



Electrostatic Loudspeakers Kits

Now available in the US and UK



The full-range Acorn ESL Kit

ER Audio of Western Australia has been supplying electrostatic loudspeaker kits and repair kits for commercial ESLs such as Quads and B&W to the audiophile community for the past 15 years.

We are proud to announce the establishment of our American and UK/Europe distributors to coincide with the release of the flagship electrostatic loudspeaker DIY kit, the **Acorn**.

The **Acorn** has a double-stacked ESL array with three electrically separate sections. Construction is easy and straightforward.

Sonically, the **Acorn** ranks among the very best of commercial ESLs regardless of cost.

UK/Europe

Colin Topps • ctaudio@btinternet.com

USA

Mike Beck • beckaudio@gmail.com

Rest of the World

Rob Mackinlay • Rob@eraudio.com.au

Visit our website:

www.eraudio.com.au

A TINY VINTAGE GARAGE AMP

Could John Stewart post the schematic for his 3W AU6/6AQ5 garage amp ("An Affordable SE Triode Amp," GA 4/00)?

*Jim Petersen
Springfield, Oreg.*

John Stewart responds:

I built this little amplifier back in 1968. Since then it has been used in quite a wide variety of locations. For the past few years it has been in my workshop. Program sources are an Eico HFT-90 FM receiver and a matching Eico HFT-94 AM receiver.

I managed to build the entire amp, tone controls, and preamp into a Hammond 8 × 12 × 3 chassis. Most of the major components are on a 3 × 12 sub-chassis inside. That includes the power supply, power amp, preamp, and tone circuits. I assembled the sub-chassis on the bench. The controls, input, and output connections are mounted on the front and rear panels of the chassis. These were all wired together at the final assembly stage.

For more on this simple 3W amplifier, go to **www.audioXpress.com**. Once there, click on the current issue and follow the link title "articles and addenda."



Visit **www.audioXpress.com**

SE 211 AMP

I enjoyed the clever use of the interstage transformers in the "Push-Pull for Single-Ended 211 Amp" article by Lee Roitberg in the November aX (p. 30). I do have two comments.

On page 30 under the heading "The Light Goes On," Mr. Roitberg says "Amorphous core, nickel core, cobalt core—these are the words many an audio builder lust (sic) after."

AlliedSignal called the amorphous metal product line MetGlass® when they introduced it, and amorphous cores are available in many different alloys with square-loop or round-loop annealing, and grain-oriented and non-oriented strip configurations. Not all of these alloys are suitable for audio

use. Nickel alloys have very low core losses and a wide operating frequency range, and are most desirable for low-level audio signal transformers. The relatively low peak saturation flux density of nickel alloys generally precludes their use in power and output transformers.

Cobalt alloys are not at all suitable for audio use, except as permanent magnet materials in loudspeakers (Alnico, samarium cobalt, and so on). Cobalt electromagnetic alloys, typically the permendur® alloys, are characterized by a 30% higher peak flux density than conventional 3% silicon iron. However, the core losses are also proportionally higher when utilizing this Bmax advantage. It is brittle and difficult to punch into laminations, and special annealing is needed to achieve the optimum properties. Cobalt is also a very expensive metal, at over \$100/lb as a core material. It is rarely used outside the aerospace industry, where the need for low weight and the ability to withstand high operating temperatures mandates its use in transformers and generators.

On page 33 under the heading "Ring. Ring. Ring!," Mr. Roitberg says the output "peaked at +4dB at 14.8kHz, then dropped like a rock." The vertical axis of the upper graph in Figure 3 on page 34 is in output V RMS rather than the customary dB used in a frequency response curve. While the output peaks at about 4V RMS relative to 1kHz (I read 11.8V RMS), this is only a 3.38dB increase. If the peak were +4dB higher it would have reached 12.7V RMS. I only point this out on the chance that Mr. Roitberg had calculated dB but accidentally wrote V RMS on the vertical axis.

*Chuck Hansen
Ocean, N.J.*

Lee Roitberg responds:

Thank you, Mr. Hansen for taking the time to read my article and, more important, pro-

DISTORTED REFERENCES

By David J. Weinberg (Tobias Audio)

Two books published by Berklee Press ("a publishing activity of Berklee College of Music," www.BerkleePress.com), one written by David Franz (engineer and Berklee College graduate student) and the other by Daniel M. Thompson (Berklee College of Music Assistant Chair of Music Production and Engineering), purport to provide enough information to enable effective setup and use of a home or professional recording studio. I give each a failing grade and hope they are not used in the classroom.

