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The division between „pro" and „home" audio is a fact. Guys from recording studios, working in concert halls and so on think that audiophiles are simply freaks (at most) and audiophile audio companies are just crooks. On the other hand audiophiles consider sound engineers to be deaf woodenheads. It is obvious that none of these … opinions are right, but it clearly shows how the relationship between these two parties look like.
In „pro" world the top priorities are reliability, features, ergonomics and ease of service. Sound quality is, in my opinion, important, but not at the top of priority list. On the other hand sound quality is everything for audiophiles, who might live with devices might come to bits when touched, that are very unfriendly to use, or in extreme cases even dangerous for user. That's also why pro and home audio world usually don't come together. Sometimes they do but doesn't happen to often.
It's not to difficult to point out some companies that successfully work in both worlds. JBL is one of the big names, Dynaudio and Tannoy are midrange ones, and e.g.. ATC, PMC, dCS, EMM Labs, Manley Labs are small companies that also manage to exist in both worlds simultaneously. There is one similarity between all of them – they have separate offers for pro and for home audio markets. I guess they know what they are doing – they know these two world should be kept separated.

LAP-2.V3 – a preamplifier and headphone amp from Berliner company Funk Tonstudiotechnik that we test herewith was designed for pro customers, recording studios to be precise. There is nothing in its design, look or among its features that could suggest a gesture of good will towards audiophiles. But still it reads in promotional materials: „LAP-2 is an ultra-linear preamplifier intended for both home and studio use. This preamplifier was designed basing on Funk Tonstudiotechnik reference system for mastering studios. The newest version - V3 – has a new input matrix, even more advanced input stage and additionally second output for subwoofer." And the other sentence: „LAP-2 is used as a reference device in high-end sector".

As you can see LAP-2.V3 is a new version of the device that has been used in many studios for years. It is a small, nicely build box, that should fit to both home and studio systems. There are 6 linear inputs, 4 outputs for recording (studio!) and two outputs for external power

amplifier (or one for amplifier and the other for active subwoofer). There is a small knob for volume control, but there is also possibility to disconnect attenuator (using a jumper placed inside the casing) and to use this device strictly as headphone amplifier and two-inputs selector. Manufacturer also claims that LAP-2.V3 might work as independent preamplifier with active speakers or power amplifier (version LAP-2.V3a) or as extension of a stereo power amplifier (LAP-2.V3b). There are many different versions of LAP-2.V3 that differ with finish, or functionality.
There are also few versions of front panel, and any user might order another one change it himself when or if needed. Available colors are: white (RAL7035), black, blue, dark red, silver and gold. Manufacturer, as an option, offers front panels made of brass – polished, gold plated or chrome plated.
The standard LAP-2.V3 is delivered as preamplifier with common volume control for headphones and monitor output. Upon request for particular usage customers can order a LAP-2.V3b version with fixed monitor output level, and fixed recording output level. In this version volume control works only for headphone output. Comparing to previous version now the output power of headphone amplifier has been increased by circa 80%.

As you can see there any many options to choose from. I tested LAP-2.V3 as headamp replacing Leben CS-300 XS [Custom Version] in my system, and as a linestage replacing Ayon Audio Polaris III [Custom Version] tube preamplifier. Funk Tonstudiotechnik delivered also 2 pairs of their BS-2 interconnects along.

SOUND

Recordings used during test (selection):

- David Sylvian, *Sleepwalkers*, P-Vine Records, PVCP-8790, CD (2010).
- Denielsson/Dell/Landgren, *Salzau Music On The Water*, ACT Music + Vision, ACT 9445-2, CD (2006);
- Depeche Mode, *Fragile Tension/Hole to Feed*, Venusnote Limited/Mute Records, CDBONG42, maxi-SP CD (2009).
- Dominic Miller, *Fourth Wall*, Q-rious Music, QRM 108-2, CD (2006);
- Jun Fukumachi, *Jun Fukumachi At Steinway (Take 2)*, EMI Music Japan/Lasting Impression Music, LIM DXD 038, silver-CD (2008);
- Lars Danielsson, *Mélange Bleu*, ACT Music+Vision, ACT 9604-2, CD (2006);
- Laurie Allyn, *Paradise*, Mode Records/Muzak, MZCS-1124, CD (2007).
- Nosowska, *8*, Supersam Music, SM 01, CD (2011);
- Pink Floyd, *The Wall*, EMI Records/EMI Music Japan, TOCP-71142-43, 2 x CD (2011).
- The Red Garland Trio, *A Garland of Red*, Prestige/Universal Music Japan, UCCO-5126, CD (2007).
- Thybo/Stief/Gruvstedt, *Super Trio*, Sundance/Lasting Impression Music, Limited Edition, LIM UHD 047, UltraHD CD (2011).

