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AUDIO REVIEWS

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MAY 2007



EDDIE CURRENT ZANA DEUX

Reviewer: Ryan Clarin

Source: Meridian G08

Amps: Eddie Current EC-SS, Eddie Current HD-25, Moth S2A3

Headphones: 2 x Grado RS-1 (vintage with brown headband and current new production with black headband), Joe Grado HP-2, Sennheiser HD600 w/Cardas, Sennheiser HD650 w/Equinox

Cables: Chimera Labs Advantage Series II, BPT IC-SL, Enigma Audio Oenomel interconnect, BPT L-10 x2 (stock and shielded, both with upgraded Oyaides), VH Audio Pulsars

Power: BPT Pure Power Center strip outfitted with Oyaide outlets, Oyaide SWO-DX wall receptacle

Review Component Retail: \$1,900



The Zana Deux is the current top-of-the-line headphone amp offering from Eddie Current and thus owned, designed and developed by Craig Uthus. It is a tube OTL amp with 3 inputs and 2 preamp outs, allowing it to become the centerpiece of an audio system that incorporates both speakers and headphones. It uses two 6C33C-B tubes, one per channel, a 6SL7 input tube and two 6DM4A damper diodes. It utilizes an external power supply to separate out the custom toroidal power transformer. Craig's retro-styled, intentionally low-powered SET amps under the Moth Audio brand were quite successful and are still highly recommended and sought after today. When Moth Audio went defunct, Craig who had created and engineered the circuit topologies for Moth, devoted his efforts to Eddie Current, catering to the professional and the home headfi listener. The other half of Moth Audio was Joel Marshall, who designed the appearances of Moth's designs. He is also involved with set and prop design for Hollywood

The 6C33C-B tube, created by the Russians for military applications, can be seen in various power amps, most notably the offerings from Balanced Audio Technology. The *Deux* in our review subject's nomenclature alludes to the fact that this is a reincarnation of a concept that was the cornerstone of what Moth Audio would represent to the audio industry in the early 90s - completely different, non-traditional designs with looks that resembled old school American hifi. Before we continue with the *Deux* iteration of the Zana, it is important to look at the *Un* iteration, the original Moth Xana.

I have been a member of HeadFi for almost 2 years. Whenever the typical discussion arises about the best headphone amp ever made, the Moth Xana is almost always mentioned, usually by some veteran member who has been in the game much longer than these 25-year old ears. Craig and I have shared many emails and phone discussions about Moth Audio

and Eddie Current and have developed a nice relationship between manufacturer and user (I have owned his HD25 and currently own the Moth S2A3, Eddie Current EC/SS and Moth Cicada single-driver speakers). Craig is an absolute pleasure to talk to, always willing to give of his time to answer questions, help diagnose issues with gear as well as just chew the fat. With me and other users, he has also developed a reputation as a straight shooter, someone who won't try to sell you on one idea or concept and will instead just tell you what his particular product is, from what it derived and how it eventually came into being. During one phone discussion, Craig mentioned how in the early 90s, he had approached Joel about co-founding Moth Audio, with Craig doing the design and circuits and Joel using his set and prop design expertise to create a very specific product line, meant to stick out and offer a different approach to hifi. At first, Joel was not interested but Craig knew he was into headphones so he proposed to launch as their first product an all-out assault on headphone amp design. The goal was to create the ultimate headphone amp system with minimal compromises. That was enough to get Joel's kilt up and him involved. Moth Audio was born. Here is how Craig describes their original Moth Xana:



"We had two iterations. The design came about as an evaluation tool for music, DACs and cables. We knew the amplifier had to be optimized for one kind of headphone and settled on the Sennheiser HD600, which at the time was the most neutral and resolving. Yes, electrostatics were better but we also wanted to *sell* the amp so current-production headphones became the priority. OTL topology was chosen because of the extreme difficulty in making a first class zero coloration output transformer. The choice of coupling capacitor was agonized about over several iterations, with a hybrid capacitor made up of polypropylene, paper and soybean oil being judged the sonically best. We opted for single-ended OTL because the push/pull capacitor-less circuits seemed to cancel some of the music. The power supply was a classic inductor-capacitor filter with mercury vapor rectifiers. Slow turn-on was achieved by using a pass tube with a resistor opto isolator. The signal circuit used two 60-position Shallco gold-plated switches with carbon composition

resistors. The controls were attached with a belt and clutch system so the user could change the balance while the volume would continue to track by turning either knob.

