

Xpress Mail

CORRECTION

I found an error in my article "The Double-Dipole Subwoofer," which was published in *audioXpress*, November 2004, p. 18.

In Fig. 12, the regulated power supply, the values of resistors R2 and R4 which adjust the output voltage of the voltage regulators, should both be 2k7.

*George Danavaras
Athens, Greece*

REVISED TEST

In response to inquiries about my recent article ("A Transconductance Tube Tester Test Standard," Feb. '05 aX, p. 18), I have made several changes to allow the Transconductance Test Standard to work on higher input (grid signal) voltages, such as on some selected ranges of the Hickok Model 539 series. Measurements on this standard were

within $\pm 1\%$ of 1500 μ S with input signal voltages of up to 7.5V RMS and plate voltages up to 250V DC. This necessitated some modifications to the circuit as shown in Fig. 1.

I devised a new circuit board. Due to the power dissipated within this device at higher plate voltages, I've also included additional holes to attach a heatsink with standard 1.0" spacing between pins. I turned the heatsink down on a metal lathe such that the bottom 1.5" fit within a standard 1.25" O.D., thin wall (0.050" wall thickness) tubing. I then fit the aluminum tube over the octal plug socket and potted using Loctite E-60NC Hysol epoxy potting compound. The outside of the case heated up approximately 30°C after 15 minutes of operation at 200V DC plate voltage.

*Joel Hatch
jhatch200@yahoo.com*

Revised Transconductance Test Standard Circuit Board---single-sided (Fig. 2)

C1 = 0.15 μ F P10969 (Panasonic ECQ, 250V metal polyester) [Digi-key]

R1 = 250k Ω (Vishay 1/4W) [Mouser]

R2 = 118 Ω (IRC Precision, 0.1%, 1/4W) [Mouser]

R3 = 511.2 Ω (Vishay 1/2W, selected from 511 Ω 1% resistors, 509.5 to 512 Ω are suitable) [Mouser]

D1 = UF4004 (Vishay 400V, 1A rectifier) [Mouser]

D2, D3 = 1N5245B (Diodes Inc., 15V zener) [Digi-key]

U1 = 10M45S (IXYS) [Digi-key]

HeatSink = HS239 (Aavid Thermalloy 5300002B02500) [Digi-key]

Octal Base socket = Octal Socket Accessory #15 (QQQ Octal Pin Plug) [Angela Instruments]

Reference: Outside Circle Dia. = 1.100", Bar adjacent to hole on diodes indicates cathode.

AUDIO TRANSFORMERS

AMERICA'S PREMIER COIL WINDER

Engineering • Rewinding • Prototypes

**McINTOSH - MARANTZ - HARMAN-KARDON
WESTERN ELECTRIC - TRIAD - ACRO SOUND
FISHER - CHICAGO - STANCOR - DYNACO
LANGEVIN - PEERLESS - FENDER - MARSHALL
ELECTROSTATIC SPEAKER TRANSFORMERS**

Williamson Amplifier Transformer Specialist
**WE DESIGN AND BUILD TRANSFORMERS
FOR ANY POWER AMPLIFIER TUBE**

PHONE: [414] 774-6625 FAX: [414] 774-4425

AUDIO TRANSFORMERS

185 NORTH 85th STREET

WAUWATOSA, WI 53226-4601

E-mail: AUTRAN@AOL.com

NO CATALOG

CUSTOM WORK

FIGURE 1: Revised Transconductance Test circuit.

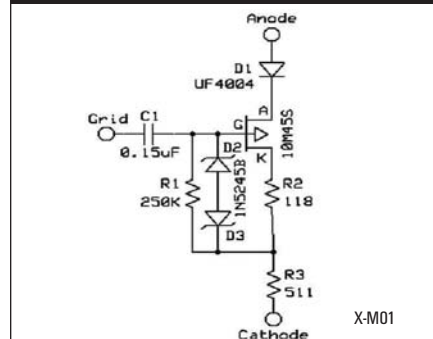
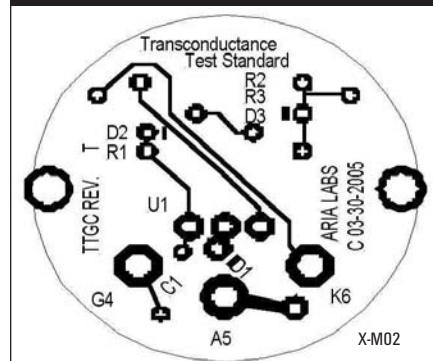


FIGURE 2: Revised board.