Recording and Producing in the Home Studio: A Complete Guide (©2004, ISBN 0-87639-048-3, 236 pages, \$25) is Franz's attempt. Franz introduces the book as "for artists, songwriters, bands and aspiring engineers and producers who want to better understand how to engineer and produce their own recordings." This book is of limited use to a musician who is starting to produce and create his own recordings, and who wants an overview of what topics he needs to learn about, plus how they interact. It reads as though written by a musician whose ego led him to write, but in spite of his engineering degree seems without the depth of knowledge, or the ability to teach that knowledge, that is necessary to fully inform the budding musician/producer/engineer.

The most useful and informative part of the book are sections 2-4 (chapters 4-14), which address practical operational techniques useful in producing, recording, and mixing. Franz explains the role of the producer versus that of the engineer, acknowledging that in many home studios, the musician does it all. He suggests microphone selection and techniques, channel assignments, various traditional mixing board functions, how to take advantage of MIDI, editing techniques, and mastering. These seem to be based on his preferences with conventional mixing boards. He doesn't make clear that there are other ways to approach each task that might be better suited to the way other musicians work or think. The novice musician could become confused if he uses this book as a tutorial and his equipment doesn't offer the same capabilities. ■

To Continue

 Visit www.audioXpress.com

LARGE SIGNAL ANALYSIS OF DIFFERENTIAL TRIODE TUBE AMP

By Muhammad Taher Abuelma'atti

The author presents a mathematical model (basically a sine-series function) for the input/output voltage characteristic of a differential vacuum-tube triode amplifier. The results show that, similar to transistor-based differential amplifiers, the vacuum triode differential amplifier generates only odd-order harmonic and intermodulation components. The results also show that the amplitudes of these components are strongly dependent on the amount of cathode feedback and the amplitudes of the input tones. Moreover, the third-order intermodulation component is dominant and is higher than the third-harmonic component by about 12dB over a wide range of the input voltage. ■

To Continue

 Visit www.audioXpress.com



A Winding Path

There is no music on a record! Just a winding path of vertical and lateral amplitude waves.

The time signature comes from the spinning turntable platter.

Modern disc cutters can achieve Wow and Flutter of 0.01%. Shouldn't your turntable do as well?

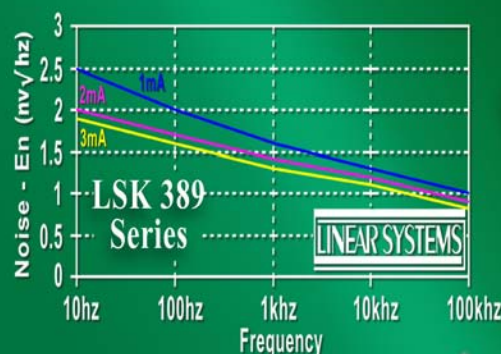
The Audiophile Standard

KAB

Preserving The Sounds Of A Lifetime

www.kabusa.com

1nV Low Noise Dual JFET



Low Noise < 1nV
Monolithic Dual
Tighter Idss Matching
Narrow Idss Grades
Low Capacitance: 20pf
Functional Replacement for 2SK389

www.linearsystems.com

800-359-4023

GLASPERLENSPIEL Single ended
300B stereo amplifier featuring
SMPS and 4 Silver Rock transformers



Emotion
in
Sound

DULCET 98 dB/w/m efficient
Two driver loudspeaker
system by Mantra Sound



www.audio-consulting.ch



ROCK SOLID Silver wire input
transformer solid state amplifier
Point-to-point silver wiring

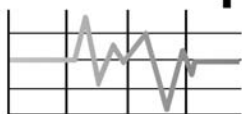


SILVER ROCK
Silver wire passive transformer-
attenuator preamplifier



SILVER ROCK PHONO
Solid state phono preamplifier with
MC silver wire step-up and inductive
RIAA equalization

Test Equipment Depot



800.996.3837

The source for premium electronic testing equipment

New & Pre-Owned

- Oscilloscopes
- Power Supplies
- Spectrum Analyzers
- Signal Generators
- Digital Multimeters
- Network Analyzers
- Function Generators
- Impedance Analyzers
- Frequency Counters
- Audio Analyzers



Call now to speak to one of our
knowledgeable salespeople or
browse our extensive online catalog

www.testequipmentdepot.com

• Sales • Repair & Calibration • Rental • Leases • Buy Surplus

viding some feedback.

