

**VALVE**

PO BOX 2786  
Poulsbo, WA 98370

**BOTTLEHEAD!  
THE NEW RUN  
OF S.E.X. KITS  
IS DUE NEXT  
WEEK!**

That's right Whammy, and the new kits will be set up to install the Ultimate Pleasure Output transformer. I bet this run sells out even faster than the last one! Don't dally folks, We've already presold 1/3 of our next run!

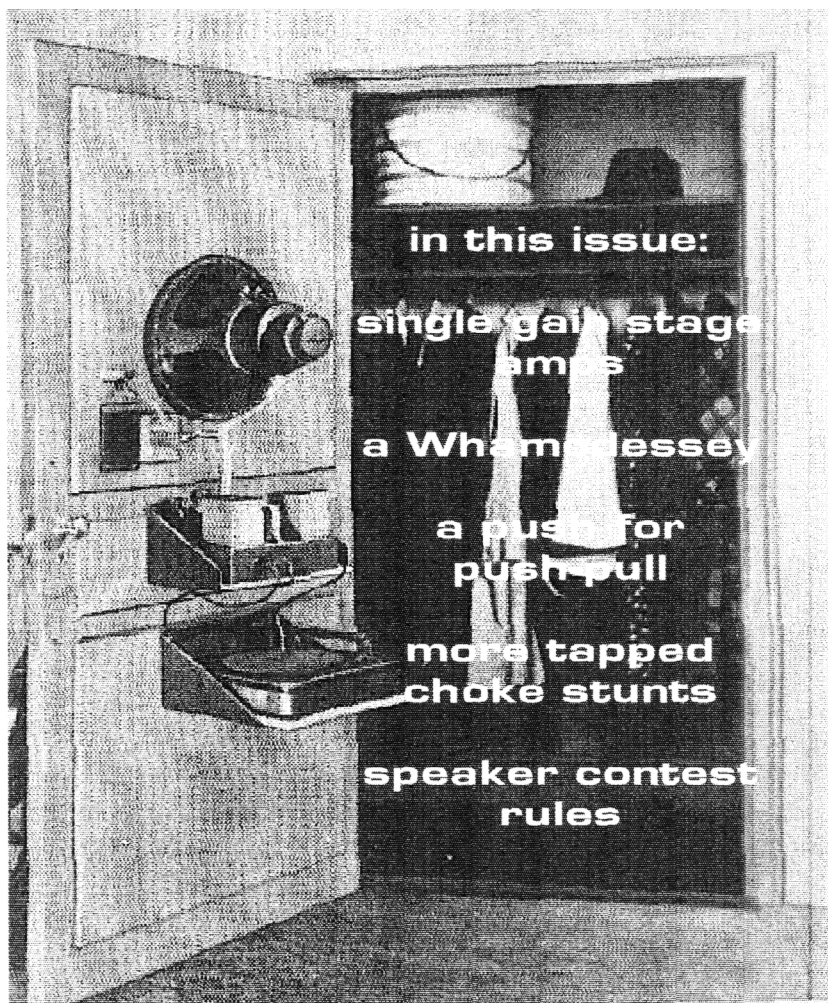


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ELECTRONIC  
TONALITIES  
Mr. Bottlehead is  
not a real  
person. Any  
resemblance to  
an 807 is pure  
coincidence.

Full S.E.X. kit (monoblocks & drivers), \$350+tax+shipping&handling - "Amps alone" kit, \$320+tax+shipping&handling  
Assembly manual available separately for \$10, refundable with purchase of either kit. Call Electronic Tonalities, 360-697-1936  
to order, or for more info. MC, VISA, AMEX or check OK.

# VALVE

VINTAGE AUDIO LISTENERS AND VALVE ENTHUSIASTS



and you thought *your* system was radical...

volume 3, number 9

September 1996

# VALVE

the monthly magazine for tube audio  
eXperimenters

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## editor's thing

I will start by apologizing for the tardiness of this issue. We are facing yet another format change. I have given up in disgust on the desktop publishing software I have struggled with for the last two and a half years. As I attempted to improve the quality of this rag with the addition of more and more graphics, it became more and more buggy. The last two issues have both vaporized somewhere near completion, requiring a complete rewrite. I have attempted to preserve the format as nearly as possible with this new software, Microsoft Word (thanks, Dave!). Hopefully we will have some true publishing software again soon.

Along with the cheeseball software, the dear old Deskjet has gotten jumpier and bumpier with three years of nearly constant use. This letter has been produced on a borrowed printer. I am working on acquiring a laser printer which will hopefully allow us to directly print each magazine, which ought to be a huge improvement over the second generation photocopy you are now reading. All we need now is 120 new members to afford it. We have hit 170 this month, so this may be attainable by year's end. Keep spreading the word about us Bottleheads!

We welcome George Wright to the masthead this month, as our new 'mapmaker'. George sends me a couple of wild new schematics a week, so we'll start publishing a few each month, as a dare to you scratchbuilders. This month George takes use of Mike Lafevre's new tapped audio choke to eXtremes.

Oh yeah, dont forget to check out Joe Robert's new web page at [www.soundpractices.com](http://www.soundpractices.com). We'll be contributing some wild circuits to the Workshop when it gets up and running.

Keep your tip hot,

DAN

## department of corrections

### Whamos

The Whamodyne construction article in the May 96 issue has the following boo-boos:

The total volume of the subwoofer is stated to be about 3.3 cubic feet. It is really about 1 cubic foot for the back, closed chamber, and 1.3 cu. Ft. for the front vented chamber, for a total of roughly 2.3 cubic feet.

The depth of the tower is stated as 10". It is really 11" (the 9-1/2" side panel plus the 3/4" thick front and rear baffles).

Go by the dimensioned drawings for construction, not the text. As it was rewritten for the Audion article, it went from standard to metric and back to standard, and something was lost in my translation.

### S.E.X. kit

Some versions of the S.E.X. manual have a goof on page 23, the voltage measurements.

Regardless of what your manual says, terminals 10 and 16 should measure around 170 VDC.

Also:

Don't forget to use some sort of shorting plug on the input as you measure the voltages. That way you don't have any amplified hum (AC) on the line, screwing up measurements.

Make sure you get shiny, adequately covered solder joints on all the terminals by heating the joint well enough and putting on enough solder. Crimp each wire around the terminal a bit to give a good contact area for the solder to flow between.

Don't do any mods before you build and test the completely stock amp. Let it run in for a few days, then you can start to play with mods

Doc B.

## 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 bakeoff; converting the Stereo 70 to 6GH8's; a QUAD system; triode input Dyna MkIII; MkIII vertical tuning; smoothing impedance curves; Altec A7; Ampexes Nagra 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 MI200; 6L6 shootout; a vintage "audyssey"; 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; 684's + Magnequest = SEctasy; 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.

