

VALVE

VINTAGE AUDIO LISTENERS AND VALVE ENTHUSIASTS

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February 5, 1995
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at Classic Radio, Poulsbo
12 Noon

March 5, 1995
Member triode amp projects
at Classic Audio, Seattle
10 a.m.

volume 2
number 2
february
1995

VALVE

is the newsletter of

Vintage Audio Listeners and Valve Enthusiasts

dedicated to the preservation and dissemination of vintage audio knowledge.

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VALVE

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Membership Rates:

Full Memberships & Foreign

Subscriptions: \$ 35.00 a year

Stateside Newsletter Only

Subscriptions: \$ 20.00 a year

Please make checks payable to

VALVE

VALVE in no way assumes responsibility for anyone harming themselves through exposure to the contents of this magazine. We believe electrons flow from minus to plus, and they can kill you along the way if you're not careful. Vintage audio equipment operates at potentially lethal voltages. Always treat it with respect.

editor's thing

Our good friend and fellow member Jim Lissa got a sickening surprise last Wednesday when he arrived at his store, Classic Audio. Someone had come in the night before, apparently using copies of Jim's keys, and taken virtually all of the vintage tube gear in his store. The list of items taken includes four HK Citation II's, a Heathkit W-6, a pair of Classic Radio modified Dyna MkIII's, a Stereo 70, a couple PAS3's, a Scott 399, Mac 50's, 250's and a C-24.

As you know, a lot of this stuff was from kits and didn't necessarily have serial numbers on it. The numbers don't really have too much value unless the felon is apprehended, and the stuff is most likely on its way out of the state or the country anyway. The Seattle police told Jim that he was a criminal for dealing in merchandise that didn't come with serial numbers! It must be a bitch owning a fruit stand in this town!

Interestingly, a person who had been employed by Jim on occasion has mysteriously disappeared. Further checking revealed the fellow to have an alias or two, some phony addresses, and past indictments for burglary. This reporter is not making any allegations, just noting an interesting coincidence.

Anyway, we all ought to take this as a reminder that our funky old tube gear is getting valuable, with all the positive and negative aspects that brings.

Start thinking about keeping your collection secure, or be like me and don't collect much. Nobody seems very interested in ripping off homebrew.

Maybe just as important, don't blab about other member's collections to strangers. That's why I don't give last names or addresses when I discuss collectors in this newsletter.

If you're selling something to a person you don't know, don't take them into your trophy room. Show it to them at the

dining table, or meet them at a swap meet. Save the show for us fellow members!

Photographing your collection is a good idea too. This is a common practice among antique radio collectors. If the piece has a serial number, write it on the back of the photo. Not only does it give you a visual ID if you lose something, You also create an historical reference of your rare pieces. Heck, send me some of these and I'll print them in a future issue.

Eric is super careful about buying stuff, even at swaps. He gets everyone he buys from to give him a signed receipt.

Not only does this please the IRS, he at least has some info if a piece turns out to be hot, and a record of purchase price for his wife Diane to use if godforbid something happens to him, and she needs to liquidate the collection. Very smart. He carries a notepad for the sellers who don't bring receipt books.

My personal formula is to be in the business so everyone knows the minute I get something new. They buy it from me before I decide I like it, and I don't have anything left to protect. This, combined with never getting away from the shop, and never having any cash, seems to make me a low priority for lowlifes looking for stuff to steal

As for the poopstain who ripped off Jim, I'm sure you're all thinking of just punishment in the event he's caught. I have come up with the most inhumane torture I can think of. Marry him to my ex-wife.

Don't let the blue smoke out, and don't let the boogeyman in,

DAN

restoration 101 - lab

The turnout at last month's meeting was great, with a lot of new faces and good questions.

Enthusiasm for a restoration seminar was high, so I'll take the next step and offer such a seminar in March and April.

The seminar will be composed of three Saturday sessions, from 11 to 2.

The first session will be Saturday, March 11. During this session we will examine the pieces brought for restoration, determining a rational restoration approach, and a parts order.

We'll wait two weeks for the next session, March 25, to allow time for mail ordered parts to arrive. During this session we'll perform the actual parts replacement.

The final session will be Saturday, April 1, during which we'll make adjustments, solve problems and audition our work.

Cost of the seminar will be \$35 for members, \$50 for subscribers, and \$75 for non members.

I will limit the seminar to six participants in order to maximize my own and my equipment's availability to each participant. If we get enough response, I'll do another seminar in April and May.

Please call me at 360-697-1936 by Friday, March 3 for a reservation. We will need to discuss what piece you're planning to restore and where you can find schematics and service information.

You gotta have service info for the piece you bring because time limitations won't allow for reverse engineering. Hopefully you can get what you need from our library or the public library. Check soon in case you have to dig a bit for info.

If you're not sure what you want to work on, give me a call and we can discuss some possibilities. I'd suggest an amp, a preamp, an integrated amp, a tuner or a receiver, in that order. First projects should be kept simple - dan

world audio amp

Picked up a fun toy this month at Classic Audio. It's a Single Ended stereo integrated amp kit designed by Tim de Paravicini and marketed by the British audio mag Hi-Fi World. Uses a 12AX7 for the line stage, two 6922's for the driver/anode followers, and a single 6080 dual low- μ triode for output, with each triode playing a custom made output transformer.