VACUUM STATE



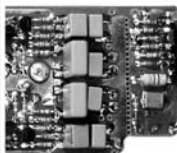
The Winner of Bill Gaw's
Enjoy the Music.com
Best Of 2003 Award
and Best Of 2004 Award ...
Our dpa300B differential
monoblock poweramps!



RTP3C differential preamp
(MC phono & line):
*'Sounds like a Nightingale
that's fallen in love!'*



Our Upgrade modules for
SACD players have won



POSITIVE FEEDBACK ONLINE
2004 Brutus Awards
Best SACD Mods



Pure four nines
silverfoil & silverwire
interconnects and silverfoil
speaker cables.
*'I am really shocked by
their performance!'*

All products available finished or as KITS!

Showroom at: Vacuum State GmbH
Büsingerstr. 5 8203 Schaffhausen
Switzerland Ph + 41 52 620 35 81

www.vacuumstate.com

TRANSFORMER SOUND

I read Norman Thagard's article about H.V. differential amplifiers in *audioXpress* ("Single-Ended to Differential Mode Made Easy," Dec. '04, p. 8) with great interest. Congratulations on your work. I never thought of connecting so many tube amplifiers in series/parallel to achieve such levels of power.

We (at Audio Consulting) are working on differential topologies for solid-state and tube amplifiers. Although in both cases, power never exceeds 30W, the sonic advantages of differential topologies are quite obvious (at least to us), especially in these times when the audiophile community calls for single-ended circuits. Here are two areas we would like to address:

Phase splitters. This is a very critical stage. We have tried many circuits—solid state and tube—and finally use transformers. We still believe that this is sonically the most satisfying way of producing 180° out-of-phase signals. The two out-of-phase signals are identical voltage wise and source impedances are identical, too. The latter is more important to sound performance than we

initially may think.

Many topologies that are used to produce out-of-phase signals use different devices or a number of devices for each phase, which lowers the performance.

Of course, the quality of the transformer is absolutely crucial. It happens that transformers are our specialty and we have produced many different types that may be used to achieve 180° out-of-phase signals: from low impedance to high impedance, with or without voltage gain, copper wire or silver wire, various magnetics, from regular 0.35mm grain-oriented steel to extremely exotic materials in wooden cabinets.

Power from power lines to high power amplifiers. Your very original way of using standard tube power amplifiers and its advantages can also be applied to the utility mains. You mentioned that you were having mains voltage down to 107V AC when operating all your power amplifiers, showing the limitations of running 115V AC power lines where power is provided with high value AC currents.

In our constant battle for better-sounding mains, we have developed very spe-

The Ultimate Acoustic Analysis System.

*For real-time testing of
Audio System performance!*

- 1/12th Octave Real-Time Analyzer (RTA)
- Energy-Time Graph (ETG)
with octave & 1/2 octave band filters
- Sound Pressure Level Meter
- Speaker Distortion Meter (THD+N)
- Signal to Noise Ratio
- Speaker Polarity Test
- Integrated Audio Signal Generator
- Handheld, Portable, Battery Operated
- Serial Data Download and Report Software



Powerful • Portable • Affordable

SENCORE

1-800-736-2673 • sencore.com • e-mail sales@sencore.com

Subscribe To The SENCORE News at www.sencore.com

cial power supply and mains isolation transformers that allow for much higher energy transfer from the mains to the amplifiers. Today's mains quality is extremely bad for audio components, and this has nothing to do with sags, HF, or RF. But this is another story.

One transformer that we use for Europe and Asia has a 400V AC primary winding that allows it to be connected between two of the three phases we get in our homes. Mains here comes with three 230V AC lines that are out-of-phase by 120° and one "0" connection. Normal connections between the "0" and one of the three 230V AC lines lead to the standard 0-230V AC mains situation we have over in Europe and parts of Asia.

Using power between two out of the three 230V AC lines leads to 400V AC ($\sqrt{3} \times 230V$ AC). Using power that way has the big advantage of avoiding the "0" connection, which carries the bigger part of the unwanted "pollution."

