

Tonochi's Audio Room – Supplemental Info

Introduction of PC Audio



2021/11/21

Introduction of PC audio to Gaudi II system

I decided to replace the DAP with PC audio in the system design of Gaudi II (Ver.2.1) in 2018. I thought it was time to do it half a year ago, and began building the PC audio subsystem. I faced some problems I hadn't anticipated. It took me half a year to introduce the PC audio. This document describes the development.

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Selection of PC

Criteria

The top criterion is silence. No mechanical noise is not allowed.

I've been using SONY HAP-Z1ES (called HAP hereafter). It emits mechanical noise from the cooling fan and the HDD. This fact made me dislike HAP. So, I've decided to choose PC that doesn't have a cooling fan nor an HDD.

The PC will be not only an audio player but also a movie player. So, it must meet the system requirements of audio player apps such as KORG AudioGate 4 and media player apps such as CyberLink PowerDVD 19.

Good appearance is one of the criteria too. The PC for audio should be go with other audio components. I don't want extravagance but classy design.

OlioSpec canarino Fils9

It took me a long time to find a satisfying PC. I finally found OlioSpec canarino series. Among the series, canarino Fils9 (called Fils9 hereafter) appeared to fit in with the audio rack AR-416 Air. I chose it.

The specifications of the Fils9 I got are as follows:

Enclosure	Silver, w/o slot for optical disc drive
CPU	Intel Core i3 10300T (Comet Lake)
Memory	DDR4 2933 16GB (8GB x2)
Storage	SSD 500GB (SATA)
PSU	150W (12V 12.5A)
OS	Windows 10 Home 64bit
Preinstall	dBpoweramp (CD ripping app) foobar2000 (music player app)

I received Fils9 from OlioSpec on the end of January, 2021.

I expected it could be used as a DAP as soon as a DAC was connected to it. But there turned out to be some problems with Fils9 and the sound quality (SQ) was not satisfactory. I had to re-select the DAC and apps. It took me half a year to complete this project.

Review of Fils9

I built up the PC audio subsystem by using Fils9 and the peripherals shown in the table below. Evaluation of Fils9 includes these peripherals.

Component	Manufacturer	Model	Note
Display	SHARP Century	AQUOS 4T-C43AM1 LCD-10000UT	43" flat TV, 4K 10.1" LCD w/ touch panel, USB3.0
Keyboard/mouse	Logicool	MK240	Wireless keyboard/mouse combo
Wi-Fi adaptor	Buffalo	WI-U3-866DS	11ac, USB3.0
Optical disc drive	Pioneer	BDR-XU03J	Portable BD drive, USB3.0
DAC	KORG	DS-DAC-10R	DSD5.6M, 192kHz/24bit ADC/DAC

Fils9 had a few problems and was unstable in operation. It took me three months to improve it. The most serious problem was that the enclosure of Fils9 wasn't electronically shielded enough and emitted substantial electromagnetic noise.

After I came up with a solution for this problem, I evaluated the PC audio subsystem in performance and sound quality by making measurement and trial listening.

I concluded the PC audio wasn't satisfactory as a DAP for Gaudi II system. But I've decided to improve it until it could satisfy the criteria of Gaudi II.

For details, please refer to the document linked below:

https://nobody-audio.com/English/posts/topics_en7.html



Fils9



DS-DAC-10R

Re-selection of DAC

As mentioned in the review report on Fils9, KORG DS-DAC-10R wasn't a good choice. I looked for another good DAC. I had two criteria:

1. Low clock jitter
2. AC-powered (USB bus power isn't used)

I want to say I choose the best one regardless of price, though, I don't have a deep pocket. I searched for DACs priced up to 80,000 yen.

Anyway, I don't believe that the more expensive, the higher quality. Expensive ones often have excessive functions and performance, and those could be a cause that impairs sound quality.

It didn't take me a long time to choose a good one, since there weren't many candidates.

I selected TEAC UD-301-SP/S (denoted UD-301 hereafter).

I bought it at TEAC Store (an online store). A USB cable for audio, SAEC SUS-380, came with it. The price was 39,600 JPY (tax included).



UD-301-SP/S

Review of Fils9+UD-301

I built up the PC audio subsystem composed of Fils9 and the peripherals shown in the table below, and evaluate it as a DAP.

Component	Manufacturer	Model	Note
Display	Century	LCD-10000UT	10.1" LCD w/ touch panel, USB3.0
Keyboard/mouse	Logicool	MK240	Wireless keyboard/mouse combo
Wi-Fi adaptor	Buffalo	WI-U3-866DS	11ac, USB3.0
Optical disc drive	Pioneer	BDR-XU03J	Portable BD drive, USB3.0
USB DAC	TEAC	UD-301-SP/S	DSD5.6M, 192kHz/24bit, USB2.0
USB cable	SAEC	SUS-380	For audio, 0.7m
Player app		foobar2000	Driver: ASIO

Measurements

Test signals were saved in 192kHz/24 bit WAV files and played by Fils9. The voltage across the dummy load (22kohm) that is connected to the output of the DAC was measured.

Frequency Response

The figure below shows the frequency response. The output voltage at 1kHz is regarded as 0dB.

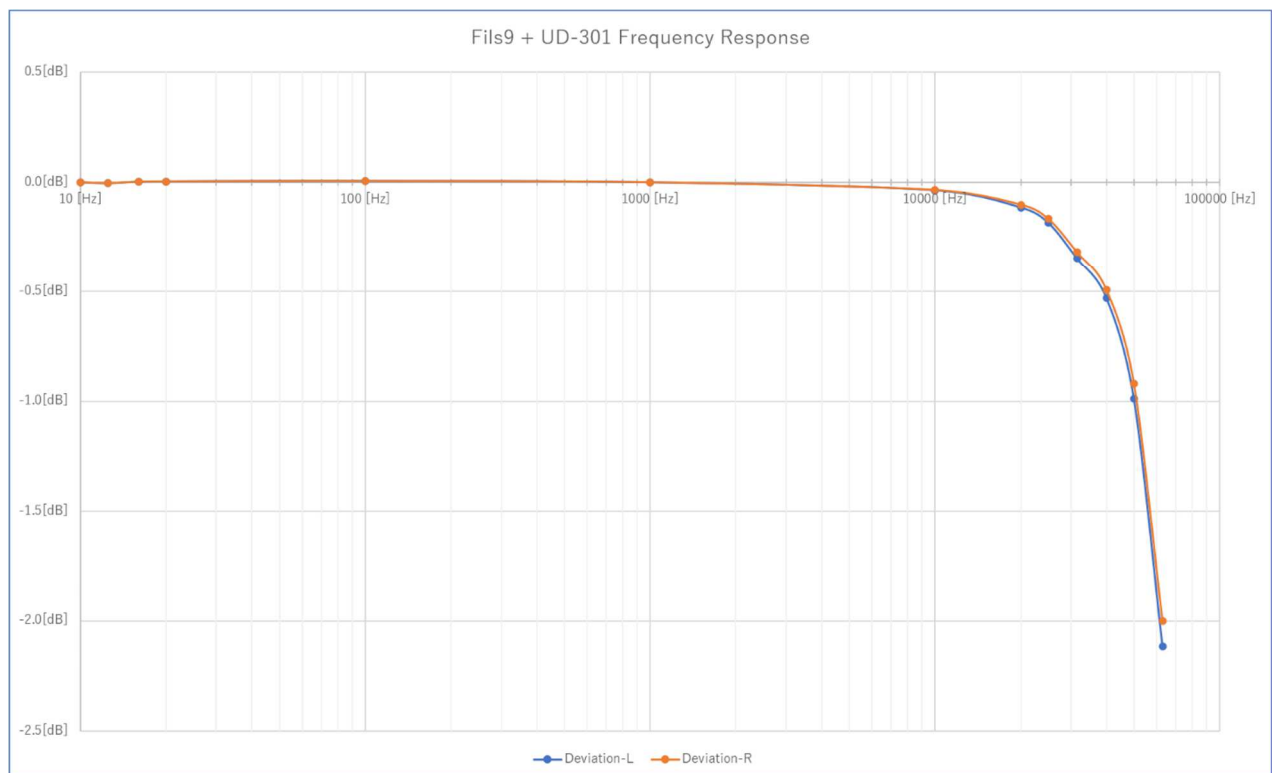
The response in the high treble slightly dropped as in DS-DAC-10R.

-0.3dB cutoff frequency: 31.5kHz

-1dB cutoff frequency: 50kHz

It seems that phase shift begins at 5 to 6kHz.

