

VALVE

VINTAGE AUDIO LISTENERS AND VALVE ENTHUSIASTS

in this issue -

Restoring a Lowther, part 2

easy tube CD output hack

down in Vacuum Tube Valley

Superwhamodyne spy photo!

upcoming meetings

SPECIAL MEETING

October 8, 1995 12 noon
Lowther Acousta audition and
meeting with Tony Glynn,
Lowther Club of America
at Electronic Tonalities,
Poulsbo

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VALVE

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editor's thing

I feel that I'm being given my opportunity to rebound in the face of adversity this month.

As you probably know by now, I've spent the last eight months developing a new efficient loudspeaker. How well does it work? Beyond my expectations.

Along the way I was invited to enter the efficient speaker contest, sponsored by the Oregon Triode Society, the Philadelphia Audio Society, and the Colorado Audio Society.

Well, the deadline for entry was last week. I hadn't heard a thing from the Triode Society, where I sent my application. After several phone calls to Positive Feedback, the OTS, the Colorado club and Ron Welborne, who initiated the contest, I now know the following:

-The Oregon Triode Society and Positive Feedback have more or less parted ways. The Triode Society had been given little information about the contest, and are deferring to Colorado.

-Mine was the only timely entry from the West Coast. This is very sad. If we do not develop and share affordable speakers good enough to use with the fabulous single ended amps being produced by the likes of Welborne, Cary, Wavelength, et. al., I fear these brave companies will be forced to give up on single ended technology. This would be a blow to the DIY'er, as well as those who would purchase equipment from one of these manufacturers, since these manufacturers are responsible for a large part of the interest in SE now being shown by the mainstream audio press-which, of course, generates even more interest by the manufacturers to produce new SE parts and designs.

-I may or may not have won the OTS trial by default, and may be asked to ship my speakers to Colorado for the second stage of the competition.

-There may be some entries to the Philly

club, as SE interest seems to be well represented on the east coast by the likes of J.C., Reichert, LeFevre and the rest of the 'Joe Roberts Gang'.

-The OTS has not had a meeting in several months, apparently because they have nowhere to meet.

While information on the contest has trickled in, I have had an offer from a European magazine to write an article about my speakers, dealer inquiries from Asia, and a very preliminary meeting with an single ended amp manufacturer about a trial with his amps and the Superwhamodynes.

From all this I have determined the following:

-VALVE will not become a magazine and split from the club. As the market gets full of new audio mags, we shall remain a small potatoes monthly audio newsletter, from a small club, for better or worse.

-I may, however, accept some of the offers made lately to write for other audio mags.

-OTS members are invited to come up to VALVE meetings and have some fun. You guys must be going through some pretty heavy withdrawals with no meetings in several months!

-There is some preliminary talk about doing a Northwest version of the speaker contest. I wonder if we can get any more entries than the national contest? Whoever promotes this will really have to work hard to encourage entries.

-I will be going into production of the Superwhamodynes, either after the current contest, if it happens, or much sooner. It is very important to the continuing development of state of the art tube audio to get our projects out where fellow audiophiles can hear them.

If the efficient speaker contest doesn't work out, I'll at least publish plans and sources. Any of you big mags interested in the story?

Don't let the blue smoke out,



september

About five folks showed up for our highly specialized meeting.

Dave brought a big collection of 78's, as did Jerry and Ben.

Dave also brought a Stanton cartridge, a couple different styli, and his restored Fisher 50C, as well as the RCA single ended amp described last month in 'What's Brewin'', and a modified Newcomb SE record player amp using a 6BQ5.

We all felt that the unrestored Scott LC-121 was rather bass shy, due possibly to funky caps in the tone control circuit. Substitution of Dave's Fisher made for a more balanced frequency response from the shellac. However, I wouldn't write off the Scott until I fully restored. Too many cool features.

While the modded Newcomb didn't quite cut it fidelity-wise, the RCA amp was quite nice. Dave is considering its use for driving the big mono speak he's building (four 10" eminence woofers and a JBL LE175 horn).

One surprising audition was that of a later shellac 78 that had almost zero noise. Apparently this could be produced if enough care was taken. We guessed that the record was never played on old, heavy tracking equipment, possibly due to the fact that it was a really corny performance. It would seem that even vinyl 78's, which we also heard, become a bit noisy when played with ancient, primitive needles.