#### What we hope to have in 1996 (\$25):

Single Watt, Single Tube, Single Ended, an amp for Lowthers; the Vintage Speaker Shootout of 1996, QUAD vs. Lowther, vs. A7; the Voigt Loudspeaker, the Single Ended eXperimenter's kit; cathode coupled SE 6AS7 amp; how to build the Super-whamodyne; improved CD tube output; refoaming AR woofers; mesh plate tubes; rebuilding QUADS; QUAD amp filter surgery, and a whole lot more!

## single gain stage amp - ala Francais

Le 29 Juillet 1996

Dan,

To complete my letter of 7/22/96,

The best operating conditions for the  
STC 3A167M/CV5112 are the follow-  
ing:

$V_{plate}$	160V
$V_{grid}$	-2.65V
$I_{plate}$	30 mA
$Z_{load}$	3.3K $\Omega$
Power	1.24W

I use the 3A167M/CV5112 in a con-  
figuration such as this:

In tri-amping this amp drives a horn  
tweeter very well. In this case the  
cathode bypass condenser value is  
brought down to 7 $\mu$ F, paper in oil is a  
good choice.

You can obtain STC #A/167M from

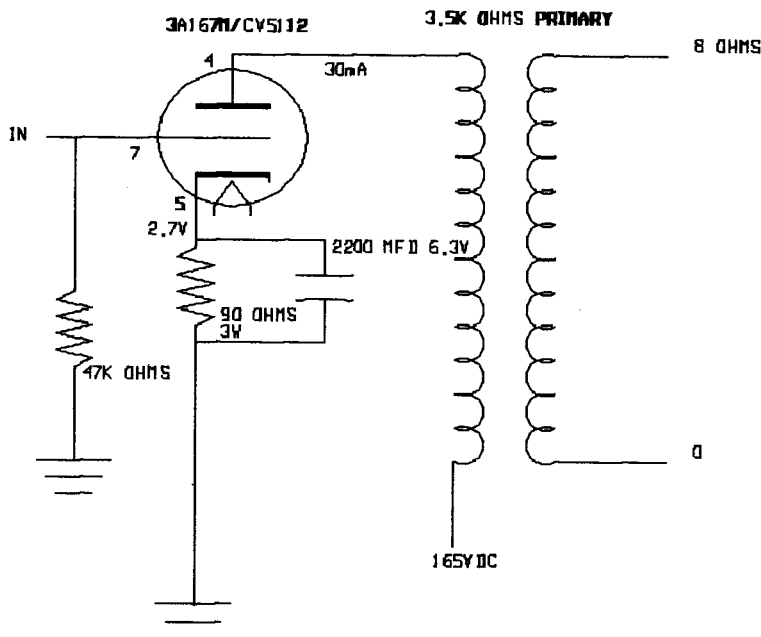
LANGREX (UK) for £ 22.50

phone 0181 684 1166

fax 0181 684 3056

I use the 3A/167M in a line level out-  
put transformer coupled preamp and  
in the 'one tube' amp.

Best regards,  
Marc Veyer



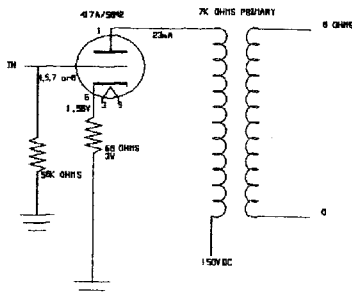
The 90W cathode resistor is made  
with two A-B 2 watt 180W carbon  
composition resistors in parallel.

By the way, I am taking advantage of  
my holiday to write an article for  
VALVE entitled "A LAFON direct  
coupled amplifier with 6336A"

## single gain stage amp 'Murican style

Paul showed up at the August meeting with a cute little surprise, inspired by our correspondence with Marc Veyer. Mounted on a way too big chassis (it was supposed to become a 2A3 amp) was a stereo amp composed of two one tube, single gain stage channels, using the 417A/5842, powered by a brutally simple half wave silicon rectifier power supply.

Paul used the following setup:



The sound was very intriguing, except for the brutal hum introduced by the power supply, a half wave diode rectifier into a brute force filter of about 2000  $\mu$ F. I guesstimated about 3/4W out of the amp.

Paul gave me a note the next week: "measured the 5842 amp, 38Hz-20kHz, -3dB, @.25W. Can get 1W out with moderate distortion on the scope."

I had to develop this further, not only in my mind, but in my ear as well, so I hauled out the breadboard. Onto it went a pair of Raytheon 5842s in parallel, running into the Ultimate Pleasure Peerless/Magnequest TFA-204 OPT, temporarily borrowed from one of my S.E.X. amps. Power supply was my Kepco series regulated (coke bottle 6550s,

5R4GYB rectifier, 5651 reference tube, oily caps), dialed down as low as it would go, about 170 VDC. The cathode resistor was a 35 $\Omega$  Utah wire-wound. Grid resistor was a 100K metal film. That's it.

The sound was completely absent of "cap scum". How can I explain this properly unless you've heard it?

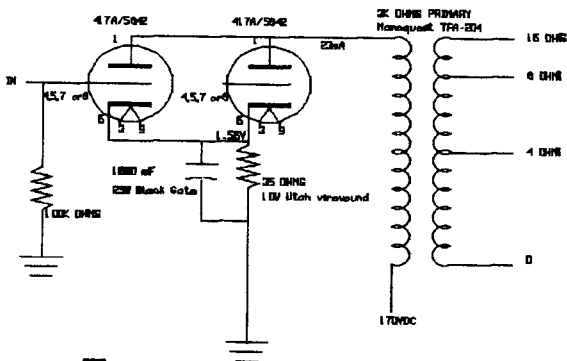
On the down side, things were a bit light down lower, and power wasn't exactly house shaking, at about 1.5W.

I somehow ended up with a pair of 1000  $\mu$ F 25V Black Gate caps (from an old tape recorder or something). Someone on the Joenet suggested I might use a 800-900  $\mu$ F cathode bypass, so I hooked one in.

Nice improvement, more bottom, and I didn't seem to hear any cap distortion coming into the picture.

The super fast and clean sound merits some experimentation, in spite of the flea power. This might make a great Lowther amp, and next time John Tucker's Exemplars come to visit, they will get a try too.

The next step would be to parallel four of the 5842s into a 1500 $\Omega$  primary or so tranny. Maybe John Atwood would loan us a UBT-1 (1600 $\Omega$ ), which should handle the 90-100 mA current draw easily. With three or so watts you could power a few more types of speaks. Give this a try if you have the parts, and share your observations. I think we're on to something... Doc B.