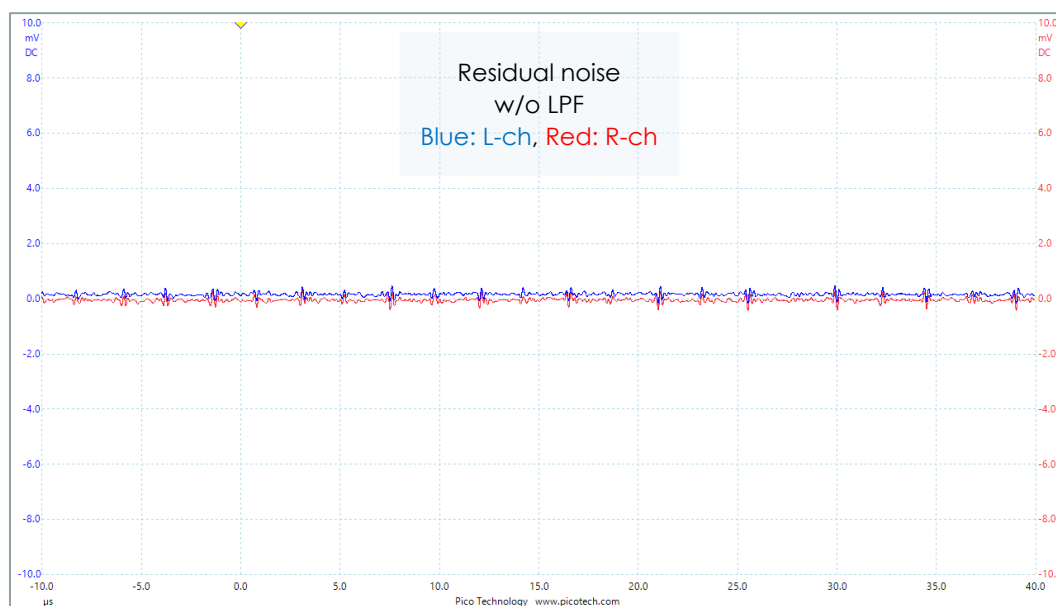
The channel balance is good. It looks like there's a slight deviation at 20kHz or higher, but the difference between channels is less than 0.1dB. It is not a problem.



Residual Noise

Excellent! UD-301 is far superior to DS-DAC-10R.

Condition	Left channel		Right channel	
	AC (rms)	DC	AC (rms)	DC
w/o filter	69 [uV]	175 [uV]	78 [uV]	-47 [uV]
w/ 40kHz LPF	8 [uV]	193 [uV]	8 [uV]	-39 [uV]



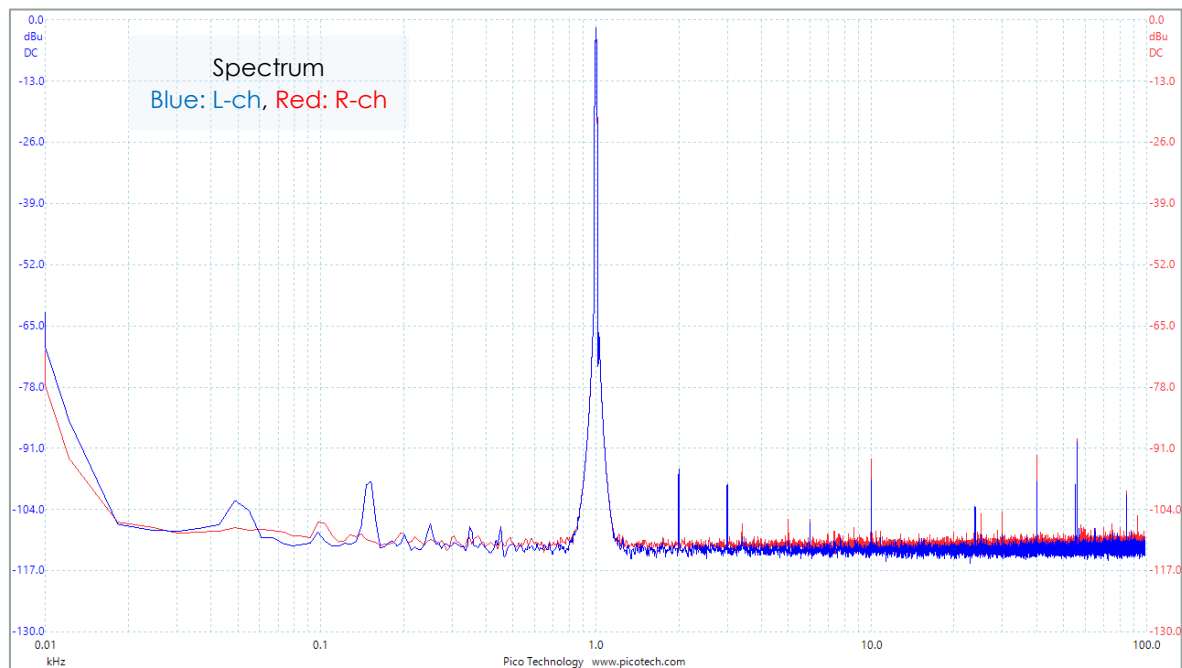
FFT Analysis

The table below shows the result of the analysis, and the figure below show the frequency spectrum. The input signal is 1kHz sine wave.

UD-301 excels DS-DAC-10R.

Index	Left channel	Right channel
THD	0.005 (0.007) %	0.005 (0.006) %
THD+N	-69.42 (-62.20) [dBc]	-68.31 (-62.49) [dBc]
SFDR	87.92 (77.17) [dBc]	87.17 (76.98) [dBc]
SNR	69.52 (62.23) [dBc]	68.39 (62.52) [dBc]
IMD	0.039 (0.040) %	0.039 (0.040) %

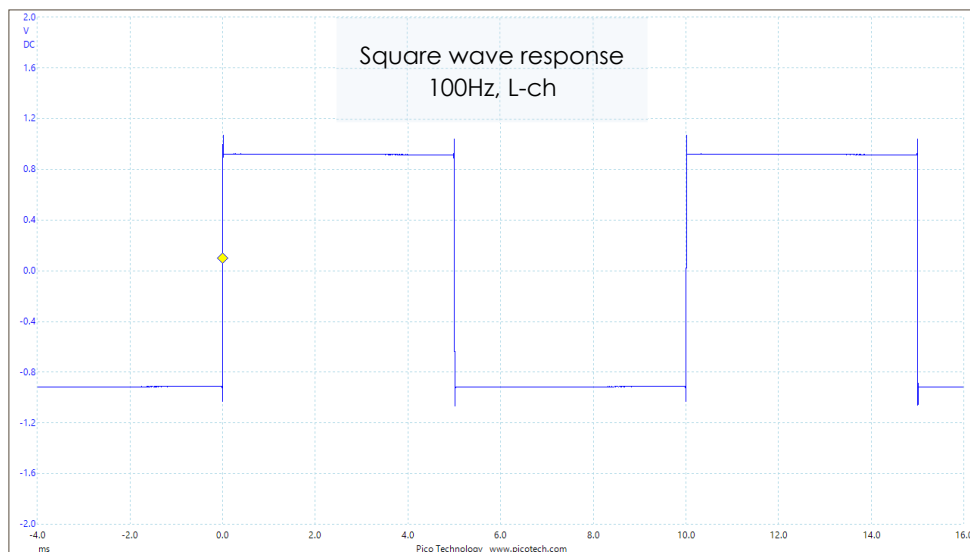
The numbers in parentheses are data of DS-DAC-10R.

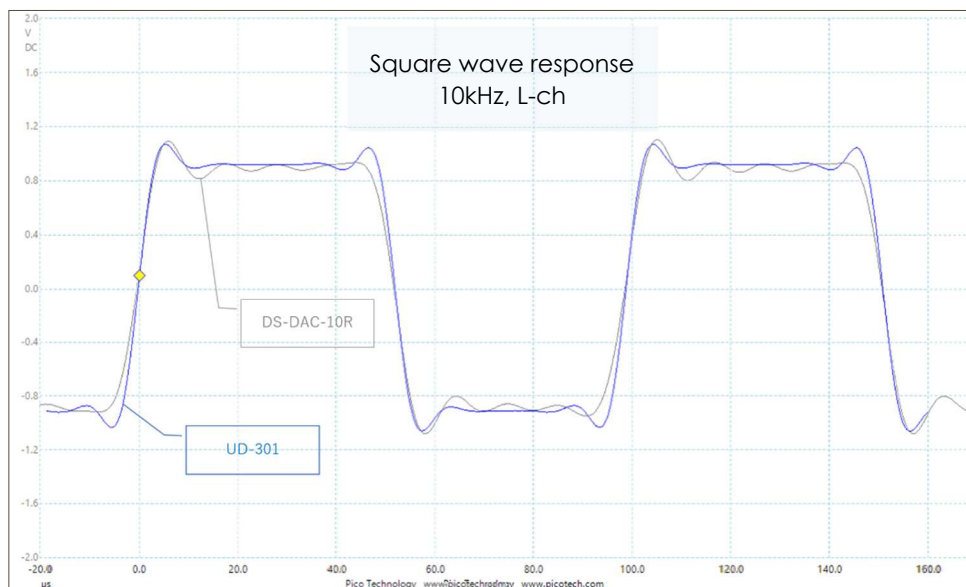
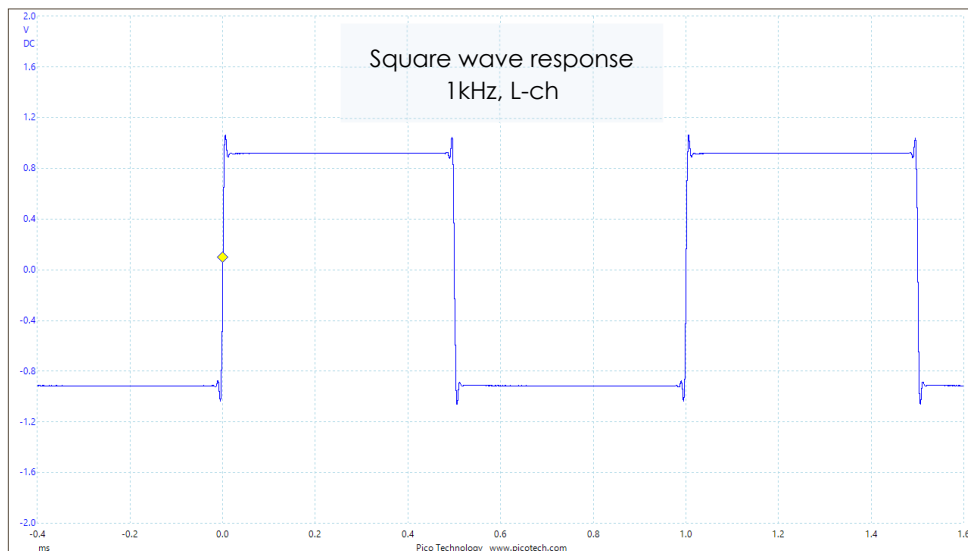


Square Wave Response

Square wave responses at 100Hz, 1kHz and 10kHz are observed. The waveforms are exactly the same in both channels, so only the waveforms of the left channel are shown here.

