Still wrestling with the hardware…

Looking back over recent tube audio history, one would have to say that single-ended triodes sure moved in fast and heavy for such an unlikely idea.

Unlikely, that is, from a technical electronics standpoint.Clearly, the notion had a lot of instant popular appeal as a sort of philosophical gesture. These days the finger automatically points at media hype, but I think the growth of SE had more to do with a willingness to believe in a new promise. It was a social movement of sorts.

Simple, low-power amps were a novel and radical idea, generating a context of mystification and surprise, and inspiring all sorts of revolutionary thoughts in the minds of audiophiles. Based on the cosmic implications projected onto the idea of SE, the amps were expected to live up to a higher set of aesthetic and spiritual ideals than the average unwashed tube amp off the street.

For a time, many believed that single-ended power amps *had* to sound good, before they even heard one. They had faith in what was basically a total unknown. *Why* is a very interesting question that has to do with a lot more than engineering principles, although certain pro-SE engineering arguments can be very instructively made.

Out there in the fertile minds of the audio mania public, the simple-as-dirt SE triode amp somehow got twisted up in a web of bizarre holistic single-ended intrigue, becoming a symbol for something bigger than bigness itself, occupying the sphere of creative lifestyle mapping and even taking on a deep spiritual new-agey dimension that most home appliances and tools do not inspire among their users.

Simplicity has always been holy to tweaks and single-ended no-feedback triode amps redefined the possibilities of minimalism.If *simple* is the goal, here was the golden path to the promised land. Get behind the wheel of a single 300B and you're there.

The sages say "Less is more" and perhaps it is—but it is still *less*, and if there is a SE-DHT Zen paradox at play, this is it.

One kind of power trades off against another kind of power. Low power amps have certain abilities that higher power units might not, but the argument goes both ways, back and forth, quite a few times.

Projecting from past lessons, I believe that it's a mistake to block *any* path just because it isn't the purest, coolest way to design according to this year's modes of techno-elitism. SE fanaticism sure is fun, but the ears know that there are plenty of valid ways to play music with electronic equipment. Open minds and clean ears are what paved the way for SE triodes. The further exploratory power of this open-to-whatever-works attitude is still tremendous. There's *always* more to discover.

Well, what next? Mini-watt amps may be great at special jobs like biamping,but thier low power ratings present obvious practical constraints, things being as they are with loudspeakers. The power shortage undeniably limits the systems we can build with this good-sounding technology. So, what about triode amps with more output power? Can we get some extra juice without paying too high a price? Although I am perhaps the world's biggest fan of low-powered SE triode amplifiers, one must admit that, in terms of output power, the only way from there is UP.

So, if either kicking some wide-range booty or expanding the practical applications of triode-fueled musical reproduction are among our goals, as they should be, let's see what else is up besides single-endeds.

A survey of old books shows that given known technology, available materials, and a few forgotten tricks, there are many ways to break the eight-watt barrier with some degree of class. And maybe some of them would not require selling our souls to the devil, although attitude shifts and mental readjustments may be required.

Back to the source

I wanted to build the 1948 Peerless A100 kit amp featured in SP #16 for about fifteen years, ever since I found that ancient issue of *Radio and Television News* at a flea market. Reading Melvin Sprinkle's article took me back to those innocent years before the coolness of SE, *wu*, the first watt, amorphous cores, and other fun wackyness of the last ten years of hyper-fi elaboration, back to the source.

What the ancestral Altec pro designers were after was a high-power TRIODE amp for home use, a very "purist" sort of thing back then, as it is today, now that we have relearned what triode amps can do about musical enjoyment in the home.

Okay, the power triodes in the A100 were an indirectly-heated variant, not our holy DHTs, the mode of operation Class AB2 not *pure* Class A, and the amp incorporates some now-dreaded global feedback, but this artifact of bygone industrial pro-audio design was obviously a high-aspiration package for the crack sound engineers who put it together.

Its link with our generation's practice is through the buzzword *triode*. When you wanted very high quality reproduction and were willing to pay a few extra dollars per watt, there was a lot to be said for triode amplifiers…and there still is.

In this design, Altec tried to address the power economy of the triode amp, beefing up the efficiency with Class AB operation. Contemporary triode hifi buffs insist on nothing less than luxurious Class A, the power limitations and the rapidly rising cost curve for output power above a few watts not withstanding.

Class A is expensive. An equal investment in tubes and parts delivers progressively much higher power in Class AB, AB2, or B operation—and so it was that triodes were typically used in olden days, even in exacting high fidelity applications such as cost-nearly no-object cutting head amps and such.