Thus a 400-230V AC isolation transformer allows for a totally new and isolated 230V AC line feeding your audio system. There is a similar situation in the US.

In the US, 230-115V AC transformers work perfectly for homes having access to both 115V AC phases (out-of-phase by 180° here). The situation in the US really is a differential topology, by analogy to your way of using power amplifiers. Sound wise, this also leads to big improvements, for reasons that would take another few pages to mention.

I really became excited about your work and we would be most happy to provide you with free samples of phase-splitter transformers in case you are interested in further experiments. We just need to know the output stage topology and impedance of your preamplifier in order to produce an optimum phase-splitter transformer. If the impedance is low enough, we may even consider voltage gain within the transformer.

Serge Schmidlin

Audio Consulting

14 B Chemin Des Vignes

1291 Commugny

Switzerland

Norman Thagard responds:

Thank you very much for your kind letter. It was the incremental improvement in reproduced sound noted with each increase in

the number of amps that spurred me to find a way to maximize the power.

My reason for settling on the single-transistor phase-splitter was its excellent objective performance combined with simplicity. I wanted to avoid additional active stages if I could.

In theory, transformers offer a superior method of converting a single-ended signal to a differential one, but as you note, transformer quality is crucial. Since I have some facility at electronic circuit design and none at transformer construction, I opted for the electronic approach to phase-splitting.

Some years ago I purchased a book on transformer design and construction, so I do have a pretty good idea how to go about it while preserving frequency response. I am still unmotivated to attempt it myself, as it looks like a fairly daunting task. Nonetheless, there are folks who can "roll their own," modify existing transformers, and/or re-wind defective tube amplifier output transformers, a capability that I especially admire.

I would love to compare the sound of a transformer phase-splitter with the one currently in my system, which is the MOS-FET-based version of the Concertina phase-splitter as described in my article. For vinyl playback the phase-splitter is directly driven by the output of a two-stage MC cartridge phono preamp, which has a BiMOS folded-cascode, single-ended (as opposed to complementary with push-pull action) output stage whose output impedance ranges from about 25Ω at 20Hz to 10Ω at 20kHz thanks to negative feedback. For CD, SACD, digital cable, tuner, and so on, playback, a Marantz preamp drives the phase-splitter.

I have no idea what its output impedance is, but would guess it's probably pretty low. Since most of my listening is through the phono preamp, I would have a greater interest in a transformer optimized for the MC phono preamp. The differential input resistance of either channel's tube amp complement is 0.5MΩ. Of course, my single-transistor phase-splitter outputs each drive four paralleled input channels of the tube amps and therefore "see" a single-ended resistance of 250kΩ.

Again, I appreciate your kind letter and your offer.

NOISE AMP

Thanks to Charles Hansen for his article on the Noise Meter Amp (*audioXpress*, Jan. 2005). As an "advanced dabbler" who reads *audioXpress* and who knows

**Pure
Simple
Natural..!**

Jasmine **Products**

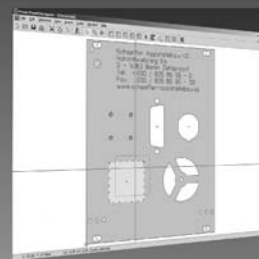


www.fixaudio.net

Fixaudio
110 boul. Labelle local 6
Ste-Thérèse, Qc. J7E 2X5 Canada
Tél.: (450) 437-5205 fixaudio@aei.ca

Front Panels?

Download the free »Front Panel Designer«
to design your front panels in minutes ...



... and order your front panels online
and receive them just in time

**Unrivalled in price and
quality for small orders**

www.frontpanelexpress.com

Electronic Crossovers

Tube

Solid State

Passive Crossovers

Line level

Speaker level

Custom Solutions

We can customize our crossovers to your specific needs. We can add notch filters, baffle step compensation, etc....

All available as kit

Free Catalog:

Marchand Electronics Inc.

PO Box 18099

Rochester, NY 14618

Phone (585) 423 0462

FAX (585) 423 9375

info@marchandelec.com

www.marchandelec.com

just enough about electronics to get himself into trouble, I have a few questions about this project.