The test signals themselves are slightly distorted due to the analog-to-digital conversion.

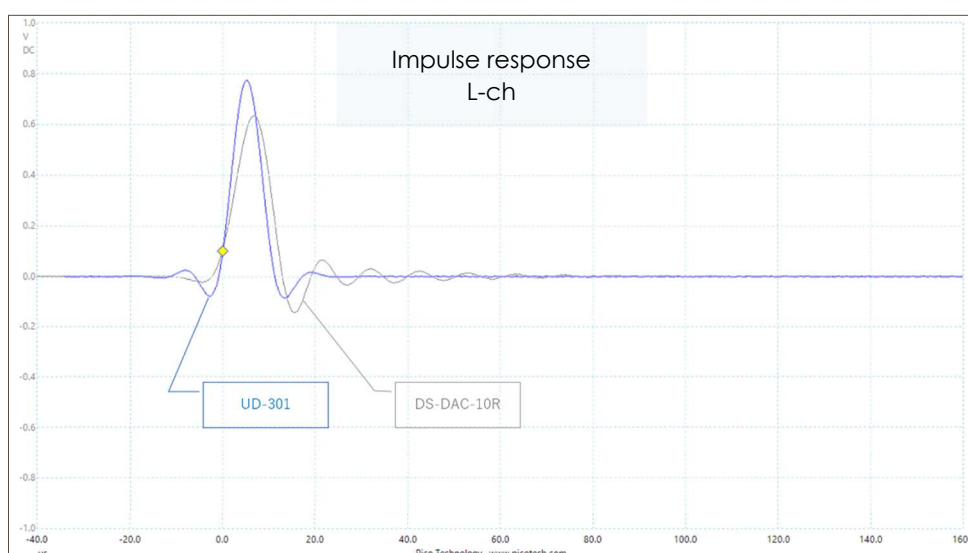




No ringing is observed. The peaks that look like overshoot/undershoot are not real overshoot/undershoot. They are caused by lack of RF due to A/D conversion.

Impulse Response

The waveforms are exactly the same in both channels. Only the waveforms of the left channel are shown here.



UD-301 causes no ringing. It is an ideal waveform.

Impulse response is the most influential to SQ among the measurements. The difference between DS-DAC-10R and UD-301 is largest in this measurement. I can tell UD-301 has better SQ than DS-DAC-10R without a listening trial.

Channel Separation

Separation was measured at 20Hz, 1kHz and 20kHz.

Frequency	Direction	Separation
20 [Hz]	L → R	100.0 [dB]
	R → L	95.4 [dB]
1 [kHz]	L → R	102.5 [dB]
	R → L	100.1 [dB]
20 [kHz]	L → R	101.4 [dB]
	R → L	101.1 [dB]

Very good result.

At 20Hz, some noise is induced into the left channel, so the figure for R to L is lowered by about 5dB.

Sound Quality

I used both Gaud II and Kinglet for listening trials. I spent one month to evaluate SQ.

UD-301 sounds clearer and more transparent than DS-DAC-10R as the measurements imply.

In addition to its good appearance and excellent measurements, SQ is so good. I have an impression that UD-301 is designed in very earnest way.

Comparing with SONY HAP-Z1ES, it is hard to tell which is better, HAP or Fils9.

I was relieved that Fils9 with UD-301 was a match for HAP, since Fils9 with DS-DAC-10R wasn't as good as HAP.

Since the purpose of this project is replacing HAP with PC audio, it is obvious that the SQ of the PC audio must be at least the same level as HAP. And, hopefully, higher than HAP, because it is more expensive than HAP.

I tried some improvements for higher SQ.

Improvements

I tried another USB cable and another player app to determine the best combination.

Comparison of USB Cables

When I installed UD-301, I used the USB cable that came with UD-301 (SAEC SUS-380) without a doubt.

This cable isn't the accessory of UD-301. The retailer (TEAC Store) tied it to UD-301. Probably, SUS-308 had a reputation as a USB cable for audio.

However, I remembered a painful experience with USB cable for audio before.

https://nobody-audio.com/English/posts/topics_en4.html

I began feeling this SAEC cable is questionable too.

I tried a general-purpose USB2.0 cable to compare with SAEC.

I bought ELECOM U2C-BN10BK for 1,100 yen (incl. tax) at a nearby PC shop. The length of the cable is 1m. The shorter, the better, but it was the shortest at the store.



← SAEC SUS-380



ELECOM
U2C-BN10BK →

Measurements

No difference is found in frequency response, impulse response, square wave response and channel separation.

ELECOM is slightly better than SAEC in residual noise and FFT analysis.

Residual noise

ELECOM is slightly better than SAEC. As for the DC component, the figures are low enough for both ELECOM and SAEC.

Condition	Left channel		Right channel	
	AC (rms)	DC	AC (rms)	DC
w/o filter	57 (69) [uV]	182 (175) [uV]	65 (78) [uV]	-58 (-47) [uV]
w/ 40kHz LPF	7 (8) [uV]	180 (193) [uV]	7 (8) [uV]	-64 (-39) [uV]

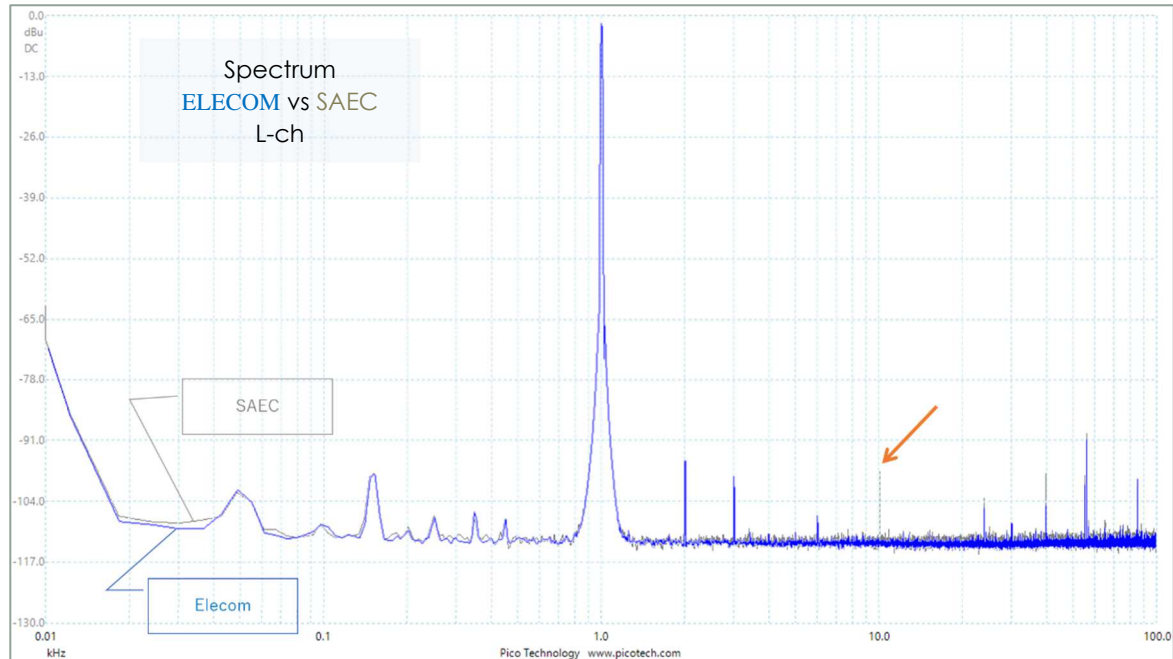
The numbers in parentheses are data of SAEC

FFT Analysis

ELECOM is slightly better than SAEC.

Index	Left channel	Right channel
THD	0.005 (0.005) %	0.005 (0.005) %
THD+N	-69.96 (-69.42) [dBc]	-69.11 (-68.31) [dBc]
SFDR	89.20 (87.92) [dBc]	88.15 (87.17) [dBc]
SNR	70.07 (69.52) [dBc]	69.19 (68.39) [dBc]
IMD	0.039 (0.039) %	0.039 (0.039) %

The numbers in parentheses are data of SAEC



The biggest difference is the harmonic at 10kHz (pointed by the orange arrow in the figure above). SAEC gives substantial magnitude of harmonic (about 14dB), but ELECOM gives no harmonic.