Rectification is solid state, volume pot is an Alps 50k, jacks are gold plate and speakerposts are nice heavy duty things. Chassis and end bells are black powder paint. The kit appears to have been partially assembled by the original owner, who then disassembled it and kept the resistors, caps and diodes.

I heard of this particular kit about six months ago. Apparently the original purchaser found the kit more than he bargained for and decided to cut his losses.

The kit instructions warn that it is intended for experienced builders, and I think this is what stopped him. For experienced builders means "we are too lazy to put detailed assembly instructions in this kit." The point to point wiring diagram leaves off such essentials as cathode resistors. A new builder could be very intimidated by vague directions.

I think I have most of the parts necessary to build this baby, including, of course, Vit Q's and Tfunkens to replace the Sovtek stuff that came with the kit. Also some super cool 6080's with graphite plates. they probably won't sound as good as metal plates, but we'll try both. After a few other projects.

what's brewin'?

Eric has organized his shop with heavy duty shelving and will be setting up a listening room for his Altec A7's and 605's next. We hope to have a meeting there later this year.

Picked up some JBL LE-5 midranges, the kind used in the original Edgarhorns, last month. Another project for the distant future!

Non-member Doug (c'mon Doug, pay up) did a beautiful resto on an AR turntable this month, right down to a reproduction nameplate. Looks better than new. He's got it at Classic Audio, by the way.

Eric found a source for rebuilding Altec 3000, T-3000, 601 and 602 tweeters. Turns out the diaphragm also goes in some Altec mics. An outfit in Anaheim CA, called Micromikes rebuilds them. For a price, natch. Eric says you can do it yourself, as he has, but chances are high that the magnet assembly will be stuck, coming apart when forced out, wrecking the tweeter's efficiency.

Charlie Kittleson has built a new business! Vacuum Tube Valley, located in Sunnyvale CA, is a partnership of Charlie; John Atwood, advisor to the new Dynaco; and Eric Barbour, contributing editor to Glass Audio. They do cool tube stuff, are open by appointment, and put out a newsletter. Ring any bells?

dinkin'around

tech tips and other unsolicited advice

Okay, here's a bunch of quick tips:

Stereo 70 bias supply

Doug, who will be a member soon, called to verify that replacement of the selenium rectifiers in the bias supply of a Stereo 70 solves almost every case of drifting bias he's come across.

Seeing as the lack of current balance and high current draw are two of the potential trouble spots in a 70, this mod is good insurance.

Use silicon rectifiers rated high enough for the voltage and current (tiny), and remember that this is a negative supply, so the diode points to ground. New caps wouldn't hurt either.

Make big money repairing tube testers

Got no less than four tube testers to work on this month. Two B&K 707's, and two Hickok Cardamatics. Here's a breakdown of the problems:

The first 707 would read shorted on the meter with no tube in it, but the short light didn't come on. The problem was said to go away after about 20 minutes. When I tried it, I heard a small snap, so I checked for shorts in the switches. Nothing wrong, so I disconnected the meter and checked it with a continuity tester. Turns out the minus terminal was shorted to the metal case.

The other 707 had a plastic case on the meter, so one might want to buy a plastic cased version of this tester. You gotta open it up to tell which kind of case the meter has.

What was wrong with the other 707? the owner said 12AU7's tested good, but 12AX7's read low in the same socket. Looked in the manual, and guess what it said. 12AX7's read low. Next case.

The first Cardamatic suffered from in-

consistent readings, and wouldn't calibrate properly with either it's battery calibration cell, or it's zener cell.

After a thorough cleaning of the super flimsy switch contacts, and cleaning and retrimming the sockets with my famous jeweler's screwdriver in the socket trick, everything worked OK, with the zener cell calibrating fine. The battery cell tested OK on a voltmeter, but I suspect it was weak, so I didn't fool with it. Use the zener cell if you have a Cardamatic.

The second Cardamatic had a bad tube and really dirty contacts. After a good cleaning and crimping, things were better, but I ran through the full calibration to make it as good as possible. You shove 53 cards in the meter, one at a time, and make adjustments.

About ten of these need to be done on a regular basis. And this tester was designed to be a time saver!

The moral of the story is that tube testers are fairly simple beasts, and most problems are due to bad tubes, loose sockets and dirty contacts. Start with these if you have problems. Oh yeah, and read the instructions!

balance without pain

Working on lots of Scott gear this month makes me think of the cool way they adjust DC balance on the output tubes on amps where the cathodes of an output pair are tied together to ground. Usually you have to put a voltmeter across the plates of the two tubes and adjust the balance control for 0V, floating your meter at 400+ volts and asking for a BIG jolt. I got a nasty one right through the test leads doing this recently.

Scott's solution was to hook a load to the amp, put a scope across the load, and remove the driver tube, which lets you see hum in the output stage. You then watch the scope and dial the 60Hz you see on the screen to minimum amplitude by adjusting the balance pot on the appropriate channel. Voila, balanced output. And no tinglies.

triode class a W-4

By Myron Milner

Now this is the kind of stuff I love to see submitted to the newsletter. Myron has taken a classic amp and modernized it with some really thoughtful design work. And sent very nice schematics to boot!