My main interest is in audio recording, and it seems that this noise amp could be used to determine the quietest tubes to use in microphone preamps. Is this amp overkill in such a situation?

Also, I'm building some solid-state power supplies for some old German tube mike preamps. Is this amp a good choice for obtaining lowest noise in the supply circuits, or is there a better choice?

Mr. Hansen says that he routed the circuit board with a Dremel tool. I'd never heard of this technique, but after some surfing on the Web, I found out that this is common practice. Perhaps Mr. Hansen would be willing to tell us about his routing setup—what sort of jig he uses, computer controlled, and so on?

Is it necessary to rout the board for the Noise Meter Amp, or is etching a possibility considering the need for low noise? Etching would certainly simplify matters for me after seeing

the complexity of computer-controlled routers.

Last, as someone who is seriously considering building this project, are there other testing tools that might be more appropriate for me? I realize spectrum analyzers don't come cheap, but wonder whether they might serve a dual purpose: determining offending frequencies in power supplies as well as determining lowest noise.

*Mark Drury
Pleasanton, Calif.*

Charles Hansen responds:

My Noise Meter Amplifier has a low input impedance (600Ω or 8k5) that would be incompatible with the high impedances at the plate of a common-cathode tube amplifier stage. The high values of grid and plate resistances will generate correspondingly high levels of Johnson noise, which may be difficult to separate from tube noise on an absolute basis.

A 1MΩ grid resistor will generate about 18μV of noise at room temperature over a 20kHz bandwidth. This grid resistor noise looks like an input signal and will be amplified by the gain of the amplifier stage.



PARTS CONNECTION

The Authority on Hi-fi D I Y !

No matter what your requirements are, pcX has what you need. Whether it be vacuum tubes (NEW, New Old Stock or OS), sockets, transformers, capacitors, resistors, connectors, hook-up wire, etc...we've got a world class selection of all the best brands...and more arriving every month!

Visit our website and sign up for our quarterly eConneXion Newsletter!

www.partsconneXion.com

Tel: 905-681-9602 Fax: 905-631-5777

1-866-681-9602

*Toll free order line

*USA & Canada only

VISA MasterCard PayPal, US money order, bank draft, cashier's check

order@partsconneXion.com

International orders welcome!

SANYO OS-CON **audience** **KIWA ME** **ELNA** **nichicon** **MUSICAL**

LC Audio Technology **PEARL** **ELNA** **ELNA** **ELNA**

Vacuum Tube Wizard **Dynamic** **Dynamic** **Dynamic** **Dynamic**

MultiCap **MultiCap** **MultiCap** **MultiCap** **MultiCap**

GOERZ **GOERZ** **GOERZ** **GOERZ** **GOERZ**

DISCOVERY CABLE **DISCOVERY CABLE** **DISCOVERY CABLE** **DISCOVERY CABLE** **DISCOVERY CABLE**

OHURA **OHURA** **OHURA** **OHURA** **OHURA**

audioquest **audioquest** **audioquest** **audioquest** **audioquest**

WATGATE **WATGATE** **WATGATE** **WATGATE** **WATGATE**

CADDOCK **CADDOCK** **CADDOCK** **CADDOCK** **CADDOCK**

reizenhm **reizenhm** **reizenhm** **reizenhm** **reizenhm**

KIMBER KABLE **KIMBER KABLE** **KIMBER KABLE** **KIMBER KABLE** **KIMBER KABLE**

Super **Super** **Super** **Super** **Super**

2885 Sherwood Heights Drive, Unit #72, Oakville, Ontario, CANADA L6J 7H1 • NOTE: No "on-site/walk-in" business at this time

AC-powered heaters can also introduce 60Hz hum. I don't know whether valid noise measurements could be made at the cathode of these stages, where low value resistors are typically used.

The most significant noise source in the tube itself is shot noise, caused by fluctuations in the plate current due to the random collection of electrons at the plate. The shot noise in a temperature-limited cathode is higher than the noise with a space-charge limited tube. Other sources of tube noise are the random ionization of the few remaining gas molecules in the "vacuum," the noise induced by electron flow near the control grid wires, noise caused by current fluctuations between the screen and plate in a pentode, and microphonics.

You might want to do some research on the Internet to find a suitable test method for measuring noise in vacuum tubes.