Sound quality

At first, I liked SAEC.

SAEC sounded vivid and sharp.

However, as I listened more and more, my evaluation overturned. SAEC's sound has changed by aging.

Treble became sounding loud and bass withdrew. I felt SAEC sound too loud.

I redid measurement of SAEC after I used it more than 10 hours.

Another Measurements of SAEC

The characteristics at 20kHz or higher are somewhat different from the previous one, though there is no difference in the audible band.

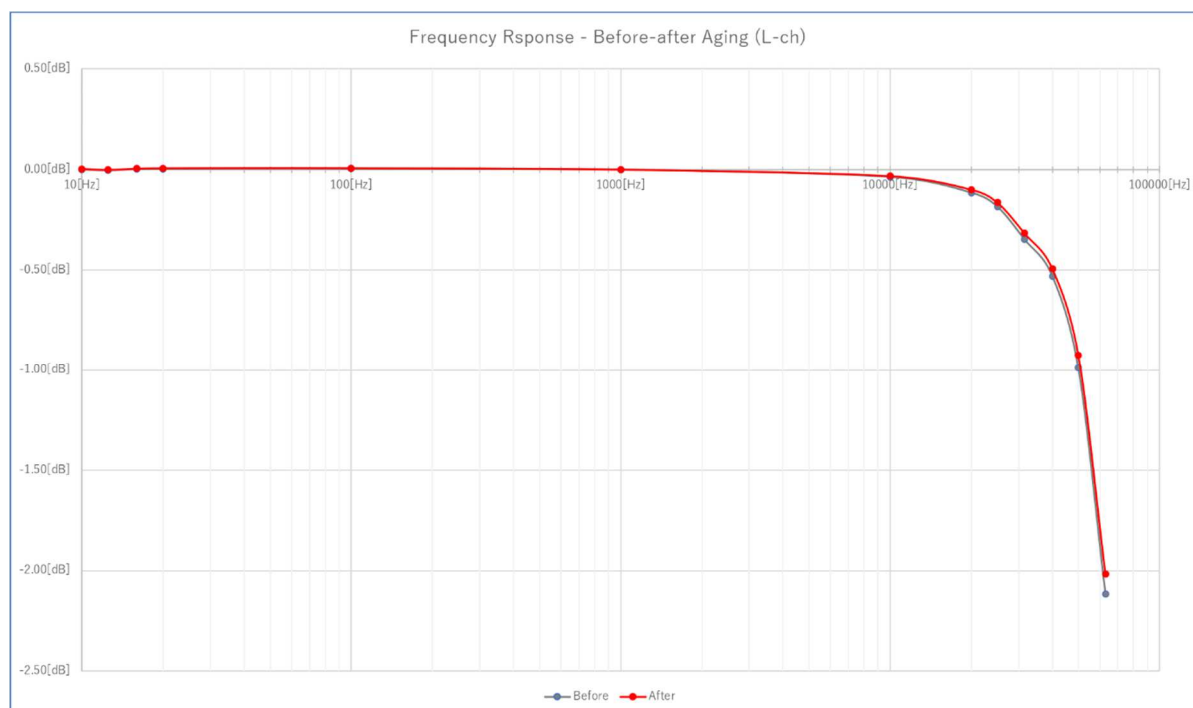
There are no differences in impulse response, square wave response and residual noise.

Frequency Response

The gain is slightly higher than the previous one at 20kHz or higher. As frequency increases, the gain increases.

The table below shows the data of the left channel. The right channel is the same.

Frequency	Gain Before aging	Gain After aging	Difference
20kHz	-0.11 [dB]	-0.10 [dB]	+0.01 [dB]
25kHz	-0.18 [dB]	-0.16 [dB]	+0.02 [dB]
31.5kHz	-0.35 [dB]	-0.32 [dB]	+0.03 [dB]
40kHz	-0.53 [dB]	-0.49 [dB]	+0.04 [dB]
50kHz	-0.99 [dB]	-0.92 [dB]	+0.07 [dB]
63kHz	-2.11 [dB]	-2.02 [dB]	+0.10 [dB]

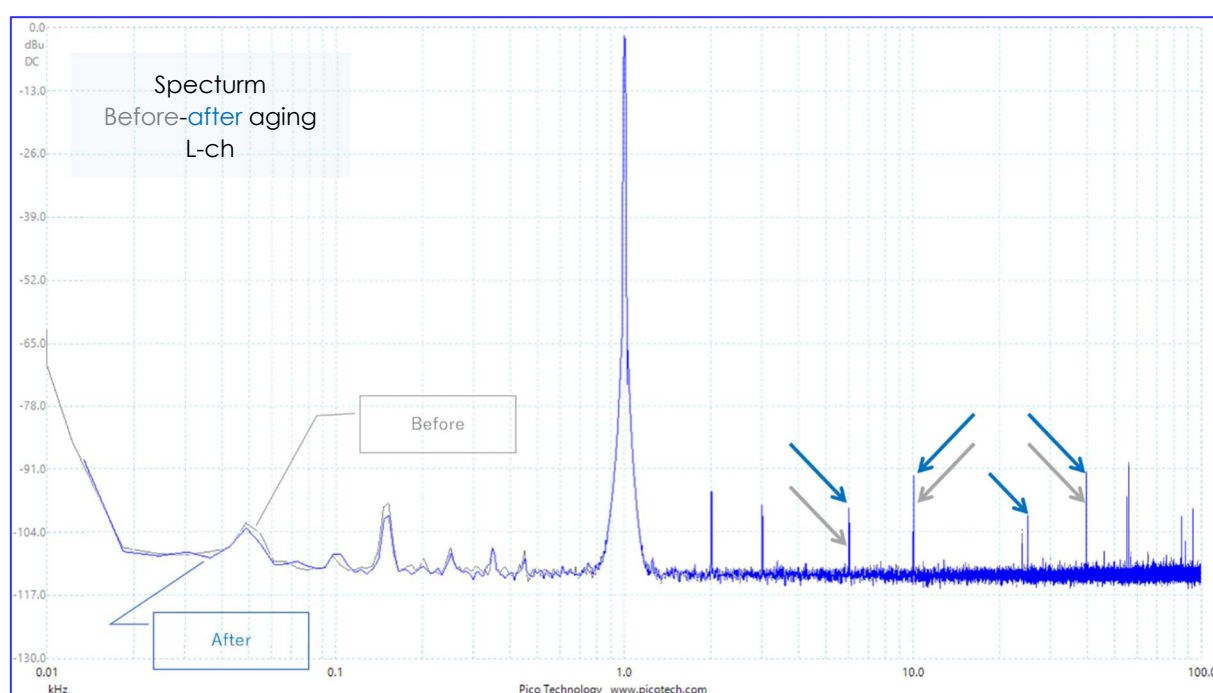


FFT Analysis

It seems that the figures are the same as the previous ones. However, the spectrum shows harmonics have increased in the high treble region (6kHz or higher).

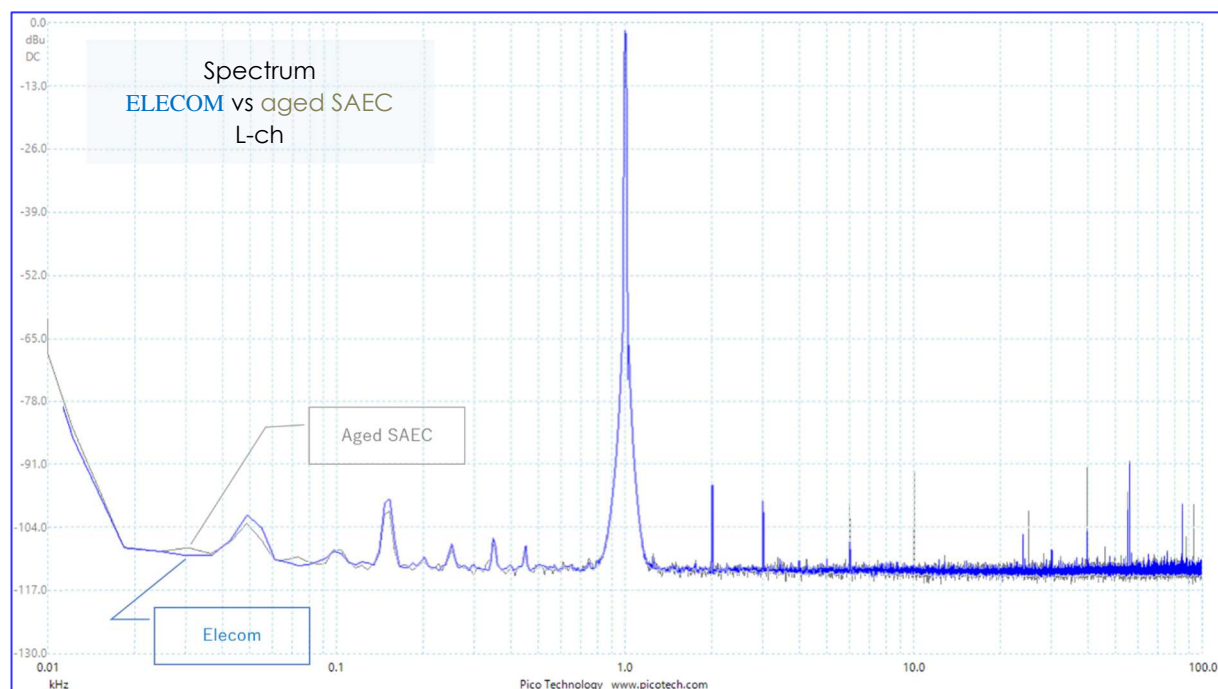
Index	Left channel	Right channel
THD	0.005 (0.005)%	0.005 (0.005)%
THD+N	-69.70 (-69.42) [dBc]	-68.29 (-68.31) [dBc]
SFDR	88.58 (87.92) [dBc]	82.05 (87.17) [dBc]
SNR	69.81 (69.52) [dBc]	68.36 (68.39) [dBc]
IMD	0.039 (0.039)%	0.039 (0.039)%

The numbers in parentheses are the previous data.



