VALVE

VINTAGE AUDIO LISTENERS AND VALVE ENTHUSIASTS
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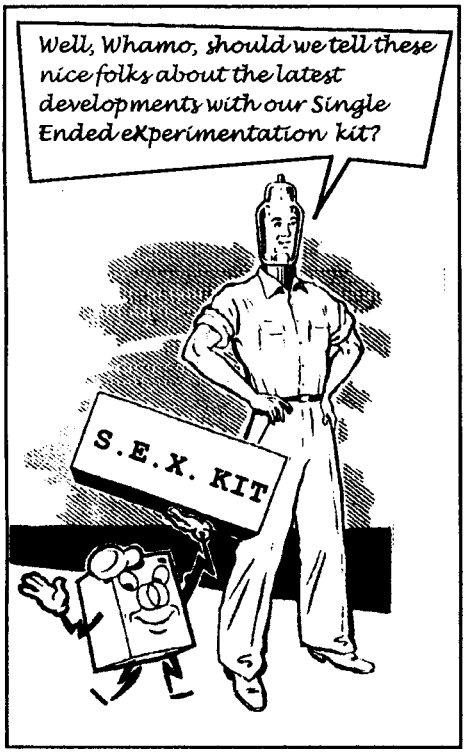

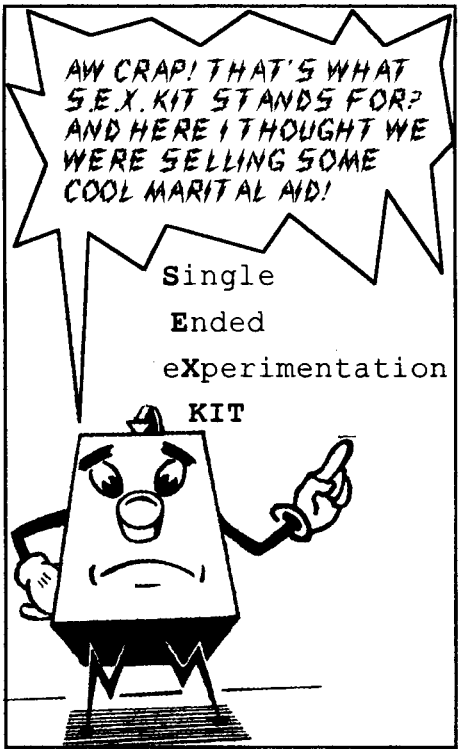

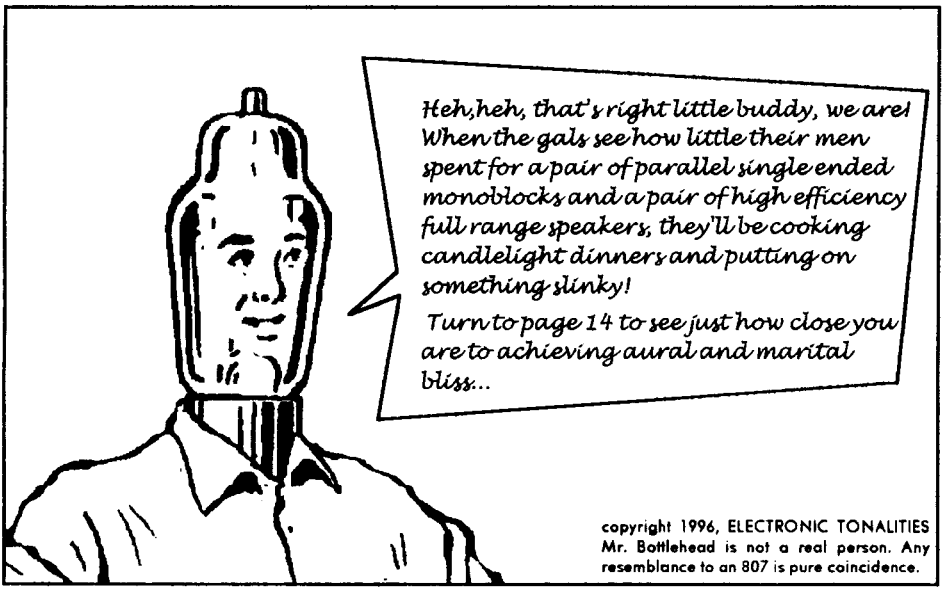

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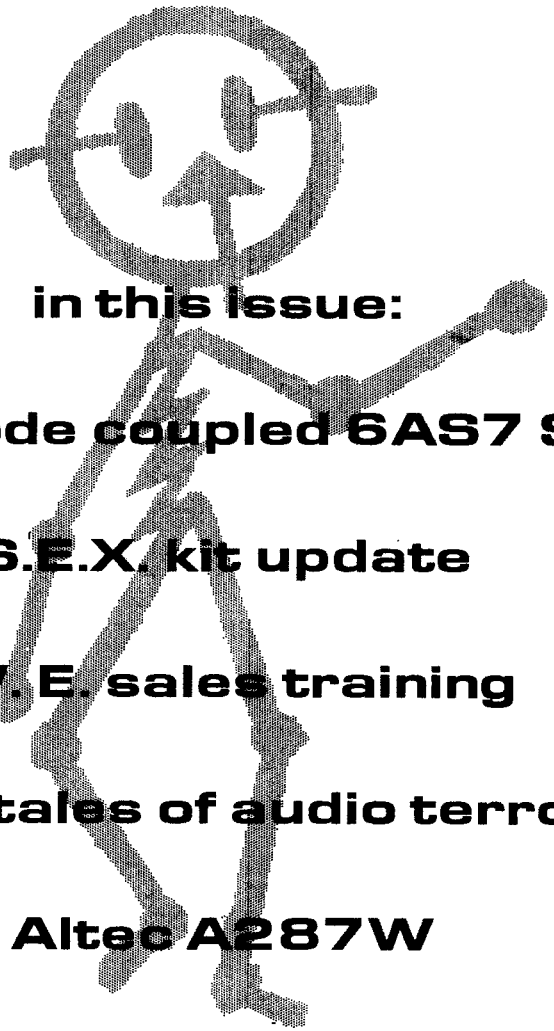

in this issue:

cathode coupled 6AS7 SE

S.E.X. kit update

W.E. sales training

true tales of audio terror

Altec A287W

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VALVE

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editor's thing

YO. between helping my friend out of yet another crisis at the old bakery and coming home to compulsive audiofanatics calling me and asking me to give them the Answer they seek, I wax philosophic.