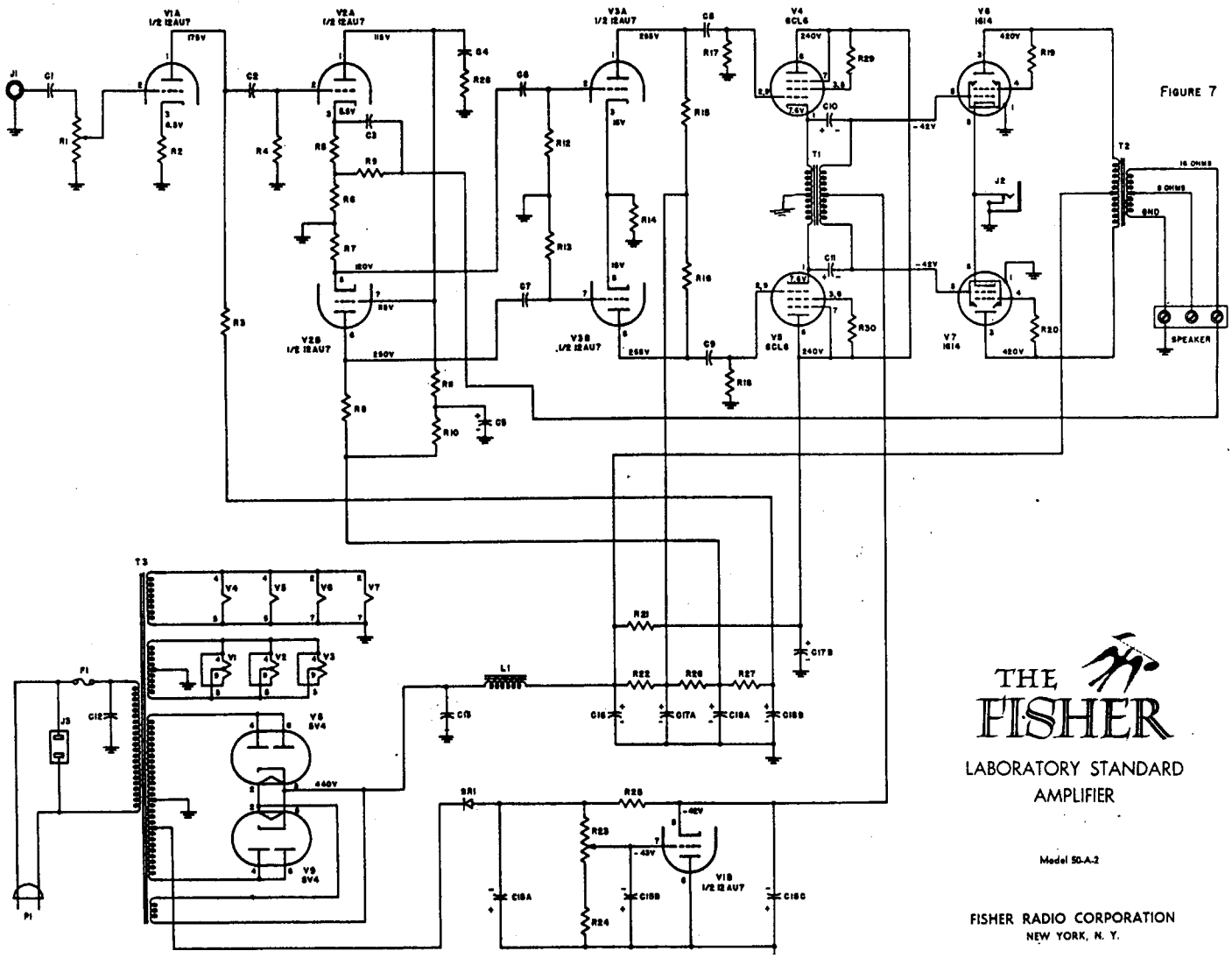
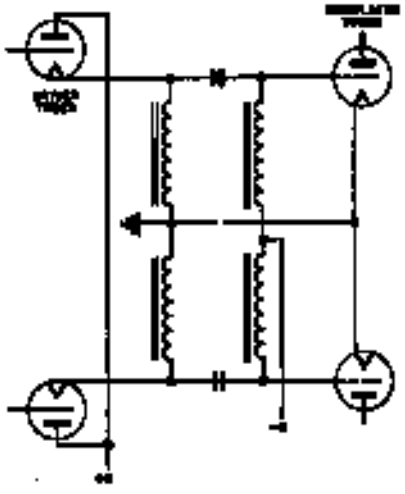