The harmonics at 6kHz, 10kHz and 40kHz became larger and the new peak appeared at 25kHz (the gray arrows point the peaks before aging, and the blue arrows point the peaks after aging in the figure above).

The figure below shows comparison of ELECOM and aged SAEC. It is clear that ELECOM produces less harmonics at the high treble region (6kHz or higher) than SAEC.



Selection of USB Cable

I concluded ELECOM is better in both the measurements and SQ.

I've selected ELECOM U2C-BN10BK.

Needless to say, it is my judgement. Other audiophiles may select SAEC if they like treble-boosted, crisp sound. USB cables for audio still remain in the market because there are some who regard them as good cables in spite of their high prices.

Comparison of USB Ports

When Fils9 is reviewed with DS-DAC-10R, I concluded there was no difference in SQ between the USB ports.

I made the same trial listening against Fils9 with UD-301 to compare the USB hub (SOTM tx-USBhubIn) with the USB port on the motherboard (the USB2.0 port in the rear panel).

I feel some difference this time.

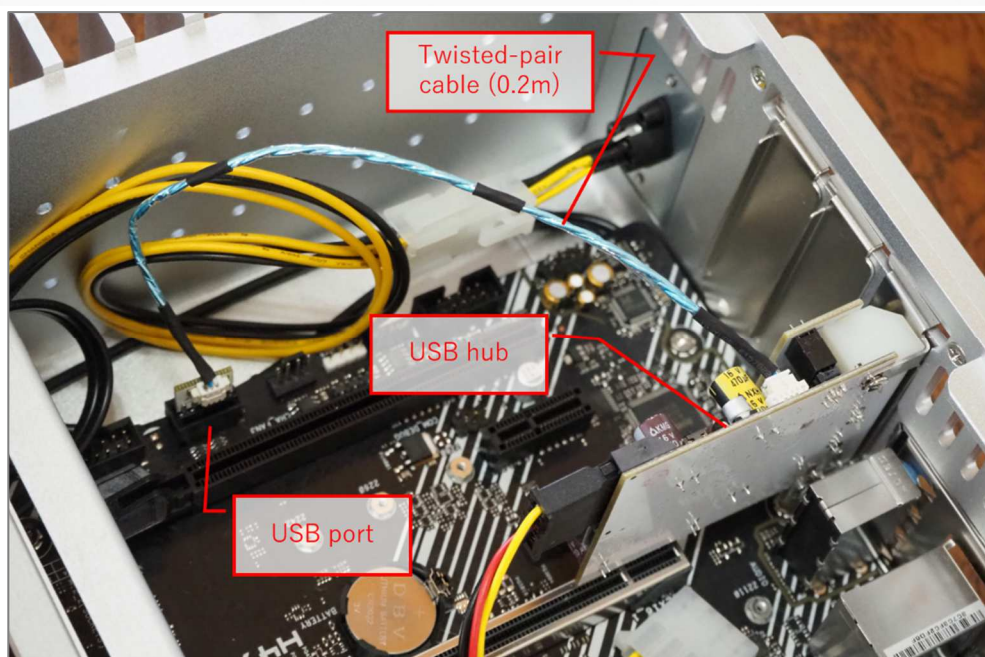
I feel the USB port on the motherboard sounds better than the USB hub.

Not only for USB cables but for other types of digital cables, the longer the cable, the higher the error rate. In order to transfer data without error in isochronous mode, the shorter the cable the better. 0.7m is rough standard.

ELECOM U2C-BN10BK is 1m long. It a bit too long for audio use.

In addition, when the USB hub is used, it is actually extended by 0.2m to 1.2m in total. It's because the 0.2m-long twisted-pair cable is used in the enclosure to connect the USB port on the motherboard to the USB hub, as shown in the photo below.

One more catch. This twisted-pair cable is not shielded. It is no good! The cable must be doubly shielded because plenty of electromagnetic noise is enclosed inside the enclosure.



This USB hub actually impairs SQ.

This USB hub is designed to improve the quality of the bus power, but UD-301 doesn't use the bus power. On the other hand, the USB hub deteriorates the quality of the signal lines.

I've decided to use the USB port on the motherboard.

Comparison of Player Apps

So far, I've been using FB2K, I'll try some other player apps.

KORG AudioGate 4

This app doesn't support DACs manufactured by other manufacturer than KORG. So AG4 isn't good for UD-301.

TEAC HR Audio Player

This app is dedicated to TEAC DACs (called HRAP hereafter).

Measurements

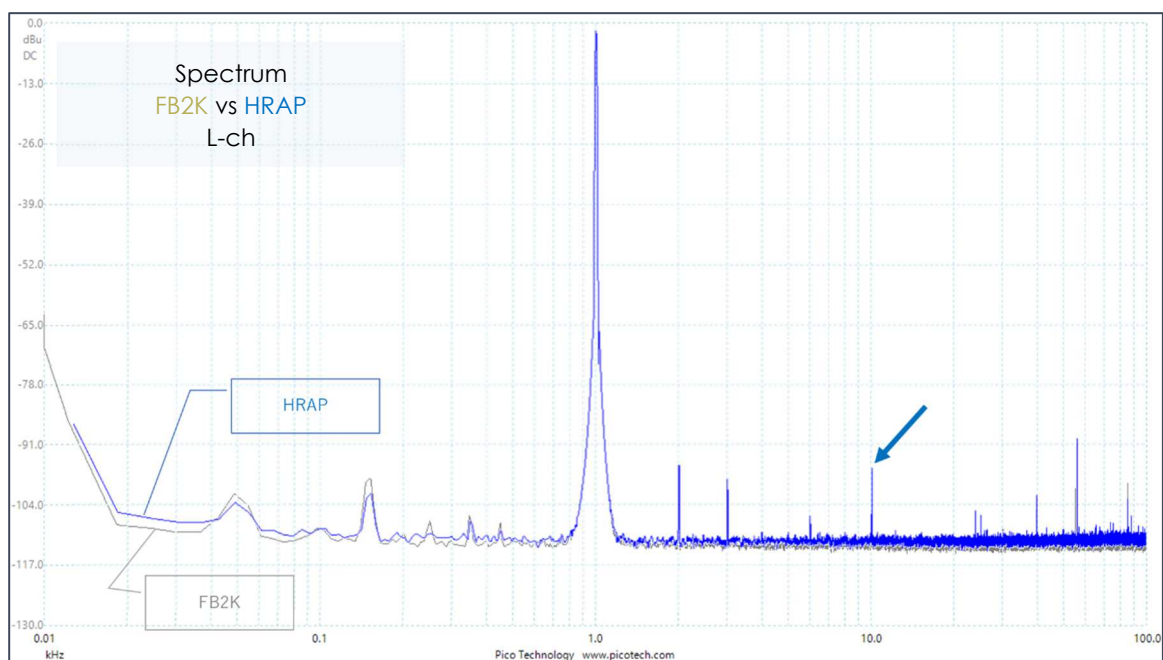
Almost all the data are the same as FB2K.

There is a very small difference only in FFT analysis. HRAP is better worse than FB2K.

Index	Left channel	Right channel
THD	0.005 (0.005)%	0.005 (0.005)%
THD+N	-68.75 (-69.96) [dBc]	-67.78 (-69.11) [dBc]
SFDR	87.92 (89.20) [dBc]	86.90 (88.15) [dBc]
SNR	68.85 (70.07) [dBc]	67.85 (69.19) [dBc]
IMD	0.039 (0.039)%	0.039 (0.039)%

The numbers in parentheses are the data of FB2K.

When HRAP is used, there appears harmonic at 10kHz as with SAEC's USB cable. The levels of the peaks at low frequencies (less than 1kHz) are lower than FB2K.



Sound Quality

I don't notice difference in SQ for PCM sources.

I think HRAP is a bit better than FB2K for DSD sources.

Selection of Player App

I'll use HRAP for DSD sources, although its user interface is so bad.

I'll use FB2k for PCM sources.

Comparison with DAPs

Once again, I'll compare the PC audio with SONY HAP-Z1ES. Is the PC audio really better than HAP in both measurements and SQ?

I'll also compare it with the replay feature of DAR (digital audio recorder) KORG MR-2000S.