## coming attractions

In an effort to ease the confusion of late, here is a tentative schedule of coming events:

### October

This will be a very special meeting. Unless they've been sold, John Tucker will bring us the Triode Support System's Exemplar horn loudspeakers he brought with him from Houston when he recently relocated in the Puget Sound area.

These speaks are definitely worth hearing! Not your typical "A7" sound. They run about 103 dB, without honk. They've given me a chance to listen to really raunchy, loud club stuff, electric blues, etc., that really didn't blow the roof off the sucka with the S.E.X. amps and Whamos.

We'll do this meeting here at the clubhouse on Sunday, October 6, 12 noon.

### November, December

These two meetings will be devoted to critique and tweak of our entries to the \$100 speaker challenge at the PAS meeting in January.

On November 3 we will have a listen to whatever you have prototyped, and run some measurements. Please come, even if you don't have an entry. We need all the support and input we can get.

On December 8 we will listen to the more or less finished products, and have our usual Holiday champagne snack. I will try to have a finished prototype of my 211 amp to use as drive for our entries.

Both of these meetings will be at the clubhouse, 12 noon.

**ABA  
Andy Bartha Audio  
Electronic Audio Works  
(305) 583-7866 EST**

### PSE STUDIO V AMPLIFIER MOD

TESTIMONIAL: WOW! ...even cold, out of the box something special was happening. BASS... noticeably tighter... easily tell the difference between a bass guitar and a bass drum. HIGHS... clean and extended with no peaks or roll-offs. SOUNDSTAGE... Everything was rock-solid... fixed clearly in the recorded space. Your craftsmanship is evident in the superb workmanship. Even now I am looking at the rest of my system to see what can benefit from ABA magic!

Sincerely,  
Len Scheline

**You'll be amazed what my mods will do!**



## **Whamos, the word from the rest of the world -**

*The number of Superwhamodyne systems being built out there is very flattering. It's also going to push the design to new heights, as we compile the experiences of the many experimenting bottleheads out there. (time for a paren... Check out the current Glass Audio issue, 4/96, p. 72. In the letters column a guy named Lance Cochrane, who doesn't appear on our VALVE subscriber list, refers to his "fellow bottleheads". I wonder how he coined that term?....).*

*Among our growing group of bottleheads, I have reports of several systems in SoCal, a couple in Oregon, some in Ohio, a system in Texas, and a system going together this month in Rome (yes, the real Rome), just to mention a few. Anyway, here's some of the first reports back from the real world about how the Whamos go together and sound.*

*First, a report from Allan Rosenthal, a man so mad as to own Lowthers, QUADs, Edgarhorns and now, Superwhamodynes:*

S.E.X. and Superwhamodynes- I could hardly wait to have first hand experience! This letter strips naked my experiences with these devices. Over the last three weeks I have built the S.E.X. amps, the S.E.X. speakers and finally the Superwhamodynes!. When I first read about these in VALVE, I was filled with curiosity and anticipation. This was followed by a strange tenseness upon reading the construction details. The climax rapidly approached as the last screw was driven in. Nirvana was reached upon aural stimulation. The cigarette and the martini never tasted better. Ahh, life is good.

Now that I've gotten that out from under my belt, I;d like to write a few words about "The Process". Forget

Xanax, Prozac, Halcion, Rush and Dr. Laura. Building and listening to the amps and the speakers was a truly transcendental experience that surpassed drugs or talk radio. I built the amplifier thinking that, at best, I will have an amplifier that is a good as the Kit 1 and that, at worst, I may gain some understanding of how and why a bunch of resistors, capacitors, transformers, inductors, and rectifiers can amplify. When I hooked them up to my new Lowther PM7A silvers (thanks, Tony) in Acousta 115 cabinets that I built myself, I was shocked. I actually enjoyed the S.E.X. amplifiers as much as, if not more than, the Kit 1. In my system, in my listening room (20x30x8-15 ft ceiling), and with the kind of music I listen to (small scale classical, female voice, early music, folk, blues, jazz), the combination of the Lowthers and the S.E.X. amps resulted in greater midrange detail and deeper bass than with the Kit 1. The sound with the Kit 1 is slightly warmer and "bigger". Imaging, which is not that important to me, was good and similar with the two amps. All I all, I am happy with either amp driving the Lowthers. Of course I suspect that with the S.E.X. amps this is just the beginning of an evolutionary process.

I was pleasantly surprised when I hooked up the S.E.X. speakers. At lower listening levels the midrange detail was excellent and the imaging was the best I've experienced. Interestingly, I did not feel that I was missing anything at the upper end of the frequency spectrum- at my age this should not surprise me, I suppose. When pushed too hard, the speaker begins to have a forward, "transistor" sound. The S.E.X. speakers deliver the emotional content of the recording- this is not cheap S.E.X. I could be happy with these speakers in a small room- in fact, even in my large listening room, they were very satisfying for the smaller scale musical pieces I frequently listen to.

The Superwhamodynes took about four full days to complete. I probably would not attempt to build these unless I had the following tools and an understanding significant other (as I do):

- ◊ table circular saw
- ◊ jig saw that is variable speed and has a scroll feature
- ◊ at least one power hand drill
- ◊ various clamps.

The most difficult part is cutting out the holes for the drivers- this requires complete concentration. Don't attempt this unless you have adequate time and you are not in the throes of a caffeine high. The construction was uneventful with the following caveats:

1. The midrange drivers come close to the edge of the front panel. Some of the screw holes for attaching the front panel to the sides, which I drilled before mounting the drivers, were covered up by the edges of the drivers.
2. I was not able to obtain the brass bushings, that are used with the threaded rods, as described in the 'neck bolt' article. Instead, I used 7/8" hardwood dowels in the apposite positions. The sides of the towers and subwoofers are now bowed in about 1/16".
3. I could not find fiberglass ceiling tiles. Instead I used fiberglass mats that Radio Shack sells. As instructed installed them on one of the two side walls- unfortunately I installed them on the walls where the yellow fiberglass is most visible through the vents.
4. The domes of the tweeters are exquisitely delicate and I managed to dimple both of them. One popped out when I played music. Taking Dr. Bottlehead's advice, I used a piece of tape to successfully "pop out" the dome of the other one.

In my large listening room, the S.E.X. amps are not capable of driving the complete system to realistic levels on

all recordings. In particular, female voice would invariably clip the amplifiers. The towers alone are easily driven, however. The Kit 1 amp (7-8 watts) drives the Superwhamodynes with aplomb. What I wrote earlier holds here as well- the Kit 1 has more bloom and the S.E.X. amps have more detail and more bass. *(the stock S.E.X. amp has about 10 dB negative feedback. This probably accounts for the difference in sound. With the Magnequest TFA-204 on the S.E.X. amps, zero feedback sounds very nice, and the amps would probably be closer in flavor, with the S.E.X. amp still having better midrange definition - Doc B.)* Both amps are exceptionally musical with these speakers.