I must admit that most of the source material we dug up didn't inspire me to pursue 78's as a new source of audio satisfaction. But it does seem that one can extract the maximum from 78's with carefully selected equipment.

As a matter of fact, the success of devoting a meeting to a single recording medium has me laying plans for a reel to reel fest in the near future.

Start digging out those old tapes!

what's brewin'?

Jim Lissa casually asked me if I'd have any ideas for fixing up his Stereo 70 real nice. He stood back as I went Mr. Toad on him. Before I was done I think I fell on the floor, turned my head fully 360 degrees, barfed up some Vitamin Q, and spouted more or less the following:

"Forget that triode input crap I did last year. We're gonna switch to 6CK4 triode output for starters. Then we'll build a front end that uses Mu stage 6922's or something equally wierd. No more jumbo capacitors in the power supply, but we'll add another choke, and gaseous regulator tubes for the front end. Oil coupling caps and solid chassiswire are a must to get maximum smooth from those Dyna transformers. We'll put pots in the inputs for direct CD input. Oh yeah, we'll be using ultrafast recovery soft start diodes in the bias supply, and a shielded power cable with MOV's across the hot wires and bypassing to ground. And the star ground/buss.

"Of course if you'd rather not take such a conservative approach, how about restacking the transformer lams for air gapping and running 50's single ended? We could make a DC filament supply, and use 40's for inputs and 26's for drivers... maybe we could use interstage transformers...how about a day-glo green chassis with brass plated transformer end bells... I know a guy who could engrave hunting scenes on them...we could put blue LED's under the chassis like a lowrider...and a picture of my mom over the nameplate on the cage..."

At this point Jim looked at me with that 'seek professional help' look and made like he was real busy on the phone.

But he'll come around....and then....YEEEEEEAAAAHHH! the Stereo 70 that ate Jet City!

Meanwhile, I've become the proud owner of a pair of the hot new Svetlana SV811-10's. I will attempt to convert my Dyna MkIII's to SE, using these babies. Now let's see, where did I put that engraver's phone number?

any requests?

Hey, is anybody out there looking for a place to meet in Seattle? Haven't heard a word yet ...

Does anybody have circuit diagrams or curves for the following tubes - SE 304TL, SE 450TH, PP 10's (class A). I'd sure like a copy if you do.

I'm looking for some tiny power transformers like the type used in old VTVM's. Anybody tossing some junk test gear?

Anybody got an equipment rack they want to dispose of? My gear is all ending up in rack cabinets these days, so I guess I'd like one.

meeting the gang at VTV

Got back this week from the Bay Area. While down there I took Charlie Kittle-son up on his invitation to visit Vacuum Tube Valley, the home of the new tube publication of the same name, in Sunnyvale.

Charlie explained that the magazine's name was chosen because the office sits dead in the heart of Silicon Valley, across the street from AMD Microdevices.

Charlie works with Eric Barbour, of Glass Audio fame, and John Atwood, engineer extraordinaire and owner of one electron.

The three of them were joined by Rich Curtis, who I knew to be a radical Single Ended hacker, bashing Stereo 70 transformers apart with a hammer and air gapping the cores for use with single 300B's.

This place is tube heaven. What did I see? Here's a few items:

- MJ magazine, going back to 1985
 - The giant WE theater amp featured in the current issue of VTV
 - John's new Ampex 440, full of novistors
 - boxes of single ended transformers from all sorts of manufacturers, waiting for testing by Eric
 - a pair of rare Altec 1530 amps, using 6146 outputs
 - a Fisher multiplex generator
 - an H.H. Scott LT-111 tuner (that's not a misprint!)
- and shelves full of tube gear and test equipment.

In the office sits a reference system consisting of a Dynaco CD player, John's PSE 2A3 amps, as shown in his transformer brochure, and some B&W speaks.

I got to listen to Eric's novistor preamp in the system as well. Excellent imaging with a great center stage.

Charlie pulled the Chicom 2A3's from one channel, and substituted some good ol' Murican tubes. Very nice subjective improvement with better midrange and bass.