Regarding your first comment, you bring up a very interesting point on different core materials and the reality that some of them are not usable for audio applications, but I fail to see how this has any direct relevance to my article considering that I do not discuss the merits of any of the core materials or their intended use. While the science of core material can be fascinating, this article is not the proper forum for that discussion. Not to diverge from the article further, but please take a look at www.magnequest.com. I believe you will find a few transformers made of both nickel and cobalt that are readily available for audio use.

Regarding your second comment, although it is customary to see frequency response curves displayed in dB, the visual impact of a 4dB spike would have been lost in the graph and some people may see the anomaly as minor. By presenting the graph in V RMS, an emphasis was placed on the spike. With the limited data points presented on the graph, the highest peak is only 3.3dB. In reality, the graph continues to rise between the two highest data points provided to just over 4dB.

The idea that you took the time and effort to calculate the peak from a 2.25" by 2" graph just amazes me. If I had been aware of your intentions, I would have included the exact 14.8kHz data point. I hope you use this tenacity when you build this amplifier.

HAPPY DIYER

I am executive editor of *IEEE Spectrum* magazine. I have had wonderful success building an amplifier highlighted in the June 2004 issue of *audioXpress* (Satoru Kobayashi's "KT88 Hybrid PP Stereo Power Amp").

I finished the amplifier about a week ago, and have been absolutely amazed and delighted with its performance. I have been testing it with a cheap, portable Sony CD player and a pair of 14-year-old, two-way B&W speakers, and even with this modest setup the amplifier's beautiful response and tone shines through. It is certainly a match for my no-expenses-spared 300B single-ended

monoblock amps that I have been using for the past few years, and which cost me probably twice as much to build as did Mr. Satoru's KT88 push-pull.

I first contacted Mr. Satoru almost immediately after reading the article, and have been corresponding with him regularly ever since. I have found him to be incredibly patient, kind, helpful, and even witty. The smallest question or inquiry on my part resulted in an immediate reply—sometimes multiple replies—and often quite late at night. I often got the impression he was staying up late simply to make sure he had answered all my queries to my satisfaction. This kind of interest and assistance is pretty much unprecedented, in my experience.

During the project, there were very few parts I had to order from Japan. All were easily obtained, but perhaps more important, all could have been substituted for with US or European parts. The only exception was the beautifully designed chassis.

The Perfect Gift for any DIY Audio Enthusiast!



Twelve issues of

- Hands-on projects
- Helpful articles
- New technologies
- Expert advice

Only \$29.95, that's a **65% SAVINGS** off the cover price!

To order a gift subscription, call 1-888-924-9465 or go to www.audioXpress.com

CANADA ADD \$12 PER YEAR. OVERSEAS RATE: \$59.95 FOR 12 ISSUES.



Dyna^(tm) Clone Transformers...world's most popular and fastest selling Dynaco^(tm) replica transformers, priced competitively with generic massmarket transformers! Used by hobbyists, repairpersons and OEM's worldwide. Made in America's heartland by transformer professionals with over 50 years experience making private label and OEM transformers.

Dyna Clone output transformers are dimensionally identical and wound the same as the originals, with the same number of turns, sections and wire size, using the same patented Dynaco winding method, and made on the same core size and material. All have the requisite ultralinear screen taps.

Dyna Clone power transformers use improved insulation technology and 100% solids resin (no dripping wax!) impregnating to provide transformers that run cooler & quieter than the originals. Bolt in replacement installation, no cutting or drilling.

See and read more at www.triodeelectronics.com

Dyna Clone Power Transformers

PA211 Upgrade and Replacement transformer for Dynaco PAS2, PAS3 and PAS3X preamplifiers.

PA522 International export version of PA211 with "universal" 120/240V 50/60 Hz primary.

PA774 Upgrade and Replacement for ST35 and SCA35

PA060S Improved replacement power transformer for ST70

PA135 replacement power transformer for Dynaco (tm) Mark 4.

P782S replacement power transformer for Mark 3 and Mark 2

C354 Exact replacement for chokes in ST70, Mk2, Mk3 and Mk4

Dyna Clone Output Transformers...compare price, quality, weight & specs to comparably priced mass market transformers. Why settle for generic when you can have a classic?

Z56548 Reproduction of the Z565 output transformer as used on the ST35 and SCA35 amplifiers, except that the output taps are **4 and 8 ohms**

A470S reproduction of the Dynaco A470 output transformer as used on the Dynaco (tm) ST70 and MkIV amplifiers

A431S a reproduction of the Dynaco A431 output transformer as used on the MkII and MkIII amplifiers and Sunn guitar/bass amplifiers.

