry Bicknell responds:

Thank you for raising the comments about "HS." On my side of the world, HS has meant high stability, not heat-sunked. This latter is often, although not always, denoted by a pattern of dotted or radial lines around the device concerned.

As to specifics, 1% and a power rating of 1W would be fine. The only other significant resistor to watch is the feed to the zener diode. It will become warm, and plenty of airspace will help generally.

Regards, and good luck with your project.
aX



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