

Well let's continue. I have now two pcbs like above. One near the genuine BOM and the second tweaked like above for starting the experiments. Yes the experiments began with a second already tweaked pcb. So it's not scientific and I have not one year to listen to all part by part and each time with the SOTA burning in of 100 hours. It is not writed to be compared to the mods of this thread or of the true genuine one (according to the BOM and its 2 factor "n" possibilities because the choices given at many emplacements) but began after the mods of this thread and with few more mods on the second pcb. So it can not answer to the question : "is it better ?" No it's different, sorry to repeat myself, it was for matching my taste and system, and for this last with the qualities of its own defaults ! But I will try to describe what I think to be usefull to match for three different results at the end according your own taste and system... or the storie would have not have any interest for you dear reader(s), fellows my almost friends, you who share the same insane hobby than me but with sane intention and the difficulty to follow my delicious english ! Notice it's a long writing with repetition for the procedure to be understood and start where you are interested with the changes or a more serious work !

So if caps have no sound of its owns, they can sound different at the same value in a same layout and system because they interact. Firstly with each others and with resistors for resonances and dielectric, voltage value, ESR, ESL, legs pitch, material of legs & how they are connect inside: all those fabulous things we call sometimes magic and we have difficulties to put in equation : so the tests & try instead!. Secondly the whole result sound always different with each systems (the others gears of the Hifi) because loads are diferent, with also caps, resistances in the input stageof the pre/amp... Vendors know that, matching possibilities are infinite, it's a good business and a good hobby with the hope behind to waste only time but no (or less) money with DIY. What at trap, we like both music and how it is impacted by the relation to the electronic "et tout ça" ("and all the things around"). It's a double hobby !

But here people know well than parts in a same schematic/layout is a way to set up each system to be haute couture self tailored..., cooked... You like salt ? Use Silmic ! Hé but I use Silmic both in my flesh meal and my fish meal... How to compare ! I don't care. Here the first pcb is just a reference for working on the second pcb the one I prefer. They are not equal in relation to my system and different also in the absolute. And one detail also I forgett: the second pcbs as the 4n7 of the outputs with fkp2 from Wima (which seems not to be metalized ?) and the first is the bomed MKT from Vishay. The PS is the genuine with 2 x 4.7 uF Pan. FM and the two 0.1 uf Wima MKS2. Sorry for the list, I will try to recapitulate at he end but as said the list is not the goal but more the procedure as I feel a list can give different result by listener.

The first thing I tried to understand was C17. I can't hear differences but stayed in final as it's hard to do and dangerous for the crystal to heat with the multiple arrangement of above post in both pcbs. C4 was not a challenge for me and as the pcbs are different I didn't benchmark it alone; mzybe I'm wrong...my bad, sorry! On the second I went with NPO 603 case to have the minimal inductance. Said to be important also in serie (// is not advised also but I can't testimonie here as I didn't try to add an NPO on the first PCB which is populated with 1 uF MKT Wima MKS2 (Garry input to try up to 4.7 uF; BOM is 0.1 uF, IIRC). In theory all those values from 0.1 uF and types are enough for this kind of signal. I noticed myself an improvement with 1 uF Wima instead 0.1 with my first pcb.

Here beginn the first usefull input with C19 & C5 as I notice it impacted more my system in the sens of what I was looking for: more softness & more flesh (my system needs it. First

because the treble have a climbing curve and the second (flesh) because I like when the sound is a little thick in the mid-treble). I swaped for 1 uF Acrylic caps of the PS BOM !

If you have just one mod to do, try this one as it's easy. I found it softer & more relaxing, but some harshness remain yet... but they are less. Same qualities impacted the both pcbs ! Both pcbs have the same polymer caps before (C3&C18). Words are difficult :softeness, warmth, less tighty: it went in the good direction for me ! I went back on the first pcb with tantalum for the suit of experiments as I wanted to have a stable reference with the rest of step by step changes. For the second pcb the decision took to have the acrylic base with also C20&C7, this time no special better or worst change with the last. Staying with the less fragile tantalum seems the best idea as acrylic are said to be very sensitive with EMC and soldering. A trap cap in fact, but I'm a fanatic and own two pcbs, I can risk to damage one because the pads are more fragile it seems even if the quality is very nice according the few I know. For some C19 & C5 should be enough for adding a little steam to the sound without loss of resolution, only the clearness and the lighty will be attenuate and little "sensuality" added in the low-mid...Finally the better words who come in mind is : more sensual. Try this one before all other mods, also because after I started fro here with the second pcb. Plated pads are a little less risky than buried vias which are difficult to get empty with solder without damaging the cap and the pcb also. I did my tests with vias with the legs of the caps bended below the pcb with a contact and a match on the top between the can and the pcb to increase the contact below (the buried vias are conductive also). Btw someone explained me it's always better to have the legs bended on the conductive pads around the vias before soldering (less resistance) ! I pushed the vice to cut all the legs of each cap at the same size to minimize crosstalk with the continous ground for the polarized leg ! Hurk I don't know, but when doubting...