FIGURE 7

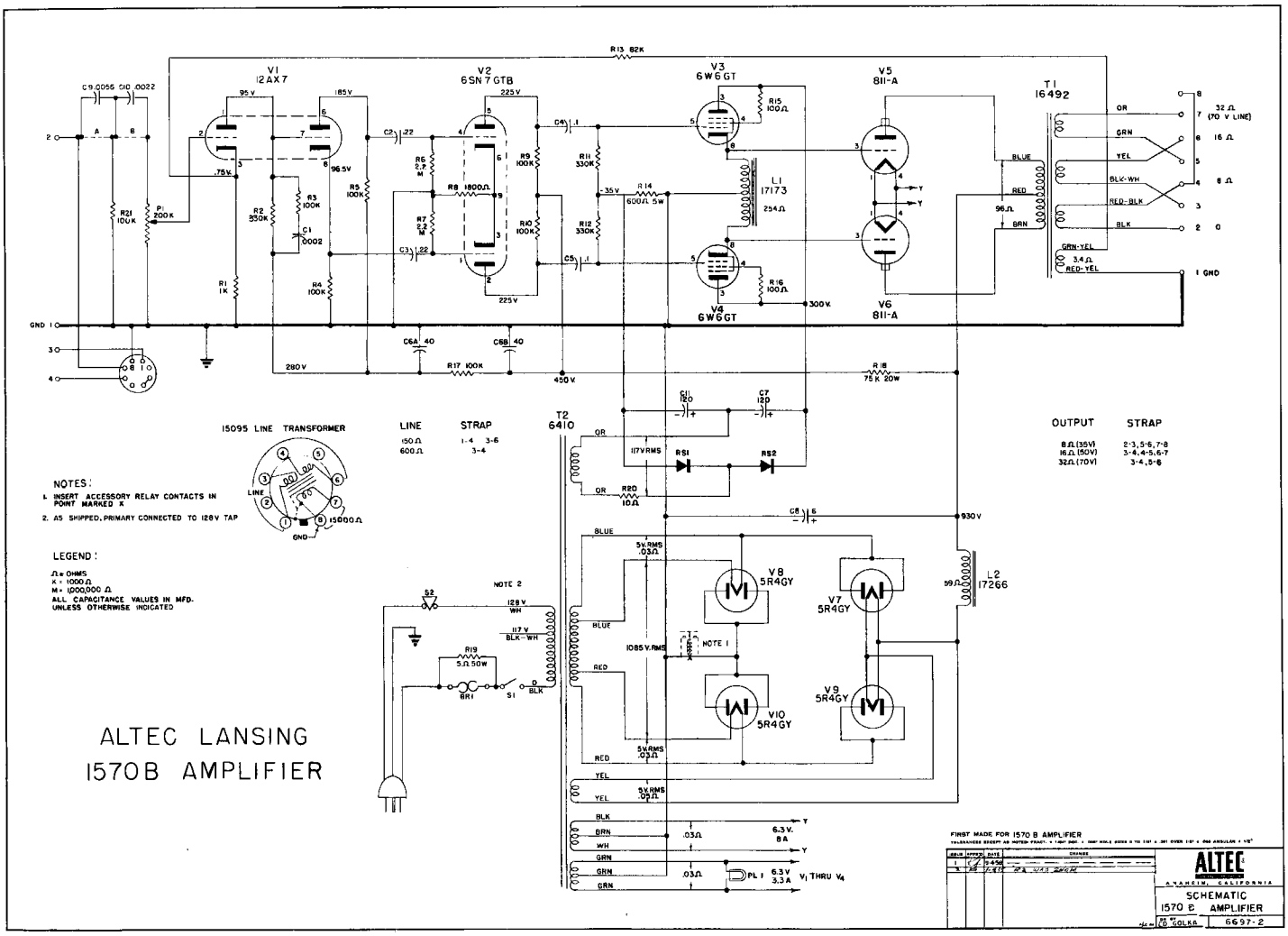


ABOVE: Though not the fashionable thing to lust after today, triode-wired PP pentodes with a low-impedance cathode follower driver stage were hot stuff in some upmarket early 1950s hi-fi amps, such as the Fisher 50A (6S4s or triode-wired 6CL6s driving triode-strapped 1614s) and later 55A which used this drive scheme for claimed efficiencies in excess of 55% with 50 watts out.

LEFT: Suggested driver topology for 1940s state-of-the-art high power modulator from Reuben Lee's 1947 text, "Electronic Transformers and Circuits."

Iron core components are employed to provide required AC impedances with low DC resistance for minimum power loss,an important consideration in high power Class B amps which often presented substantial cathode current and grid current demands.

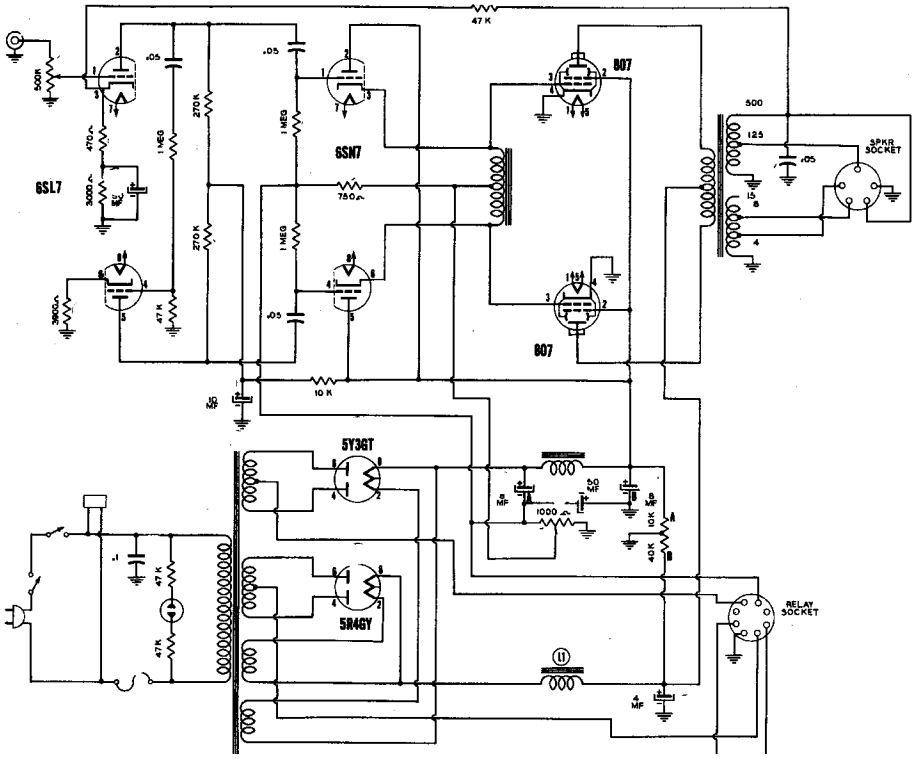
Symbol	Description
C1, C2	Capacitor, Molded Tubular: .1 mfd; 400 V
C3	Capacitor, Ceramic: 24 mmfd, 10%; 500 V
C4	Capacitor, Ceramic: 220 mmfd; 500 V
C5	Capacitor, Electrolytic: 1 mfd; 450 V
C6, C7	Capacitor, Molded Tubular: .01 mfd; 400 V
C8, C9	Capacitor, Molded Tubular: .1 mfd; 400 V
C10, C11	Capacitor, Electrolytic: 20 mfd; 150 V
C12	Capacitor, Molded Tubular: .01 mfd; 600 V
C13	Capacitor, Molded Tubular: .01 mfd; 1000 V
C15-A,B,C	Capacitor, Electrolytic: 20 mfd; 100 V; Com. P
C16	Capacitor, Electrolytic: 80 mfd; 500 V
C17-A,B	Capacitor, Electrolytic: 40 mfd; 450 V
C18-A,B	Capacitor, Electrolytic: 40 mfd; 450 V
R1	Potentiometer, Composition: 500,000 ohms
R2	Resistor, Composition: 4700 ohms, 10%; ½ W
R3	Resistor, Composition: 100,000 ohms, 10%; ½
R4	Resistor, Composition: 470,000 ohms, 10%; ½ W
R5	Resistor, Composition: 2200 ohms, 10%; ½ W
R6	Resistor, Composition: 1000 ohms, 10%; ½ W
R7, R8	Resistor, Composition: 47,000 ohms, 10%; ½ W
R9	Resistor, Composition: 2200 ohms, 10%; ½ W
R10	Resistor, Composition: 100,000 ohms, 10%; ½
R11	Resistor, Composition: 47,000 ohms, 10%; ½ W
R12, R13	Resistor, Composition: 470,000 ohms, 10%; ½
R14	Resistor, Composition: 4700 ohms, 10%; ½ W
R15, R16	Resistor, Composition: 100,000 ohms, 10%; ½ W
R17, R18	Resistor, Composition: 470,000 ohms, 10%; ½
R19, R20	Resistor, Composition: 68 ohms, 10%; ½ W
R21	Resistor, Wirewound: 4000 ohms; 15 W
R22	Resistor, Composition: 2700 ohms, 10%; ½ W
R23	Potentiometer, Wirewound: 10,000 ohms; 2 W
R24	Resistor, Composition: 2200 ohms, 10%; ½ W
R25, R26	Resistor, Composition: 4700 ohms, 10%; ½ W
R27, R28	Resistor, Composition: 10,000 ohms, 10%; ½ W
R29, R30	Resistor, Composition: 100 ohms, 10%; ½ W
F1	Fuse: 3AG; 3.2 Amp. Slo-Blo
J1	Jack: 1 Female Contact,
J2	Jack: Closed Circuit
J3	Jack: 2 Female Contacts