1/10/95

Hi Dan

This is a diagram of the circuit I used to modify a pair of W-4 amps to class A triode.

You will notice that the front end is a simple differential design using constant current regulators at the cathode, and direct coupling between the first and second 6SN7 (the less coupling the better).

The resulting advantage is the circuit is push-pull from the input to the output. this results in an absolute current demand on the power supply (try that with a single ended design).

I haven't had a chance to compare it in an A-B test against a single ended design yet, but looking forward to it.

Myron

Myron is quite modest in his description of this circuit. I see the following points of interest in his schematics:

- a DC filament supply and balance pot for the 6B4's, which are notoriously hummy without such amenities

- a choke input power supply for B+, giving the rectifier tube an easier life

- a Highstone type grid resistor at the input grid

- Connection of the output tube plates to the screen taps on the output transformer to properly load the 6B4's

- no global feedback

These amps are being used to run QUAD ELS's. Note that Myron has re-assigned the secondary taps on the output transformer. I presume this gives a closer to optimum load to the 6B4's. I'll guess that Myron tried connecting the 6B4 plates to the plate taps and used the original 4/8/16 ohm layout, and liked the sound of the current configuration better.

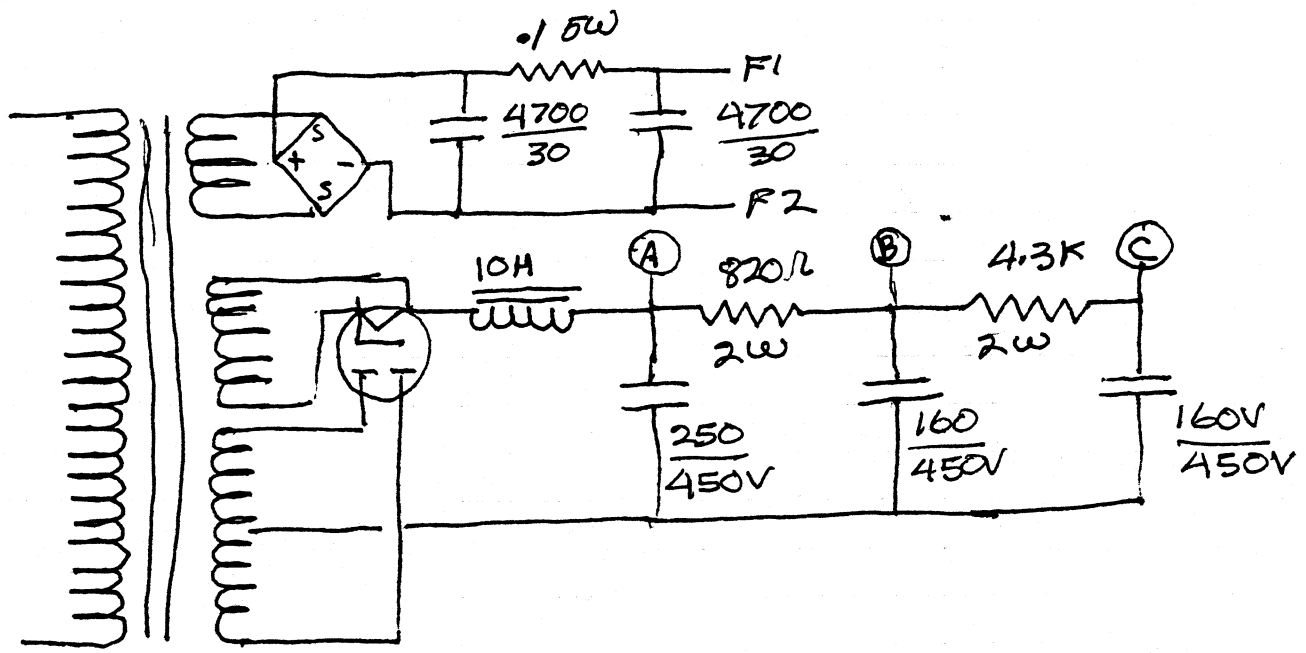
This is the kind of thing you determine by listening. I've found connecting speakers to lower impedance taps (outputs see a higher load resistance) can make an system leaner and more detailed sounding, while going to a higher impedance tap (outputs see a lower load resistance) can warm things up.

Yes, yes, it breaks some stupid rules and makes guys with distortion envy get their panties in a bunch. They'll cry about not using the whole primary winding, and mismatching the loading. But you can play around with triode loading a lot more than pentodes, and B+ adjustments (higher B+ for higher load impedance, lower B+ for lower load impedance) are allowed, so you won't hurt much by trying it.

I too would like to hear this amp AB'd with some other iron, and thought we might have the March meeting at Classic Audio devoted to triode amps, both PP and SE. If you've got a project you'd like to bring , give me a shout.