The table below shows the result.

Competitor	Measurements	SQ (listening trial)	Note
HAP-Z1ES	C	B	High-level white noise and mechanical noise are generated. SQ is good.
MR-2000S	A	A	Both measurements and SQ are excellent.
Fils9 w/ UD-301	A	A	Both measurements and SQ are excellent. Radiated EMI is intense.

Review of HAP-Z1ES

Advantages

- SQ is good. Especially, vocal sounds naturally.
- Radiated EMI is small.

The low EMI is just what we would expect of audio equipment. When I saw the inside of HAP, it looked like an IT device and I doubted its EMI performance. But it's my misunderstanding.

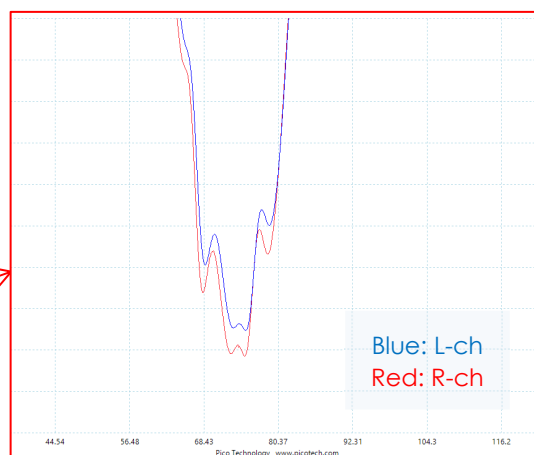
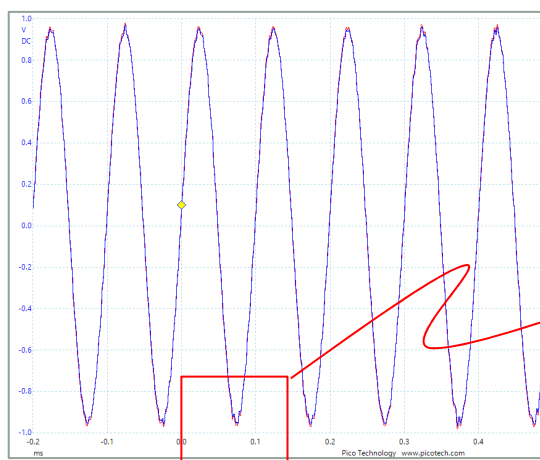
When the radio is placed on HAP as shown in the photo on the right and tuned to an AM radio broadcast, no noise is heard. You can enjoy the radio without problem.



Shortcomings

- White noise is induced.
- Vibrations of the cooling fan and the HDD reach the rack and the rack emits audible noise.

The level of the white noise is high, but it isn't audible. The noise is induced only when HAP replays a music file. When HAP stops, the noise isn't induced. This noise might make the sound softer and mellower.



10kHz sine wave w/ white noise

I used to believe the mechanical noises of the cooling fan and the HDD were emitted by the enclosure of HAP, but now I understand it isn't true. Of course, the enclosure emits small mechanical noise, but the noise from the rack is far louder. Good insulators can reduce the mechanical noise significantly.

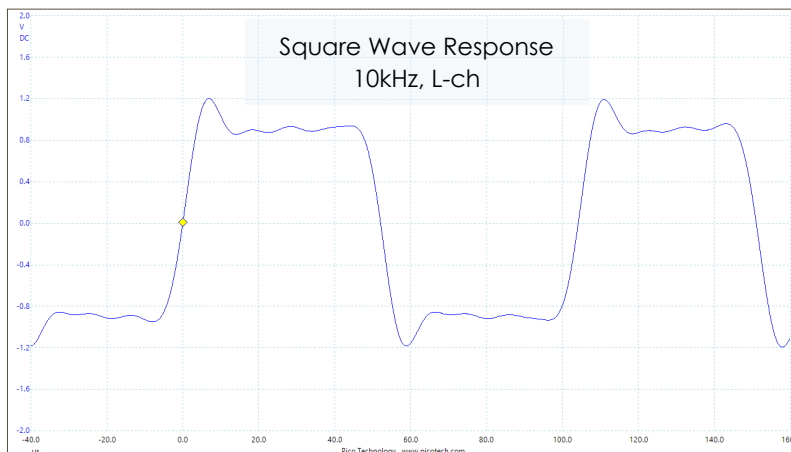
For further details, refer to the review of HAP linked below:

https://nobody-audio.com/English/posts/topics_en5.html

Review of MR-2000S

Advantages

- Very good measurements
- Very good SQ
- No mechanical noise in spite of the built-in HDD
- Little radiated EMI



Flawless waveform



Like HAP, noise isn't heard from the adjacent AM radio

Shortcomings

- For a music player, the capacity of the storage is short and the user interface is poor

For further details, refer to the review of MR-2000S linked below:

https://nobody-audio.com/English/posts/topics_en6.html

Conclusion

The PC audio is now better than HAP in SQ, and comparable with MR-2000S after the half-a-year struggle.

The PC audio excels them in user-friendliness such as user interface and expandability.

I'm pretty sure that the PC audio is better option than HAP.

I decided the final lineup of the devices and apps, and the cabling and layout.

One thing I worry is that the PC audio radiates far more EMI than audio equipment.

I still don't know how much the EMI of Fils9 affects other audio devices. My solution is to place Fils9 as far from other devices (especially analog devices) as possible.

Lineup

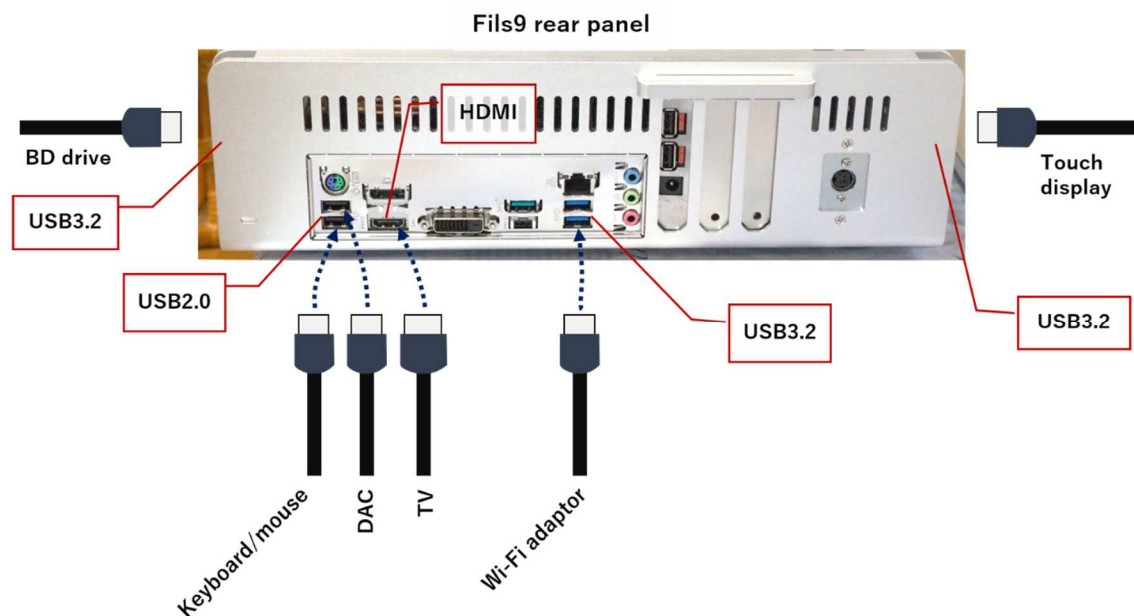
The table below shows the final lineup.

Component	Manufacturer	Model	Description
PC	OlioSpec	canarino Fils9	Silent PC, 2TB SSD is added
Display	Century SHARP	LCD-10000UT AQUOS 4T-C43AM1	10.1" display w/ touch panel, USB3.0 43" 4K LCD TV
Keyboard/mouse	Logicool	MK240	Wireless keyboard/mouse combo
Wi-Fi adapter	Buffalo	WI-U3-866DS	11ac, USB3.0
BD drive	Pioneer	BDR-XU03J	Portable BD drive, USB3.0
USB DAC	TEAC	UD-301-SP/S	PCM: 192kHz/24bit, DSD: 5.6Mbps
USB cable	ELECOM	U2C-BN10BK	USB2.0, 1m
LINE cable	(DIY)	CB1	Shielded quad-core RCA - RCA cable
Power strip	ELPA	WBS-T3010B	1m, 3 outlets, w/ switch
Player app	- TEAC	foobar2000 HR Audio Player	For PCM sources For DSD sources
Ripping app	dBpoweramp	CD Ripper	For CD ripping
Movie player app	CyberLink	PowerDVD 20	Chiefly used for DVD and BD
TV app	Deqion	Dixim Play	It receives data from STB via Wi-Fi

A 2TB SSD (Crucial CT2000MX500SD1) is added to Fils9 as Disk1.

Cabling

The devices are connected as shown in the figure below.



The receiver of the keyboard/mouse is connected via a 1m-long USB extension cable (ELECOM U2C-E10Bk). The receiver is placed far from Fils9.

