

Lake People G103P and G109P Headphone Amplifiers

By [John Grandberg](#) ~ Posted: Jul 9, 2012

<http://www.innerfidelity.com/content/lake-people-g103p-and-g109p-headphone-amplifiers#3EgmJLfjwIWUxYd3.97>

Introducing Lake People

Don't feel bad if the name doesn't ring a bell, Lake People is not a high profile company compared to many of the big players on the market. They started in 1986 making gear for recording and television studios, and have been making headphone amps since 1989. Despite this pedigree, their focus on studio gear combined with their German origins kept them fairly obscure as far as the North American market is concerned.



That changed some when they launched the Vioelectric line a few years back. Vioelectric is focused on the audiophile market, and is very Head-Fi friendly with their compact enclosures. The line consists of several headphone amps, a DAC, and a phono stage. I use Vioelectric gear in my reference setup and quite enjoy it.

The actual Lake People branded models have always been very utilitarian in form and function---basic sturdy enclosures or rack-mount configurations, mostly XLR inputs, that sort of thing. But with the newly redone G-series of headphone amps, Lake People are now reaching out to the home user with attractive but low key black aluminum enclosures, choices of RCA or XLR inputs, and reasonable pricing. In this review I sampled the lowest and the highest priced models in the range to see how they stack up.

Lake People Models

G-series models are available in Standard or Pro configuration. For the entry level G103 model, Standard means RCA inputs only, while Pro means XLR inputs. The unit is so small that I don't think they had room for both types. For the top range G109, the Pro adds XLR but keeps the RCA inputs. Pricing is a bit complicated - here's the list I was given, in Euros rather than US Dollars.

- G103S - 245 EUR
- G103P - 295 EUR
- G109S - 445 EUR
- G109P - 495 EUR

To an extra wrinkle to the equation, those prices include 19% VAT, which would not apply to orders outside of that area. If we take away VAT and convert EUR to USD using the current exchange rate, the G103 and G109 come to approximately \$250 and \$450 respectively. Pro configuration adds roughly \$50 to each price. These amps are so new that there isn't a North American distributor yet. Those duties will likely fall to the [same distributor](#) who currently handles the Vioelectric line. (UPDATE: the new North American Distributor for Vioelectric and Lake People gear is located [HERE](#))

Design Theory

Before we get into specifics of each amp, I'd like to discuss the general topic of headphone amplifiers. There are two main camps in the headphone world: those who feel that all competent headphone amps sound identical, and those who think each amp has a unique flavor of its own. Interestingly, Lake People/Vioelectric has managed to become well respected among both types. NwAvGuy has repeatedly used Vioelectric as an example of well engineered gear, yet there are plenty of subjectivist users with expensive power cables and interconnects who have also given Vioelectric praise. It's not often that a company can bridge that gap and earn respect from both sides.

I asked Lake People CEO Fried Reim about his design philosophy, and about headphone amp design in general. About what makes amps sound different from one another? Most any well engineered amp will have a practically ruler flat frequency response assuming it isn't being over-driven beyond its capabilities. With frequency response being identical, how can two amps possibly exhibit any differences in sound? Fried agrees that amps can in fact sound different, and he gave me some thoughts on how or why that may be the case. English is not his first language but you should have no problem understanding his point:

"You are right, a properly made headphone amp from any brand will most times measure ruler flat concerning the frequency response in the audible range and far above. But here is where the differences begin. Every designer has his own approach about how far the frequency range should spread. The unwanted regions are cut by the use of capacitors.

"As you know, the frequency edges are defined at -3 dB. And at this point we also are faced with a 90 degree phase shift. Cutting the low end at, lets say, 3, 5, or 10Hz is of minor interest in my opinion. You can't hear that low with a headphone anyway, so frequency or phase shift issues are really negligible.

"All this is more critical when cutting the high edge of the frequency range. A limitation to 50 kHz (-3dB) will affect the 20 kHz level by about 0.5 dB (which is not critical) but also by a noticeable phase shift at this point and below. So somebody might argue: why not kick off all these upper frequency limitations ... and in fact, some manufacturers do so. But in times of massive electromagnetic interference from everywhere it is not very intelligent to design an amp which is capable of amplifying long wave radio frequencies. Also, any CE or FCC certifications will be out of reach.