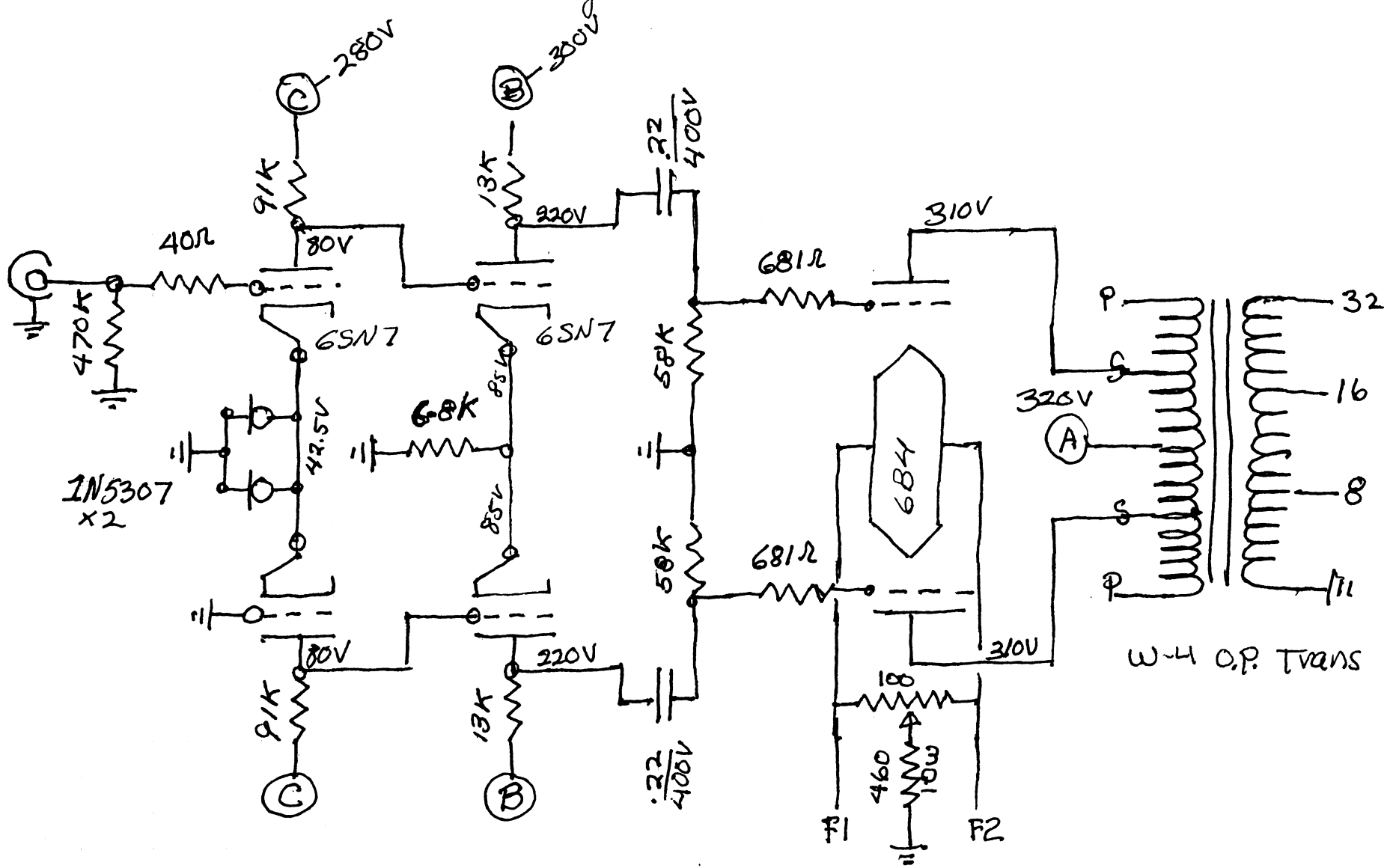
We'll try to get some real efficient speakers for the audition.