I will write a preliminary report about the sound of the Superwhamodynes based on my very limited listening experience with them. I find that it takes several weeks or months to obtain the most out of any speaker; positioning in the room being the most important parameter, and it is time consuming. Additionally, long term listenability requires, well, the long term. Regarding the sound quality of the Superwhamodynes!, they are among the best that I have owned. They seem to reveal at least as much detail, especially in the midrange, as all of my references. These currently include the Lowthers, the original QUADS, and the Edgarhorns. The sound is effortless with proper amplification. The imaging is good, with height extension being notably better than my other speakers. When the subwoofers are wired in phase with the towers (unlike Dr. Bottlehead's recommendation) the upper bass/lower midrange seems to be undernourished. On the other hand, when wired out of phase, as recommended by Dr. Bottlehead, the bass region is definitely too loud in my room. The quality of the bass, however, is very good: I can't imagine anyone wanting greater low-end extension, and timbre is true. To address

the bass balance, I will be evaluating the following:

1. adding another ½ lb. Of polyester fiberfill (one lb. Total per subwoofer) will decrease the efficiency somewhat (*and go a little deeper to boot - Doc B.*)
2. finding a more suitable location in the room for these particular speakers. I suspect that since these speakers have extended low end, my usual speaker positions are not appropriate.
3. using a separate amplifier for the subwoofer so an exact bass level can be attained.

Overall, I am very pleased with these speakers. I anticipate that I will spend many enjoyable hours listening to music with them.

In summary, the last few weeks have been great fun. I will report back on the Superwhamodynes in a month or two.

Regards,  
Allan

*Allan sent this fax the next day:*

Last night I placed another ½ lb. of fiberfill in the subs, also I moved the speakers to a different location. The balance is now much better- for most recordings the balance is just right- for others, perhaps the recordings themselves are boosted in the bass. I am really surprised how deep the bass goes!

*Thanks Allan, for a very thorough report! Now folks, here's another nutty eXperimenter's story:*

Hi Dan,

Enclosed please find \$1.00 for Crazy Eric for use of the name Superwhamodyne!, a name I really like, by the way.

Yup, built a set, with a lot of help from a woodworking friend. Speakers are definitely not an electronics project,

which is much more comfortable ground for me. How do they sound? Pretty good, I guess. What? No ranting and raving with an excess use of superlatives? Not yet, as I've only heard them used with a \$75 piece of junk car radio! The old radio really shines and the bass is truly fantastic. Units of this sort usually crank out as much power as a SE 2A3 and I'm impressed with the efficiency.

I live with a 12VDC solar system and have been looking for a 12VDC - 120VAC rotary inverter, with no luck at all. I guess I will have to run my beloved tubes with a solid state sine wave inverter - sigh. At least all of my filaments will have battery powered DC.

Thank you for publishing the fruits of your labor for your readers to utilize. I can sense great potential in these speakers and can't wait to really hear them.

I enjoy VALVE and don't mind some ads. Parts have to come from somewhere and it is challenging enough to gather them up and assemble them into a working unit. I will leave the manufacturing for others.

Thanks again!

Mark Heinlein

*About that pair in Rome-*

Dear Dan,

I'm very happy for your letter. I think that in September one store in Rome will hand build your loudspeaker, so we can prove the design. This kind of project is very interesting, in *Audion* #8 you will find another very interesting one.

Thank you for your kindness in offering assistance answering questions about your Superwhamodynes, in case people ask about them.

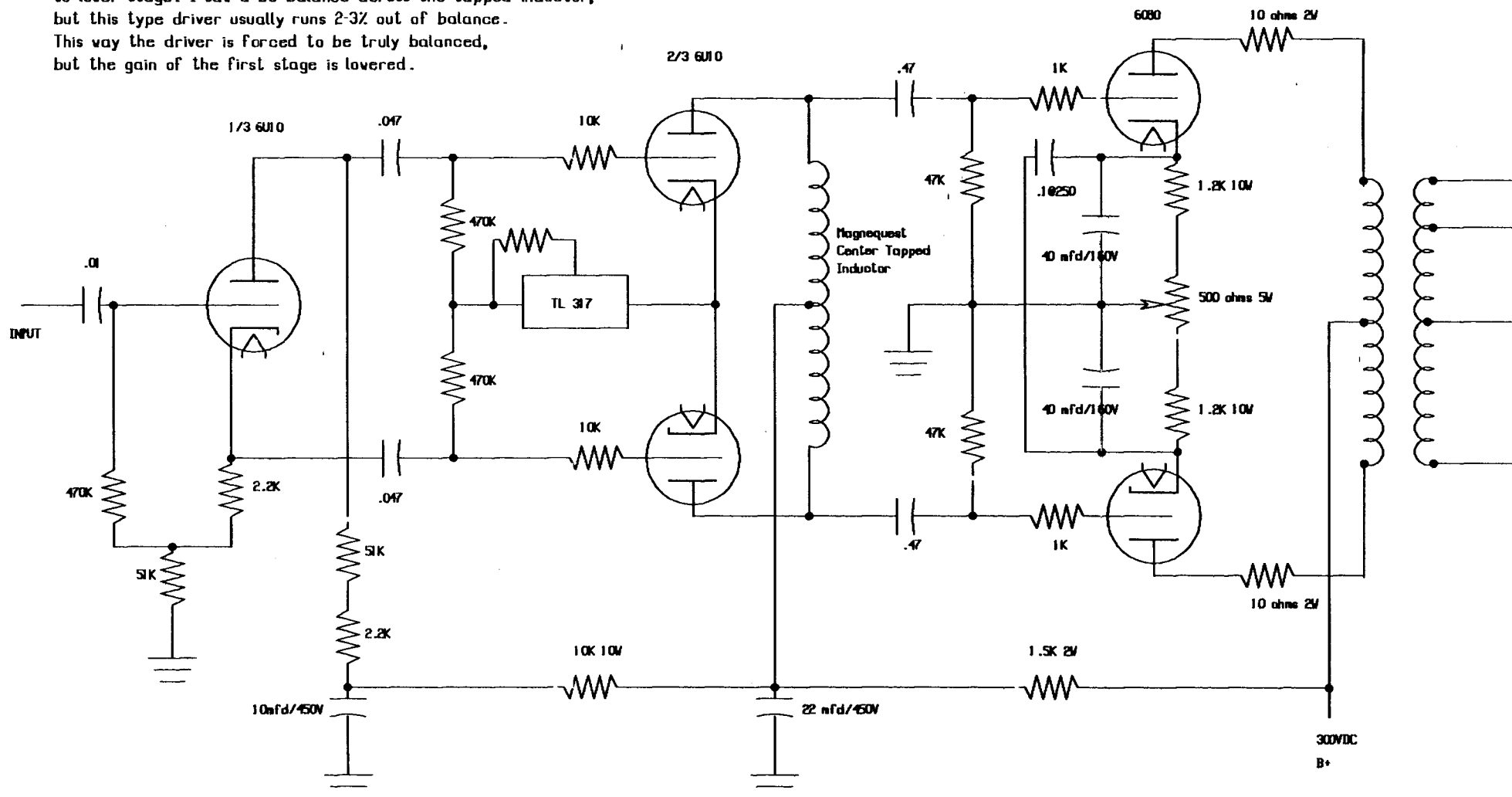
Luciano Macri  
AUDION magazine

**VALVE 8/86**

# GEORGE'S ATLAS - "IMPROVED BROOKLET"

NOTE: THESE CIRCUITS ARE UNTRIED. PROCEED AT YOUR OWN RISK!