Japanese versions of the music on CDs available on CD Japan

LAP-2.V3 as a headamplifier
I conducted this test in the same way as always when reviewing headamps. My reference device is Leben CS-300 XS [Custom Version] and additionally also Struss R150 – an integrated amplifier with build in but separate headamp. During the first part of the test i used same headphones as during other tests - Sennheiser HD800, AKG K701 and HiFiMAN HE-6. I realized quite quickly that only combination of K701 with LAP-2.V3 sounded good enough. But even that was not the best set up. I found out that LAP sounded best with an old AKG

model K271 Studio, and even older Beyerdynamic DT990 Pro (I bought mine in 1993).
I should have seen it coming – a headamp used in studios should work best with headphones intended for studio use – kind of obvious if you think about it. As far as I know K271 Studio are still among the most popular ones in many studios, and the DT990 Pro (600 Ω version but also DT770 Pro closed version) were treated as reference ones for many years. Using those headphones I personally did many recordings and ran many concerts. I am well aware of their advantages but I also realize that their time has already passed, that there are many better headphones available on the market nowadays.
Especially that both pairs are quite a difficult loading to drive. It is not about their impedance (AKG have 66 Ω, and Beyerdynamic 600 Ω) which is similar to parameters of headphones I started this test with. It is most likely about combination of their sensitivity, frequency response and impedance curve.

The sound delivered by LAP-2.V3 with all „home audio" headphones lacks proper weight. The worse combination in this aspect was the one with HiFiMAN and also with Sennheiser. The tonal balance was shifted toward upper midrange and the bass surely didn't have the weight it should have had. Despite that HD800 delivered sweet treble with impressive resolution – no brightness, harshness or what so ever. I'd call them even rich, and surely also selective.
LAP seemed to delivered treble in similar way with all headphones which most likely meant it was kind of its own sonic signature. Above mentioned selectivity was really impressive – no worse than presented by much more expensive reference amplifier. It reminded me in this way another great, „pro" headamp - SPL Phonitor 2730.
It's a truism but I am going to say that anyway – every equipment built for studio usage is supposed to help people working there to „hear more", to analyze whatever is there so they need to hear it in the most transparent way possible. Tonal balance, timbre, dynamics are important too, but they all come second.
And it look like LAP-2.V3 delivers just that. It offers fast, selective, clean sound. Listening to more and more recordings I could clearly tell what sound engineers wanted to achieve, what mistakes they made, and even what their own personal preferences were – these were particularly clear to me. For example – I listened to the last album of Peter Nooten, that was recorded only with his Mac Book Pro at home. The limitations of this choice were absolutely obvious to me – sound lacked depth and was quite bright. My reference system showed me more or less the same, but it presented this sound as bit richer, thicker, with better depth that German headamp was not able to deliver.

When I first tried K271 and DT990 Pro with LAP I was truly surprised. And I shouldn't have been. When you think about it the synergy between all elements that are supposed to be used together for certain purposes is a must, is a *sine qua non* condition. When I worked in a studio I did not even realize that. Now I can see it clearly that the same „rule" works for studio equipment too.
AKG K271 Studio delivered very rich sound with a lot of „flesh". I never heard these headphone sounded this way before, never ever. They deliver quite warm sound and everything is shown very close to the head. The selectivity I noticed before was still there but now supported also with overall richer sound and bass better than anything I ever heard from any „home audio" headphones. Instruments were presented very close to the head and were amazingly palpable.
DT 990 Pro are more subtle, and bass is not so prominent as in AKG presentation. Depth of the soundstage is bigger with DT showing instruments bit further from the head, which is a result of some special, passive system these headphones are equipped with. These headphones showed same thing that caught my attention previously when listening to HD800 – warm and rich treble. K271 Studio are not so refined in this area, are bit more „raw" there.
Well, so even though Funk Tonstudiotechnik LAP-2.V3 might look like a hi-fi device and most audiophiles should be fine with it taking place in their rack, it seems not to be a good match for hi-fi headphones. Some of its attributes like selectivity and clarity of the sound are more than good, but the sound lacks weight and the tonal balance is shifted towards upper midrange, and the bass also lacks weight and slam. It works great with studio headphones though. Together they create a great listening experience.