schematic of triode class a W-4 power supply

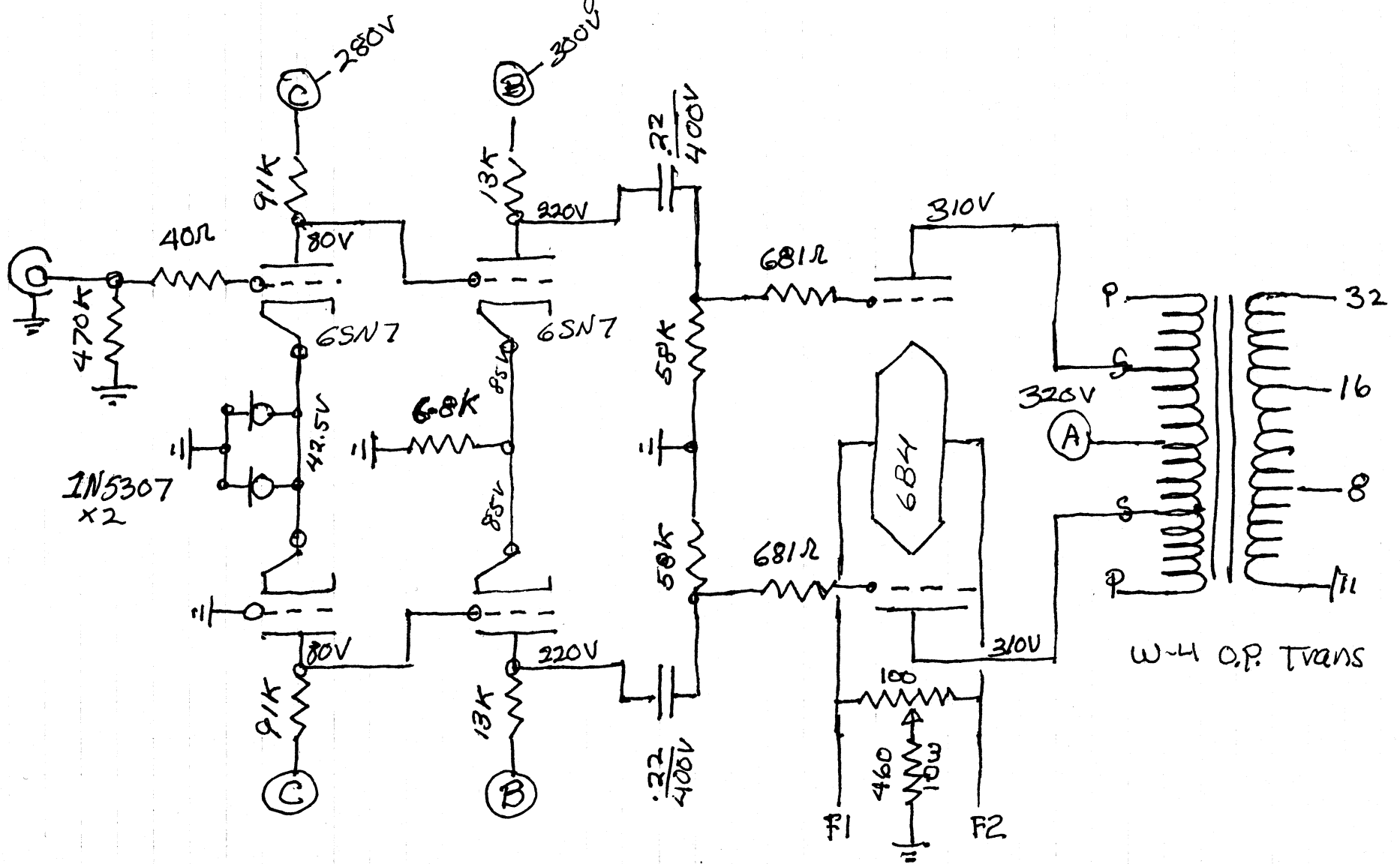


Loesh Audio Design Triode Class A

(Constructed on Heath w-4 chassis
8 watts (maybe))



Loesh Audio Design Triode Class A (Constructed on Heath w-4 chassis 8 watts (maybe))



Optimus 990 - is it really any good?

Coincident to my newfound love of fooling with single ended amps these days, I have found a distinct lack of good sounding, reasonably priced, efficient loudspeakers to run them through.

It would seem that the lower power SE amps sound better than those a little more powerful (although I haven't pursued this for myself yet), so the ideal situation calls for a super efficient, fabulous sounding loudspeaker.

I have as many, if not more, biases than the average guy about what kind of speakers sound good.

Having owned or listened to ESL's, planars, horns, Walshes, domes, 1 ways, 2 ways, 3 ways, 4 ways, 5 ways, ribbons, passives, bi-amped, triamped, blah, blah, blah, I've formed some criteria for what I'd like in a cool SE amp type speaker.

1) It seems like one ways should sound best. No phase shift or humpy-suckout problems. BUT - no bandwidth. So I guess I'd settle for a two way for an 'ultimate' type system. Three or more is doable, but darned tricky to make sound right with all sorts of music.

2) I love planar speakers. BUT no efficiency there! QUADS are real sounding, but forget the bigass symphonic stuff I love, like Beethoven and Prokofieff. No blast.

Magnepans are nice, but inefficient as heck. I'm gonna triamp my MG11A's pretty soon, with SE powered tweet and mid. But now I'm back to that three way problem.

3)Horns honk. But they're efficient as heck. And some sound real. My JBL LE175's are a bit honky but real sounding. I'm not a big Altec fan, though. Too honky. Edgarhorns are supposed to be good, but now I'm back to that damn three way problem again, as they are midranges.

Well, where do I stand at this point?

Looks like a two way system that uses horns.

Okay, I says, If I'm going to build something, why not make it a marketable design? Not too expensive, but incredible sound.

OK,OK, that's impossible.

But how about one inexpensive design for the guy getting into SE, and one killer? Yeah, that's the ticket.

Well I pick up this issue of Stereophile, the magazine that takes the fun out of audio, and here's an article by Sam Tellig on having fun with an AES SE kit amp! Maybe there's hope for Stereophile.

Well Mr. Tellig goes to Radio Shack and picks out some Optimus 990's, a two way, vented system with a 15" woofer and horn tweeter.

He says the amp clips, the highs are rolled off and there's a dip in the mid-range, but they are really dynamic and have lots of bass.

So I says, "Hey, maybe I could sell an upgrade kit for these things and make a zillion bucks."

I got a pair, out of the box and beat to hell, but on sale and with a written 30 day guarantee.

So I call up Dave and ask to use his megabuck HP 35665A dynamic signal analyzer to check out these speakers that are worth about 1/100 the analyzer's price. He says sure, and I run a bunch of frequency and impedance checks.