Look goddamit, we do this audio thing for one reason, to have Fun. Period. You poor saps who "just retired and have lots of money and time to spend, so tell me what's the finest I can go out and buy," or who "want to sell the drivers I bought last week based on the recommendation in Stereophile, because they really aren't as good as sex," just don't GET IT.

You audio angstmasters should do one of three things. Either 1) learn how to play an instrument, well, so you can spend the rest of your days listening to a *real* "emotionally involving" experience, or 2) take up bungee jumping off a 200 ft. drop with a 225 ft. bungee cord (*very* emotionally involving for 5 or 6 seconds), or 3) accept the harsh fact that the most satisfying moments in our lives come when we make realizations of our own accord, a process that requires us to *work* for the knowledge, and hence, satisfaction we desire.

Unless you've built one yourself, you will never understand why the system I have at home, built and tweaked almost entirely by myself and my most respected experimenter friends, sounds so much better to me than anything else I listen to. Which is why I may feel closer to the Answer we all seek than you may feel you are.

Look, if you were at a point where you wanted to raise kids, and somebody said you could have a couple of kids who are well bred, well mannered and handsome, you might be tempted. But think of all the great fun you'd miss by

not creating them on your own. As you grew older you would surely be able to brag and show off your 'prizes'. But just think, you'd have no recollection of the passion and total consumption of their conception, or the trepidation, and later, sheer joy of their birth.

OK, OK, I'm really getting wierd on you now. But the point here is that "rolling your own", or "DIY'ng", or just dinkin' around is not just a means to an audio end for cheap s--ts like me and Paul. It is a way to achieve a high percentage of satisfaction during a never ending search for audio perfection.

Now I'm not saying you have to go out and scratch an Ongaku tomorrow either. I will bet you this. If you feel unqualified to build something on your own, and you start with a very simple project, like maybe last month's cheap speaks, you will find in the end that, whether you liked the speaks or not, you come out with a sense of achievement, having acquired that much more knowledge valuable to your determination of what you really want from an audio system.

Hell, even if you win the lottery the next day and buy an Ongaku and some silver Lowthers, you'll appreciate them more than you would have without the personal growth you got from building something with your own brain and thumbs.

So if you really feel all constipated about your audio experience, here's Dr. Bottlehead's prescription:

-Take a night off from your system-read a book or make love to your wife

-Go listen to some really high end stuff at your audio salon of choice

-Go hear some live, unamped music. this will remind you that audio, at best, is a poor imitation of the real deal

-plan, dog parts, and build a project-you gotta finish it or it doesn't count

-sit back, listen, and say to yourself "Hey, I really do good work"

letters from fred

by Fred Suffield, P.E.

on ruggedizing tube salemen

At one time Western Electric made a series of small tubes for very high frequency, they were in spherical glass bulbs. They worked excellently from an RF standpoint, but the envelopes were fragile for military equipment use

Western Electric tube works developed an extra hard glass and made some, the envelope was so rugged that it was almost impossible to break the glass. The W.E. Field Engineer in Los Angeles had been trying to get several of the aircraft companies to use the W.E. tubes in some equipment and the fragile argument always defeated his sale. So when the extra rugged tubes were available on a sample basis he took one to show to his customers. He boasted in the office, after trying it, that he was going to go into his customer's office and toss one of the new tubes on the floor to show how rugged they were.

His friends in his office thought about this, and before he left to go to one of his potential customers with the new tube, they exchanged the new tube in the box for one of the old, fragile ones.

The field engineer went to his customer, into the head man's office, and said, "I want to show you something!".

He proceeded to take the tube box out of his briefcase, took out the tube, and threw it on the floor.

It smashed into a million pieces.

The potential customer asked, "What the hell did you expect?"

The much sadder sales engineer returned to find the whole office waiting and realized what had happened.

Enough to spoil a whole day!

march

We'll have the March meeting at Mike Hayes' place, Sunday March 3, Noon.

Mike was telling me about his latest setup last Saturday night. He has Altec 604's in fairly small boxes running down to about 67Hz, where they are augmented by subwoofers

The tweeters are run by a single ended 6B4's and Magnequest transformers. The "midranges" are run by SE 300B's and more Magnequests. The subs are powered by push-pull 6B4's. No crossovers.....

Mike also has some pretty serious front ends, both for vinyl and CD's, although he has been getting pretty high on an exclusive diet of LP's the last few months.

Oh, yeah. Upstairs Mike has a pair of Tannoys in BIG cabinets. Pretty cool.

Mike also has some very nice Mac gear, which I'm sure he could be persuaded to put online.

This will be one of our member/ subscriber only meetings.

The meeting will start at 12 noon.

Mike lives in Olympia, not too far from the brewery. Call me this week for directions if you plan on going.