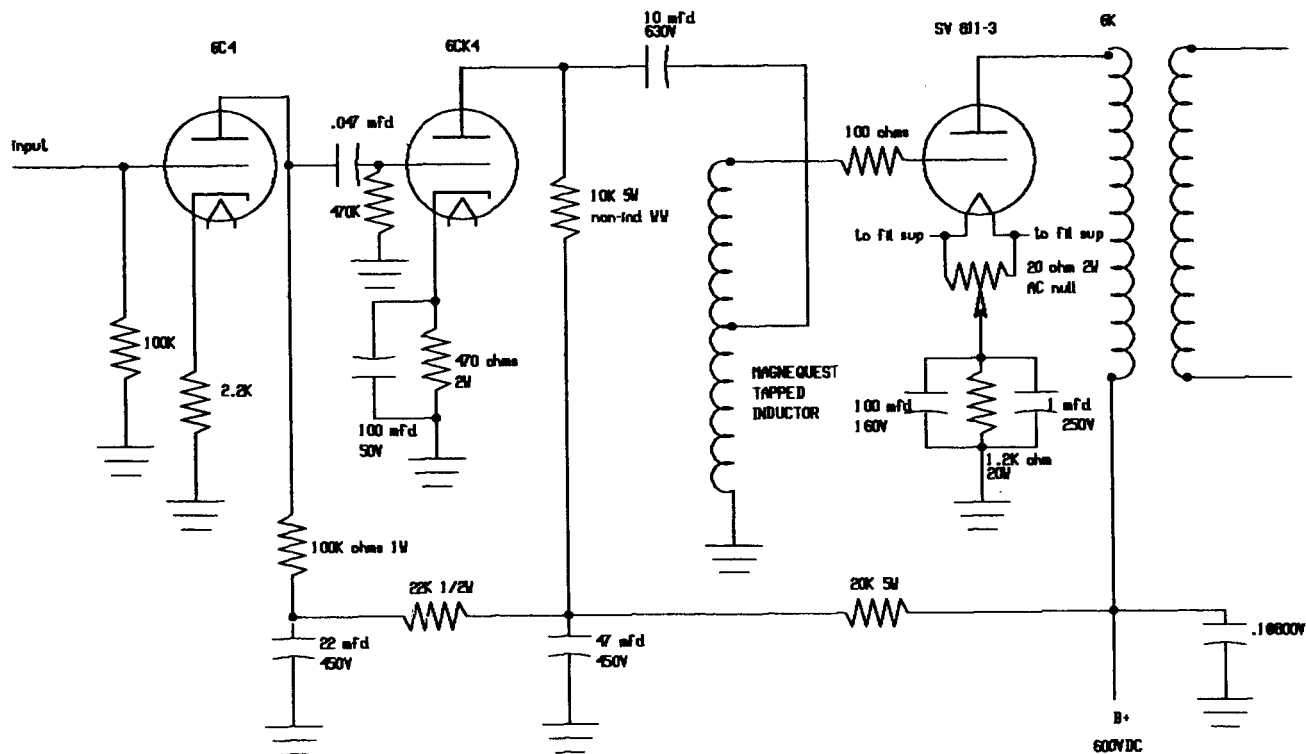
Original circuit had upper driver driven with cathode coupled phase to lower stage. I saw a DC balance across the tapped inductor, but this type driver usually runs 2-3% out of balance. This way the driver is forced to be truly balanced, but the gain of the first stage is lowered.



WE LISTENED TO DAVE AND PAUL'S ORIGINAL CIRCUIT ON SEPT. 9. A KNOCKOUT! THIS SHOULD BE EVEN BETTER. THE SOUND IS NEAR SET, IT REALLY IS "BROOK LIKE". TRY THIS CIRCUIT! DR.B.

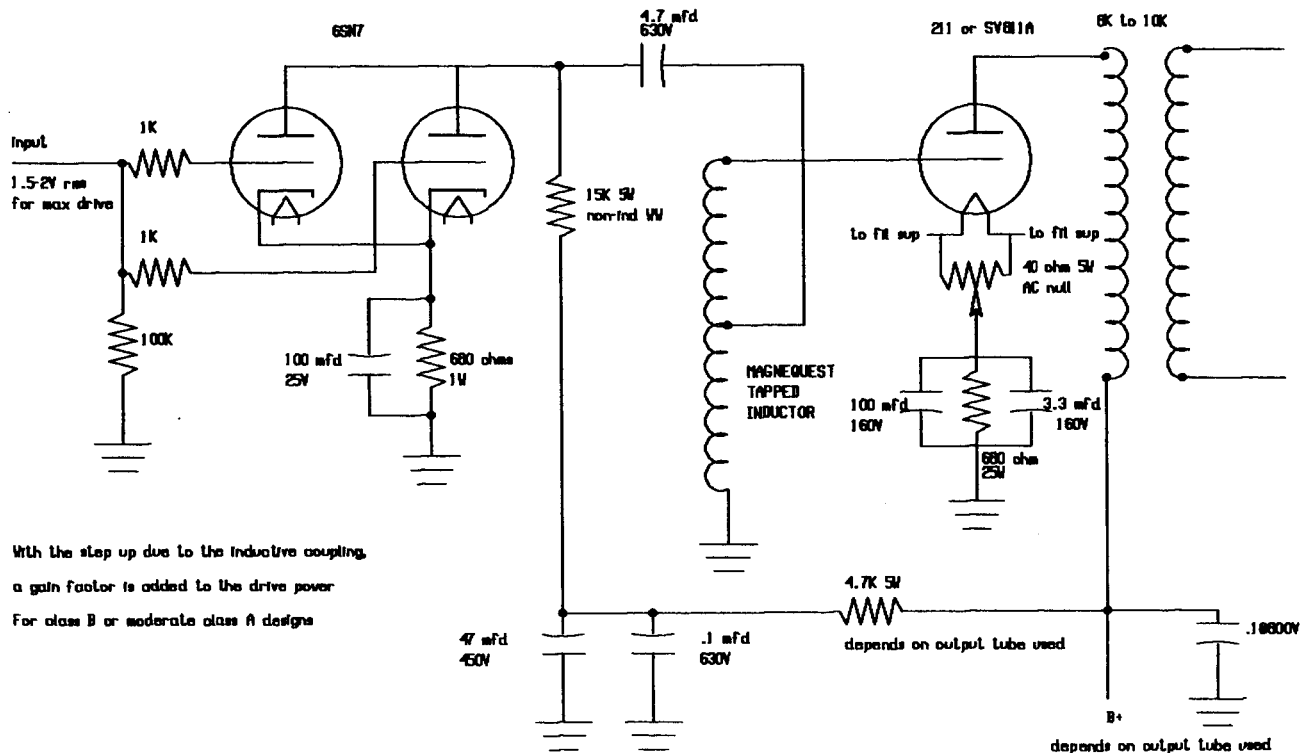
# GEORGE'S ATLAS - INDUCTOR DRIVEN SE SV 811-3 AMP