Two good books that cover noise in electronic applications are:

Low Noise Electronic System Design by C. D. Motchenbacher and J. A. Connelly (Wiley-Interscience) ISBN 0-471-57742-1, and *Op Amp Applications Handbook* edited by Walt Jung (Newnes-Analog Devices) ISBN

0-7506-7844-5.

I designed the Noise Meter Amplifier after running into limitations while making power supply noise measurements, so this is an ideal application.

I used the Dremel router in six other projects for *Audio Amateur*.

"RIAA Preamplifier With HeadRoom™ Module," 6/97 *Audio Electronics*, pp. 8-21 (this included a photo on page 12 of the routing technique).

"Precision Sine Wave Oscillator," 5/98 *Audio Electronics*, pp. 8-23.

"Budget Wave Analyzer (Part 1)," 3/99 *Audio Electronics*, pp. 8-17.

"Mating Subs and Satellites via Passive Crossovers" (with GR Koonce), 8/99 *Speaker Builder*, pp. 38-51.

"An Audio Balun," 6/00 *Audio Electronics*, pp. 16-23.

"HV Differential Amplifier," *audioXpress*, pp. 20-25, Dec '04.

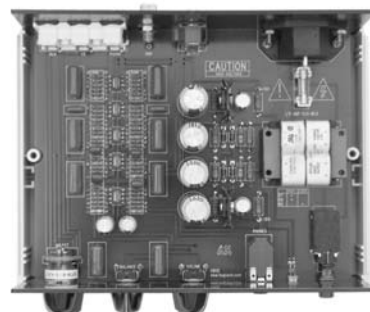
It is not necessary to rout the board as I did. You can use an etched board (preferably double-sided with a maximum ground plane area). Note that I did not use a computer-controlled router. My routing was done manually using a fixture to hold down the board and a clamped straight edge to guide

You can build this preamp!



The new OBOE full function preamplifier is based on the famous BUGLE (Stereophile recommended component) phono stage, adding a line stage, headphone amplifier, and a power supply.

Easy to build, there is only one wire to solder. Order as a "half-kit" or fully assembled.



www.hagtech.com

Image 傲士

Vacuum Tube Amplifier
Made in China

Attractive of Single Ended

Looking For The Distributors

We are well known supplier of Vacuum Tube Amplifiers manufacturing in China, We are also available OEM for you, Now we are looking for a partners and distributors in your country, Don't lose opportunity and please contact us today.



300B Tube Intergrated Amplifier

Output Power: 9w x 2 (Single Ended)
Output Impedance: 4Ω/8Ω
Input Selector: 3
Vacuum Tubes: 300B x 2, 6SN7x2
6BX7 x 2, 5AR4 x 1
Dimension: 42 x 33 x 22cm(WDH)
Weight: 30Kg

- GE 6BX7 Push Full Music 300B
- Used M-Cap Tin Foil Cap for connection
- Power Amp. Terminals available

SE8 Tube Intergrated Amplifier

Output Power: 10W x 2 (Single Ended)
Output Impedance: 8Ω
Input Selector: 2
Vacuum Tubes: EL34x2, 6SN7x2
Dimension: 23 x 16.5 x 24cm
Weight: 11Kg



Manufacturer:

Nelson Audio Nelson Audio

Tel: (+86) 20 6118 9377

Fax: (+86) 20 6118 9378

E-mail: nelson@nelsonaudio.cn

www.nelsonaudio.cn

NEW Products NEW Suppliers NEW Technologies



NEW CATALOG
EVERY 90 DAYS

Delivering the latest with the greatest.

SEMICONDUCTORS | PASSIVES | INTERCONNECTS | POWER | ELECTROMECHANICAL | TEST, TOOLS & SUPPLIES



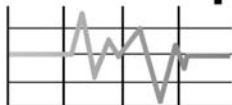
New Products
New Suppliers
New Technologies
New Catalog Every 90 Days!



(800) 346-6873
www.mouser.com

Mouser and Mouser Electronics are trademarks of Mouser Electronics, Inc.

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

the router.