Then with the two pcbs and the same C35 & C22, I tried to understand if C21 is important or not. More than I thought. And each time I tried it with different C35 and /or C22 both tested on each pcb to understand the importance of the main caps supply (C22 with its smd decoupling kept).

I tried 4 caps : 10uf : Silmic, Panasonic FM, Nichicon Polymer (PLVK1K00MCL1), Panasonic polymer (25SEP10M). You can paste & copy in your browser as it is the manufacturer ref. Great improvement, softer, more details, fleshier with the SEP, more relaxing... but a little less neutral? The expensive PLVK was a deception but can match better with the acrylic above than without in the sense it's a catastrophe without it. Each time SEP was better by a large margin for what I'm looking for and also in the absolute. For me it's an important improvement in the same spirit than the 470 uf at C22. I went with it after with C13 & C8 : amelioration also in relation to the Pan. FM (kept on the first pcb as reference). Less critical also as garry noticed. Never try 10 uf MKT here but 20 uf SEP-F with lower ESR and legs pitch on the first : better than the Pan FM also. Both SEP & SEPF polymers were not benchmarked each other but I will go at the end of the history on the first pcb (which is the ref at the moment) with the SEPF 20 uF (2 mm pitch legs) for C13&C8 as I've got it (You know with Demning wheel, reference are improved but you have to stop one day to have a fix point of observation ! Where did I hear this ?). As I said it's not scientific here, I'm biased but I try to be less biased with the continuation of the history... The famous C22 & C35 and their friends : C31, C32.

We know now we can have an important change with only C5&C19 then C21... results have a concistency in relation to different C22 and/or C35 and in the absolute with the first reference pcb.

The first pcb is always our reference and the tests continue with the second pcbs with all the changes above. With C22/C35 and friends, many things were listened to during the C21 tests. We come back to zero with more changes: C22 then C35 and vice versa and both together... the absolute head-aches ! I'm a fanatic, stupid tweaks. Stupid, not so much as the final result will be totally different and a perfect match with the waited qualities for my system... Universal, no ! Good match at home ? Yes ! Twice better : an totally another gear. Here I surmise more people to be interested because many discussion about these two caps in the two threads !

Here I have to talk about the first pcb again. I made some experiments before having the second pcb, some are listed in this thread. I made an error with one Nichicon R7 cap I hoped to be 390 uf but it was 39 uf ! What a beginner ! More than ten years playing with playing with caps for that ! Hé I'm not a guru... Also with Black-Gate at C18 and C22 with different values I have (few) than the advised one. To say I always come back with the first pcb with the good UCC of the BOM (the low size ref is even better) and the 470 SEPC for C22. This last was benchmarked with nearer value with old Sanyo SP (the blue) and old Sanyo (purple) : both old polymer technic : discontinued. For the little history, T. Loesch use the old SP in the AMR flag ship. During my first tests the SEPC was always better when I owned just the first pcb and I kept it just because more details. 100 uf SEPC was behind the 470 uf here. Very good input from Garry fellow as it is an universal input (go for 470 or more)as we will see after ! 100 uf SEPC both with SEPC at C22 & C18 : catastrophe : too thin, too tight, tonal balance, bad... it becomes a bad device on my hifi system ! The importance of a long description is to show a ref can match in a place & not everywhere...it's not tires below a car!

Remember, JG buffer is not used here in my tests : so the last filters before these caps tests are the 4n7 shunt caps, the zero ohms caps or wire in serie and the wires before the RCAs (those are very important and after viewing all the photograph I believe it's a missing part in many box : it changes all the sound and can waste all as a limiting factor !). I think it's the time to play around wires concept... Houuuuuu the two cents Eldam audiophile... houuuuuu, bad hobbit ! Hummmm my wires....my preciousssssss ! Sorry I'm long like a trilogy.

My system use simple good wires enough (for me and my money) : Oyaide first price off shelves for interconnect (excellent and neutral)– and for speakers mono wired Cardas : first price per meter (excellent cable because bought not in box with plugs but per meter (less expensive)...these Cardas is a little climby in the treble for me and my system but at this price it's an excellent wire and I tried a lot, also DIY, cat5 (beurk !) : double the gnd wire speaker can have a benefit if your speaker has like me a low efficiency and add fleshy background...funny experience but OT ! Amp is a Chord SPM 1000B & the pre Yamaha CX2 (the new not the legendary first one)... all gears in second hand like the speakers...