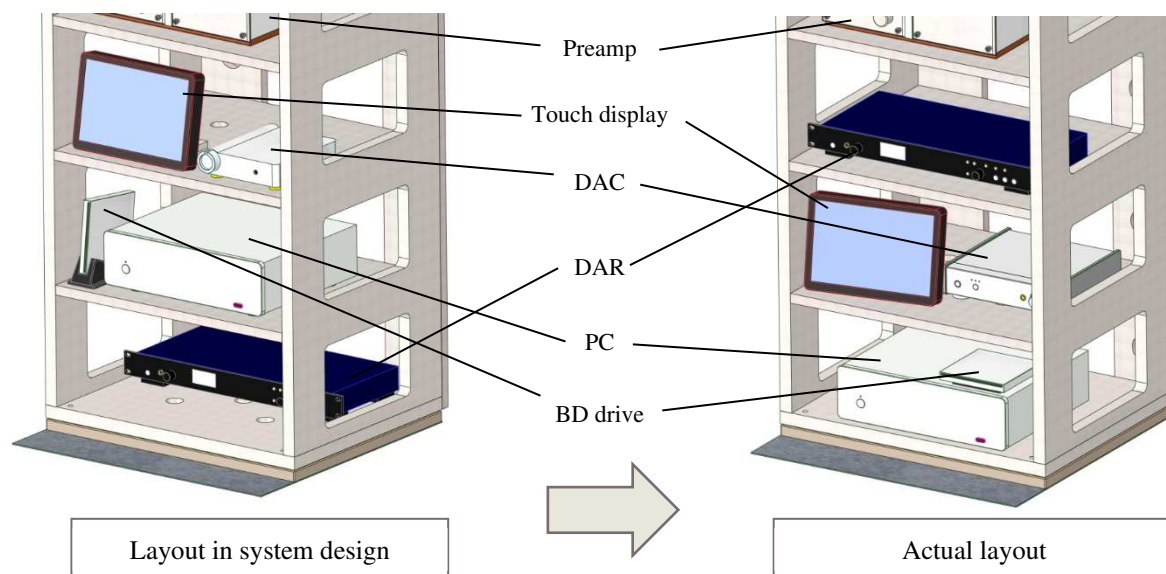
The Wi-Fi adapter (WI-U3-866DS) is also connected via the extension cable (0.5m) that is the accessory of WI-U3-866DS.

The BD drive and the touch display are connected to the USB3.2 ports in the left and right heatsinks. Because these two devices are not used regularly. When they are not used, they are unplugged.

Layout

Component Layout

To keep it away from the preamp, Fils9 is placed on the first tier (the bottom) of AR-416 unlike the system design. And the peripherals are on the second tier.



The BD drive (BDR-XU03J) is set on Fils9. This BD drive emits big mechanical noise and vibration for its compactness, so an antivibration rubber is put between the BD drive and Fils9.

Though the BD drive is set near the right heatsink of Fils9, no trouble happens due to heat release. It's because Fils9 doesn't consume much electricity. Its power consumption is 25 to 35W in actual use. The heatsink is warmed, but not hot.



Antivibration rubber

The Wi-Fi adapter is hung on a plastic hook as shown in the photo above.

Layout of the keyboard/mouse

The position of the keyboard and mouse could adversely affect SQ. Consideration is needed.

It's handy if the keyboard and mouse are placed in front of the listener. But they shouldn't be placed on the floor. If there is a table in front of the listener and the keyboard and mouse are on it, it's ideal to use them. However, if a large table is between the listening position and the loudspeakers, the sound waves could be distorted due to reflection and/or diffraction.

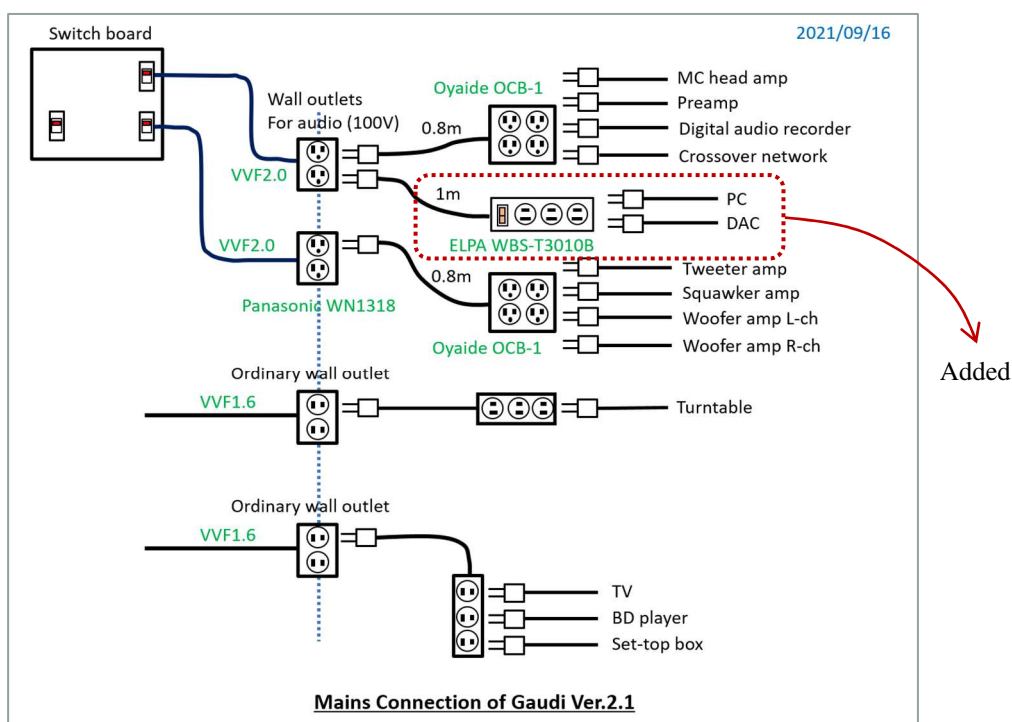
My solution is to use a very small table. I placed it near the listening position, and set the keyboard, mouse and an infrared remote on it.



AC Power Supply

Fils9 and UD-301 are plugged to a power strip with switch. The power strip is necessary to reduce the standby power consumption to zero. Fils9's standby power consumption is rather much (1-2W).

The power strip is ELPA WBS-T3010B. It has three outlets, 1m-long cable and a master switch.



The power strip is placed on the left of Fils9. It is unseeable from the listening position since Fils9 hides it. The power strip is near the power switch of Fils9, so it's naturally seen when the user turns on Fils9. The user can see the state of AC power at a glance because the switch of the power strip is illuminated.

UD-301 saves its state in memory when it is turned off. When the AC power is turned off and back on, UD-301 turns on without pushing the power button.



Settings

Settings of Windows 10

PIN and password are not set so that the account starts automatically after power on. The account is the default one. It is the only account in Fils9.

FB2K is added to the startup list so that it starts immediately after the system starts.

When Fils9 is turned on, FB2k starts without any input, Fils9 looks like rather an audio player than PC.

The two displays are used: 43" LCD TV and 10.1" touch display. The former is set to Display 1 and the latter is Display 2.

The magnification is 150%.



The TV is kept connected, but the touch display is connected only when it is used. When the touch display is plugged, the touch display works but the TV doesn't. When the touch display is unplugged, the TV works as the PC display.

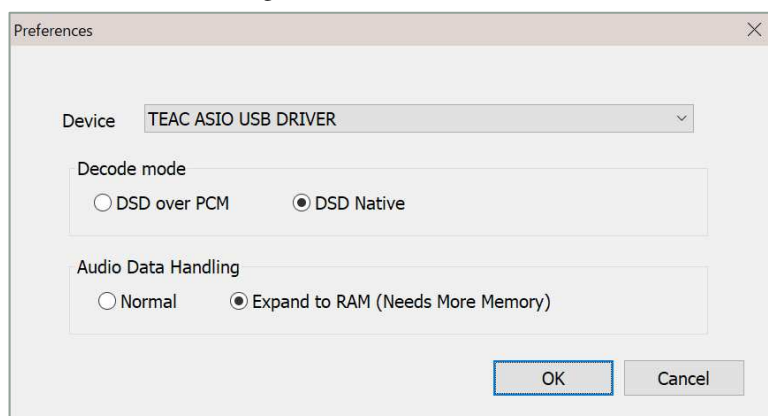
This switch-over by connecting/disconnecting the USB cable can be done even when the system is running. It's easier than changing the settings of Windows.