"The signal path only went through one coupling capacitor and that was the 7.5 pound 250uF paper-and-oil output coupling cap. The Xana used a Western Electric 417 driver tube that was interstage-coupled to the grid of the 6C33C-B output tubes. The power triodes ran at 300mA with fixed bias, 90 volts on the plate or 27 watts each at idle. The plate loads for the output tubes were giant toroidal inductors storing huge amounts of energy. There was no feedback on the Xana and it was intended to drive 300-ohm loads. It could swing 40 volts peak into 300 ohms or 5 watts, enough to make you deaf in that many seconds or fry the voice coils. This kind of headroom was mandatory to get the speed and punch

and hear every detail in the music. There are two versions as I said, one with 5U4G rectifier tubes on top and just the power transformers outboard, with a cathode-loaded choke output. It was thicker and slower sounding than the final version discussed above. Because the amp only drove high impedance headphones and cost \$5,900, it had a limited market."

Limited to five owners to be specific. Yet the Xana became a bona fide legend around HeadFi initiates as something so rare and esoteric that only whispers of it were spoken. The Xana had entered an underground culture known only to a few and turned into official folklore. Rumor has it that various headphone aficionados have offered well above retail price to buy existing Xanas from the current owners only to be denied time and time again. Good luck trying to find one too. According to Craig, Joel Marshall owns one and Craig has asked him repeatedly to borrow it for a HeadFi meet only to be rejected. It shouldn't be a surprise that the Moth Xana wasn't a financial success. In the early 90s, headphone listening was nowhere at the level where it is at today. With the creation of the forums in 2001, we have seen huge growth in headphone users and manufacturers have taken notice, creating more hi-end headphones as well as lower-cost options to meet all the demands. The biggest area of growth has been with headphone amps. The last 2-3 years have seen an exponential increase in amp offerings from the likes of Ray Samuels, SinglePower, Meier Audio, HeadAmp and numerous other DIYFP (do-it-yourself-for-profit) outfits. We have also seen the birth of the international headphone meet, with the 1st one last year in New York and the 2nd one occurring this past April in San Jose. These meets featured many manufacturers advertising their products and hundreds of users from all around the world who brought their own headphone systems to share and compare. Even members from the audio press have taken notice, with *Stereophile's* Wes Phillips and Jon Iverson recent attendees who did a nice write-up on the *Stereophile* website. Nowadays, people barely bat an eye when it comes to purchasing a \$5000 + headphone amp such as the new Ray Samuels balanced tube B-52 (\$5,300) or SinglePower's SDS-XLR (\$5,000+ depending on options). Simply put, the Moth Xana may have been ahead of its time, a niche product created for a market that wasn't quite developed and ready for it.

Now Craig Uthus aka Mista Eddie Current decided to step out of the shadows of the Moth Xana with an updated version. The Zana Deux is "an attempt to have as much of that great sound as possible, to drive low *and* high impedance headphones and be more cost-effective." \$1,900 is still a bundle of cash yet even with a limited production of 5-10 units a few times a year, the reputation of Craig under Moth Audio and Eddie Current as well as the lore of the Moth Xana has headfiers more than comfortable making the requisite deposits for their own slice of the legend. On the boards, impressions have been very positive and every single production run has sold out within days.