The results are thus:

WOOFER - free air

Q_{ts} .888

Q_{es} .998

Q_{ms} 8.092

F_s 16.86 Hz

V_{as} 16.604 cu. ft.

Minimum impedance 6.3999 ohms

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FIG. 1 FREE AIR IMPEDANCE CURVES

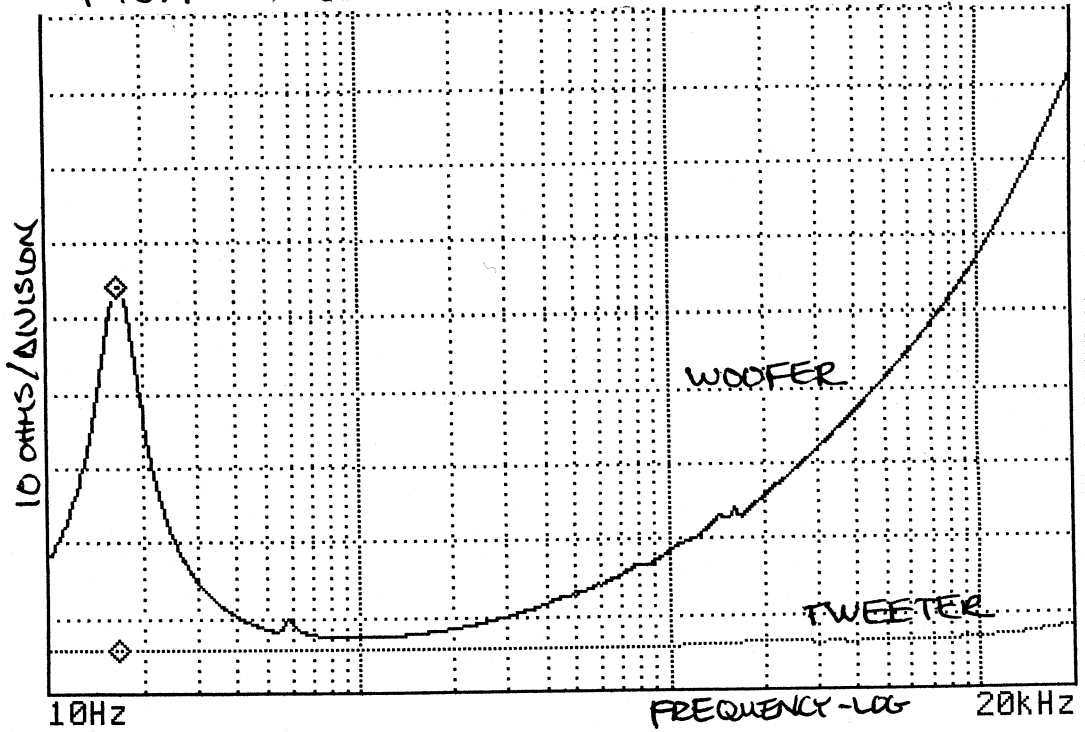
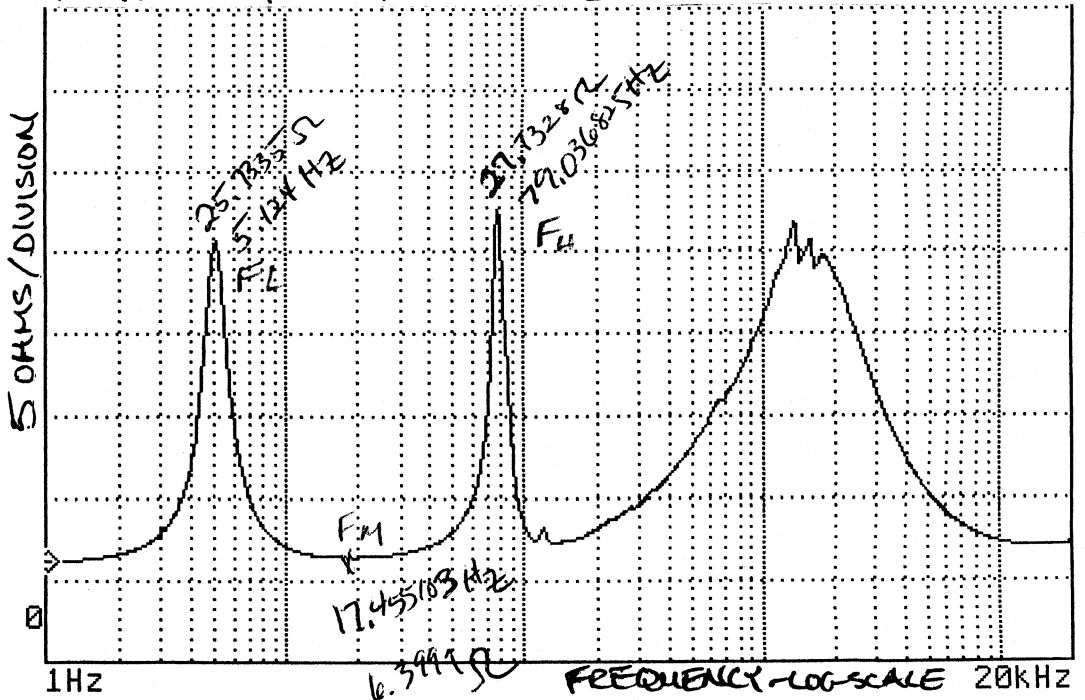


FIG. 2 SYSTEM IMPEDANCE CURVE



TWEETER

F_s 2165 Hz

Q_{es} 11.5

Q_{ms} 1.61

minimum impedance 5.4 ohms

Figure 1 shows the impedance curves of each of the two drivers in free air, combined on one graph. Note the steep rise of the woofer's impedance above 100 Hz, and the tweeter's fairly flat curve.

