

# Triode Dick's Page

## Audio Research LS7

...a nice adventure...

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### A little bit from myself and a lot from BJ...

It's not a casual thing to do for the average music lover... building an amplifier from scratch, with transistors or tubes. But hey, all those enthusiastic stories about the tube makes you curious nevertheless. You can try talk yourself into a courageous mood to see if it's not possible to build your own amplifier. A pre assembled manufactured amplifier is not what we really want, looking at the current prices. However there are a few nice and payable amplifiers for sale, thanks to the cheap labor force in the Far East. But there's also a lot of junk on the market, from builders that ride along the reborn popularity of the tube.. Not long ago, another alternative came into focus: I found an Audio Research

pre amplifier for sale.... A LS7 produced in the late nineties..



Audio Research will always speaks to the imagination of a lot of tube lovers, because of their very recognizable amplifiers, which appearance seems not to be changed since the 70's. The sturdy cabinets with thick front plates and provided with a few characterizing handlebars. It is one of a few

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cabinets from which I find the handlebars almost indispensable beautiful. The shape of the knobs and long toggle switches are also typical Audio Research. It is breathing some sort of timeless quality. An AR amplifier from 20 years ago still doesn't look outdated. You can call that a compliment to the designer. They won't cooperate to contemporary fashions. The inside is just as sturdy looking. All PCB's are twice as thick as normal and are in-house produced. You can recognize an AR PCB out of thousands, even when there's no tube used. It looks very much like Mil. Spec. stuff, what's made for eternity..

## The Big Man...

The Big Man behind Audio Research is Bill Johnson, the 'BJ' in the title of this story. Bill always made tube amplifier, withstanding all solid state storms, from the moment the tube was out of fashion and obsolete, according to the industry.... But Bill also left the tube path and produced less good designs. Some hustling with FET-amplifier stages, hybrid designs where a tube just could shown its filaments



but had no additional value..... all solid state, that, much worse, not really sounded nice. But the man always came back to the 'real thing'. In the year 2005 it was again all tubes they produced. The solid state is at service of the glowing glass tube and not the other way around. That's how it should be.

## The LS7...

The LS7 line amplifier where this is all about, is a box filled with tube stars..

Four tubes, straight as a whistle, so far as I can see... a solid state controlled power supply, not much wiring because of the well-



designed circuit and an Alps stepped attenuator. The LS7 is, I think, the last AR tube pre amplifier with a conventional volume regulator. AR was already in an early stage busy with electronic controlled volume regulators. The descendant of LS7, the LS8, had an almost identical setup, but was provided with a solid-state controlled volume regulator. A little bit odd, 8

years ago, when those things weren't that fantastic as they are nowadays..

These days the technique is evolved in a way that there are really good sounding volume regulating IC's, but I remember that the LS8 didn't receive a warm

welcome (sound wise) by the writing press. The LS8 was evidently judged as the subordinate of the LS7.

What's the fun of a LS7 from Audio Research? The first thing is, that you can find an amplifier in mint condition for a few bucks... 650 euros in my case. Quite a machine with a lot of potential. A cabinet just built from aluminum, a well-built interior and a pleasure to operate. You can't buy a China Amp that measures up to this American for that kind of money.

## Other tubes...

Through an ad in the local paper, I met a friendly man in the neighborhood. A fancier of older audio jewels as Quad ESL and tube amplifiers. A man who was and is careful with his stuff. The AR amplifier stood on a shelf for many years. Back home I first removed the hood to undust the lot. The Sovtec looked as 'not used' and they tested on my tube tester as NIB. After some dusting and vacuum cleaning, the LS7 looked as new again. Looking at the sturdy gold plated RCA connectors, they didn't had a though life. I felt more and more happy. This is nice, very nice ..... This amplifier had to go on the audio rack. It would take a few days before the sound was back on level again. It was as I thought; the sound



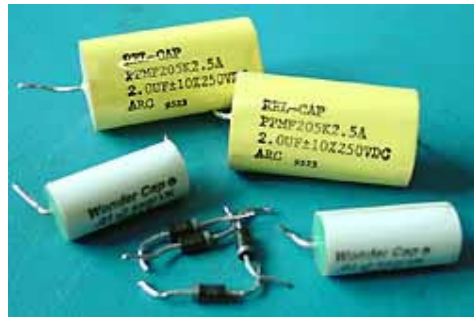
was cold en stuffy. After a while that resolved to a much prettier sound, but it stays somewhat limited and flat. Time to change the tubes. The Sovtec 6922 never was my favorite tube and I looked on the attic for a quartet of old Philips or Amperex replacements. A set new Philips E88CC's may do the honors. Wow, that's a difference! The stuffy sound gets more space, but it's not quite what I had in mind.