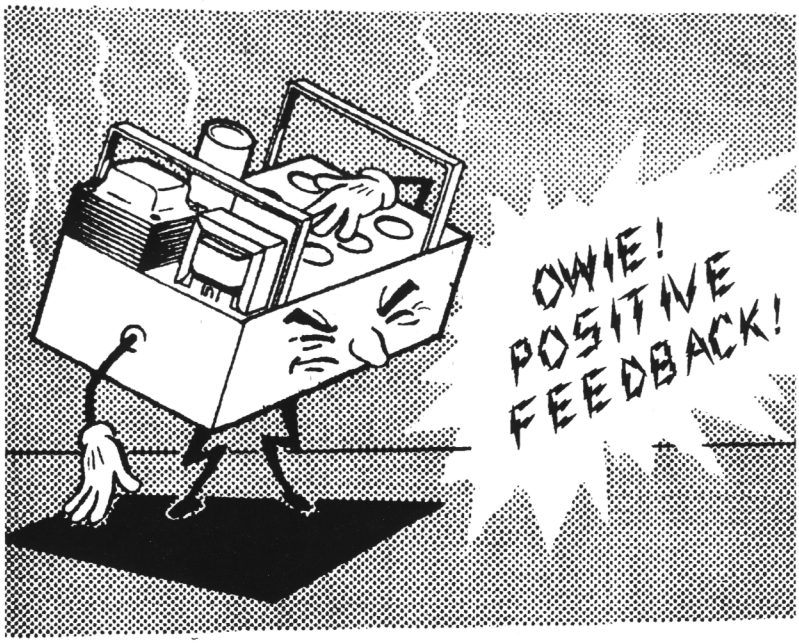
I suspect there will be a carpool of some sort forming from the Seattle side, so you may want to check with Dave or Paul about heading down in one car.

Come on down guys, it's only Olympia, not Tiera del Fuego!

april

I hope to have two events in April, our regular meeting April 7 (we'll do a show and tell meeting), and a special presentation of the S.E.X. kit later that month. Stay tuned for details -

At the special event we'll build and raffle off a S.E.X. kit before your very eyes! Hope to do this at Classic Audio.



whither the S.E.X. amp?

"Hey, Mr. Bottlehead, you jerkweed, pompous blowhard. Where's your little amp and speaker kit?"

Hang in there, it's coming. Didn't anybody ever tell you patience is a virtue? As of this writing I have a cool sounding pair of speaks and a two tube PSE amp that kicks butt. With an output transformer that gave me a real challenge.

I found this this cool little air gapped, 2500Ω to 16Ω output transformer, but it ended up biting me on the butt 'til I tamed it. Turns out the windings are not interleaved, and the high frequency response is only good to about 6 kHz without feedback.

So how do I know the amp kicks butt? Well, last Sunday the guys wanted to hear my very mutilated prototype. Dave even brought an IM distortion meter over to really embarrass me.

While I really hadn't planned to fire up this latest experiment with the PSE topology, the guys talked me into it, much to their regret.

You see, the amp had been kicking around the shop floor the last month. Among other things, it had served as Whizzzer's (the combination family cat /homeless flea mission) bed, and also as the test bed for a highly unstable positive feedback loop. Further crippling this particular circuit's abilities was the crusty contact of the wiring which had been tacked and retacked onto the relay sockets I used for the DN7's during prototyping.

So we go to fire it up on one of the SEX speaks, and it hums, squeals and cuts out like a '76 Ford Granada.

As I crouch on the floor, poking the amp with a diddle stick, I hear the guys saying, "We'll be back inside when we hear music playing."

Eventually I get it going, but it sounds

pretty funky with the positive feedback, fairly loud but distorty and hummy.

The guys are saying, "Gee Dan, maybe that talk about neat lead dress keeping noise down is true." Owie. I'll never show a work in progress again.

Dave measures some ridiculous IM figures, like 30%, which turn out to be partly due to the positive feedback and partly due to accidentally overdriving the circuit by about 40% above the max.

Well, I can't take much more, so I ask Paul if I can hook one of his Magnequest 025's into the circuit. I disconnect the positive feedback loop .

Bingada bangada boom. Sweet clean highs and IM (still overdriven) drops to 5% with zero feedback! The amp kicked butt.

Sooo, I've got this great little amp and speaker kit I want to sell that seems to need a little $300 upgrade to be perfect! I decide that there *must* be a way to compensate for the inexpensive output transformer's frequency response...

After a couple days off, I rebuilt the circuit, very neatly, with real tube sockets and a fresh start on the wiring dress.

Application of degenerative feedback on the output stage cathode (by removing the cathode bypass capacitor) and negative feedback from the OPT secondary to the input stage cathode for a total of about 6 dB NFB, tamed the PSE 6DN7 amp enough to get 1watt at 0.4% THD and 2 watts at 1.9% THD. This is about *twice* the power at *less than half* the distortion level Dave got from his one 6DN7 amp. The 3dB down points are 28 Hz and 14 kHz. Since the SEX speakers only go 100 Hz - 15kHz, this is a pretty good match, particularly since the vintage speaks we auditioned last month didn't seem to go much higher than this (and definitely not down to 28Hz) either. The slight downside is a relatively low 10 dB of gain. In reality (I know that's a scary term to us audiophiles), the gain doesn't seem like much of a problem with the high efficiency speaks and a source with a decent output voltage swing. Two watts output is attainable with 2V in. I measured around .75 volts coming out of my Fisher FM 200B tuner on Classic KING, and the SEX speaks sounded plenty loud for a small room. A tube preamp should have more than enough juice to run the little amp to 2W.

I want to make this kit a good deal for the money (believe me, at these prices I ain't makin' a big profit) while accomodating builder's tastes, so this is where the Single Ended eXperimenter's kit stands...