Another fun toy in the system was John's blind capacitor comparison box. The box has every type of capacitor imaginable in it, with a single rotary switch on top. You just put the thing in the line and switch it around for different sounds.

John is working on a new amp design, which uses PSE EL34's in triode mode. This may be available soon. Sounds like a primo match for Superwhamodynes.

We spent lunch trading rumors. Unfortunately, some might incite lawsuits so I can't really spread them here. Generally they had to do with where what you buy is really made, and whether or not certain writers and publishers should really be in the business (take me, for example).

In talking to Eric I found that he has been involved in the development of the Svetlana SV811. He waxed pretty enthusiastic about the tube, and considering his softspoken style, I took his enthusiasm pretty seriously. This guy really tests stuff. He gets his hands on every version of a tube he can find and really works them over.

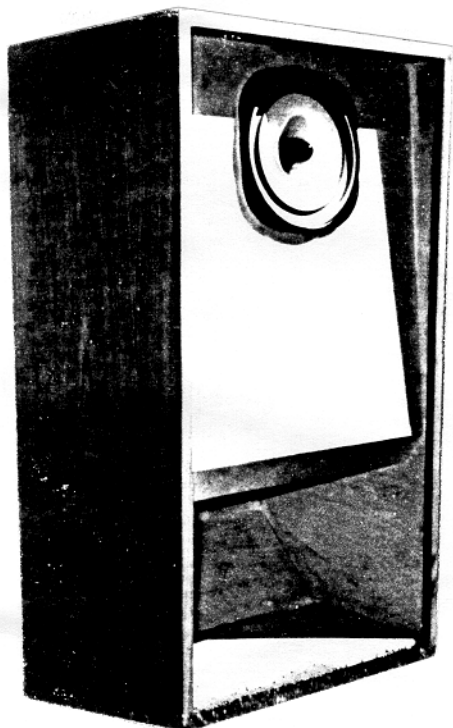
Charlie had a bit of his collection stored in the lab. Lots of Fisher, Scott, HK. Also some interesting homebrew amps and shortwave stuff. I'm sure the best bits will turn up in VTV. Charlie said he's really anxious to get good copy of any vintage audio brochures and technical information for future manufacturer's retrospectives. If you have some good stuff, or know someone who worked in audio back in the 50's and 60's, let him know, preferably by fax.

And if you haven't yet subscribed, do it. The second issue is bloody marvelous!

Discovering the Lowther, Part II

By Doug Grove

Last month's VALVE featured my discovery of the Lowther speaker. I described the restoration and upgrading of Lowther PM6A drive units. This month will be devoted to Lowther Acousta cabinet restoration, final assembly, and testing. This has been a truly exciting and successful project, resulting in some very nice sounding horns!



If you'd like to know how your wife would like a pair of Acoustas in the living room, have her hold these pages in front of her nose while facing the living room wall.

The cabinets are hand-built, of differing dimensions, not quite square. Through years of neglect they ended up warped, scratched and dented, needing major finish work. They must have been from different production runs as they were constructed from various plywood, veneer and grill cloth materials. Both cabinets buzzed at higher listening levels. Besides being annoying, I figured that a lot of acoustic energy was being wasted on vibrating cabinets, resulting in efficiency loss and diminished bass response.

So here's what I did:

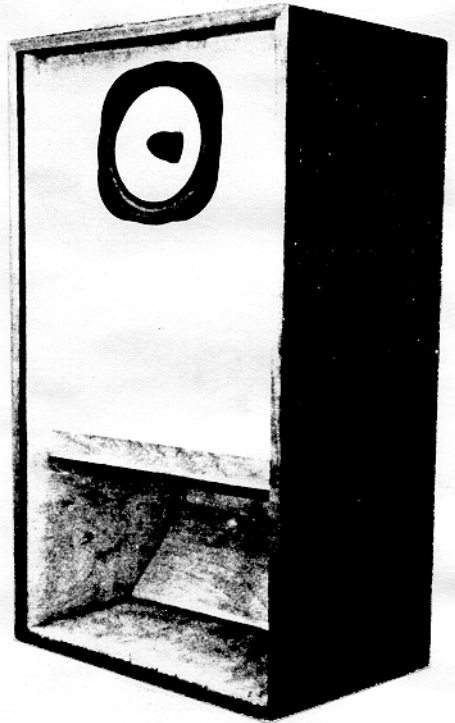
I spent many hours straightening out warped sides and pinning the interior baffles with finish screws. Each speaker was placed in "traction" with clamps and weights while it was screwed and glued. All accessible baffle and brace joints were reglued, sometimes using a syringe to place glue in tight spots. I then finish sanded as much of the cabinet interior as I could reach. Scratches and dents were filled and sanded, paying particular attention to fastener holes and corners. A new veneer was needed to cover up all the filled areas. The finish wood of choice for this project was cherry. I used a treated paper backed veneer product (from Oakwood Veneer