LAP-2.V3 as a linear preamplifier
German preamplifier delivers very clean, very fast sound. I would say that its sound is a bit „raw", meaning that each sonic difference between this device and my reference one would be a lack of something, never an excess of anything.
In the previous paragraph describing LAP-2.V3 as a headphone amplifier I mentioned that it acted differently, usually not so well with hi-fi headphones, but it started to sound great with studio ones. The tonal balance was shifted towards upper midrange and the sound was bit lean (with hifi headphones). With LAP-2.V3 working as preamplifier these two „weaknesses" are still there but they are not key elements defining the sound anymore.
Sound is very clean/clear. Very. Most of, even high-end, preamplifiers might sound bit dull, „gray", not so dynamic comparing to LAP. Selectivity is still great, resolution too, although it is easier to follow an attack phase of the sound, or particular instruments, than to discover the texture of their sound, or to define particular 3D image in the space. Also when working with power amplifier and loudspeakers Funk Tonstudiotechnik preamp delivers weighty, slammy bass. It is very fast, taut, rich and delivered with excellent grip. It never sounds dry, or without proper weight nor extension – regardless kind of music we listen to we should get heavy enough, tuneful bass. The only exception is slight emphasis of mid-bass or so called „kick bass", that is responsible for part of sound of kick drum for example, deciding about its richness. It might create impression of some edginess of the sound. But there is no meagreness, you don't feel like the „loudness" function is used.
Top end is neither rough nor acute. As I already said it seems to be slightly rolled-off. It derives from lack of richness, weight at least comparing to preamplifiers like Manley Jumbo Shrimp (which is twice as expensive). And there is nothing one can do about it.

The tonality of LAP-2.V3 is defined by two main elements – powerful bass and slightly lean treble, and quite strong upper midrange. I already mentioned that the latter element is something to consider as it might be a decisive factor of how well this preamplifier will fit particular system.

Midrange is quite strong, especially its upper part, which on the other hand creates an impression the lower midrange, which is responsible for part of female vocals and richness of man vocals and so on, seems slightly rolled off. So the accent is slightly shifted towards upper midrange. It is not a huge shift, especially that bass is quite strong too, but I think this would make fitting into very transparent system problematic.
I noticed some improvement when I replaced Funk Tonstudiotechnik interconnects with Oyaide Tunami Terzo. The balanced moved bit down and sound became bit warmer. There was also some cost of that – some of this incredible speed and dynamics of LAP was gone and it was definitely not a good thing. With such a fast and clean sounding preamplifier telling a difference between two versions (two different remasterings) of *Little Suite* from *Super Trio* album was just simple. Same tune showed perfectly this amazing speed of German preamp.

I don't now any other preamplifier in this price range that could offer this level of performance. Most of so popular nowadays devices like preamp/headphone amp or preamp/head amp/ D/A converter combinations sound either lean or dull. But here manufacturer found some kind of balance and thus this device is as good preamplifier as it is a headphone amplifier.
Funk Tonstudiotechnik LAP-2.V3 has also its sound signature which may not fit into all systems. It would not matter that much when used in studio, as deepness, richness of the sound, depth of the soundstage or differentiation are not so highly valued there.
In home systems I thing LAP would work best with tube power amplifiers or solid-state but the warm sounding ones. The first part of this sentence might seem a bit controversial to some of you but you might change your might if you check it yourself. I think it might sound very well also with analogue power amps working in class D – they might make use of LAP's speed and dynamics. As for headphone amplifier it worked well only with studio headphones. I'm not really sure why, as it was not about impedance, but a fact is a fact. It is small, nicely build preamplifier, that on this price level is to be beaten. The two limitations from my point of view are" a lack of remote control and power cord that can't be replaced.