For $275 (sorry, the $200 goal wasn't possible with the vastly improved parallel single ended arrangement) you'll get the following:

-four 5" aluminum cone full range drivers (two per channel)

-parts to build two 2 watt PSE monoblocks, including two power transformers, two chokes, two output transformers, four 6DN7 dual triodes and sockets, necessary rectifiers, capacitors and resistors, power cords, switches and fuseholders, input jacks and binding posts, terminal strips, and two custom punched flat panels, with holes for the transformers and sockets, to be mounted on wood bases by the builder.

-instructions for building both the amps and speakers

The builder will need to supply only the speaker baffles (2-2'x2' plywood sheets), the bases for the amplifier chassis plates, and miscellaneous wire, screws, and solder. Screw holes will need to be drilled in the mounting plates. This will allow the builder to place terminal strips in different positions to accommodate the use of different capacitors, etc.

I hope to demonstrate the production version by the end of March. Stay tuned!

dan

true tales of audio terror

(well, extreme surprise is probably a better term, but terror sounds so much better)

by Jim Dowdy

An elderly Canadian gentleman responded to my Audiomart ad seeking some BIG chokes.

He said " I've got four here... they're pretty big, you can have them all for $50 (Canadian) plus shipping."

He gave me the basic specs, and they sounded just perfect... so I figure, even if it costs another $50 for shipping, how can I go wrong?

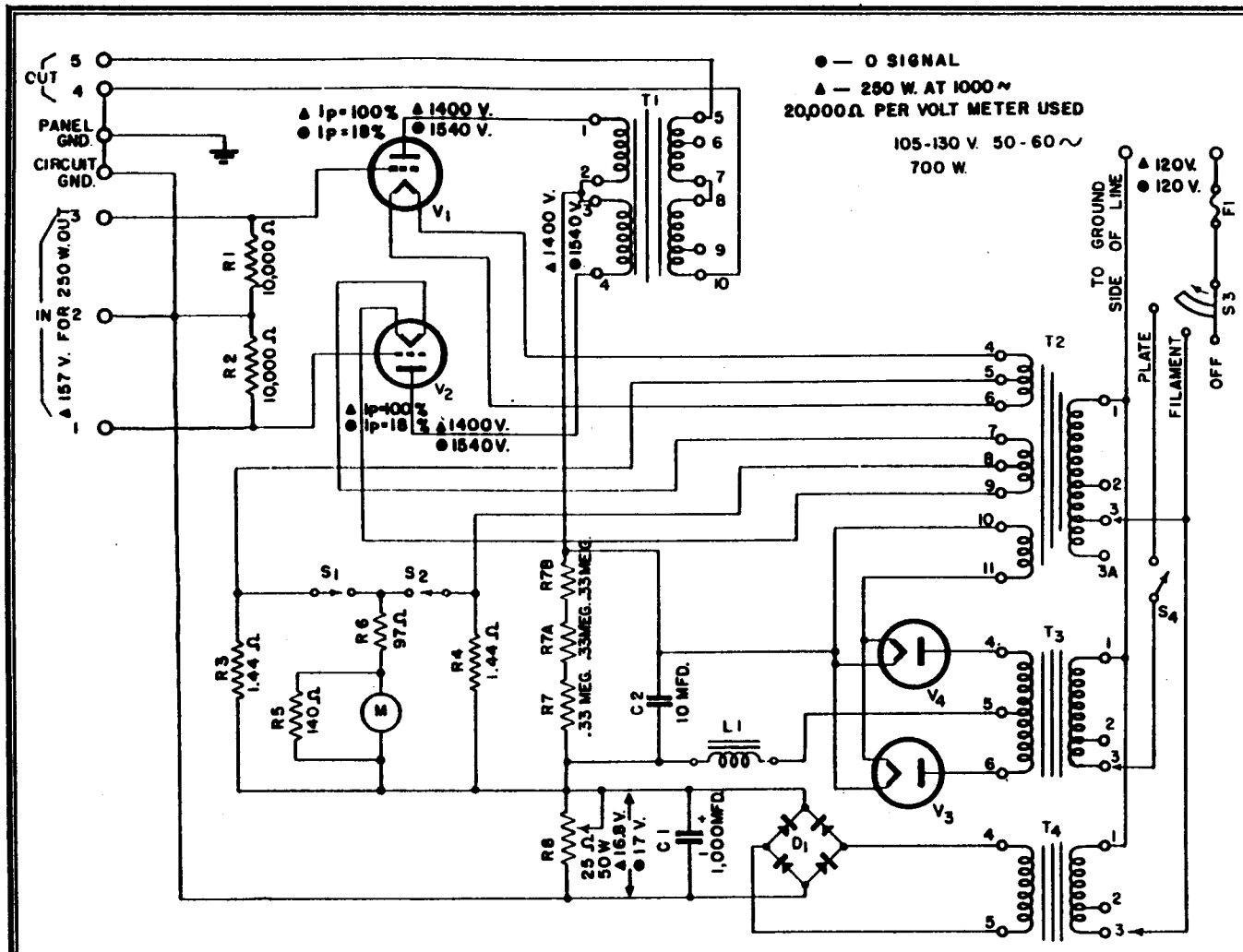
I send out my $50, and a couple of weeks later a Yellow Freight semi pulls up with a $200 freight bill and a GIANT wooden box that weighs in at over 250 pounds!

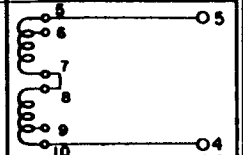
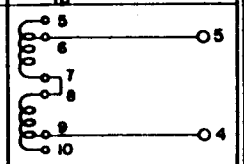
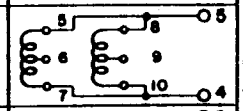
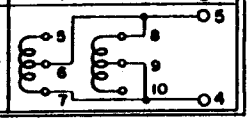
My usually patient wife watched in horror and all of the neighborhood children gathered 'round as I disassembled this massive crate in our driveway with a crowbar... out came the most amazing chokes you've ever seen in your life. Of course, she didn't believe me when I told her that I was almost as surprised as she was!