"Even when there is no specially designed frequency limitation, real life audio electronics are limited by component issues. These are described as GBW (Gain Band Width) and slew rate. The higher the feedback gain, the lower the GBW and the slew rate. And here we come to another reason for sonic differences: although the frequency response is flat and (measured) distortions are low, low internal gain (+8 dB, a factor of 2.5 with Lake People/Vioelectric models) not only keeps the noise floor low, but also allows for high GBW and high slew rate.

"But in my opinion most sonic differences are caused by impedances. The output impedance from the amp will always interact with the impedance from the headphone. This will have more or less influence on the frequency response and thus affecting the sound of the connected headphone. In some cases this will support your personal preferences, in some cases not. In former times when most premium headphones had high impedances this was not a big issue. But many of today's premium headphones have low impedance.

"It is very difficult to measure what really is input to the human ear. So frequency/impedance interactions are most times calculated theoretically and displayed in a 2-dimensional curve, or better (as there is also an SPL interaction) in a 3-dimensional "waterfall" model. Perhaps you have seen MLSSA measurements from loudspeakers in different rooms. The headphone listeners "living room" is between the transducer and his ear, but also affected by the individual shape of the outer-ear and inner-ear. And here the whole thing goes beyond perfect measurability ...and thus a subject for personal taste, tales, magic ...

"To limit impedance issues Lake People/Vioelectric models offer output impedances well below 1 Ohm and so the chances are low for impedance related interactions between the amp and the can."

This isn't meant to be an exhaustive treatise about the ins and outs of amplifier design (though I think that would make for an interesting article all by itself). Rather, it is an interesting look into the opinion of one designer in the objectivist camp who believes there are legitimate reasons for why his designs sound distinct from one another. The bit about measurement difficulties falls in line with what [Tyll has been saying](#), and also backs up the idea that some headphones can sound better or worse than their measurements would lead you to believe.

Speaking of measurements, Tyll has been working on a [test suite for headphone amps](#) but it isn't ready yet. So at this stage all I can do is talk about the design of these amps, and tell you how I subjectively feel about the sounds they make. Though I have a feeling these types of amps will end up doing well in Tyll's battery of tests, rather than the "tuned by ear" audiophile variety.

Let's have a look inside, and listen to the amps ...



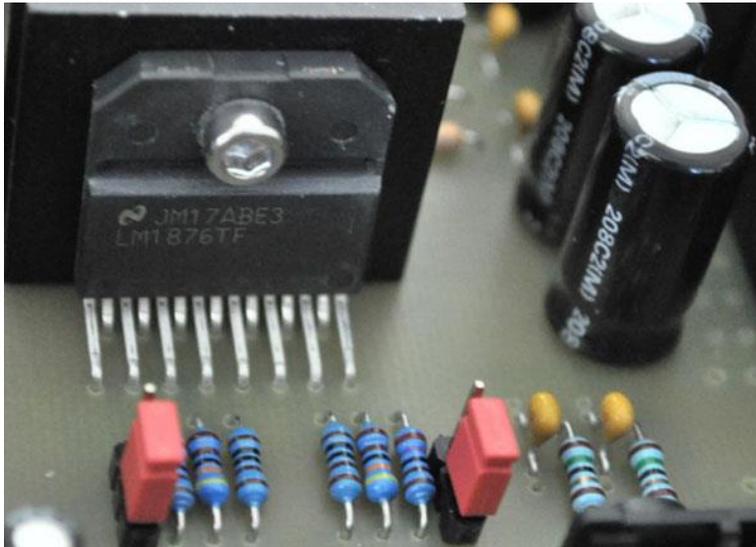
Listening Tests

The setup used for evaluation consisted of a custom music server running Foobar, USB out to a Vioelectric V800 DAC, then out to the amp. An Apex Butte was also used for comparison. Headphones included a wide variety of dynamic and planar driver models, as well as various custom in ear monitors. I also used a line out cable from my iPad to get a second opinion from a more basic source.

The Lake People G103



The entry level G103 is a very compact unit, measuring 4.25 inches wide, 2 inches tall, and just under 6 inches deep. It should be able to fit just about anywhere. The front panel is exceedingly simple: dual 1/4" headphone jacks, a power button, and a volume knob. That's it. Around back we see an IEC power cable inlet and a pair of input jacks - XLR variety in my case since I have the Pro version.