Test methodology
The preamplifier is equipped with small, rubber feet that surprisingly well stick to the base. It's a smart solution as otherwise, considering its size and small weight, LAP would move around a lot. During first part of the test it stood on a granite shelf of my Base IV Custom rack, but later on I put it on Acoustic Revive RT-38 platform. Try it for yourself…
During test I used BS-2 interconnects delivered with LAP, and also Oyaide Tunami Terzo. I like the sound better with Oyaide. RCA sockets used in LAP-2 V3 are quite small so I couldn't use my reference ICs from Acrolink – their thick plugs didn't fit.
Test was run as AB with A and B known. As a reference devices I used Leben CS-300 XS [Custom Version], Struss R150 integrated amplifier and Ayon Audio Polaris III [Custom Version] preamplifier.

DESCRIPTION

Funk Tonstudiotechnik LAP-2.V3 is a linear preamplifier with headphone amplifier. It's been designed for studio usage and thus there is no remote control, but there are few record outputs (signal is buffered and its level is fixed). Front, back and side panels are made of solid, thick aluminum. The bottom is made of steel. Device is equipped with four rubber feet.

Front and back
On the front there is a small volume control knob, 6 push-buttons as input selectors, push-button for record output selector, on/off toggle switch and a headphone socket. The knob is quite small but using it is handy, the scale is given in dB in small steps, so it is possible to precisly set the volume. The push-buttons are made of rubber (as the knob is) and also they work easily. Above them there are some LEDs – green ones indicated chosen input, red ones indicating which input is a source for record output. There are six analogue inputs, four record outputs and two outputs with adjustable output level.
On the back there are two rows of RCA sockets – decent but not extraordinary one and placed so close to each other that it is impossible to use interconnects with large plugs. A fix power plug comes out from the side of the device and the plug has no ground pin.

Inside
The electronic circuit has been almost entirely done with SMD technique. Usually it is done in such a way that there are inputs, than input selector and the signal is amplified in two channels. It is done differently here. There are inputs and than signal is buffered, separately for each of them. Buffering and amplifying of the signal is done in integrated circuits, and than for each input there are two selector chips – one for adjustable outputs the other for recording outputs. On only after an active output is selected signal is being amplified in integrated circuits – there is a buffer at input and CD4041UBM driver, and than TL064C – a quadruple J-FET amplifier. The input buffers have a high input impedance with an instant response.
In the front there is a black Alps for signal attenuation.
There are OPA1611A chips, one per channel, at headphone output. Same chips are used at outputs. There is a small power supply at the side with small toroidal transformer and active voltage regulators. RCA sockets are not gold plated (only ground is gold-plated). There are two jumpers next to the pot that allow to bypass volume control for monitor output. There is a single PCB there.

Technical data (according to manufacturer):
Frequency range:
1 Hz – 200 kHz/±0,2 dB
10 Hz – 20 kHz/±0,01 dB
Phase response:
±2° absolute (20 Hz – 20 kHz)
±0,2° relative (20 Hz – 20 kHz)
Nonlinear distortion (THD; 1 kHz):
< 0,0001% (< -120 dB),
typ. < 0,00007% at +6 dBu input level
Nonlinear distortion + noise (THD+N):
1 kHz < 0,00025% (20 Hz-20 kHz)
10 kHz < 0,00045% (20 Hz-80 kHz)
Crosstalk input/input:
1 kHz: > 115 dB
10 kHz: > 104 dB
Noise MONITOR-OUT unweighted: -109,0 dBu 20 Hz - 20 kHz eff. (gain=0,0 dB)
-112,5 dBu "A"-weighted
Dynamic MONITOR OUT: 137,5 dB A-weighted eff. (Gain = 0,0 dB),
134 dB CCIR 468 unweighted
Dimensions (SWG): 210 x 42 x 172 mm

Linear preamplifier/headphone amplifier **Funk Tonstudiotechnik LAP-2.V3**
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Text: Wojciech Pacuła
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Funk Tonstudiotechnik (pic. 1)
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