Specs:	pair#1	pair#2
inductance	3Hy	15Hy
max current	750mA	600 mA
dcr	8Ω	42Ω
dimensions	6x7x9	7x9x11
weight	48 lbs	65 lbs

The 15 Henry chokes are silver and black potted jobs that look like they should be power transformers for a small building. Maybe I'll just mount them on tip toes and bolt everything else to them!

Jim



OUTPUT TERMINALS T1		
SECONDARY		
OUTPUT IMPED.	LOAD IMPED.	STRAP CONNECTIONS
20 Ω	20 Ω	
9 Ω	9 Ω	
5 Ω	5 Ω	
2.25 Ω	2.25 Ω	

PARTS LIST	
C1	MALLORY FPS 059 1000 MFD.
C2	G.E. 23F37G2 10 MFD
R1-R2	IRC 10W 10,000 OHMS
R3-R4	CINEMA ENG. AE 1.44 OHMS
R5	CINEMA ENG. AE 140 OHMS
R6	CINEMA ENG. AE 97 OHMS
R7-7A-7B	I.R.C. BTA 330,000 OHMS
R8	OHMITE 0562 50 W. 25 OHMS
L1	ALTEC LANSING TYPE TM-507
T1	ALTEC LANSING TYPE TM-219
T2	ALTEC LANSING TYPE TMJ-551
T3	ALTEC LANSING TYPE TMS-579
T4	ALTEC LANSING TYPE TP-701
S1-S2	H&H. 3592M MOMENTARY (CLOSED)
S3	H&H. 80178
S4	H.&H. 21806F
D1	VICKERS S1001
M	ALTEC LANSING % METER. DWG 3679
V1-V2	RCA 805 VACUUM TUBE
V3-V4	RCA 866A VACUUM TUBE
F1	125 V. 10 AMP.

OPERATING DATA		
GAIN:	FROM 3000 OHM DRIVER	12 DB.
POWER OUTPUT:	250 WATTS AT 5% TOTAL HARMONICS	46.2 DB. (.006 W. REF. LEVEL) 54 DBM. (.001 W. REF. LEVEL)
FREQUENCY RESPONSE:		±1 DB. 100-10,000 ~
HUM LEVEL.		-27.8 DB. (.006 W. REF. LEVEL) -20 DBM. (.001 W. REF. LEVEL)

ALTEC LANSING CORP. MODEL A287W

Single-Ended 6AS7G Power Amplifier

by Daniel Normolle
December, 1995

1. Introduction

This amplifier began as a realization of a design concept that didn't work. The original idea was to use a cascode driver stage for a cathode-loaded output stage (i.e., the OPT is connected between the cathode and ground, not between B+ and plate), setting the supply voltages and driver loads in such a way that the potential at the upper plate of the cascode would be equal to the grid of the output stage, and hence no coupling capacitors at all would be required (it has been pointed out to me that this also might be achievable with a pentode driver). I was never able to get sufficient voltage swing out of the cascode arrangements I tried, so I switched over to cascaded triodes. But I kept the cathode-loaded output stage.

The 6AS7G (also, 6AS7GA and 6080) is not, how should I say, an exotic tube; it was designed as an indirectly heated, higher power replacement for 2A3 applications in voltage regulators, and, as I understand it, promoted briefly as an audio tube largely as an afterthought (there are several power amp designs using the 6AS7G in Audio Anthology, Volume 1, but the tube doesn't even appear in my 1960 RCA Receiving Tube Manual). I chose it because it is a higher-power triode that will work on a lower B+, sturdy (a must for novices such as myself) and inexpensive. Your friends who are using WE tubes to drive 50s will not be impressed. However, the results are not embarrassing, will produce enough power to drive even relatively inefficient speakers such as my Vandersteen 2cis with authority and your friends with the 50-based amplifier will get their own comeuppance in about 5000 hours. Since the driver tubes are 6SN7s and a variety of full-wave rectifiers can be used in the power supply, you won't ever have to consult the State Department or your broker to determine if you can afford to turn on your amp for tonight's party.

2. Theory of Operation

The design is straightforward; two cascaded triode VA stages drive an SE class A1 output stage, where the load on the output stage is placed between the cathode and ground rather than between the B+ and plate. The cathode-loaded driver stage requires an impressive voltage swing at the grid to get power equivalent to a plate-loaded stage, but, once that is achieved, there are all sorts of benefits: lower distortion, better damping, and extended frequency response. In addition to a few pages in the Radiotron Designer's Handbook (including the curves one needs to design a cathode-loaded output stage with 2A3s), Ternan's Radio Engineering devotes several pages to this configuration. Aside from the degenerative feedback applied to the output stage by the cathode loading, no feedback is employed in the design.

Each of the driver stages uses a 6SN7 with the two sections in parallel. The first stage produces a swing of about 14V P-P in response to a 1V P-P input signal. The second stage boosts that to a maximum of about 250V P-P. The second 6SN7 is paralleled to provide ample current to drive the output stage (the alternative seemed to be a cathode follower); the first 6SN7 is paralleled, ah, because there was this half of a 6SN7 sitting around with nothing to do; one could double the value of the bias resistors and load resistors in the first stage and eliminate a 6SN7. Bias for the

driver stages is provided by bypassed cathode resistors; I tried removing the capacitors to provide degenerative feedback at the driver stages, but the loss of gain was excessive. Since the amp appears to be highly linear on the 'scope, I think the capacitors are appropriate. Every bypass capacitor in the amplifier is paralleled by a 1μF PP capacitor and/or a .01μF PS capacitor.