in Michigan) which is very high quality and can be applied with contact cement. The veneer is protected with clear Watco Danish Oil, sanded and rubbed to a smooth satin finish. The speaker backs and bottoms were repainted black to match the original finish.

The grill frames were in fair condition, needing new cloth and attachment hardware. I replaced the old cloth with vintage Fender tan/brown fabric (from Mojo Musical Supply in California). This material is acoustically clear and very tough. A protective underlayment of brown stretch grill cloth was applied to darken the Fender cloth and keep dust out. I resisted the temptation to apply the grills with Velcro (the easy way) and made up new plastic "slide rails" so the grills are installed from the base of the speaker while resting on its back (the original attachment method).

I replaced the existing screw terminals with gold binding posts which are flush mounted with the cabinet back. A 1/2 amp fuse was added for protection. The old connecting wire was replaced with 14 gauge stranded (6 feet of anything thicker was impossible to feed through the baffles). I had to rework the speaker mounting holes and T-nuts to accommodate the new PM6A drivers. The cabinets were now complete. With their reddish wood and tan grill cloth they looked "period", like they should be standing on 1950's round tapered, angled legs. Or, maybe the tops could hinge open to reveal a console phonograph.

Before completing the installation I had to give the drivers one more tweak, so I disassembled each driver from its magnet. By flexing the cones in and out to their limits I simulated a "wear-in" period. The cones are very flexible and of low resonance, relying on the ferric coated voice coil for damping within the magnetic gap. During reassembly I paid careful attention not only to the voice coil centering, but also to speaker efficiency. Accuracy in centering was aided



by a thin piece of foam gasket between the magnet plate and the cone basket mating surfaces. The foam minimized sliding out of alignment during bolt tightening, a problem I encountered the last time I worked on them. While applying a 60Hz signal I found that within their centering range, a sort of tuning-by-ear actually increased signal loudness. Once maximum loudness was achieved, I tightened the bolts. The PM6A's were ready to install in their cabinets. the speakers were mounted using closed cell foam gaskets to eliminate rattles and insure air coupling with the horn.

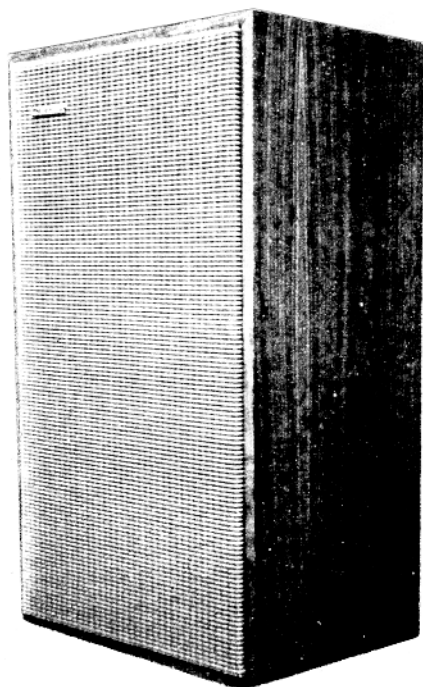
it was finally time to listen

An uncomplicated design concept: One 8" speaker, no crossovers, reproducing clear highs, accurate midrange and respectable bass in a modest sized horn cabinet. As frequency falls to the 100-200Hz range, sound is radiated primarily from the horn, while above this point sound is directly radiated by the driver. Bass roll-off starts around 60-70Hz with minimal response below 40Hz. The sound becomes more directional above 12kHz, extending to beyond 15kHz. These speakers are sensitive to room placement, as corner location does enhance lower bass, although the room must be large enough to reinforce the lower frequencies. It is clear that restoring the cabinets increased overall efficiency of the speakers, and really improved bass response.