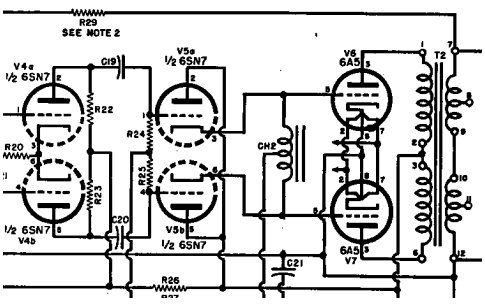


ABOVE: Famous Altec 1570B PP 811A amplifier put out 165W from 70 Hz to 20 kHz. People crazy enough to run these green monsters at home seem to like them a lot.

RIGHT: Bogen 807 PA Amplifier from early 1950s with similar driver scheme.

BELOW: Driver stage of Peerless A-100A 6A5G amp from SP#16 uses down-scaled version of 1570 driver arrangement





There weren't many home hi-fi "triode" amps in the Golden Age of postwar hi-fi but those that appeared were Class AB2 high-power jobs—30 W for the Brook 10C and 50 W for the Fisher 50A. Thirty-plus watts was big power back then,some of the most potent amps available.

Things haven't changed all that much. Then as now, some high rollers wanted both high-power *and* triode quality. Unlike today, well-engineered Class AB or B PP triodes were then considered luxury-grade designs. Today's man wants A all the way.

All of the above-mentioned amps used interstage iron to cope with the DC requirements of AB2 service and you don't usually see this in vintage hi-fi amps. The transformers and chokes were there out of electronic necessity, not because of coolness factor. I doubt there was any "coolness factor" to interstage iron in 1948.

A comparison of circuits shows the Peerless A100 amp to be a "baby 1570" circuit, derived from the Altec 165 watt big mother 811A amps that powered drive-in movies and large-scale PA systems nationwide. In essence, the A-100s as triode hi-fi amps were a by-product of the reigning concepts of high-power triode commercial amp design, downscaled to domestic requirements.

My point about the historical respect for Class AB amps is not to argue that pure Class A1 (no grid current) operation isn't the best way to run tubes because *obviously* it is. A1 might be an energy inefficient, low power out way to do things but the constant current conditions of A1 greatly simplify challenges for the whole amp design.

Efficiency is gained by shutting one of the tubes off, fully or partially, for part of the duty cycle. When that starts happening, life gets tricky fast. Class AB and B amps are a dance of tubes switching on and off, grids driven into conduction, and related demands on the driver stage and output transformer, not to mention the need for a power supply that will keep up with all this energetic activity.

Short and simple, the more efficient the amp, the further away from the safe waters of simplicity we stray. Efficiency isn't free.

I understand that from a certain fashionable techno-purist perspective, the Peerless amp is a nightmare come true but I was thinking it might sound good anyway. That's why I finally built a pair after all that thinking about it.

Building my 1999 Peerless Amps

Since I was so enthusiastic about this experiment, I decided to go all out, using only the best components I could possibly scam, mooch, and gouge from my favorite suppliers and friends.

After a year or two of shameless begging, I had a pair of B-stock walnut chassis liberated from my pal Gordon at Wavelength, a nice set of repro Peerless iron from Magnequest in exchange for the race car pic in #16…

Then I had a box of exceptionally nice 2x10 mF 600V rectangular Micamold oil transmitting caps with inch-long ribbed glass terminals, pried from Ron Welborne's private stash, before I hammered him for a "friendly price" on the lot. I'm sure Uncle Sam paid some serious dough for these first time around. I didn't want to repeat that mistake.

Whew…collecting quality parts for a major project like this is hard work, but well worth the effort,I must say.

Speaking of parts, there are a lot of them in this amp and I had to work to fit everything onto a 14 x 12" plate. I had to use some steel sheet to isolate the input pot to kill hum, and some wires are longer than I would have liked.A 17 x 14"chassis would have been a real plus, especially with the big oil caps, but too late for that now!

For small parts, I chose classic American stuff that would have been the coolest in 1948. Allen Bradley carbon resistors and Type J volume pots, surplus ceramic power resistors, E.F. Johnson ceramic sockets, and Vitamin Q caps.

I couldn't resist using a Western Electric 4 mF oil cap for the 6J7 screen bypass because I found a couple of these industrial beauties in original Signal Corps packaging years ago and I've been waiting for a circuit where I needed 4 mF to come across my bench! The gold and black water-slide decal makes these the baddest vintage parts in the junkbox.

On the other hand, I did install some extra decoupling with fresh datecode Cerafine caps and I used a couple late-model Black Gates where funky 1940s electrolytics were specified in the original plans.

Then, I switched out the Vitamin Qs upon arrival of the "care package" I weaseled out of Charlie Kittleson at VTV Pro Shop, importer of Ultratone silver and paper oil caps. I wouldn't have kept them in the amp if they didn't work better than the Qs, but I couldn't argue with the combination of softness and sparkle the silver caps added. I'm not much of a silver freak,but I did like the smooth but well-defined flavor of the Ultratones enough to try to mooch a couple more when I need livelier and more airy coupling caps than classic surplus paper-in-oils. Be sure to mention "Joe Roberts Labs" when you place your order to pave the road for future "review sample" raids on VTV Pro Shop.