The two inter-stage coupling capacitors in each channel are 0.33 μF paper-in-oil types (Jensen); I believe they are an improvement over the 1 μF+0.01 μF PP capacitors I was previously using, but I did not have the religious experience many report when I made the transition. The coupling capacitors are clearly a place where every builder should exercise his or her aesthetic judgement without fear of criticism. The B+ supplies for the driver stages are RC decoupled. A high-voltage PS is used for the driver stage for linearity at the high output voltage demanded by the 6AS7G grids in the cathode-loaded configuration; separate power supplies are used for the output stages, which require relatively higher current at a much lower voltage. As per John Atwood's recommendations for plate-loading the one-electron UBT-1, 210VDC sits across the 6AS7G, drawing 110mA at rest. An 810Ω, 20W resistor bypassed by a 30 μF+0.01 μF capacitor sits between the cathode and OT to increase the bias above what is provided by the OT; this method of biasing a cathode follower is covered in the RCA Receiving Tube Manual.

A 10Ω resistor sits between the OT and ground, and attaches to a test point on the amplifier chassis for monitoring plate current; it should have 1.1 VDC across it in the quiescent state if the bias is set properly. One could also omit it and check the bias by measuring 90 VDC across the bias resistor.

One should note that the 30 μF PP capacitors all over this design were chosen on the basis of parts in my spares box; while I believe the values are adequate, they may be, to a harmless extent, too big. The bypass capacitors on the cathode resistor of the first stage can be omitted, causing a 10% loss in gain. The loss in gain prohibits deleting the bypass capacitor on the cathode resistor of the second stage. One could also calculate the time constants and choose more appropriate values. Except for the load and bias resistors, resistor values are also somewhat arbitrary, and one could choose different grid leak and grid-stopper resistors depending on what is on hand.

The amplifier has three power supplies: one for each output stage and one for the driver stage (both channels). Each output stage supply consists of a Hammond 270FX power transformer, 5U4GB full-wave rectifier and CLC filter (47μF@500V Cerifine cap, 10H choke and 220μF@500V Cerifine cap, bypassed with 1μF and .01μF PP caps) to produce 360VDC. The driver stage as currently implemented uses a Hammond 270EX (550VCT, 100mA) transformer to feed a full-wave HexFred bridge and a CLC filter (2X47μF@500V in series, 20H choke and 2X220μF@500V in series, with a 6AU4 used as a slow-start B+ device) to produce about 800VDC, however, the driver B+ transformer gets pretty hot and it should be replaced with a higher-current 550VCT transformer (e.g., Hammond 270FX or 270HX), which is what I have specified in the drawings. The PS sits on a separate chassis from the amp. Each PS is fused just before the umbilicus, and the AC is, of course, also fused.

3. Construction Notes

If you build the PS I've specified here, you'll never fit a stereo amp on one chassis. I recommend that you build the

PS and amplifier stages on separate chassis, rather than monoblocks. The arguments for monoblocks are that they increase channel separation and allow for shorter speaker cables; I don't think monoblocks should make a significant contribution to channel separation, eight extra feet of speaker cable shouldn't make a bit of difference in the response at audio frequencies, and if the extra speaker cable costs that much money, you need to read Captains of Consciousness by David Owen and join your local Stereophile twelve-step program. Separating the power supply from the chassis will reduce potential hum problems, and hum is a big problem in SE amps, especially if you get some efficient speakers. I do not believe any significant capacitances have been introduced by the umbilicus, but I have no proof of this assertion.

I recommend DC for all the amplifier chassis tube heaters (it's not necessary for the rectifiers on the PS chassis), but if you do use a separate PS chassis, you must use DC heaters, or the relatively long run of the AC heater wires in close proximity to DC runs on the umbilicus will surely induce hum you have gone to great lengths to eliminate in the PS. I use Schottky barrier diodes in all my heater supplies, since they allegedly reduce RF hash compared to standard-issue diodes. Similarly, I use HexFreds in the driver stage rectifier.

With respect to the umbilicus, I use a forty-nine cent octal plug and an octal socket on the PS as connectors; be sure to hard-wire the umbilicus into the amp and put the plug on the PS end, so there is no possibility of an exposed plug having 800 VDC on it when your toddler tries to plug it into your dog.

I use a ground buss rather than star grounding, because I think it is easier to

make solid connections onto a buss; your mileage may vary. The buss works well with the umbilicus, since the umbilicus reduces the possibility of ground loops. More elaborate grounding schemes have been recommended, but I have not found them necessary. Personally, I like to work with 19 gauge and 14 gauge Kimber Kable, since it is strong and flexible, its insulation does not burn or melt during soldering, and it is not too expensive.