A reasonably-priced spectrum analyzer by itself may not be sensitive enough to detect microvolts of noise. 1 μ V of noise referred to 2V RMS is -126dBV. However, it is ideal for separating switching power supply noise, power line harmonics (hum), and intermodulation products due to non-linear amplification. These tend to have levels above -100dBV (0.001%) when problematic. I have found the Pico Technology ADC-216 to be valuable for audio use. Their website is picotech.com

VOLTAGE FIX

I recently built the SE amp that appeared in the 4/04 *audioXpress*, ("A Mini SE Amp," p. 6) written by Rick Spencer. I had some issues with the DC power supply voltage. Using the parts specified, I had 15.5V DC after the filaments warmed up. This is probably excessive. I put three paralleled 10 Ω 25W resistors past the cap C6, which brought the voltage down to 12.1V.

*Bruce Brown
TuninFork@aol.com*

Rick Spencer responds:

Congratulations on the completion of your version of the mini SE amp. I hope you were as surprised as I was by the richness of the sound that this amp can deliver through good high-efficiency speakers. With the Radio Shack transistor and the incoming utility voltage that I have here, the actual final reading on the heaters was 12.75V when my line voltage is around 120V and 12.45V when the power is down around 118V.

I have found that not all transformers will produce the same exact output voltage even though they come from the same production run. I even needed to reduce the capacitance rating of the filter cap in order to lower the DC voltage going to the heaters on some of my other projects. (Too bad they don't match transformers the same way that they can match vacuum tubes.) Depending on what your home power utility voltage is, you may find some variances in your readings. It sounds as though you handled the problem quite well with the dropping resistors.

I recently completed a push-pull triode amp using 6B4s, and I needed to use dropping resistors to keep the filament voltage down to 6.3V instead of the 7.8V

that I started out with. One of the greatest advantages of this hobby is being able to modify and improvise in order to obtain the results that we are searching for! Happy listening, Mr. Brown, and thank you again for your interest in the mini SE amp.

REAL-WORLD TESTING

I own Definitive Technology BP2000 speakers that I use in a home theater setup. My problem is that I have a set of five speakers but I really get 90% use out of the two-channel system. My question is, how do I test the various parts of the speaker to verify things are working as required? I purchased two test CDs from Old Colony Sound Laboratory ("My Disc—The Sheffield/A2TB Test Disc" and *Stereophile* Test CD 3) in an attempt to check them out.

I have been concerned that the speakers may have been pushed and just do not sound as detailed as they have in the past and would like to learn how to test them. I have access to basic electronic test equipment such as oscilloscopes and DVM meters, as I work in an electronics lab. What do you recommend?

Ron Pisarski
Ronpisarski@aol.com

Joe D'Appolito responds:

Mr. Pisarski's letter has no simple answer. Unless there is a gross problem with his loudspeakers, the equipment available to him is not sufficient to detect more subtle problems.

The first thing to do is a frequency response test. Relatively simple procedures for doing this are detailed in my book, *Testing Loudspeakers* (available from Old Colony Sound Lab, PO Box 876, Peterborough, NH 03458, 888-924-9465,

custserv@audioXpress.com). As a minimum you will need a good free-field microphone and a 1/3 octave real time analyzer (RTA). If there are gross frequency response anomalies, they will show up here.

If the problem is more subtle, you will need much more equipment. This includes an FFT frequency response analyzer, THD and IMD distortion analyzers, and impedance measurements. It would help if you had reference data for this such as these same measurements when the speakers were working properly.

At the risk of being accused of the

CATAMOUNT



VALVE-SPECIFIC

High efficiency (91dB)
Ultra-Stable Impedance ($6.0\Omega \pm 2\Omega$)
Magnetically Shielded
Fully Configurable Aperiodic Bass Tuning
Custom Scan-Speak Drivers
Perfect for SET's, Push-Pull and OTL's

North Creek Music Systems

www.NorthCreekMusic.com

Scan-Speak - North - Aurum Cantus
— Simply Better Technology —

Do you suffer from Audiophilia Nervosa?



Audio Asylum - an institution for the care of audiophools.

Audio Asylum is a free and independent resource staffed by a small, volunteer group of audio lunatics. Our mission is to create a unique community for stimulating discussion and helpful interchange without the flame wars and slow load times often found at other sites.

Here's what inmates have to say:

"This is what the Asylum actually is: USEFUL."

"... the Asylum has taken me to a higher level of knowledge than I ever could have acquired on my own."