I tested more than one dozen of 1 uF caps for C35, some on the photographs some not like : a MKP 200V, a lot of aluminium : Silmic I & II, others ELNA, Nichicon, unpolarised... all the MKT I have (Philips is interesting but too dry and good luck to find it), acrylic at C31 (beurk in the both pcbs! Surprising after the good results above with C5/C19!), here I forget Tantalum. To be short the Wima MKS2 gave the better results but a standard Black Gate 1 uF on the second pcb. The MKS2 with 2 mm pitch was not tested. I would love to test the BG N serie here. This change was very important with an improvement in tonal balance and something irresistible with the acoustical instruments. I have a problem with the MKS2 here :too tight, too lighty in the limit of the brightness (but not) with a little point of harshness : it sounds artificial and digital in the bad sense of the word for me. Tonal balance is bad with an

heavy tighty mid bass and a dry mid- treble. A good tip is just to populate C34 like the BOM with 0603 case : it is an alternative, low end will be less good than with the Wima but the background softer... but too tighty in both situation, trebles stay not pleasant : no doubt with cellos, harmonica, guitar, e.g... Finally you will prefer to come back with the defaults of the Wima and suffer it fault to have better.

I have a very fast mid bass and a rapid amp ! If you can not hear the mid bass disapear when the transcient is too fast like with the Wima : it's bad on my system. And with the Wima trebles are too much simple. It was the harder to find for me/ The worst for me is a bad tonal balance... I don't care to hear all the details but a bad tonal balance is the first thing to avoid for me. Not important for rock but with jazz and classical... it's an other history !

So stay with wima if you have not something else : I didn't try MKT from Cornell Dublier here or the grey MKT from Vishay... but the green MKT who are famous gave very bad result here... If you tried something else tell me the result : it's the weak link of this chip and the sound change in relation to C22 ! The charge pump stay with the BOM.

The most important with C35 is C22 as already said in this thread; I tested 6 recent polymers with 470 uF to have concistency with theh value of this thread and my first pcb (SEPC is in those six) and three old polymers from Sanyo & Sprague. Here the results are surprising for the best way and I'm able to offer a serious alternative alone (more universal but...) if you want change C22 alone but will give each time for me a better result with all the second pcb modifications (day and night with the first pcb with C22 changed alone). I advise at minimum to go with the change I did with C21 as it's important here for the good match between them. You have not the BG 1uF at C35, no problem you are unlucky but all the C22 tested works better with the C21 above.... No doubt and for a large margin.

Here the three best for C22 (all the others are very far) with a very good quality but with different characters as maybe you would like only one of the three are:

- Old discontinued Sanyo SP 820 uF/4V : the most audiophile because the best tonal balance, neutral, analogic, like a vynil, not lighty nore brightly, mate but not dark ! A dream... but not the one I prefer... I hesitate but it will go in my first pcb after. I will burn in both 200 hours... and I will benchmark again. Bass and mid bass are good not too tight nore too boomy and I surmise it will feets with huge floorstanders like the more little speakers. Zero fatigue.
- SEP 470 uF (6SEP470M) (better for me than the SEPC which is more thiner in my system). This is my choice for what I'm looking for. Tonal balance is less neutral but its others qualities match my needs : soft but clear, lighty but fleshy, not bright nore harsch, less fatiguing than the SEPC on my system. Not neutral but pleasing, adorable colorations (but colorations!) ! tenor Saxophone is pleasing, Piano is good. It add steam, material without lake of details : low harmonica is not in the upper notes. The low bass are a little too thick maybe but without masking the upper range.
- Nichicon 470 uf/6.3 V (PLE0J471MD01). This one is very special, the opposite from the two first and I assume many will like it. Because a very good special mid-treble. Very clear and transparent; very lighty never harsch or brightly...its sexy and addictive. The best for background details; strangly it is not fatiguing ! I hesitate also, it's like a very good tube : no steam, no flesh, but airy, tight but nice. I surmise it will be difficult with a two way speaker as low bass are missing and all the bass are more in the mid bass : so the tonal balance is the worst of the three but with the fat and

boomy speakers or too little room : it can match ! Best description is maybe a loudness character with no low end : the mid is digged but it is very nice to listen : give it a chance.

Older other sanyo (purple) are good but below those above: Sprague oscon 220uF/10V and Sanyo (purple) oscon 360 & 330 uF/6.3V. they give mat background which is interesting for digital IMHO.

Well the others are not near in any way. One big deception was the UCC 470 uf/10V PSA serie (APSA100ELL471MJB5S) : I was waiting a lot from it ! Initial SEPC is far better ! Nothing special...artificial.

The Lelon 470 uf/6.3V (125°) (ORU471M0JBK-0811): bad but interesting mat dark treble (but with a lake of highs note : strange) : bass and mid are bad in my system.

Annoying. Burned in 40 hours with no improvement. UCC 470uF/6.3V PSE serie (APSE6RR3ELL471MF08S)... forget it.