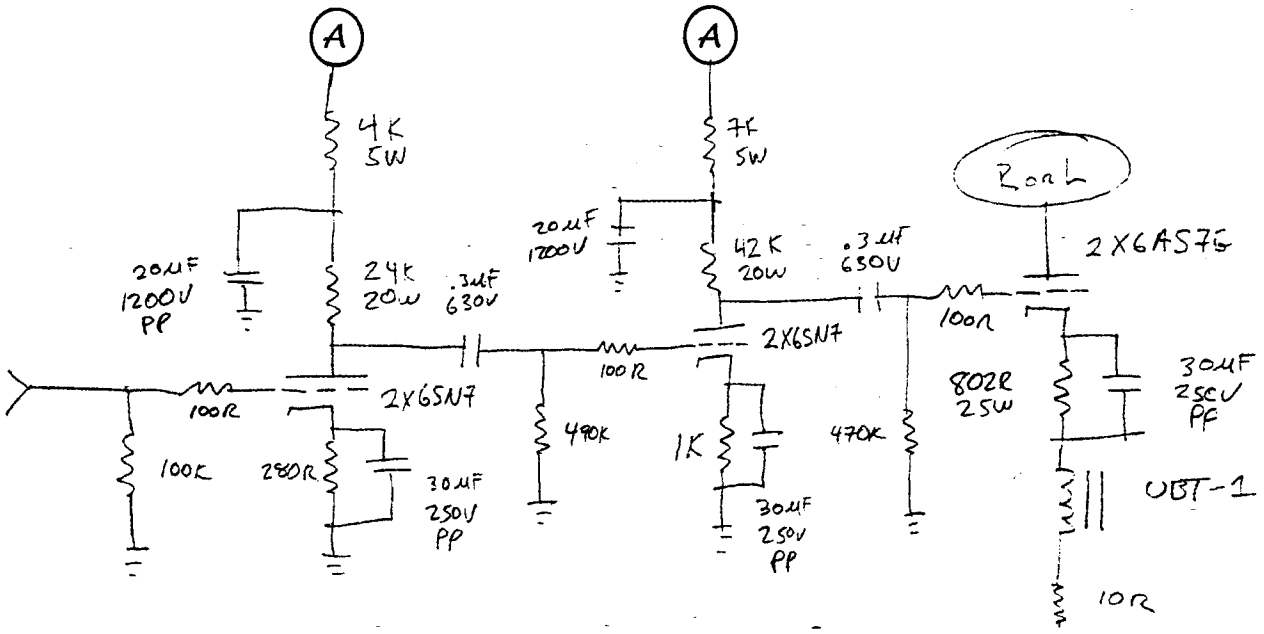
4. Work to be Done

I use 100Ω grid-stoppers on the all the tubes; I have yet to see if any or all of these are necessary (it is easier to put them on and then later remove them, rather than omit them and then search about for odd oscillations). The 5U4GB rectifiers tubes provide B+ to the 6AS7G tubes faster than I would like, so some method for slowing down their turn-on is desirable. I am prototyping a rearrangement of the second stage that allows removing the first coupling capacitor, and I will let you know the about the results. The chassis has sockets installed for a built-in active crossover for biamping, but I haven't prototyped the crossover, let alone figured out where the real estate is going to come from.

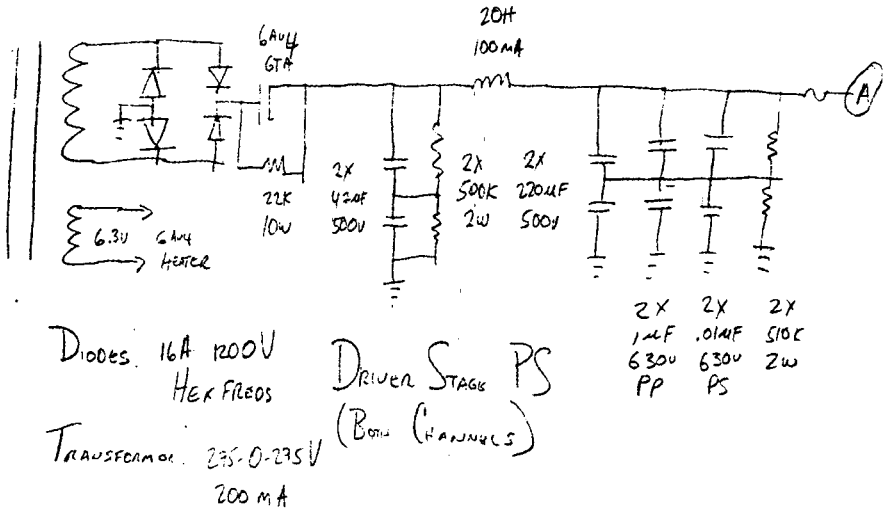
5. Impartial Review

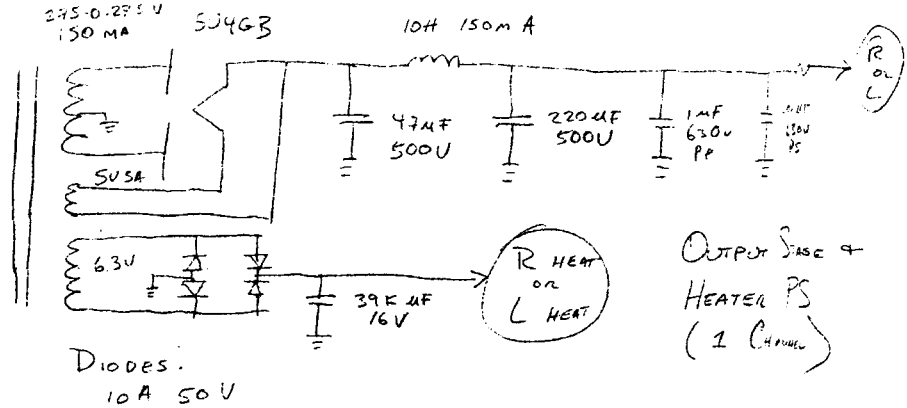
I am pleased by the results of this project. The amp drives my Vandersteen 2cis far louder than I would have expected, and runs out of power only on the loudest passages on loud recordings, in which case recovery is not real fast. As far as I am concerned, this is the amplifier's only shortcoming. Since I listen to a lot of acoustic jazz from the 50's and 60's on both LP and CD (which gets a lot louder than some of you rock-and-roll guys might expect; check out the recent re-release of Mingus Mingus Mingus Mingus Mingus on the Impulse! label), the best examples of the extremes of frequency reproduction in my collection are acoustic bass and percussion; I am impressed by the resolution of bass sounds into actual notes, with a realistic double-bass texture and lack of muddiness. I find that percussion instruments are clearly defined and differentiated. The tonal quality of midrange instruments seems very true, with a lack of honkiness on horns and realistic sibilants on vocals. The amplifier is also dead quiet; I can put my ear right up to the speaker and cannot hear any hum or hiss. Although I have spent a fair amount of time tweaking the thing, it went together far quicker than my push-pull amps, and I learned so much designing and prototyping it that my PP amps now sit in the basement, awaiting a rebuild using some of the techniques and topologies from the SE driver stage--and cathode loading.

