

This one time, at Amp Camp...

HOW THE SIMPLE TASK OF REPLACING AN AMPLIFIER LED ME TO THE WORLD OF HAND BUILT HI-FI

The initiator for the journey that ended with me attending the Amp Camp run by Tube Sound Audio (TSA) was the slow and graceful deterioration of my old amplifier. Unfortunately, with the passage of time, ever more invasive and expensive surgery was required to keep it operating; looking for the silver lining I decided it was time to upgrade.



As with most guys who can no longer deny they are in middle age, the prospect of a brand new toy filled me with happiness. I relished the process of researching, talking, listening and finally bringing it home.

A lot has changed in the 20 years since I handed over the money for my last amplifier. The world is now flat and purchases, both new and second hand, are equally easy whether from around the corner or around the world. Social media has given a voice to anyone wanting to express a point of view, or respond with vigour to those expressed by others. Closer to the subject at hand, when the now ailing amplifier was purchased it coincided with the last hurrah of vinyl as compact discs swept all before them. Twenty years later it seems that vinyl is new, compact discs are on their way out and the once proud claim from Steve Jobs that you could have "1,000 songs in your pocket" is now a few zeros short of being noteworthy.

The overwhelming confusion of my first few hours of research led me to the conclusion that my eventual satisfaction with the purchase would be very tightly coupled to my success in defining what I really wanted. Put another way I had to answer just one question:

In going through this process I learned a lot about sound and the way it is recorded, stored, amplified and heard. More importantly, for me anyway, is that I answered my question.

"what value does music and the process of listening to it hold for me"

For me when people start conversations about their hi-fi system quoting numbers, technology and circuit design philosophy I can now understand (most of) what they say, but I don't really relate to it. If however the conversation starts with senses (sight, sound and touch) and emotions then I can understand what they say, and I can relate to them. This is how I found Tube Sound Audio.

Vacuum tubes or solid state

For some, tubes represent the threshold for those who are serious about hifi and those who just listen for enjoyment - *as ridiculous as that sounds*. Equally passionate are those who think that tubes don't do anything that solid state devices (transistors) can't.

This choice seemed to be the most fundamental one that I would make and so it was the starting point of all of my research. I read texts, design manuals and articles and did a lot of listening - *to both people and hifi systems*.

Without resorting to words that would score highly in audiophile-lingo ('soundstage' being perhaps my least favourite) I came to understand a few things:

- It is pretty easy (if not cheap) to get a system that passes my 'hurdle' using either technology.
- There is a difference in the way that different systems sound. That is, tube-driven systems seem (to my ears, brain and emotions) to sound different to transistor driven systems.
- There is no shortage of people on either side of the argument that are completely convinced of their own arguments, without necessarily being particularly convincing.

Like most persistently conflicting viewpoints there are innumerable zealots on both sides. I suspect that to some degree the key proponents are each a little guilty of being "often wrong but never mistaken".

Based on what I was able to ascertain I still think the choice of amplification technology is a significant factor in the way your system will sound. That said, I think the 'best' system probably varies from person to person. In that sense I liken it to the argument that rages around who was the best frontman for Van Halen. Some like the David Lee Roth era whereas others favour Sammy Hagar. I am not necessarily sure that in the end it isn't an issue of taste.

I went for tubes, I won't justify my choice other than to say that of the systems I listened to the ones with tubes appealed to me the most. For the record, I like the Van Hagar era the best. I think his voice is better and being able to play guitar he adds an additional layer to the sound. Like I say, personal taste.

THE OTHER GREAT DEBATE, ANALOGUE OR DIGITAL?

Another minefield (in the eyes of some) to negotiate is the question of source material, that is digital or analogue. Simply put, vinyl is analogue and MP3 (4, etc), CD, SACD and other formats are all digital. In my opinion vinyl (components depending of course) provides a better all-round experience. That said, for me it isn't practical (or economical) to replace the digital music (CD and iTunes) with vinyl - *not immediately anyway*.

The advantage I see in digital is that it is a more convenient storage medium (refer to the previous Steve Jobs quote). I do however think that people claiming it sounds 'better' are missing a few points:

- Many of the mediums used to *produce* music are analogue (voice, instruments etc);
- A lot of instruments are still amplified using tube (analogue) amplifiers;
- Many of the albums that I like were originally *recorded* on analogue technology;
- The loudspeaker is analogue; and
- The *human ear* (membrane and bones) is analogue.

Because of the (largely) analogue signal path there needs to be a conversion of *information* from digital (if it is stored this way) to analogue along the way. Given that in many cases, particularly for older recordings, they started off as analogue I am yet to be convinced that the process of converting mediums can add detail. That is, I am not sure the speed of the DAC (Digital to Analogue Converter) can provide more 'detail' than was ever there on the original analogue source material.