Internally, the design is simple, straightforward, and effective. Twin EI core transformers with some smoothing capacitors for the power supply section, an Alps RK14 pot for volume control, and at the heart of the design a National Semiconductor LM1876. This is a chip amp that is intended for driving speakers, and is popular with the DIY crowd for things like [Gainclone amps](#).

[Specs on the G103](#) are pretty impressive for such a small thing. Of particular note to users of planar headphones is the current delivery

into a 50 ohm load: 1130 mW. Gain can be adjusted via internal jumpers to settings of -4 / +2 / +8 / +14 dB to account for any variety of headphone being used. Output impedance is less than 0.1 ohm.

So how does the thing sound? The first thing that struck me was the pitch black background. I'm not using that term in the sort of nebulous, audiophile way. I mean the background was literally silent, absent any hiss, hum, grit, or other undesirables. This was the case with everything--low impedance or high impedance cans, planar-magnetic headphones, and ultra-sensitive in ear monitors. The channel matching was very tight, with just a barely perceptible imbalance at ultra-quiet levels. Any real world listening gets well beyond that range.

From there, my listening notes focus on low frequency reproduction. This amp performs far better than the price would suggest. Using headphones with really good low frequency performance (HiFiMAN HE-500, Denon D7000, Unique Melody Merlin), I heard loads of texture and detail. It didn't come across as being emphasized at all, but due to the high amount of clarity it was something that my ear was drawn to. This could probably cause some listeners to refer to it as a "warm" sound. I submit that it's only "warm" in the sense that it shines a perceptual spotlight on the bass quality more than anything else.

Mids were nice and clear as well---reasonably transparent and open sounding. I believe this is what people tend to refer to as "getting out of the way of the music", as cliché as that may be. Granted it may not have the same level of realism that more ambitious amps can display, but it does pretty well, and for the price I am very satisfied with it.

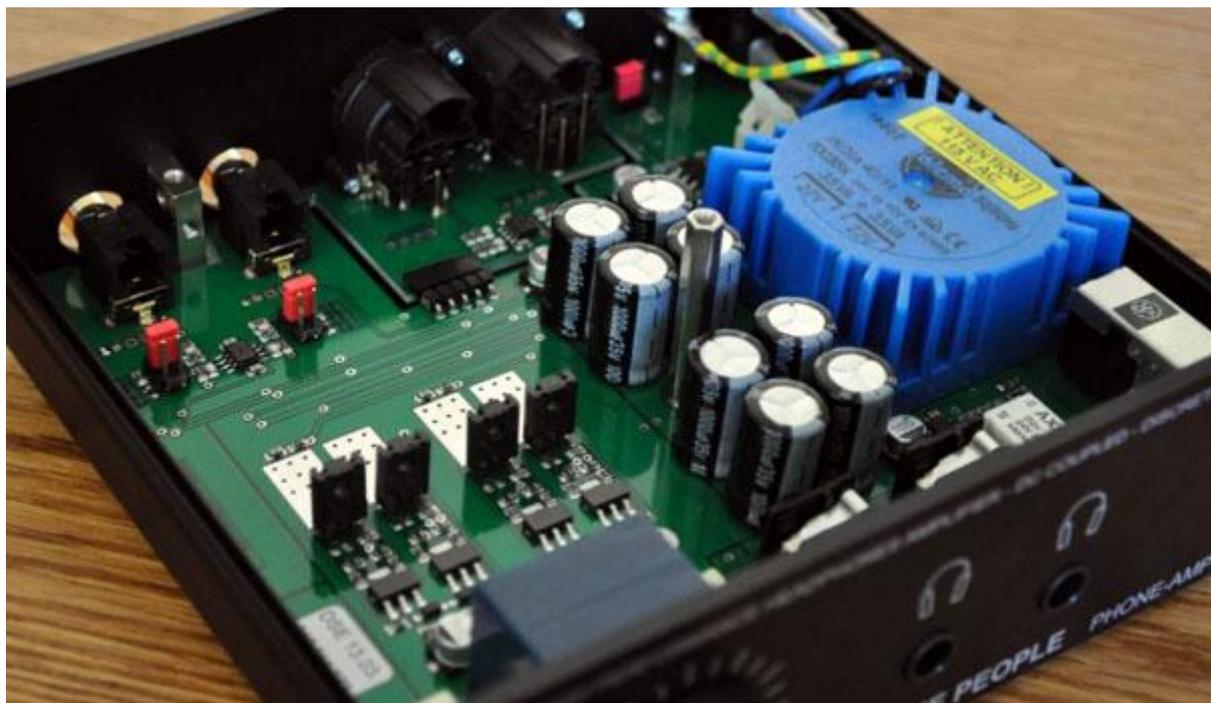
The point at which the budget nature of the design becomes most audibly apparent is in the upper mids and highs. They end up being slower, and slightly "bland" for lack of a better word. It's a subtractive shortcoming which is better than the usual solid state edginess that other budget amps have, but obviously still not ideal. This is another part that could elicit descriptions of a slight "darkness", despite the measured frequency response being totally flat. This was more easily noticed when using higher impedance headphones---a fact that Fried Reim agrees with and attributes to the combination of power supply limitations and lower internal voltage.