"I have saved hundreds...maybe thousands of dollars on equipment through the good advice received here. And not a banner ad in sight!"

"...the best return on your audio dollar will be the Asylum!"

Get committed today.



AudioAsylum.com

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

Upgrade every component in your system without replacing any!

Make equipment you already own sound better! MANA ACOUSTICS Equipment Supports are revered for making dramatic improvements to turntables, CD players, tuners, tape decks, preamps, power amps, power supplies, speakers, DVD players, VCRs, even TVs! Just think... one multi-tier rack effectively upgrades each component you put on it. And it doesn't end there – MANA Supports are upgradeable; each new level adds to the "MANA Effect." So stack 'em up, and believe your ears... the sound just gets better and better.



"Mana makes an important difference to the performance of a turntable but makes an equally big improvement to any component. The Mana Equipment table is not just good, it's fundamentally necessary for good sound... if you don't put Mana at the head of your shopping list you will never hear the true potential of your hi-fi system."
—Alan Sircom, HI-FI CHOICE

"The Mana stands are less an improvement in a system than a whole new system... I cannot recommend the Mana Acoustics Equipment Supports more strongly. They're a great investment themselves and a sure way to increase the value of the investment you've already made."
—Steve Sullivan, FI



"I don't know of anything priced close to the [Mana Acoustics] Reference Table that could have improved my system so much."
—Rob Doorack, LISTENER

BEST BUY Award —HI-FI CHOICE

★★★★★ —WHAT HI•FI?

Flat Earth Audio sells Mana Acoustics Equipment Supports direct to the public. Call toll-free:

888-653-5454

Tel: 203-888-3759

fax: 203-888-3769

www.flatearthaudio.com

**FLAT
EARTH
AUDIO**



shameless plug, if Mr. Pisarski is serious about analyzing his speakers I can only suggest that he read my book. The subject is much too complex for a simple answer.

CONNECTIONS

In the early sixties I graduated from college, found myself lacking a decent stereo, and ended up building Fisher kits for an integrated amplifier and FM tuner, both tube-equipped. Many years later I now listen to bipolar transistors, but one habit from the old days still survives.

There was always the periodic chore of unplugging the tubes and reinstalling them, the process being relied on to rub off the minute layer of oxide between the pins and sockets. This was always accompanied by a certain improvement in the quality of high frequency sound.

Now we have gold-plated connectors so that cleaning them the first time they are assembled takes care of the contaminant problem. But not all is bliss. Although I use a high-quality gold-plated F-connector on the coaxial TV antenna lead, the threaded jack on the TV set is plated with an unexceptional alloy. It always surprises me how much sharper the picture is after I clean the threads and center conductor of this joint. The DVD player video and audio cables, terminated with RCA plugs, get the same treatment.

*Darcy Staggs
Orange, Calif.*

PERFECT FIT

Great preamp project by Gary Galo in the March '05 edition (p. 24). I'm having trouble, though, finding an adapter for the circular pattern pins of the BUF-03 to be fitted on the DIP-style hole pattern of the circuit board. Digi-Key did have one, but it was in reverse configuration. Any info would be appreciated.

*Paul Check
Lodi, N.J.*

Gary Galo responds:

Thanks for your comments on the Music Library Preamp. You really don't need an adapter for the BUF-03. Simply bend the leads to fit the 8-pin DIP footprint on the PC board, and solder the BUF-03 in place. Remember that the tab on the TO-99 case is pin 8, and make sure that none of the leads accidentally touch one another.

LOG UNIT

Your March 2005 issue arrived today and while perusing it, one graph caught my attention: Fig. 3 of Gary Galo's "A Musical Library Preamp" (p. 27). Here we have a frequency response graph of the RIAA equalization error. What's notable about such a graph is that the Y-axis is scaled in units of mdB, which I presume to mean milli-dB.

Milli-dB. Let's see if I understand what a milli-dB is.

That, if I am not mistaken, is a milli-deci-bel.

That's equivalent, it should be noted, to a centi-centi-bel, or ten deka-micro-bel. Or whatever absurd combination of prefixes you care to get to the same place.

Please, the basic unit is the bel, equivalent to log base 10 of the ratio of two powers. The basic unit is not a deci-bel.