Single ended triode fans: your 1 watt amps should easily drive a Lowther. The headphone jack on my CD player (rated at about 1/4 watt) will drive them! They are so sensitive that tube microphonics and variations in driver and output tubes become listening factors. I auditioned a few push-pull pentode amps for comparison: my Dyna Mark iii's with Tung-Sol 6550's sound much better than the Mac 225 or Dyna Stereo 70. (now you know why I sold my stereo 70 and

my Mac 225, and kept my MkIII's, Doug - dan). Also I have owned a pair of AR-3a's for over 20 years and continue to use them as the standard by which I judge musical reproduction (in spite of their power requirements), especially for midrange and voice accuracy. After lots of A-B testing between AR and Lowther using a variety of musical venues...

Lowther wins. Hear them for yourself at the October VALVE meeting!



smoothing the audio jaggies - an easy CD tube output

Last week I invited audio buds over at various times to hear the final version of the Super Whamodynes. One of these friends, upon hearing my moaning over my cheapo Onkyo DX-1400 CD player, offered to bring a \$900 solid state output CD player for audition.

That was all I needed to light the tweak fire. I had to try the tube output mod for my CD player that had been itching my brains for about a year.

First I pulled out the three articles I had seen, two from *Glass Audio*^{1,2} and one from *Positive Feedback*³, which discussed tube output stages in various CD players and DACs.

Two of the three articles dealt with Burr Brown 28 pin DAC chips, PCM58P's² and PCM63P's³. I opened my Onkyo to find a pair of PCM61P's, so I thought I ought to be able to reverse engineer the pinout, even though the PCM61P is a 16 pin IC. The Onkyo also contains the same digital filter, a Yamaha YM3433, that the Audio Alchemy DAC-in-a-box uses, so I figured the digital parts quality was probably pretty decent, and therefore, the unit was worth hacking.

First, I had to figure out where to tap into the player. The Norman Tracy article in *Glass Audio*², as well as the Sheldon Stokes article in *Positive Feedback*³ both use a resistor as the I/V converter which converts the dinky current output at the analog output of the DAC chip to a dinky voltage output. Both articles also run this converted signal directly to the grid of the tube output stage. Shoot, it can't get any easier than that!

I took my trusty scope lead and started touching it to DAC pins while I played a CD. At pin 9, I got signal. Whoops, at pin 10 I got signal too. Damn, they were jumpered together!

Well, looking back at the Tracy article, I discovered that the PCM58P did the same thing. One pin was the analog current output, and the other pin was a "bipolar offset point", which sources 1mA of current to convert the 0-2 mA current swing of the DAC output to -1 to +1mA. This way the voltage conversion swings about 0 volts instead of +.2 volts.

Anyway, I knew that I could tie in at this pair of pins and hook up my I/V resistor.

I decided to use Sheldon Stokes' output stage for a couple reasons. First I hadn't fooled with an SRPP circuit yet, and, secondly, he offered resistor values for using either 12AT7's or 6DJ8's.

So I pick a couple of sockets, dig out some resistors and a couple of caps, and go looking for an old chassis to build on. Can't find a darned thing, but I turn up a little cardboard box, upon which I glue two ceramic sockets, and build up the circuit using 12AT7WC's. Oh, this is too cool!

I add in and out jacks and attach a Lambda tube regulated power supply and adjustable DC filament supply.

I then clip the circuit into the left DAC. I found a 1000 ohm resistor between the DAC and the original I/V converter chip (a 5532) which, when unsoldered at one end, disconnected the 5532 from the left DAC.

In goes a CD. Wow, obvious difference between the solid and vacuum sides. The tube side is way smoother, has much better bass, and seems a bit more transparent. It also has gobs of gain, which I need to drive my passive line stage. Awesome!