Figure 2 shows the combined impedance curve of the speaker system in the box. Note that the crossover network doesn't quite compensate for the woofer's rising impedance, showing a hump of about 25 ohms around 1500 Hz. Not so hot.

Figure 3 shows the frequency response curve I got for the whole system with damping on the floor and near by walls of the testing area. Obviously this curve has dips and peaks due to the room resonances, but the rolloff at 70 Hz and the suckout at 2 KHz to 5 KHz, remained when this sweep was done in different locations with different mics. The average efficiency was in the 90 to 95 dB1W1M range.

The problem of upper midrange dip might be soluble with a proper compensating network. I fooled around on paper with some networks, and they got complicated fast. This, combined with the fact that you have to tweak a network to get it right after you design it, leaves me hesitant to publish my paper model. The impedance compensation network alone had two caps, two resistors, and a choke. The second order crossover to the tweeter added a cap, a choke and two resistors!

All this leaves a tweeter with a pretty steep high end roll off as seen in figure 3. Now this is something I can live with for a while, in light of all my worn old vinyl, but really good recordings, like the Prokofieff I mentioned last month, definitely lack with the rolled off treble.

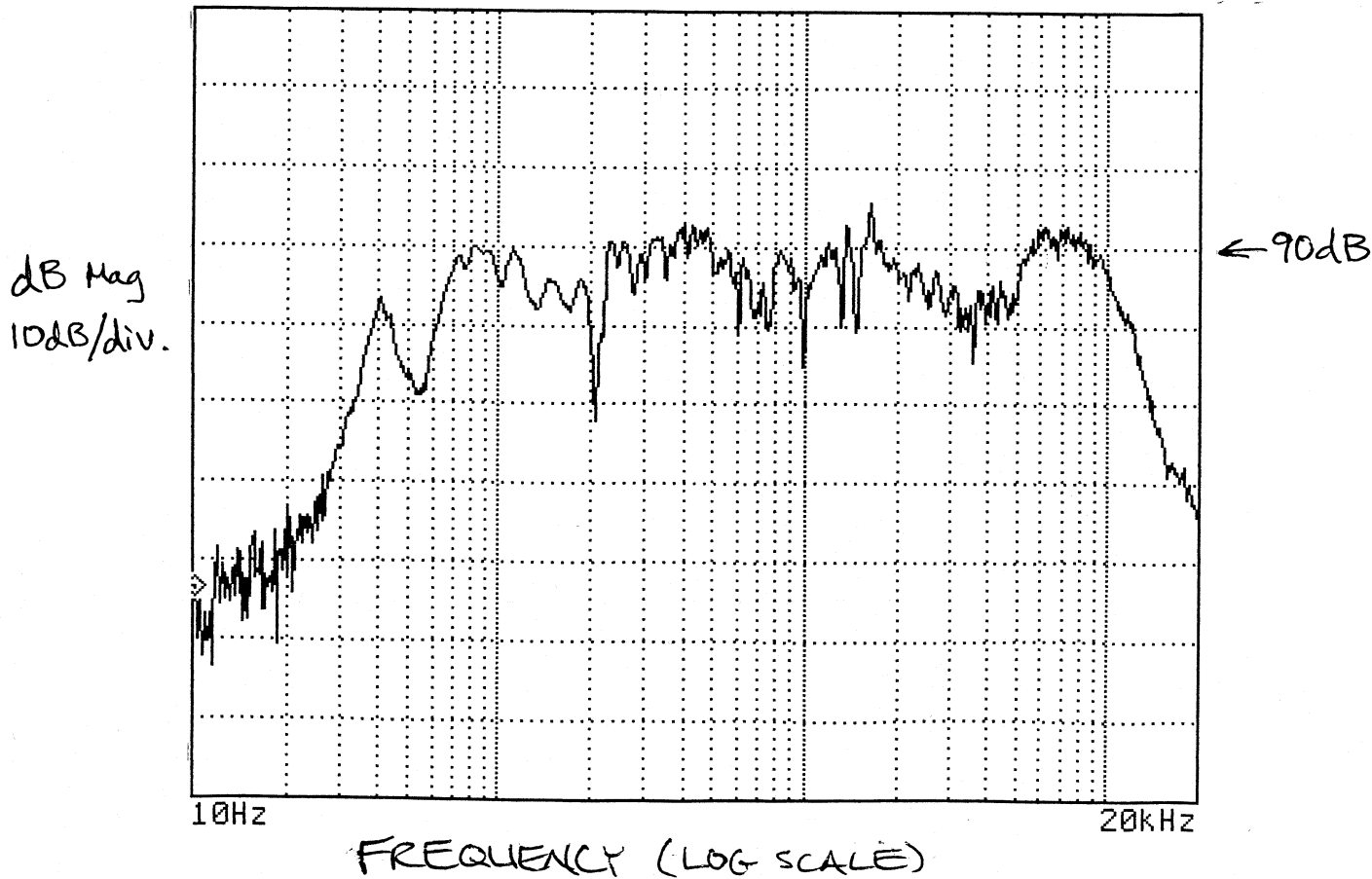
The bottom end rolloff might be lowered with a bigger box. I ran the woofer parameters through a simple PD program called Loudspeaker Analysis Program 2.10 and got an ideal vented box of 224 cu.ft.! What this means is the driver is really intended for use as a free air, in the wall, open to the back type of setup, where you mount the speakers in the wall between your listening room and the garage.