In the end, although I intended to stay as original to the classic design mentality as possible, the parts selection process led to many modern audiophile substitutions and even the old parts I used were generally higher-grade than what Altec used. Why limit myself?

The end result is that my 1999 Peerless amps look like what they are—fancy homemade hyper-fi triode amps of 1999, an eclectic melange of selected fancy parts, from new to 60 years old, arrayed on a hardwood presentation-style chassis that those rack-mount minded ALTEC sound engineers would never specify for an hard-working audio frequency amplifier.

How Do They Compare?

I suppose the big question is not how cool my homebrew project is as an *objet d'art*, but rather how do these feedback push-pulls compare to a SE no-feedback triode amp I could build with the same level of attention and the same basic parts quality, for about the same investment?

I would have to say that the comparison is very instructive and says a lot about the relative ups and downs of SE amps. One thing that is gone with the PP Peerless amps is that over-the-top emotional expressiveness that is the recognized specialty of no feedback SEs. The Peerless amps are more controlled and restrained, which is both a plus and a minus, depending on when you ask and how I'm feeling.

Unlike the pleasantly puffy low end of my SEs, the bass of the Peerless amps comes across well-damped and tight. Some of the apparent weight behind the low end delivery of SEs is lacking, replaced by improved transient edge definition, but I've been wondering whether a lot of SE bass, while quite pleasant, isn't overblown and melodramatic anyway.

I'd have to mirror similar assessments across the audible frequency range:This PP triode feedback amp seems to be freer of sonic special effects than a lot of the single-endeds I have known and loved.

I suppose one could say that these PP amps sound more realistic and natural in many ways because they don't engage in audience manipulation like SEs. However, the juicy excesses of SE are part of what I liked about the breed.What's wrong with a little excess when you're in the mood for it?

The pronounced character of some SE amps seems to work in favor of music listening *sometimes*, but this depends on the system, program material, and listeners, on a case-by-case basis. The Peerless was more tonally austere than the average 300B SE, but the color and vividness was still there. The leaner sound of the A100 added some emotional contrast which can get drowned with a really lush. beautiful sounding SE.

Probably, SE triodes are still the undefeated champs of midrange, but in most situations low-power NFB SE bass is definitely *beatable*, even though often not bad. One answer to this age-old dilemma, of course, is multi-amping, perhaps still the ultimate way to go if you've got the space, the amps, and the inclination to mess with it.

Is this push-pull amp a world beater? No, I wouldn't go that far. In fact I think I could build a single 300B amp for the same money that could well turn out better, if "better" means more dramatic, more impressive and attention getting. The Peerless amps aren't much of an audio circus act compared with a lot of the stuff out there.

I do miss the psychedelic SET midrange a bit, be lying if I said otherwise, but I like the tasteful natural presentation of the upper mids and highs from this amp as well as the snap factor and rhythmic aptitude. Not dry, not over the top, not soft, not hard-edged, the Peerless amp project gave me a well-balanced upbeat result that is quite a satisfying listen. It has balance.

Maybe I'm just burned-out on reviewing, but I can't think of very much to say about the sound of this amp even though I like it a lot—and that is a compliment, I think.

THE ATMA-SPHERE M-60,Mk.II

As discussed above, the noble goal of whuppin' butt with triodes is best approached with an open mind regarding topologies, techniques, and tubes. Lo-watt SE-DHT has a lot going for it, no doubt, but the would-be butt-whupper might want to cast out a wider net.

One amp topology that hasn't lately enjoyed the cachet it used to have is the Output Transformer-Less (OTL) scheme. Maybe with good cause, because the OTLs that were major excitement back in the old days just never really delivered the goods, if the goods you were looking for are the absolute very best in sound.

Perhaps one reason that OTLs got stuck at *very good* and never hit the *jaw-dropping great* level is that the traditional OTL scheme *a la* Futterman required a huge capacitor at the output to block the B+ from running through your speaker cables and voice coils.

Though traditional OTLs with massively parallel sweep tubes and 3000 mF output caps had nice body in the lows and mids, the highs usually sounded kind of snuffed out and/or grainy. I blame the cap, although the very high levels of negative feedback used in Futtermans probably didn't help with the mechanical sound tendency.

Many old-time tube devotees thought getting rid of the "nasty" output transformer was worth putting a several thousand mike electrolytic cap directly in the speaker line, but I personally never had a problem with output transformers, except that good ones are not free.

Over time, audio hipster ideology shifted to the belief that transformers sound good and folks want more and more iron, anywhere, everywhere. Today, a poll of maniac audiophiles would probably show that iron is well-loved and it is *capacitors* which are believed to be the scariest devices in audio. In these pro-transformer days, OTLs have lost much of their former cognitive appeal.

Still,if one could get rid of the cap *and* the output iron, *that* might be something to hear. And *that* is what Atma-sphere has been doing for almost 20 years with their adaptation of the 1950s Wiggins Circlotron bridge circuit to OTL amplifier design.

Atma-sphere keeps the DC out of the speaker coils by using equal-but-independent floating power supplies on the two sides of the bridge in such a way as to have the output terminals between them at zero VDC potential.

Ralph Karsten, chief designer at Atma-sphere, is a tube nut of the first water, been around for a long time and he's seen it all. He's very thoughtful and well-studied on the general subject of tube audio, and although he's been in the biz for decades, he's still really excited about tubes and very refreshing to chat with because he obviously still loves what he does. Beyond that,he's an outre ethno-musician, former sitar and sarod picker, now specializing in Native American flute! As just another white boy blues harp player, I'm impressed!

Well, more than twenty years ago, Ralph latched on to the kernel of the old Circlotron scheme and took it places it had never been before. The original EV Circlotron amps were Class B pentode jobs with output transformers, bearing little concrete resemblance to the refined and patented Atma-sphere OTL topology.