NOTE: THESE CIRCUITS ARE UNTRIED! PROCEED AT YOUR OWN RISK!



GEORGE'S ATLAS - INDUCTOR DRIVEN SE 211/811 AMP

NOTE: THESE CIRCUITS ARE UNTRIED IN PROCEED AT YOUR OWN RISK!



With the step up due to the inductive coupling, a gain factor is added to the drive power. For class B or moderate class A designs

## letters

*Yo, Brainiac...*

Dan - miscellaneous ideas etc.

Lowther impedance -  $V_{as}$  in the last issue is not right, expect 2-4 ft<sup>2</sup>. Quoted values give 0.4 gm cone mass, 60% efficiency.

Can you find cone mass, diaphragm area? If so, then I think I can make a SPICE model of an Acousta type cabinet to compare with the Mauhorn, etc.

S.E.X. conversions:

- 1) Dave's PP 6DN7 amp with transformer input (skip the first stage)
- 2) 300B (convert to DC filament with a 1 $\Omega$  series resistor
  - a) Cathode bias 1200W gives 300V plate to cathode @ 50mA for 6 watts out
  - b) negative supply fixed bias, 60 mA @ approx 375V plate cathode gives 9.5 watts

Both with Ultimate Pleasure, of course!

- drive with a pentode like Model 91, or with SRPP 6SL7 like Cary's SE-1 kit.

Paul

*Homewinding*

Dan,

The MCM drivers for the Super-whamodynes have already been ordered, although I really need to finish my 6C33C-B based amplifier first. The amp has made it to the fully functional prototype/breadboard stage which means (as you are certainly aware) that not only is it large and hazardous to small children, but it's butt-ugly too. Originally designed as an OTL, the bridge output source impedance measured about 18 ohms- probably not the best match for an "audiophile approved" loud-speaker. Today's version couples to

the speaks via a 900Va toroidal power transformer which makes it larger, heavier, and suspiciously similar to Balanced Audio's 60W amp.

In the past months, frequent job travel threatened to break my addiction to rosin flux fumes, so I tried to get my fix by reading transformer design books and related articles. Consequently, I think I have figured out how to make a SE OPT from the iron found in a surplus power transformer. Well, at least on paper anyway.

In the meantime, I've enclosed some useful transformer literature titles:

1. Practical Transformer Design Handbook, Eric Lowden, ISBN 0-8306-3212-3 (still available; about \$45)
2. Handbook of Transformer Design and Applications, William M. Flanagan, ISBN 0-07-021291-0, McGraw Hill
3. Transformers for Electronic Circuits, Nathan R. Grossner, ISBN 07-024978-4 ??? McGraw Hill
4. Radio Receiver Design Vol. II, Sturley, pgs. 97-110 show example of SE OPT design, pgs. 164-172 shows example air gap filter inductor design
5. Reference Data for Radio Engineers, Sams Co./ITT, chapter on Magnetic-Core Transformers and Reactors has design examples, lamination table, wire table, Hanna curves, etc.
6. Raditron Designer's Handbook, pgs. 252-3 has many references, Crowhurst, Wrathall, Partridge, etc.
7. Sound Practices, Spring 94, pgs. 39-42, Dr. Tom Hodgson, SE OPT stuff
8. Sound Practices, Issue 10, pgs. 37-39, "
9. Glass Audio, 2/94, pg. 24, 3/94, pg. 30 James Moir, Pp OPT stuff.

Jim Flowers

## **to push and pull or single end it?**

By George Wright

Now here's a subject that will never get a clear answer - which sounds better depends on who you talk to. I have been building audio amps for years, starting with single ended designs, then going into push and pull designs. Originally, my goal was to make them louder and louder - my neighbors were hoping that I would either move or come to an early end due to some unfortunate accident. Along the way, my second area of thought was to design amps that also sounded better. That is of course, the most important and most misunderstood aspect of audio, because it is so subjective. Everyone has a different idea of what music and voice should sound like. On top of that, the music we listen to can be as varied as the recording engineer, production engineer, and all other aspects utilized in the manufacturing process can make them. I've built some really nice amplifiers that tested great with sound waves and stability at all frequencies and output levels, just to see all of that testing go into the hopper as soon as I hooked up speakers and heard that piece of doo-doo distort and bomb out.

There are basically two different camps on how we should listen to audio. On the one side, you have the people who say the bass definition and the smooth sounding second harmonics of the single ended warmer tube sound is best. The other side talks about the higher definition, the absence of harmonics, and the overall less "tubey" sound of the push and pull circuits in general. A lot depends upon the type of tubes, circuits, and other parts used, plus the source used, the speaker system, and most of all, the listening environment. Audio is one of the most demanding and critical



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### **-NEW!-**

- Full Size Plans for MAUHORN Mk IV & Mk V
- MAUHORN Mk V Signature Series Speaker Cabinets, will take PM6A, PM7A, PM2A & PM5A drivers

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**SALEM, OREGON 97302**  
**VOICE/FAX (503) 370-9115**



external forces that we process - our eyes can be fooled a lot easier than our ears - compare how a television picture is constructed as opposed to how the audio is processed.

The problem with single ended amps is twofold. First there is the problem with harmonic distortion. With a single output device, any distortion that stage generates will wind up in the output, second order being quite high. Many audiophiles find this to be a pleasing effect, but it is still added distortion by any other name. Another problem with the single ended design is efficiency. Because all the output device current must sink through the output transformer running in class A mode, the output transformer is always saturated to some degree. Air gaps, windings, larger iron and hefty filtering can make the amplifiers sound quite decent, but the cost can be enormous. The output only runs at a small percentage of its actual capabilities and the amount of current required can start to eat away at any savings you may have made elsewhere in your electric bills.