Other stuff we sell: Tubes, Sockets, Other upgrade/replacement Parts.

I had it made by Mr. Shibuya, at Mr. Satoru's suggestion.

Mr. Shibuya tailored the chassis for the RCA jacks, the binding posts, and the power-entry module I selected. Mr. Satoru forwarded all these details to Mr. Shibuya for me

and ensured that Mr. Shibuya understood what I wanted, and even sent me a CAD-blueprint of the final chassis for my inspection prior to the work being done. In the end, I found that the KT88 chassis cost about one-sixth of what I had paid for the two

less-complicated stainless-steel chassis that I had had made for my monoblocks. I wouldn't hesitate to order another chassis from Mr. Shibuya.

By the way, I recently started building the "High End Preamp for Today's Audiophile" (*audioXpress*, February and March '05), which I intend to use with Mr. Satoru's KT88 amp. The contrast between the two designers, Mr. Satoru and Mr. Ben Hinrichs, has been stark.

I went to Mr. Hinrichs' website and from there to a link where I bought a kit for this preamp. The kit came with no instructions and no schematic whatsoever. It was also lacking a few necessary connectors, which I had to hand-fashion myself (I could not make the German man who sells the kit understand what I was lacking). I wrote to Mr. Hinrichs twice with a few straightforward questions, and he declined to respond in both cases. Nevertheless, I'm confident I'll be successful in the end.

I'll close by saying you have another happy customer, and that I hope I can look forward to more articles by Mr. Satoru in the future. He has certainly made a believer out of me.

My compliments to you and your staff. Keep up the good work.

Glenn Zorpette
Sea Cliff, N.Y.
aX

It's Here! ▶▶▶



The NEW 2005 Old Colony Sound Lab Catalog

To get your copy, or request a copy on-line

call 1-888-924-9465 at www.audioXpress.com

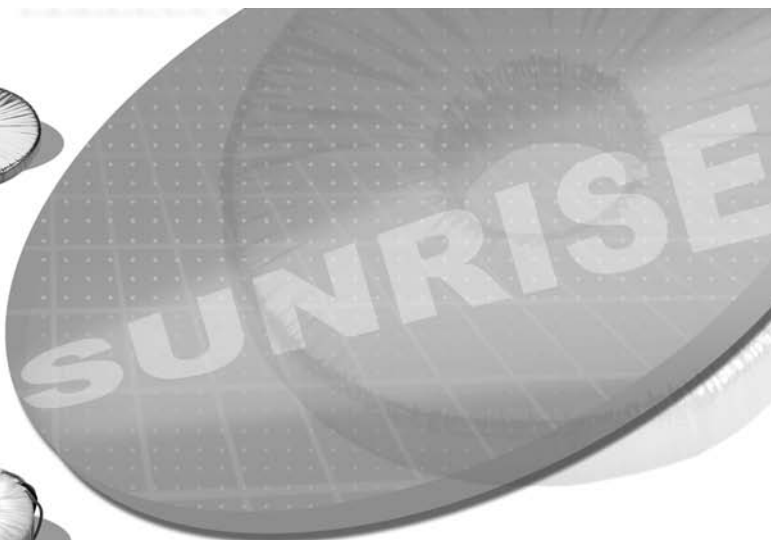
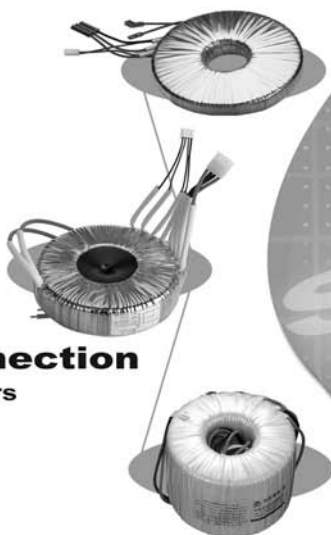
Books | Cds | Kits | Software



Old Colony Sound Laboratory, PO Box 876, Peterborough NH 03458-0876 USA
Toll-free: 888-924-9465 Phone: 603-924-9464 Fax: 603-924-9467
E-mail: custserv@audioXpress.com www.audioXpress.com



Faithful Connection
Sunrise Transformers
www.us2sunrise.com



Sunrise E.&E., Inc
TEL: 909-598-9136 FAX: 909-468-0307