On a structural level, "circlotron" is just a geometry, a configuration, like SE and PP, and it can be adapted to many uses. The M-60 design is an output capacitor-less OTL that is a pure Class A, low or no negative feedback (factory option), genuine triode design, using inexpensive 6AS7 output tubes, delivering a whopping 60 Watts output into 8Ω. Looking at it that way, sounds

pretty interesting, and a whole lot more interesting than the vintage Circlotrons, which were mainly techno-curiosities.

The only buzzword purism sins these amps commit is that a) The M-60 is *not* a single-ended design and b) It uses *indirectly heated* tubes instead of the canonical DHTs. So what, this well-conceived scheme is, in all fairness, exotic enough to hold its own in any parade of lunatic fringe designs. If a triode OTL isn't arcane enough,get a life, you know?

Actually, the manufacturer worked hard to make the M-60s a practical *non-exotic* product, as simple and trouble free as possible, based on common tubes that would be widely available in the future. The lifespan of a tube amp is fairly long and Ralph likes to think in terms of a "twenty year rule" which implies that he wants and expects to be able to support 1999's Atma-sphere amps in 2020.

The M-60s classic silver hammertone, deco-mil-spec retro styling make for killer industrial art up on the shelf. Form-function electronics surplus *objets trouvees* like jeweled red and amber pilot lights with real incandescent bulbs, bat-handle toggle switches, and a photo-etched mil-style nomenclature tag evoke the saga of tube electronics through the ages.

This classic form-fits-function visual design is a virtual celebration of the romance of bygone technology. With the pilot lights glowing and the 6AS7s all lit up, they put the Christmas tree to shame.

Yet, like anything that is cool about being self-reflexively retro, the M-60s don't overdo the act.Indeed,when they're on there is so much luminescence from the tubes that it is hard to focus on the metalwork! With tubes galore like this, you don't need ornamentation to augment the visual appeal.

One brute fact that struck me was the moderate weight of the M-60s. Although each chassis has a substantial 17 x 13"footprint, my last stupid-heavy, oil capped, choke input power supply, output transformered DIY linestage weighed more than one of these under-30 pound OTL monos!

As mentioned above, it is also easy to notice that there are a LOT of tubes in these monoblocks, definitely a tube-lovers' tube amp! The output stage consists of eight 6AS7s per side, an industrial dual triode that has the sexy coke bottle curves that gentlemen prefer. The manufacturer uses and recommends Russian 6AS7s and warns against NOS RCAs because they tend to flash over at turn-on. NOS Sylvanias, apparently the prototype for the Russian versions, will work just fine.

Fortunately, 6AS7s are a durable industrial type, plus a common and reasonably priced current production tube, so retube considerations shouldn't be too painful. Atma-Sphere gets about $20 each for cherry picked Russians and you can probably pick some yourself for even less.

The voltage amp and driver stages use four 6SN7s per side. The voltage stage uses a differential cascade arrangement employing two bottles, with paralleled halves of a 6SN7 working as a current source for the differential pair. The output of this unconventional voltage amp hookup is coupled to the grids of the 6AS7 array via a pair of 6SN7 cathode-follower drivers.

The input of the M60 is capable of being driven by a differential input via the front panel XLR jack, or via unbalanced RCA inputs with a little shorting jumper stuck into the XLR, as seen in the photo. Atma-sphere's preamps employ balanced differential outputs to maximize this capability and present the opportunity to have a balanced differential system all the way through.

I suppose the ultimate irony of the Nineties would be to take one of those high-fashion line stages with a balanced transformer output and drive the OTL with some output iron. Why not? It's still legal to get crazy like this, for now.

Like all OTLs and tube amplifiers generally, but OTLs especially, the M-60s like a highish impedance load, 8 ohms or better. The M-60 is rated at 60 watts into 8 ohms but 45 at 4 ohms. With 4 ohm speakers, the damping is somewhat compromised and the bass can sound a bit undercontrolled, according to Ralph. Atma-sphere's bigger OTLs, using more output tubes for lower output impedance, are happier with 4 ohm loads.

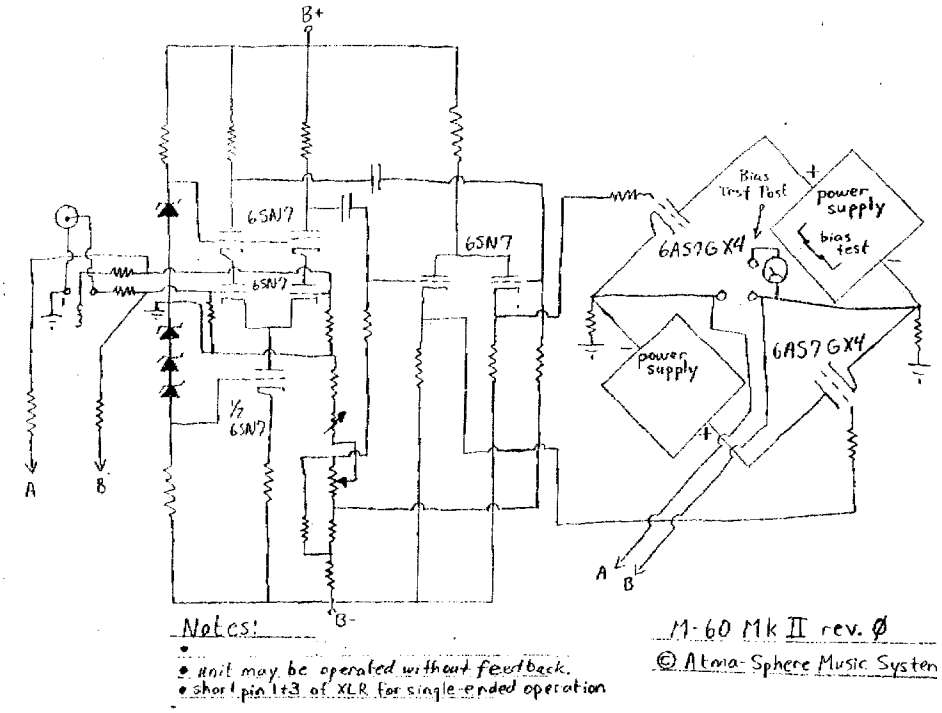
The M-60 is usually shipped with a moderate 2 dB of negative feedback to assist in driving low Z loads, but they will send you amps with no feedback upon request. The dividing line where feedback starts to help is the 8 ohm point.Above 8 ohms, it doesn't matter much if the amp has the feedback or not.