In the late 20's, RCA., I mean GE, and Westinghouse engineers addressed the problems of low output and high distortion in the radio equipment they were producing, by designing a new output circuit called a balanced output "push and pull" amplifier. They found that for the first time, they had made an improvement in the quality and output level that made the high power, high fidelity amps of the future possible. The biggest improvements push and pull made was the cancellation of tube harmonics by balancing the outputs in opposite phase. This also made problems in power supply hum drop by the same effect. When two tubes are operated in opposite phase, problems such as ground loops, distortion caused by tubes, and minor AC leakage in the plate supply tend to cancel out. Another helpful feature is the fact that the idle current is split in half and runs out of phase,

allowing more output with less one-way saturation pulling down on the primary. Recording and broadcast industries have used balanced lines and amps for years. They must know something about audio by now, don't they?

If properly designed, built and tested, a push and pull amplifier hooked up to a good set of speakers (now there's another subject I don't want to step in) and employing a good source of audio would be hard to beat. I think that a good single ended amplifier will have a hard time sounding as clear. Of course, the design of the transformer, driver, power supply and all other variables play into the final outcome, but in my opinion, the balanced approach has an advantage from the start. I know that a lot of audiophiles will disagree as to what good sound is, but that's what makes us human - the ability to never agree on everything, especially on who's system sounds better.

Don't get me wrong here, because of the huge amount of research lately into single ended designs, some very nice sounding equipment has been built and the debate is far from settled - just listen to the S.E.X. amp offered here in VALVE.

OK "Always", because of that last paragraph, you can keep your job. Look to your right to see one answer to the SE vs. PP debate.

*My beef with 'push and shove', as George loves to call it, is that the low level information just isn't there.*

*In a discussion with the Man himself, Mikey Lafevre, brought up the point that PP trannies aren't usually air gapped. Mike tells me the air gap is a great equalizer, not only in terms of PP and SE trannies and their low level info recovery, but also between various lamination materials.*

*Oops, looks like Mike has eavesdroppers. These air-gapped Brooklyn guys are really in Pennsylvania!*

Doc B.

# Introducing Brooklyn.

## Push-pull transformers that sound single-ended.

Single-ended transformers have gorgeous inner detailing due to their air gap. Push-pull transformers have extended bandwidth and a loss of natural inner detailing. Now Brooklyn bridges the gap, with air gapped push-pull transformers. The same technology used in the famous W.E. 86 amps.

Brooklyn, for a powerful single ended sound.

PART #	PRIMARY IMPEDANCE	POWER LEVEL	MAX. PRIMARY DCMA PER SIDE	DCMA UNBAL	RETAIL EACH
B14	12,000 CT	10W	40	4	\$100
B15	10,000 CT	20W	50	5	\$125
B17	9,000 CT	30W	50	5	\$140
B18	8,000 CT	15W	45	5	\$120
B20	6,600 CT	30W	70	7	\$140
B21	5,000 CT	20W	80	8	\$120
B23	4,000 CT	50W	100	10	\$150
B24	3,000 CT	15W	75	7.5	\$125
B27	1,500 CT	30W	150	15	\$135

Note: Above units available with Ultralinear taps for an additional \$6.00 per unit

Secondary impedances for all units are 2,4,8,12 & 16 ohms.

Guaranteed minimum frequency response is +/- 1 dB, 30Hz to 20 kHz.

All units supplied with vertical bell end caps.

All prices herein are special introductory - prices subject to change without notice.



Brooklyn, P.O. Box 967  
Cherryville, PA 18033  
(215) 288-4816

**Where Push-Pull meets Single-Ended**

# WRIGHT Sound Company

We want to thank those who took advantage of our introductory model WPP100 phono stage preamp. If you missed out on buying one of these great little units, there is the WPP100A up-grade system available at \$450 plus \$17.50 shipping and handling in the continental U.S., WA residents please add 8.2% sales tax. The WPP100A differs from the WPP100 in that there are better spec. components, gold RCA connectors, and a new WPS02 power supply with a power switch and plate and filament indicators. The performance is better than the original version, which beat all the competition in listening tests by members of **VALVE** and other audiophiles who have had the pleasure of reviewing this product.

Now available to **VALVE** members, and those who have tried S.E.X. amps, the first of the next step in WRIGHT products, the WPL10V complete line amp/ phono stage component. This basic model has the quality of the WPP100A, with the additions of a selector switch with phono plus three other line inputs and volume controls to make this the center of that great new S.E.Xy sound system. No longer do you need to search for a great looking front end to have great S.E.X., and at just \$575 U.S. funds plus \$17.50 shipping and handling, you can get this fully assembled preamp/line amp delivered to your door in the continental U.S., WA residents add 8.2%. The WPL10V is designed to be a cost effective basic chassis type, constructed with all the great stuff that goes into the WPP100A. We made it especially for you S.E.X. owners and **VALVE** members who want the most out of your system for the least out of your pocket. I must add that this product will work with almost any power amp you now have or may purchase, so with or without S.E.X. this is a great addition to the WRIGHT line. Stay tuned for future models. Oh, by the way, there are just a few of the WPP100s available at press time.

To purchase any of these products, please send your order and payment to:

WRIGHT Sound Company  
3516 So. 262<sup>nd</sup>, Kent WA 98032-7047

For further information, please leave a message at (206) 859-3592

## the \$100 speaker challenge

The August newsletter of the Pacific-northwest Audio Society contained the following:

"Those Valve Guys...  
by Ron Jandrase

They've called us "tirekickers". They've called our amps "200 watts of sand". They call themselves "bottleheads". This means war!

Little did I know that when I issued the "hundred dollar speaker challenge" that the VALVE group headed by Dan "Dr. Bottlehead" Schmalke is filled with self-proclaimed kings of cheap speaks! Dan called me up and said he wanted in on the challenge. Naively, I said "sure, why not?". Then Dan started sending me old newsletters from their group that talk about various projects like Dan's own "Superwhamodynes!" that he thinks could be scaled down to fall within the contest budget, and what he calls a S.E.X. kit, which is a kit for a pair of single ended monoblocks and a pair of speakers, that sells for (\$350). Anyway, these guys are really doing a lot with a little. Just think what they could do if they could afford some transistors like real men!

But seriously folks, if we don't want to be thought of as just a bunch of "plug and play" megabuck equipment geeks; let's bust out those soldering irons and show that we can also be pocket protector, calculator toting, cheap tweak geeks.