Conclusion : more than a question of flavour, good improvement can exist here with matching better with the system and the tastes of each owner. Most of the time the parts swapped were worst or just on the flavor way with no special improvement. Step by step the description shows that several adds can give a great result but it's a long time to test as reading the post & more difficult than a podium of components even if the spirit of a list could be offer (different change at different place or sometimes a podium of good caps at "strategic" positions like writed before). C35 stay problematic with the Wima (tantalum to be test. Any 1 uf polymer ? Send me please a BG N). I surmise maybe SAL RPM to do miracle here in my system. I will try the day I needs parts at Mouser/Digikey.

I think a 100% SMT caps device could be problematic : bass too tight without resonance (notes extinction), treble too brighty with bad coloration or too simple ! Here the tests was to tailor only with the caps, other PS boards not tested. I believe the wire between the board and the RCAs have to be of a good quality like a first price of Cardas e.g. (sell per meter). I used a plain 0.6 mm copper silver plated PTFE insulated for the test at the outputs but I can win more quality here with changing it in a near future with the unexpensive cardas to match with the quality of the whole system : future tests). Source wa simple SB Duet but with BNC & 75 ohms (not succeed to put of the soldering !). I can hear difference between different 75 ohms wire ! Avoid silver plated wire between PS and DAC board.

Let's try to recap (word game ?!) :

Assuming as it is the modyffing thread you start from the Garry's list like I did :

1)- I will try first to change C19/C5 with acrylic 1 uF : but no EMC friendly when soldering !

Give it 20 hours of burning in ! In this scenario. It could be enough with 1 uf Wima C35. Not neutral tonal balance but woerth it for my taste & system. Some initial harchness remains, unacceptable for me! But can match with many speakers imho (paper cones ? fabric dome ?)

2) Assuming you have a 470 SEPC and the UCC at C3/C18 (BOM) swap C21 for the SEP for softer and fleshier and more relaxing result with good details also.

3) After some hours to burn in the caps: try one of the three good 470 uF of my list according to your system and taste. It's fun to try the three as the three results are good but give also three totally different device at the end ! Please do not soldering each time the vias if you are testing. Use plugs showed above in this thread or bend the legs and avoid shorts between legs. Notice the most audiophile in the neutral sense and analogic sense is the discontinued Sanyo SP... Yeap my list is not universal, it's a +1 mod thread after all not an official BOM here.

4) As it is not universal you understood it now. Try 1 uF at C32 or C35 with a Black-Gate with C34 of the BOM. If you try something else, let me know please here your conclusion (e.g. tantal at C31, MKT not tested yet !). For me a total of 2 uF is enough, put more don't waste anything (read the thread there is a limit), so try it as well.

That's all for the list : here you understand I'm biased cause I started not from the BOM but from the BOM+ Garry list (with my ref)

I maid one or two experience on the PS board . First adding a 3.3 MKS2 in // below the pcb with the 4.7 uF output cap; it's boost greatly the bass, more boomy and more tighty, not neutral, trebles becomes...special : for people with two ways speakers with shy bass : can be a funny test as it's easy: soldering on the existing // legs below the pcb. Very good with Rock and Roll, annoying with jazz and classic. Finally after all this test I swapped the 4.7 uF pan. FM with a standard Black Gate 47 uF... after some burn in the result were increased with both boards a little more but in the way of the quality added already, it swaps more the harchness of digital signature in my system . I found often than the Pan. FM add a little harsh in the treble, sometimes the lesser serie FC can be better in Powersupply IMHO...I would like to test Jaimicon or BC or Nichicon caps here but have not the courage to do it. But the most important of all : there are no rules, it's not universal...it's diy and each layout needs its own test... I more describe a route than an universal result with a podium list and find a neutral BOM is hard to write as it is subjectiv : with the taste of the reviewer like each time with him own whole hifi system in relation to the others in a global project. Here experience of the designer is important like a little wisdom in front of the temptations to be more subjective. Here I was totally subjective with no wisdom like the description showed it with keeping some mods and continue from those after... (the ref pcb is usefull for that! To reset your ears !)

But please try it if you have two pcbs, maybe you will find the changes to be good... or not. Say it to me in both cases. Don't forget that each mods depend on the taste of the tweaker and him own system. Don't waste your unique pcb please. This DAC is good already with the BOM (future idea to include plugs on a future BOM for tests or less choice with parts ?!)

Time to me to fly also towards other DAC adventures with the TDA1541 !

Kudo for the Subu V3 & its fathers, my best source at the moment, happy with it on my two systems ! thanks to Garry to drove me on the good roads also. I can know understand how it is difficult to make a BOM from scratch as I had difficulties with already a BOM and the initial work of Garry. I went after those gentlemen and tried to give you also a short choice of items to stay close with the initial pcbs (PS & DAC).

Eldam