As a compromise, a person could take the existing box, pull out the speaker terminal panel and put in a vent the same size as the front one in the resulting hole. Then you plug the protruding vent into another box of around 7 to 10 cu.ft., which gives a second resonant peak about an octave below the 70Hz peak created by the stock 2 cu. ft. box. If you make this a slide in type of box with a shelf for the 990 to sit on, you also damp the resonance from the sides and top of the 990 box (front and back panels are pretty well reinforced for such a simple box). All that's left to do is put one more vent of the same dimensions as the others in the bigger box.

Well, once you build the box and the crossover with compensating network, you (theoretically) have a nice system with extended bass and smoother mid-range response that still has rolled off highs and only 90-95 dB sensitivity.

I think that these speakers might be OK for a low powered PP amp or a big SE, but I think I can get more interesting performance from some of the new raw drivers available. Eminence has come out with not inexpensive 12" and 15" coax units, sans compression driver, rated up to 99dB1W1M. They also make a 10" woofer which I plan to use in series /parallel, four to a side, with my LE175's, for maybe 105 dB1W1M, in a 10 cu.ft. box. I'm also scheming up an inexpensive speaker using a 5" aluminum cone driver, which claims a 96-15kHz bandwidth. Four in ser/par might yield 103dB at about \$30 per channel - dan

FIGURE 3 - SWEPT SINE RESPONSE - OPTIMUS 990



february

This month's meeting is a free for all, run what you bring, tuner fest.

We're gonna have at least:

My HK Citation III with Vitamin Q audio stage caps

My new Fisher FM 200-B (my favorite stock tube tuner)

My Kenwood L-07T (classic analog solid state tuner).

Hopefully we'll also hear:

Rick's heavily breathed on FM-1000

Eric's stock FM-1000

Bill's stock Dynaco FM-3

Dave's stock H.H.Scott 350D

Dave's Ampex tuner and mpx adapter and whatever else folks bring.

I think this time we'll just audition Stereo tuners, and we'll have a special session for mono tuners later this year.

I'd love to see some McIntosh tuners, a Marantz 10B would be awesome, a Scott 4310 or 310E would be cool, an HK Citation 15 would be neat, and so would a Heathkit AJ-15.

I will attempt to install my vintage Alliance antenna rotator on my outside antenna before Sunday. We'll use an RF preamp and a 3-way splitter to accommodate A/B/C testing through my attenuator/switch box.

Sunday, February 5, 12 Noon.

We need a volunteer to help me coordinate a really cool national type vintage and valve audio fest/ swap meet. You would be in charge of finding a location, advertising in national and local publications, coordinating talks and organizing shows and displays.

Heck, you could even get payed the same salary I get! This could be a really neat position for making contacts and getting known in the business. Call me.

cravings

Wanted

dead or alive: Heathkit W-4's

also looking for a Fisher 400 receiver in nice shape - Myron 206-782-0926

Remember, tube tuner alignments are offered at a discount to VALVE members! Mono tuners, regularly \$75, are \$35 to members. Stereo tuners, regularly \$150, are \$70 to members. Service includes tube testing, check of socket voltages and resistances, alignment of all stages with an RF/Multiplex generator, and A/B against Classic Radio's reference tuners for final tweaking. Shipping, Mods and Repairs not included in price. Call for a reservation, as we've been busy!

Classic Radio of Liberty Bay, 360-697-1936.

For Sale:

H.H. Scott S10 speakers - \$50

H.H. Scott 222C int.amp. - \$100

H.H. Scott 350 tuner - \$100

Bogen AP30 stereo int.amp. - \$20

Grommes 10LJ SE stereo int.amp. - \$10

Grommes 24PG stereo int.amp. - \$10

Rauland SA51A-25/70 rk. mt. amp. - \$60

Knight KF60 am/fm/mpx tuner - \$25

Eico HFT-90 fm tuner w/mpx out - \$15

Bogen DB10-1 mono int.amp. - \$20

Bogen R604 am/fm mono tun/pre - \$15

HK C100 mono int.amp. no cage - \$5

HK TA10 am/fm mono receiver - \$15

HK A310 am/fm mono tuner no cage \$5

Sherwood S1000 mono int. amp. - \$20

George Gott G30U amp w/mono pre-amp and extra chassis - \$150

Buy this stuff at these garage sale prices, build some cool single ended amps, and make me feel bad. I'll consider Fisher parts & equipment in trade.

Eric, The Fisher King 360-871-5921