Settings of DAC

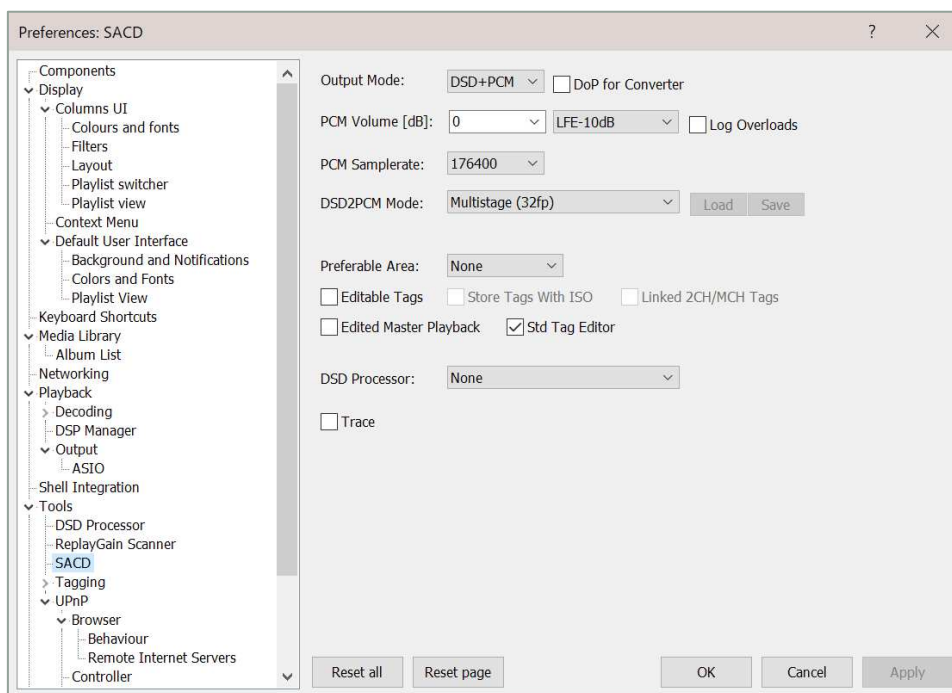
I am not going to use the upconvert feature of UD-301 for the time being. It's because it lowers SQ to my ears for some sources. But I haven't spent much time for trial listening. I haven't concluded yet.

Settings of the Player Apps

The settings of HRAP are as shown in the figure below. 'DSD Native' mode is selected.



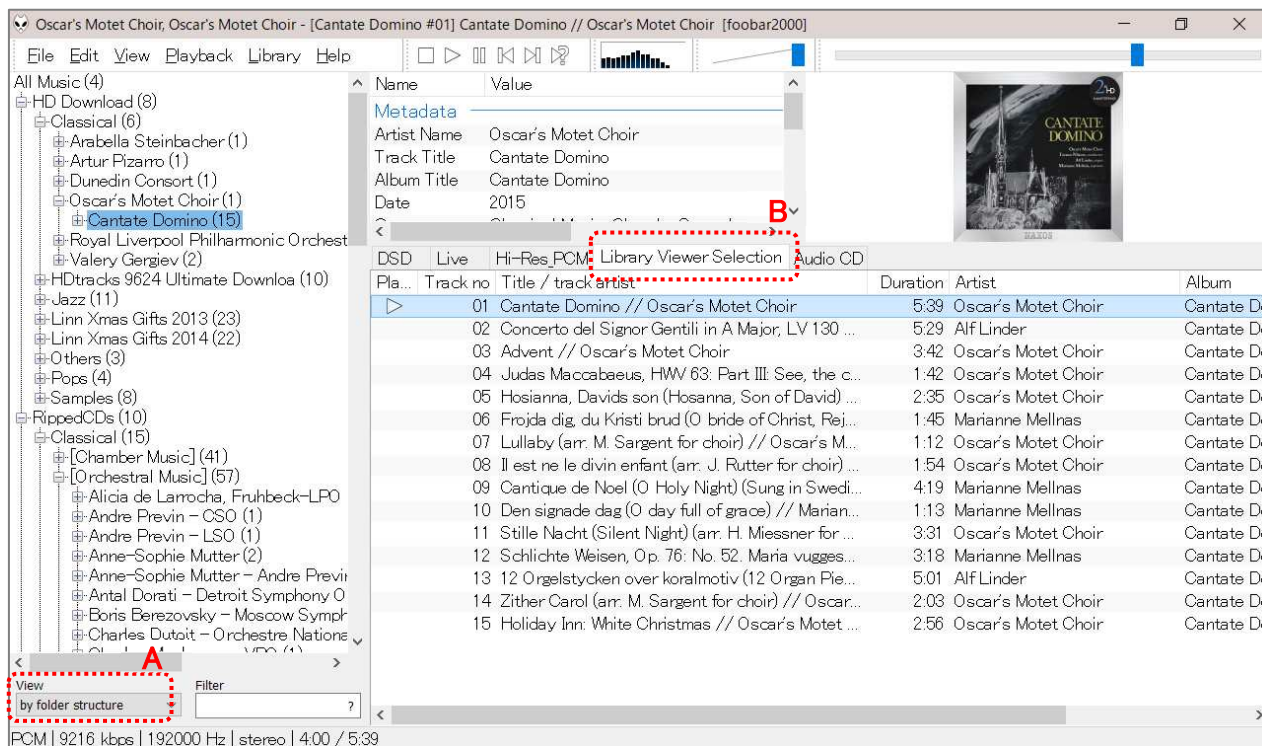
FB2K is also set to decode in DSD native mode.



The user interface of FB2K is excellent, no doubt. And, it is customizable.

I've customized it a little, but the appearance is almost the same as default. A graphical interface is attractive, but I prefer a low-keyed design. I think it is rather good for music appreciation.

As of September 2021, my FB2K looks as in the photo below. I may change it in the future.



I set 'Library Viewer' to 'by folder structure' (pointed by A in the figure). The folder hierarchy where music files are stored is displayed in Library Viewer. In the first place, I've stored my music collection in the folder hierarchy as shown below. This Library Viewer is very convenient for me.

[media category]-[music genre]-[sub-genre]-[artist name]-[album title]

Among the playlists, there's a special playlist named 'Library Viewer Selection' (pointed by **B**). When a file is clicked in the Library Viewer, it appears in this special playlist. When a folder is clicked, all the files in the folder appear in the playlist. The previous files in the playlist are automatically deleted.

Library Viewer Selection can't be used in the default setting. You need check 'Enable' in 'Preferences: Media Library'.

Thanks to this outstanding user interface, I can select one particular tune among 20 thousands in my collection (as of September 2021) within 10 seconds. In addition, 'Filter' feature helps to find a hard-to-find tune.

I created some playlists, but I seldom use them. I am satisfied with the method above.

FB2K is registered as 'music tool' of Windows. It is evoked by double-clicking a music file in Explorer. And, it is controlled with special function keys of keyboard such as 'play/pause'.

Reassessment after Installation

Sound Quality

I think SQ became a little better after I installed Fils9 and its peripherals in the audio rack AR-416.

That's probably due to some psychological effect. Now that the devices are neatly installed in the rack, the looks of the subsystem is so good. The good appearance can improve SQ.

Not only aural information but also visual information affects SQ. So, I regard appearance as an important thing lately.



The SQ of the headphone amp of UD-301 was bad at first. But it became good soon. Now it's good enough.

Though I seldom use headphones for music appreciation, it's good for listening casually. It's handy to listen to music without the multi-amplifier system.

[2021/11/21] {I tried out the headphone output more, and concluded its SQ is not good compared with other headphone amps. The resolution is not enough}

Appearance

When I selected the components, I focused on not only SQ but appearance. That was a good decision, and now I am happy with the appearance of this PC audio subsystem.

As for DAC, I liked the appearance of DS-DAC-10R. But I replaced it with UD-301 because SQ of DS-DAC-10R was good enough. The design of UD-301 is not as sophisticated as DS-DAC-10R, though, it is classy for its price. Now I like the looks of UD-301.

It is the portable BD drive, Pioneer BDR-XU03J, that I chose just because of its good appearance. It was as expensive as 24,760 JPY! It was manufactured in 2017. It should've been sold as a new old stock, but I bought it as a new one. Moreover, it didn't work at first.

Now I am happy with it. It fits in with Fils9 perfectly. It was a good decision not to replace it with another BD drive.

User-friendliness

As mentioned above, it's not too much to say that the user interface of FB2K is ideal. This PC audio is very easy to use when FB2K is in use.

HRAP is better than FB2K in SQ, but its user interface is too poor. I want shortcut keys at the very least.

PowerDVD 20, which I use for replay of DVD/BD, is user-friendly in addition to good PQ and SQ. But I don't like so many ads it displays.

In total, the user-friendliness has been much improved compared with when HAP was used.

Other Aspects

The Wi-Fi adapter still has a small problem. Though the signal quality and transfer rate are almost stable, at upper 70s% and 520Mbps, respectively, the transfer speed occasionally dropped under 300Mbps for some reason. And, on rare occasions the connection is interrupted. But the connection resumes at once, so movies on YouTube aren't interrupted. I am a bit worried, though the instability doesn't cause a practical problem. I think the performance of the Wi-Fi adapter, Buffalo WI-U3-866DS, is a little poor. I'm going to replace it someday.

As for the USB hub, I ignored the lesson I learned before (about Aurorasound BusPower-Pro), and wasted some money. The purpose of the built-in USB hub (SotM tx-USBhubIn) is improving the quality of the bus power. On the other hand, it deteriorates the quality of the signal lines. That leads to deterioration of SQ. There seems to be no hope even if the DAC is one that is powered by the bus power.

Without tx-USBhubIn, Fils9 is cheaper by 38,665 yen (as of August 2021). I recommend it.

As for the USB cable, it turned out that a common USB cable is better than one specialized for audio in both measurements and SQ.

I've been saying, "The more expensive an audio accessory, the lower the effect." and "Cost reduction is the best solution to improve sound quality." I am more confident in this appeal.



[END OF DOCUMENT]

NOBODY Audio

Tonochi's Audio Room - Supplemental Info