Here's where the "hundred dollar speaker challenge" stands. The deadline is our January meeting. I have invited the entire VALVE group to that meeting to listen to the end products with us and to have a little interclub party. Prizes (cheap, of course!) will be awarded. The rules are as follows:

1. *Total cost of all electronic parts including drivers, caps, terminals, wire, etc. for both speakers must not exceed \$100.*
2. *The prices of all items used must be readily available to the average hobbyist.*
3. *The items themselves must be likewise available.*
4. *Designs must be documented and duplicateable.*
5. *The PAS club reference system will be available at the January meeting for demonstration of all speakers, however, if a contestant wishes to use alternate amplification or source componentry that is fine as long as they are willing to let any other contestant use their components too, if so desired.*

That's it for rules. Cabinet and dampening materials are being considered scroungeable, so I am not counting their cost.... The more speakers we have to listen to in January, the more fun this will be."

Doug and I went to the PAS August meeting and hurled a few insults. Honestly, their reference system could use some more tubes and good speaks.

Our planned intrusion worked. After forty-five minutes or so of bottlehead abuse, they had four teams of two guys each, ready to try to take us on. They are planning special meetings for contestants, in order to run sweeps and such.

We should do the same. Please call me or e-mail me if you are planning on building a system for the contest. We can arrange some time for everyone to run sweeps, etc. here in the basement.

We'll audition our entries at the November meeting, so that entrants have time to tweak out the criticisms from the crowd, and perfect their entry for January.

Doc B.

## cravings

**Wanted:** A nice clean working Heath model UA-1 Basic Power Amplifier, need a mate for a lonely single, please help! Also a couple of weird 6ME5 indicating eye tubes for a Heath AJ-11 Tuner; or some information on this tube. Oh! A Harmon Kardon Citation V manual or copy would make my day!

Have lots of Sprague/CDE can caps, singles to quads, up to 500/525 volts, various MFD values, from \$10.00 to \$15.00, let me know your needs. Will trade for? I love this stuff!

Lee M. Metcalf

9319 Nash Lane

Lake Charles, LA 70607

318-598-2913

**For Sale:**

Pair Radio Craftsman C-400s \$200

pair Eico HF-50s \$500

pair Heathkit W-3s, recapped \$350

pair Gott GT30V amps \$300

Gott stereo preamp \$100

Crazy Eric, 360-871-5921.

**For Sale:** Tubes, NOS, in original boxes. US made RCA, GE, Sylvania, etc.

7591A - \$35      7868 - \$25

5U4GB - \$10      5751 - \$8

5AR4 (mul) \$35      7027A - \$40

45 - \$40      7199 - \$15

6L6WGB - \$20      6DJ8 - \$8

12BH7 - \$10      6SN7GTB- \$10

12BY7 - \$7      6LQ6 - \$30

20LF6 - \$40      6MJ6 - \$40

6JS6C - \$25      6146A - \$12

UX201A - \$25      12AX7 - \$15

12AT7 - \$10      811A - \$20

RadioTron Designer's Handbook \$100  
+ shipping

Looking for an oddball tube? Call me.

Steve Harrell

1179 Boylston St. #30

Boston, MA 02215

voice 617-247-0672

fax 617-730-8449

## Wanted:

Anybody have info on RCA MI-9375 monitor amps? They are single ended, 1622 output, with 250Ω and 16Ω output taps, cool rack mount jobs, with the tubes mounted upright on the front and the caps and trannies poking out the back horizontally. Send your service manuals, full parts lists, detailed schematics with all revisions, and full history of the designer's love life to Doc B. at VALVE, P.O. Box 2786, Poulsbo, WA 98370.

**For Sale:** Harmon Kardon Citation II power amp. New Svetlana 6550C + GE 12AX7, very good condition, with cage and manual. \$950

Two Altec 414-8C speakers (great for building Petite Onken, see Sound Practices for construction plans) \$150. 12", 8Ω, 98dB.

All + shipping

Call Rene, 407-625-1069, evenings.

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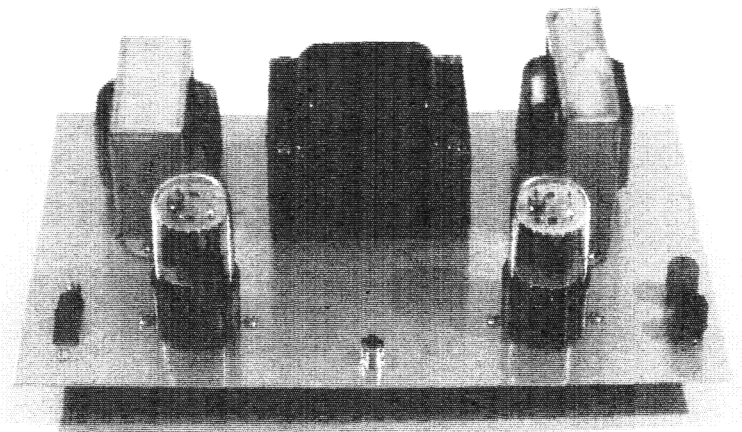
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# safe S.E.X.\*



## Single ended amps and speakers for \$350!

Before you take the plunge, spending big bucks to learn if single ended amps are for you, only to find you need to spend even more money on efficient speakers, you can try a whole single ended system on your talented ears for \$350 (*plus shipping, WA residents incl. 8.1% sales tax. Sorry, no credit cards*).

The Single Ended eXperimentation kit contains the basic parts and instructions to build a pair of great sounding parallel single ended 2 watt monoblock amplifiers and a pair of efficient, full range one way speakers. The builder need only supply lumber for baffles, bases for the precision laser cut chassis top plates, and their favorite flavor of wire and solder.

Future issues of **VALVE** will encourage experimentation with the basic kit, publish-

ing lots of modification ideas, from simple capacitor bypasses to high performance output transformer upgrades and detailed circuit mods

You already have efficient speakers? (the S.E.X. amps work *great* with Lowthers) That's fine, we'll sell you a basic "amps

only" kit for \$320 (*plus shipping and WA resident sales tax - will be \$320 as of Sept. 1, 1996*)

So make sure your first experience with S.E.X.\* is a low risk one. Get a

*The S.E.X. kit of parts includes the following:*

- Basic parts for two parallel single ended monoblock amplifiers, using two 6DN7 dual triodes per channel, with power supplies. Includes two laser cut 10" x 6" chassis top plates with cutouts for mounting transformers, tube sockets and other hardware.
- Four 5" aluminum cone full range drivers, two for each channel
- Manual, including plans for speaker baffles, suggestions for chassis bases, and simple "by the numbers" amplifier construction directions.

S.E.X. kit! Call 360-697-1936.

**ELECTRONIC TONALITIES**

P.O. Box 2786, Poulsbo, WA 98370

\* Single Ended eXperimentation