On the other hand, proponents of analogue often quote the 'harsher' wave form produced from music stored digitally. I don't really support this either, I just don't understand how moving diaphragms (loudspeakers and eardrums) produce square waves.

Like all of the arguments there are pros and cons. That said, I think all things being equal that vinyl produces (for me) a more appealing sound. Audiophiles, many of them anyway, seem to agree with this and this is why they pay top-dollar for re-released vinyl. Of course many musicians, particularly guitarists (jazz being a general exception) still favour tube technology for their sound. Overall, tubes and vinyl seem to be an appropriate and appealing combination.

To buy off the shelf or go DIY?

Having finally decided to go with tubes as the underlying technology the next choice should have been easy: determine how much I wanted to spend and then narrow down the available choices. This is where my interest in TSA first started. A very brief search for suppliers of tube-driven hifi systems brought a few factors into stark relief:

- Commercially available tube amplifiers can be very expensive.
- There is a huge DIY market, the epicentre of which seems to be continental USA where there is a significantly lower voltage mains supply delivered at a different frequency than here in Australia. These suppliers offer 220VAC or 230VAC 60Hz transformers on the fair enough is good enough principle. This is far from optimal for performance as well as tube life so TSA specially winds its own transformers in Australia for both power amps and preamps at 240VAC and 50Hz. These are specifically designed with lower flux ratings for use in tube circuits and also feature electrostatic shielding and flux banding in preamps, another advantage over the stock standard overseas kits.
- Among the DIY tube community there is a long-running battle between two circuit topologies. The two main types are those with output transformers (OPT) and those without the output transformers (OTL). If I thought that the arguments between tubes and transistors was hotly contested, I was about to be schooled.

Again, much researching, listening and reading, this time including blogs. Interestingly, the blogs taught me two things. Firstly, there are some people with far too much time on their hands. Secondly, it seems that in the world of the blogger that posting frequency and harsh language is an acceptable substitute for research, knowledge and logic.

I am absolutely convinced that there are many manufacturers out there that can supply an amplifier (or the parts for you to build one) that are far better value for money than you are likely to achieve from a comparably priced commercial off-the-shelf system. In fact, I am convinced that the best tube-driven (and probably transistor driven as well for that matter) amplifiers originate from the benches of tinkerers rather than production lines.

So is OTL or OPT circuit design the best? This will (I suspect) only become a consideration if you go down the DIY or custom built route; the vast majority (if not all) commercially available systems seem to use OPT circuit design. The best I can do here is that they both sound great and despite what the fanatics on the opposing side of each technology say, neither seems fundamentally flawed or (from a design perspective) demonstrably better than the other. I have read design books on both and heard both types of systems. They do sound different, again I think it is a matter of choice.

I chose to build. I can't say this was a decision based completely upon either performance or cost. Increasingly as I went through all the information I reflected on what I wanted from a hifi system. I came to the conclusion that for me listening to music, and the equipment required to do so, brings great pleasure. I wanted to have a genuine understanding of the process of amplifying sound and I wanted to be part of the process.

I chose OTL. I don't really have a logical reason for doing this. The best I can do is to say that the idea of a few guys working out how to solve the problems associated with this circuit design, and the potential gains, fascinated me. Does this make it better? Does it matter? I am sure that either approach would have easily cleared the hurdle for me.

Choosing a supplier

Given the huge number of kit and component manufacturers out there I thought this is where the decision making would really start to get complex. In fact, I was (not for the first time) completely wrong. The majority of kits come from overseas with the major area, according to my research, being the USA. Immediately this raises two major issues. The first being the different mains power, the second being the time difference should technical support be required. One thing that bloggers on all sides of technology and design arguments seem to agree on is the need for technical support if you are looking to build.

ENTER TUBE SOUND AUDIO

My first experience with the TSA website was a revelation. It offered me the opportunity to buy or build tube-driven amplifiers utilising either OPT or OTL design. Further, I could buy a kit, have a system custom built or have a bet each way and be guided through a build. So, here we had an Australian based company that had reengineered proven designs for local power conditions and was agnostic when it came to technology. But wait, there's more! One quick email exchange later and I was invited to Wentworth Falls to meet Stephen Price and hear the systems for myself.

So, one Saturday morning my youngest son accompanied me up to Wentworth Falls to visit the beautiful headquarters of TSA. I ensured that my 14-year-old son accompanied me because he is still some years shy of his mid-life crisis. In other words, I needed a responsible adult to help me if there were consequential decisions to be made.