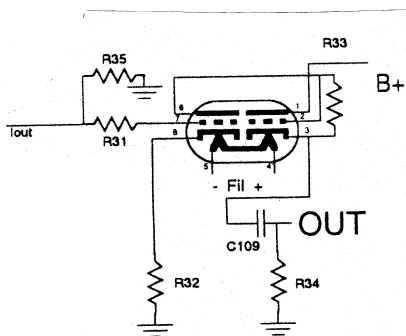
I cobble together the other channel about two hours before my friend shows up with the \$900 player. We put on the *Muddy Waters, Blues Singer* CD and compare the two players. With the tube Onkyo Muddy's voice is OBVIOUSLY smoother and the bass is better too. The only plus with the solid state player is a slightly better leading edge to transients. the next day I altered the

circuit to use 6DJ8's, which Sheldon Stokes favors in his DAC. A pair of Telefunken 6DJ8's gave me better transient attack, but bass was a bit lighter. When I switched to early 80's Sylvania 6922's, I got what seemed to be a good compromise between the 12AT7 bass and the Tfunken 6DJ8 transient response. And so they have stayed plugged into the cardboard box.

A good argument for this type of 'in the player' conversion over construction of a whole new outboard DAC is that there's no digital interface between transport and DAC to add jitter. So hacking a medium priced player might sound better than some tube DAC/transport combinations...

Dan

1. Painter, Richard, "A Valued Vacuum Tube Denon 1500," *Glass Audio* 1/89, p.15.
2. Tracy, Norman, "A Tube DAC," *Glass Audio* 1/94, p. 14.
3. Stokes, Sheldon, "DIY DAC Update," *Positive Feedback* Vol. 5 No.4, p. 43.



I out from pin 9 of BB PCM61P. For 6DJ8, B+ is 260VDC. R31- 33.2Ω, R32,R33- 680Ω, R34- 1MΩ, R35- 100Ω, C109- 2.2mF.

october

In case you didn't read last month's issue, here's the scoop on our Lowther audition.

Doug Grove will be bringing the Lowther Acousta's you've been reading about in VALVE these last two issues. They will be totally restored, with new driver assemblies, Alnico magnets, and a new cherry skin and 50's style grill.

Please, please bring any low powered tube amps you have to try with them. We would all be curious about how well 300B's, 2aA3's, 6B4's, etc. would sound with a pair of these wild and wonderful speaks. Don't forget your favorite source material for audition.

To help us understand these truly unique speaks, Tony Glynn, founder of the Lowther Club of America, will be coming up from Salem,OR Saturday and Sunday. Tony will explain how the Lowther drivers differ from other drivers, and how to get the best performance from them.

He tells me he even has a few reversible tweaks that are pretty easy to implement, which make the Lowthers sound even better.

Unfortunately I never heard from the membership regarding a good place to meet in Seattle. We will meet here at the 'clubhouse' in Poulsbo at 12 noon, Sunday October 8. This will allow us to audition the tube output mod I made to my CD player, which I consider a maximum bang for the buck type of project.

This is a meeting to bring your new audio acquaintances to. Grab anybody you know, particularly the folks who say they've heard about this single ended stuff but never seen it, and drag them along.

It appears that the Superwhamodynes will be around this weekend as well, so we can do a little comparison with the Lowthers. Should be interesting to compare such radically different designs...

superwhamodynes revealed

Super secret spy photos smuggled from the top secret labs at Electronic Tonalities reveal an exotic looking two piece tower speaker.



It appears that the atomic brains at the underground labs of ET, located near ground zero of the Bangor Trident Nuclear Submarine base in rural Washington state, have spared no expense in the development of this new loudspeaker for single ended amplification. Note the use of the \$89,000 Audio Note Ongaku integrated amplifier and \$11,000 Krell KPS20i CD player for listening tests of the prototypes.



The materials used in construction of the prototype cabinet appear to be blond ash veneer, black lacquered hemlock trim, and natural cork. The drivers are rumored to be made from a high tech metal alloy, referred to by ET officials as unobtanium. Another source tells us that all internal connections are formed from solid copper. The exotic triangular grills are thought to cover vents of a similar shape. While ET says the vents are strictly for bass extension, unreliable sources claim that they are actually cooling vents for a power source based on the propulsion unit of the interplanetary spacecraft recovered by the US Air Force from Roswell, New Mexico in 1947.