Ralph claims that they tried a feedback switch but the difference between no feedback and 2 dB feedback was quite subtle. On the other hand, the effect of switching between 8 dB and no feedback,which they also tried, was quite dramatic and suggested that the lesser amount of feedback was far the better option.

One of the reasons the M-60 aroused my interest is that it is available in kit form.My ears always perk up at the mention of a kit. Aside from the abstract pleasures that kit building provides, its hard to ignore the positive economics of going the kit route. The storebought version goes for $4195 and basic kit goes for only $2495! That's getting close to the point where you can get a biamp quad set of M-60 mono kits for the price of one pair of ready-mades, a discount not to be sneezed at.

Although the M-60 chassis is quite spacious and the components are not crammed into the box,this amp has a lot of connections in it, a lot of wiring snaking about. By the looks of it, I would have to rate this a kit project of at least moderate

Atma-Sphere M-60 Mk.II OTL Amplifier
Schematic Diagram



difficulty and scope. Like the Peerless A100 discussed above, the M-60s have a lot more parts in them than most simple SEs, so this would be a somewhat bigger undertaking than a 91 amp or similar DIY SE special.

Since it's a kit, though, you're saved from the exacting dog work of the metal shop and you can rest assured that the end product will look better than what 99% of garage homebrewers could accomplish. And what you'll end up with is a name-brand item, in case you ever want to move it along. There's not much buyer demand for ugly scratch-built homebrew OTLs these days, so you can build it for less yourself from scraps and throw all your investment away.

Compared with what you can buy ready made in 60 watt monoblock triode OTL amps for $2495, I'd have to say that the Atma-sphere kits easily hold their own, if you know what I mean. Seems like a good value package for the money, even without hearing it. And I am pleased to give these amps an enthusiastic thumbs-up for the way they sounded too.

Although I have only heard four or five OTLs, these are easily the best OTLs I have heard, but beyond that I'd have to say that they are wonderful TRIODE amps, enjoyment+ for music listening. I found myself digging out old R&B vocal harmony sides and roots reggae records to play on the M-60s. Great, great T-Bone Walker amps and outstanding for bluesy female vocals like Etta James and Dinah Washington, the M-60s have a lot of character and create a lot of atmosphere in the listening room…or is that *Atma*-Sphere?

There's no mistaking the special tube flavor of the sound of the Atma-Spheres, a nostalgic, grandiose tone that evoked a classic vintage tube amp sort of charm, but I would be hard pressed to name any specific vintage amps that sounded like these do. Most vintage amps don't compete with the M60s in terms of immediacy and fresh air. These amps are colorful without sounding deadened or muffled like most antique units.

Even though the M-60s were a new experience for me, they sounded very familiar, very friendly. Smooth beyond smooth, the M-60 is easily the most fluid, grain-free amp I ever heard in my life. Very easy listening. Maybe THIS is why people want OTL/OCL amplifiers?

The mental image I'm trying to find words to describe is the big triode jukebox sound—vivid, dramatic, super bouncy bass, big liquid midrange, 3-D effects out the yin yang. The M-60s are a very fun-filled, hedonistic listening experience that has a lot of the tonal romance of a 300B single with much more grunt and power.

I say *romance* because like a triode SE, the M-60s present a blatantly "tube enhanced" portrayal, but like the good SEs, the M-60s do it in a refined and sophisticated manner that adds to the comfort and enjoyment level of music listening without coming across as a cheap overdone special effect.

Right before packing them up, after a couple hundred hours use, one Sovtek 6AS7 heater went out. Didn't even notice at first because the amp kept playing fine. Could have been like that for a week or two before I noticed it. No explosions, no fires, no meltdown. To be honest,I couldn't even hear a difference. OK, I'll turn in my reviewer's license at the door.

Otherwise, the amps ran problem free for the nine months I had them. Some tweaking and adjustment is required at setup and during the initial burn in period.After that, they didn't require any attention. I was worried that they would be flaky about adjustment but they were very stable. When I swapped them in and out of my system, I periodically checked the bias and balance, they were more or less still right on.

Worthy of note is that sixteen Class A 6AS7s definitely throw off some British Thermal Units as a by-product of that fifty watt Class A output. Ha, Ha—Did you think Class A was free? I noticed the extra warmth in the listening room after the amps cooked for a while but I live in sun-baked Texas and I'm used to running low watt two tubers.

I will mention that my fellow Texan, John Day (who lives in a part of Austin just as hot as here) heard these M-60s and blurted out the analysis that "they sound like a powerful, well-broken-in engine!" He begged me to borrow them to run his Altec A7s and he was on the verge of buying, until his wife threatened to move in with her mother if he bought another tube amp. John says they're the best amps he ever heard on his horn system. I say about time you heard a real amp, bubba!

Another Austin audio buddy, jazzbo triode DIYer, Dexter Guilford, came over to hear the Peerless amps a few weeks ago and he promptly called LaFevre and bought a set of Peerless kit iron. Different strokes for different blokes.

The moral of the story—aside from the obvious implication that I should be out

shaking down manufacturers for even more payola—is that there is still a gold mine of good ideas off the beaten-track and a lot of potential payback in prospecting out in the unmapped fields of audio experimentalism. The chances are that you and I would find much to enjoy among the possibilities.

The real subject of this article is something that is impossible to put into words: how these amps sounded similar, while sounding quite different. I'm trying to probe how they are both examples of triode amps, without invoking the almost-useless, non-descriptive buzzword "The Triode Sound," even though that's what I'm wanting to say.