The initial meeting with Stephen Price in his listening room was a watershed moment for me, and I might add my son. This is where some serious introspection is required. Stephen's components and speakers sound great (remember, I really don't go in for audiophile-lingo). I mean they sound amazing. I can still remember the look of disbelief on my son's face when he heard the first notes from Carlos Santana's guitar. In short, they pass the 'hurdle' and then some. Any better would be wasted on me and I suspect any objective judge regardless of the degree to which they are afflicted with 'audiophila'. However, to view the systems that Stephen produces, or helps us punters produce, as simply components in a hifi system is in my opinion missing the point. Whereas tube amplifiers have a certain cachet, they are by and large aesthetically challenged. Not so the product from TSA, they are hand crafted things of beauty. Some of the chassis are even manufactured from native timbers felled and milled on Stephen's property. As a bonus, TSA can also supply speakers that are matched (in both performance and aesthetic) to the amplifiers.

There you have it, an opinion on hifi equipment that is not completely focused on the way in which sound is reproduced and amplified. This isn't to say that the sound isn't all it should be. In my opinion the sound is fantastic, particularly for vocals, brass and percussion. But for me a hifi system to really excel needs to be more than that, it has to deliver something more. The products from TSA are beautiful objects, the fact that these beautiful objects sound great seems like a bonus.

Perhaps the last word on the first visit is best summed up by my son's first words on the drive back. "Dad, I never thought I could be impressed by a timber box, I was wrong". Well said that man!

Choosing components

Let me say that the products offered by TSA range in price and build complexity quite significantly. Perhaps the most surprising thing for me was just how good some of the lower cost models sounded. That is of course up to the point that they are compared to the more capable, and of course expensive, components.

I chose to go with the Marawin Phono Amplifier, the TSA O4 Pre-Amplifier and the 15 W Power Amplifier. I didn't go for the mono-block 300B Power Amplifiers. I know they are in the eyes (or perhaps ears) of most people that 300B represents the best that tubes can deliver; the truth is I just couldn't pick the difference between those and the 15 W model. I also opted for TSA's Megalong speakers. Initially I found it interesting that they are single driver speakers, but they sounded simply great and are well regarded.

It really is a bonus to be able to sit down in a quiet room and listen to various combinations of components and speakers. There is no hard sell here and there is plenty of time taken to compare the results using different sources, amplifiers and speakers.

SOME OTHER THINGS I LEARNED ON THE FIRST VISIT, THIS TIME ABOUT SPEAKERS...

When I first started the journey of replacing my old 50 Watt amplifier it seemed to me that my starting point would be something with at least the same output power. This assumption remained unchallenged until I entered in the world of vacuum tube amplifiers, and particularly those with OTL circuit topology. The TSA amplifiers that I looked at ranged in power output from 1.5 W per channel through to 30 W per channel - *that is from about half to one-thirtieth the power of my geriatric amplifier.*

This is where perceptions and prejudices really are best 'checked at the door'. When coupled with the right speakers, tube amp outputs as low as 1.5 W can be very loud indeed. How loud? Well, certainly much louder than any domestic system that I have ever heard.

The issue here is that the right speakers are high sensitivity; that is, they need less power to drive them. My very rusty first-year electronics knowledge reminded me that there is a relationship between the strength of a magnetic field, the amount of electrical power and the 'work' that this could do. So, as you might expect to have low power you need a stronger magnetic field, produced in TSA speakers through larger and higher quality magnets. This makes the speakers significantly heavier than some of their counterparts designed for high power (largely solid state) applications. Interestingly, it seems that a significant reason for the success of solid state amplifiers in the market is the reduction in cost of the *speakers* rather than anything to do with the amplifiers. When looking at the 'work' that these speakers do, it is really about the amount of air that is moved (the final piece in getting the sound, via air pressure, to your ear). The TSA speakers seem to buck the trend here as well. Whereas many commercial systems I looked at were very compact, the speakers at TSA are anything but - *they have presence*. I went for the 10" drivers, but there are also 12" and 15" drivers available - *with corresponding increases in cabinet size.*

As mentioned, the single driver part also intrigued me - *prior to that I thought more was better*. Again I was mistaken, more is certainly more complex to design and build properly but I am not convinced it is better. I am sure that either is fine in terms of passing my hurdle, that most of the literature on speaker design indicates that multi-driver design is only really successfully completed with the aid of significant computational support and in some cases simulation.

Amp Camp or Custom Built?



As much as I was impressed with the TSA approach and products, I must confess that Stephen and I share a different appreciation of the aesthetic. Stephen's chassis are simply beautiful but I was looking for something different. I favour the mid-century period of design which is more Birch ply than native Australian hardwoods.

A brief discussion with Stephen revealed another one of the advantages of the whole TSA approach. Because each system is custom built the customer can (if they want) supply their own chassis. So through the process of me designing and building the chassis Stephen regularly modified the underlying circuit schematic to make sure that the build would progress smoothly. There was also the opportunity for me to upgrade or modify some of the components. As a guitarist I am always complaining about scratchy potentiometers. Stephen built two stepped attenuators for me to overcome this problem, I highly recommend this as the results are exceptional.