The bad thing of the ECC88's is, that there are more bad sounding tubes as good tubes. Almost every tube manufacturer nowadays is making an ECC88, but man... what a lot of junk there is on the market. Incomparable to the old European production, that's becoming scarcer every moment. Are you searching for a couple of good old ECC88 tubes, then you better look on [Ebay](#) in Germany. Philips (NOT Philips ECG from the 80's), Amperex Buggle boy, Telefunken, Valvo, that's where you have to look for. The chance you find a pair or a quartet for a reasonable price is big.

## The output...

The quality of the foil capacitor back in 1995 was not on the level they were a few years later. The tube revival did give us some nice special audio capacitors. Jensen was one of the first with the well-known paper in oil caps, which were

unbelievable popular for a while. The Infinicap, Audyn, Mitcap, Auricap, Mundorf, and expensive Teflon caps...you name it. The Auricap and, with somewhat more reserve, the Mundorf silver cap, are my favorite coupling caps. The new generation Audio Note copper foil cap is also very good. I didn't try the full range of available capacitors, so there are probably more jewels for sale.



The LS7 is a very accessible amplifier. Top and bottom can be removed and you can work on it without any problem. The super thick PCB is sturdy hanged between front and back plate. I start with a few simple upgrades. First I remove the 4 standard '4006' diodes and they are replaced by the BYW96E, a faster type with a faster recovery, what provides you with a much cleaner power supply at the same time. The old output capacitors are a parallel mounted RELcap and a little

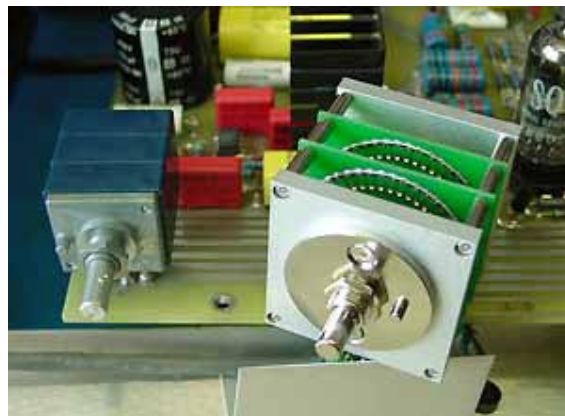
Wondercap. Something you could see often these days. A single Auricap replaces them. That's far as we go for a while.... Power back on ...

That's helping a lot. The somewhat cold en flat sound is getting more air and the dimensions of the stage are far outside and beyond the speakers. The layers in the sound image are also much better noticeable. This gives inspiration. I leaved the amplifier for what it was during a week and had no desire to remove it from the rack to apply the next change. It just sounds very good. But a look on the pitiful power cord made me change my mind. I'm first going to mount an IEC connector so I can attach a decent power cord to the LS7. That's not a difficult thing to do with an aluminum case.



A little bit drilling and sawing... within a quarter the job is done. Much more practical when you want change cords to tune the amplifier with several different power cords.

Last but not least, the Alps pot. Not quite bad stuff, but what would a multi stepper do at this place? A little bit measuring and fitting revealed that a couple of resistors were in the way of the pot meter. They could be replaced easily to the bottom side of the PCB. This provided me with a lot of space for a much bigger stepped attenuator. Then came the hard part. The front had to be removed. The cabinet is luckily quite easy to take apart and just as simple to assemble it again. But it's not something you do between two other tasks. If there is gain in the quality of sound, no problem, but what a disappointment ... there is some annoying harshness in the mid frequency area now. It seems to be if the blue Alps pot is better on its place into the AR circuitry as I thought it would be. Now, three listening days later, the beautiful stepped attenuator will be removed. I will first try out a 24-steps ladder attenuator, built with Dale resistors. I'm very curious. Because, if it's sounding less to my ears also, I will replace it immediately with the original Alps. The team, the total combination of components, should be okay and if a "star player" don't fit, you'd better remove it... will be continued..



## Temporary situation...



This AR LS7 adventure keeps interesting. In this way, it is certainly possible to own a very beautiful amplifier for a reasonable amount of money. Even when you lack on knowledge and guts to build one from scratch. It is also a good thing if you don't overestimate yourself. To build a tube amplifier and have a good result is in principle something everybody can do, but it's not a piece of cake. Frustration is always there when you spent a lot of money and your project won't succeed. To replace a couple of capacitors or tubes, is something almost everybody can. When this is your first project, this beautiful Audio Research is a nice start in the wonderful world of tube amplifiers. The amplifier was excellent 10 years ago and is excellent still. With a few modern, and a few (NOS) components, it is

completely up-2-date. Good for the years to come, because there's hardly any wearing out for this device.



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<a href="http://www.arcdb.ws/">http://www.arcdb.ws/</a>	A hobbyist who made a complete database of the available AR devices from the beginning till now..