Daniel Normolle's 6AS7 amp – amplifier circuit - 1 channel



Daniel Normolle's 6AS7 amp – power supplies





cravings

Wanted: Lafeyette 70 watt power amp and/or schematic/manual. Also looking for EV SP12, TW35 HF Wolverine driver, CR35 crossover, Jensen H222 12" coaxial, Lafayette (Goodman's) SK 210 12" triaxial.

Please call 360-678-7414, ask for Ed.

DESPERATELY WANTED: 2-4 x 20-25 mfd 1500 volt paper -in-oil caps.

Jim Dowdy, phone/fax: 770-451-5684.

Looking for the following obscure stuff:

-304TL sockets and plate and grid caps

-Denon DL 103 phono cartridge

-6BK4 tubes No, these aren't some hot new collectible, I just want to try my direct coupled ESL theories out.

-matched pair of 2 amp or better 7.5V filament transformers

For sale:

-Magnepan MGII a's. Excellent, with cartons. $400.

-386-40 upgradeable to 486, 5 megs RAM, 160 meg HD, VGA-TV card (connects computer video to SVGA monitor or TV monitor), Media Vision sound card. Would make an awesome platform for some good audio measurement or speaker design software. $300.

Dan, 360-697-1936.

I am looking for the following items:

-Identical pair of mint Altec 604C

-Identical pair Altec 605 cabinet for 604

-identical; pair Altec corner type cabinets for 604

-identical pair of Altec Iconic, Magnificent, Barcelona.

Wai Kei Leung/ Hong Kong,

fax: 852-23875560.

For sale:

Fried Studio V's, transmission line speakers. These have the new MARS circuit. **I am selling mine for $1900 o.b.o.** They are $3600 new from Fried. I have had them about six months. They sound <u>really great</u>. They are now very tight, clean and clear, unlike they come from the factory. It is too bad that Fried didn't take time to execute this fantastic design properly. The design is clearly the result of Bud's many years of experience, and the cabinets are definitely first rate. I have totally upgraded them using Focal drivers for mid and bass and used good caps and custom hand wound chokes. I then spent a great deal of time getting the internal damping just right. the only reason I am selling them is that I have decided that I have too much money tied up in them. (I reviewed my priorities and decided to donate the sale money to the local women's shelter where I am a board member).

Gordon Burkhart-Schultz, Work: 510-423-2907; fax: 510-447-8242; home: 510-889-0193.

Classified ads are free to subscribers. Ads must be submitted in writing, and will be run pending space availability

VALVE now takes commercial ads.

Available sizes and per issue price:

3-3/8"x 2-1/8" vert.(quart. page)	*$6*
7" x 2-1/8" vert.(half page)	*$12*
3-3/8"x4-1/2" hor.(half page)	*$12*
7"X 4-1/2" (full page)	*$24*

Preferred submittal is one of the following graphic formats: PCX, TIFF, BMP, WMF, EPS, CGM or DRW.

PLEASE NOTE:

Any submittals of hardcopy will be scanned to PCX format for insertion in VALVE, with the usual degradation in quality. Call us if you need an ad layout, for an additional fee.

did you just tune in? here's what's happened so far...

Back issues

Volume 1 - 1994 issues - $20

a Williamson amp; Dyna Stereo 70 mod bake-off; converting the Stereo 70 to 6GH8's; a QUAD system; triode input Dyna MkIII; MkIII vertical tasting; smoothing impedance curves; Altec A7; Ampexes, Nagras and ribbon mikes; Triophoni, a 6CK4 amp; audio at the 1939 World's Fair; books for collectors and builders; V.T. vs. R.M.A. cross reference; FM tuner tube substitutions; Big Mac attack - the MI 200; 6L6 shootout; a vintage "audessy"; more FM tuner mods; vintage radio mods; Heathkit rectifiers; PAS heater mod.

Volume 2 - 1995 issues - $20

Rectifier shootout, tube vs. solid; FM 1000 recap and meters; single ended 10 amp; triode output W-4; Optimus 990 - speaker for SE?; star grounds; tuner shootout; Living Stereo, vinyl or CD?; World Audio SE integrated; firin' up - smoke checking; Brook 12A schematic; 6C33 vs. 3C33; Heathkit power transformers; 6B4's + Magnequest = SEcstasy; W5 mods; triode operating points; Dyna restorations; Marantz 7,8 and Scott LK150 impressions; hackable vintage gear; Quasimodo - PP 805 amp; restoring a Scott 340 in 75 minutes; a dream system for 78's; cartridges and styli for 78's; Restoring a Lowther, part 1&2: easy tube CD output hack; 6ER5 phono preamp: 304TL & 450TH SE operating points; hypothetical DC ESL amps.

And here's what we hope to have in 1996:

Single Watt, Single Tube, Single Ended, an amp for Lowthers; the Vintage Speaker shootout of 1996, QUAD vs. Lowther vs. A7; the Single Ended eXperimenter's kit, amp and speaks for $200; a Heathkit W-1 thru W-5 shootout; a new, improved tube CD output; Eico HF 60 vs. HF 50 vs. HF 89; how to build the Superwhamodyne, a speaker for single ended amps; and a whole lot more!