I chose Amp Camp because I wanted to be part of the build process but also wanted the assurance of a guided build. I am sure that customers with custom built systems are just as happy with the outcome.

The build

Not possessing Stephen's very significant woodworking skills I chose to compensate by using CAD design and the services of a CNC machine to produce the components for my chassis. I chose European Birch ply and Stephen was able to source the very same material (albeit laminate for more appropriate acoustic performance) for the speakers.

Given the approach I chose chassis construction was about as hard as an infant's jigsaw puzzle. I was thrilled with the outcome and decided to do the finishing before I met with Stephen for the build. Despite my best attempts with sandpaper and Danish Oil I just couldn't achieve nearly the same level of finish that

Stephen can. Fortunately for me, nothing leaves the Amp Camp workshop unless it meets the TSA standard and so Stephen refinished all three components for me.



With the chassis ready to go, the build proper commenced. This is where you really can appreciate the quality that goes into each and every build. There are no circuit boards and the customer gets to choose the quality of each and every component. Further, there is the ability carry out design changes in the fly. Interestingly, Stephen

seems to understand just how much supervision to give for each stage of the build. Each step is audited and with good humour Stephen identifies the errors and oversees the required corrections. It became obvious pretty quickly why the forums on kit supplier sites are full of half built projects and stories of fried components. No such concerns at TSA.

Perhaps the best indication of how much I enjoyed the build, and the after-hours music and wine appreciation sessions, is summed up this way. I spent a straight week building amplifier components for about 10 hours a day and when it came time to leave I felt like I had been there for less than a day.

The result

The result is, I think, spectacular. I have achieved what I wanted to and so much more. It sounds better than I could have imagined. Clearly better than any commercial system I listened to in all the research I did. The



sound is simply sublime (no this is not an audiophile word).

It looks great, I have a hifi system that looks like no other. If you are going to spend time and money on something that is going to be sitting in your house it may as well look the part. The TSA product would sell on the aesthetic alone. This is something else it takes a while to really process, with each system custom built and over 100 different real timber veneers to choose from there really are very few limits on how your own system might look. A previous customer apparently supplied a chassis that was brass, like I say you really can get what you want.

WHAT DO OTHERS SAY?

I am clearly emotionally attached to the system. Like I said at the beginning, for me music is not only about sound. It is as much about how it makes me feel. As such, I thought I should get some less biased opinions.

My guitar teacher. This guy knows music, and being a professional guitarist he is well versed in the 'tube sound' - *tubes never went out of vogue for guitarists*. I played him Steely Dan 'Aja' and Miles Davis 'Kind of Blue' followed by Led Zeppelin 'IV'. I thought when he didn't speak that he was formulating a response

that wouldn't deflate my brimming pride. So concerned was I with my own ego that I nearly didn't notice



the tear rolling down his cheek. Lucky I did notice because what he said can't really be printed. He liked it.

My son. My eldest son is 17. He sat and listened and then finally spoke. "Best thing I have ever heard". Remember, he is 17, pumping up my tyres isn't top of his priorities.

My wife. Finally, the real test. I disappeared off to the Blue Mountains for a week to build a stereo system. Further, I could have easily bought one that met her needs while spending less money and taking far less time. One of my wife's favourite albums is Diana Krall "Live in Paris". We went to a Diana Krall concert at the Sydney Opera House and my wife said "that sounds exactly the same as the new stereo". Good enough for me.

Was it the right decision?

It has now been a couple of months since I first turned on the system in my home. I thought I would wait this long to write the review to see if any of the initial shine looked like wearing off.

The new system has reignited and sustained the love I have for listening to music. Not using music as 'white noise', but really listening and appreciating music. The system has made a huge difference to the way that people spend time at our house. The quality of the sound is such that just sitting and listening, even for the casual listener, seems like a worthwhile activity.

I set about replacing a solid state amplifier and ended up with three vacuum tube amplifiers and a pair of



high sensitivity, full range speakers. More than that though I realised that, for me, listening to music is about more than just the sound; it also has an emotional element which is fully exercised by this system.

So, would I recommend TSA and Amp Camp? If you love high quality audio equipment and are looking for something special (or even unique) then TSA is a very compelling proposition. The offering becomes even more appealing if you take into account that each and every system is hand built and finished to the owner's specifications. In all my research I couldn't find a more appealing offering for what I was after. As for Amp Camp, I loved the experience. I can't say I got a better system, I can however say I built the one that I now have; a week very enjoyably spent.

In my experience there are precious few occasions when the anticipation and expectation that comes with a significant purchase is exceeded in every way. I can honestly say that for me the experience from first enquiry through specification, build and now ownership has been brilliant.

Highly recommended.

Darryl Walker <dwalker@huegin.com.au>