The G103 is not on the same level as the \$495 Apex Butte. Yet it costs significantly less - the price in Standard form is roughly half. It does manage to keep pace with the Apex unit through the lows and most of the mids. And it even has certain advantages over the Butte, such as the gain selection and low volume channel balance. If one was on a fixed budget and really wanted to try a pair of planar headphones, I can't think of a better entry level amp to recommend.

The Lake People G109



The [Lake People G109](#) is a bit wider than the G103, measuring about 6.5 inches wide, 2 inches tall, and 6 inches deep. The front and rear panels are similar with the exception of inputs, where the G109P keeps both RCA and XLR. The RCA inputs have priority so unfortunately this is still a one-input-at-a-time device.



Internally, the G109 differs from the G103 in some key areas. It features a higher spec toroidal transformer with a larger array of smoothing caps, a premium Alps RK27 pot, and offers three gain choices (-4, +8, +14 dB) instead of four. The business end consists of a classic NE5532 opamp driving a discrete diamond buffer made up of 4 transistors per channel. Output impedance is less than 0.2 ohms. Once again, this is a relatively simple design but very well executed.

These improvements pay dividends in terms of sound. We keep the excellent low frequency performance, which is actually subtly improved (especially with higher impedance headphones, at high volumes). We get a slightly improved, transparently clear midrange. But this time we get matching quality in the upper mids and highs---the G109 is agile, with transients being more accurately resolved.

It's a very neutral sound, and since everything is on the same level it doesn't give that perceived "warmth" of the G103.

My favorite aspect of the G109 is its universal ability to drive pretty much any headphone in existence. Very short is the list of relatively affordable amps that can swing this much voltage into high impedance loads while delivering gobs of current into planar models (over 2000 mW at 50 ohms), with variable gain and an inky black silent background with even the most sensitive IEMs.

Of course, this is still a device built to a price point, and as such it isn't intended to be a statement product. Folks looking for really high end performance should be checking out gear from from [ECP Audio](#), [Apex Audio](#), or [Eddie Current](#), just to name a few. In comparison to its upscale Violectric V200 sibling, the G109 is less resolving and isn't as velvet-smooth up top. Nor does it capture that convincingly holographic "you are there" feel. But the V200 is twice the price, and has a host of improvements like double the output transistors per channel and much higher power supply voltage with more regulation. It's impressive that the G109 does so much with so little.

The Apex Butte is an excellent comparison for the G109. It costs about the same, and in many ways sounds about the same too. Once again the Butte suffers from having a lower quality volume pot, while the G109 has essentially perfect channel balance. From a usability standpoint, I like having the different gain options to play with. When using sensitive headphones, or especially IEMs, I always wish the Butte had more usable range in the volume---it gets really loud, really quickly. Aside from those minor issues, the Lake People and Butte have very few distinguishing sonic traits. I think I hear a touch more upper midrange accuracy on the G109, especially with higher impedance headphones, but the difference is fleeting.

Conclusions

The philosophy of headphone amplification, according to Lake People, is simple: high output voltage; high output power; high damping factor due to low output impedance; and low noise through low internal gain. These four essential ingredients are easy to describe but not always easy to achieve. With the G109, and to a lesser extent the G103, Lake People have accomplished those goals. In the process they have matched or even exceeded the already high performance of the Apex Butte, which is a very respectable accomplishment. I highly recommend each amp within their particular price points.