Using units such as milli-deci-bels is about as handy as calling a kilometer a deka-hecto-meter. That you could call it that is no excuse for numerical obfuscation.

And this in a magazine whose editor seemed not so long ago to be going on at

length about that "damned spot."

A flesh wound from wielding a bidirectional cutlass, perhaps?

Dick Pierce

Professional Audio Development

dpierce@cartchunk.org

Gary Galo responds:

Figure 3 is a simulation graph generated by CircuitMaker 2000. CircuitMaker switches from dB to mdB when the largest unit on the Y-axis drops below 1.000dB. It's the program's choice, not mine. Having a double prefix ahead of the basic unit is hardly without precedent, however. Remember the micromicroFarad (mmF or $\mu\mu\text{F}$), before pF became standard?

I suggest that Dick Pierce direct his dissatisfaction with the mdB to CircuitMaker technical support: circuitmaker.support.na@altium.com.

Figure 7 is the RIAA response I measured. I used Microsoft Excel to generate this graph from the data I entered. The Y-axis was formatted by me, in this case. No obfuscation on my part.

Dick has confused Ed Dell with Shakespeare. In aX Aug. 2001, Ed wrote "Out, Out, Damned Dot." aX

Lundahl Transformers in the U.S.

K&K Audio is now selling
the **premier European audio
transformers** in the U.S.

New Lundahl Products

- Amorphous core tube power output transformers – SE or PP
- Special SE 845 output transformer
- Compact high inductance power supply chokes
- Tube line output transformer

High-End Audio Kits

- RAKK DAC 24bit/192kHz D/A Converter w/ tube output stage
- MM/MC Phono Preamplifier
- MC Phono Step-up Unit
- Differential Line Stage Preamplifier
- Minimal Reactance Power Supply
- Tube Microphone Preamplifier

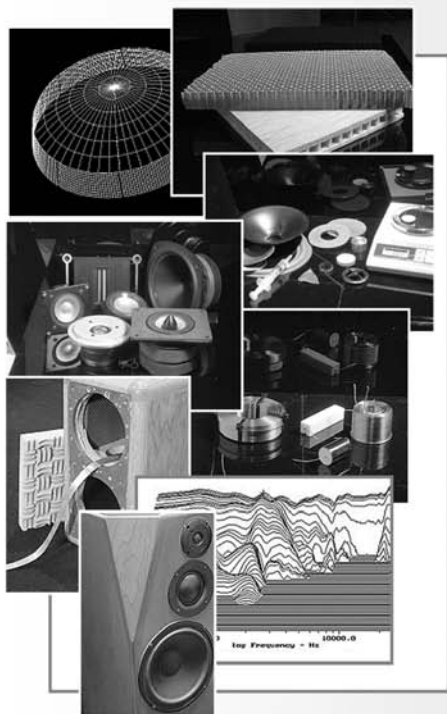
For more information on our products
and services please contact us at:

www.kandkaudio.com

info@kandkaudio.com voice/fax 919 387-0911

NEDELKU LABS™

PRECISION
LOUDSPEAKER
ENGINEERING



LOUDSPEAKER ENGINEERING SOLUTIONS.....

■ Design & Innovation

Development from idea to finished product in systems, drivers, and x-overs. Whether you are looking to develop a new unit or just want to maximize performance on an existing system, we can help. Nedelku Labs has been involved in some of the highest acclaimed speaker systems worldwide.

■ R&D

Nedelku Labs is committed to development of new materials and applications for the loudspeaker industry. Extensive experience in the relation between materials and applications allows us to achieve the end sound you desire. Let Nedelku Labs help you with development of your prototypes.

■ Consultation

Advice and recommendation to help you reach your goals in design and manufacturing. We also offer vendor screening and recommendations allowing you to reach the manufacturing quality you expect.

■ Measurements

Our facility is equipped with the latest state of the art test equipment. All systems are tested in our large anechoic chamber. Our services include system, driver, and x-over measurements revealing your components performance in detail. We offer measurements by B&K, Clio, HP, Klippel, LMS, MLSSA.

CONTACT:
info@nedelkulabs.com
www.nedelkulabs.com

NEDELKU LABS
4921 Robert J. Mathew Prkwy
Eldorado Hills, CA 95762