Both amps have the quiet background and the natural yet colorful tonal palette I expect from triode amps. Both designs were relaxed and smooth without being muddy and obscure, and that's a quality I can definitely relate to triodes.

Both amps were forgiving of the quality of the source material, being friendly to less-than perfect records and recordings. As Herb Reichert once put it, "A good amp is one that plays *all* of your record collection." Triodes, to me, mean *easy listening.*

The M-60s were a bit softer than the Peerless amps, the bass was a bit more full and punchy, and they were perhaps somewhat smoother than the PP homebrew monos, all the while sounding three times as powerful, which they are.

The A100s had a bit more of a high-definition information retrieval illusion and the whole presentation was slightly shifted toward brightness a notch from the bouncy, rich midrange of the M-60s. The A100s had more gritty bite in the upper mids than the Atma-spheres, which was nice on cymbals, but,from another perspective, the utter lack of any nasty edges was a positive feature of the OTLs.

Despite certain pronounced differences in flavor between these amps, there's a remarkable alikeness in fundamental presentation characteristics—the way they projected music into room space, how they rendered texture into the body of the sounds, how they engaged the ear— which is not to say that either amp sounded generic.

The two sets of amps represented two wildly divergent concepts of amp design, yet they sounded like they were swinging from the same family tree, the top branch on the Triode Bush, perhaps.

I mentioned the triode similarity aspect to Ralph Karsten and he suggested that maybe this is an example of a wider phenomenon where the sound of amps tends to converge as said amps get "better." He said, "Music only sounds one way—like itself—and this is why as amps and speakers get better they should exhibit less difference. So it should come as no surprise that two high quality triode amps of different design should sound similar if all the ducks are in a row."

There could be something to that line of thinking, although I'd want to leave the question of "better" as open as possible to allow for future surprises.

I will say this, that as I listen to more triode amps—single-endeds, push-pulls, low power or high power, directly heated or indirectly heated—I'm hearing a lot of the same things. Good things.

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Manufacturer's Comments—Ralph Karsten of Atma-Sphere

Our goal with our amplifiers was to create a new type of amplifier that had never been made;not just for the fun of it (although we had a lot of fun anyway) but because it might serve the music. The result was the world's first reliable OTL (a term that sometimes makes us cringe because of the unhealthy legacy left behind by Futterman and his heirs).

We made the amp reliable by also creating the world's first symmetrical OTL, negating the need for the dreaded negative feedback that kills music. We believe in the principle of Occam's Razor: the simple solution is probably the right solution—so the amp has only one stage of gain, making it, so far as the music is concerned,the simplest tube amp in the world.

It is the only amp in the world that is Class A, all triode, fully balanced (differential) throughout, zero(or 2db) feedback with a single stage of gain and a direct-coupled output.A bit of a mouthful,but the better your speaker the easier it is to hear how much better it is.By comparison, it is a little less colorful than most SE designs, due to its lower distortion. You'll get used to that real fast. Once you get used to hearing this, SE amps tend to sound harsh by comparison.

We don't like feedback at all but were forced to deal with the issue in the M-60.The problem is that altogether too many people want to use tube amps with the wrong type of speakers.So if you haven't heard it before, you are hearing it here now: IF YOU LIKE TUBE AMPS, STAY AWAY FROM FOUR OHM SPEAKERS!!

The fact of the matter is,ALL tube amplifiers perform better on 8Ω or 16Ω than they ever could on 4Ω.Of course, having said that,there are a lot of 4 ohm speakers that work fine with our amps,but all other things being equal they would all work better if they were 8 ohms instead.

OTLs have gotten a bad rap not only on account of reliability but also load sensitivity. The thing about that that surprises a lot of people is the revelation that transistor amplifiers are actually MORE load sensitive (although in the opposite direction,less power into high impedance, the opposite of tubes).

We have built the only DHT OTLs in the world. We used the 300B (4 per channel) and produced 14 watts into 8 ohms. The amp sounds very similar to our 6AS7 based designs, in fact, the choice of output tube has only a small bearing on the sound we achieve.

I've often thought about using the 2A3,since it would be a cinch, but once you've gotten used to really clean power its hard to get by with less—I like to rock! 2A3s would require quite a few on hand to do anything significant.

We have finally introduced the S-30, a 30 watt stereo amplifier, in our quest to offer OTLs at an affordable price. Actually, our vision has always been to build the 'OTL for the masses', something that was only a dream before we made reliable OTLs a reality.

Despite the fact that we make only balanced amps and preamps, we have always felt that we had more in common with the single-ended crowd then the powerhouse (read: club-handed) push-pull camp. That is because we have shared the vision of simplistic circuitry with Class A triodes and zero feedback. For what its worth, we have been making triode amplifiers for a longer period (over 21 years) than any other manufacturer in the world.

The SE revolution served to legitimize our way of life;in the 70s we were simply thought of as nuts ("triodes? really? I gotta go.."),in the 80s, quaint,if not a little exotic, and in the latter half of the 90s (after 20 years) we are finally experiencing market acceptance. The presence of high efficiency speakers has been a boon. We have many Lowther and horn customers (and have had a long relationship with horns on the home front as well).

One nice thing about this OTL technology is that the sound is not limited by high power. Our larger amps actually sound better than our smaller amps,flying in the face of conventional wisdom.

This means that lower efficiency speakers can be used, but even with a set of the 220 watt MA-2 MkIIs,its nice to have a speaker that has efficiency in the low nineties rather then the mid eighties! If you ever want to hear how good the recording really is in Black Sabbath's "Paranoid," you simply have to have a speaker that's easy to drive!

By the way, our amps are so reliable that they hold up easily as guitar amplifiers. The only problem is that they don't 'bite' like conventional guitar amps do because they won't distort as much.

A last word. The thing that has always made Sound Practices a cool mag has been the simple fact we must emphasize having fun in the process. FUN is the most important aspect of audio. Avoid der tube Gestapo! I hope you get where we're coming from.

Thanks and happy listening!

Ralph Karsten