In January, Craig was able to send me his master unit for a period of 2 weeks, the one he built himself which he then hands over to the assembly company hired to handle formal production. Fit and finish are exquisite and with the 6C33C-B tubes upfront and exposed, the amp is downright sexy. The internals utilize clean point-to-point wiring laid out very well. The unit was already burned in so I flipped the switch, let the tubes glow for about half an hour, plugged in my reference Joe Grado HP-1000 headphones and instantly found myself transported into the music. At first this was not a formal review affair but simply a kind gesture on Craig's part to let me hear what the Zana was all about. During that 2 week period, it was all there - dynamics, midrange, bass, treble, soundstage, tonality... every single aspect of the sound was coherently conveyed without any highlighting or emphasis. Headphone listening is naturally a very intimate and personal experience and good rigs can shut off everything around you to really engage you into the music. The paradox of headphone listening, however, is that the act of directly coupling drivers to your ears millimeters away can actually place you farther away from the music. Headphone systems are more prone to mechanical and electrical noise and any noise present in the system can detract from your musical enjoyment. With efficiencies running at 90+ decibels for a *milliwatt* of power, every single detail from tonal instrument color to a random cough from a performer is brought to the foreground. Sometimes these little non-musical details are accentuated so much that it takes away from the musical performance. Hence manufacturers of headphone products must walk a thin line, with the overall balance and presentation of paramount importance.

Upon that first hour of listening to the Zana, it was clear that this headphone amp was perfectly balanced in that regard. In fact, the entire two weeks with the Zana were all about instant transportation into the musical performance. I could close my eyes and feel the performers' breaths as they started their phrase into the microphone. I could hear and see into the venue, picturing where the recording took place, with a soundstage so spot on that performers could be placed with pinpoint precision; with dynamics that scaled from the quietest of musical passages to the full impact of orchestral blasts; with timbral nuance rich in harmonic color; and a treble so smooth, silky and sweet that it would you melt. The Zana Deux brought back feelings and memories of my first fine headphone encounter when I was still innocent and fresh to noq, years later, become one of the most enjoyable times I ever had listening to recorded music through my rig.



Alas, I had to send the Zana Deux back to Craig so that he could use his master sample to kick off another production run. Craig promised to send me another unit to enable a more extended time with the Zana for an official review. This unit showed up last month. The first thing that really struck me was the apparent speed and quickness of the Deux's sound. This thing boogies like a fiend, with balls and drive completely beyond its specified power ratings of a *mere* 200mW into Grados and 650mW into the Sennheisers. Dynamics were explosive. When asked to, sounds burst out of the drivers with real vengence but without clipping or compression. Two recordings that really highlighted this aspect was an original 1984 Japanese issue of Steely Dan's *Aja* [MCLD 37214] and the JVC XRCD2 of Beethoven's *Fifth Symphony* under Fritz Reiner, performed by the CSO [JVC 68976].

Aja is my favorite rock CD, combining elements of Jazz with articulate and smart Rock, sounding refined and complete in terms of production and performance. The groove is tight in the construction of each musical line and passage. Reiner's interpretation of the 1st movement in Beethoven's *Symphony #5 in C Minor* is a bit more up-tempo than other versions, at times somewhat rushed and disparate. It has a frantic feel but contrasts beautifully with the more lyrical moments of the movement. As a listener, I enjoy Reiner's dynamic liberties here. With the Zana Deux, *Aja* maintained a sense of forward propulsion that kept me locked in and engaged consistently regardless of how familiar I was with the album. A level of freshness was also brought to Beethoven's *Fifth*, sounding utterly dynamic and free of constraint. A music teacher trying to teach me to properly execute forte on the violin and voice once said, "Do not think of the musical symbol F as forte but rather as *free*." A true forte passage should have no limit to its power and impact, gushing forth with a visceral quality that takes over and shakes new life into your spirit. That's why I love Beethoven - I feel that am listening to a free man. The Zana captured all of the majesty and heroism inherent in his *Fifth* so beautifully interpreted by Reiner and executed by the Chicago Symphony Orchestra in this reading.

Prior to the Zana, my most extensive forays into OTL headphone

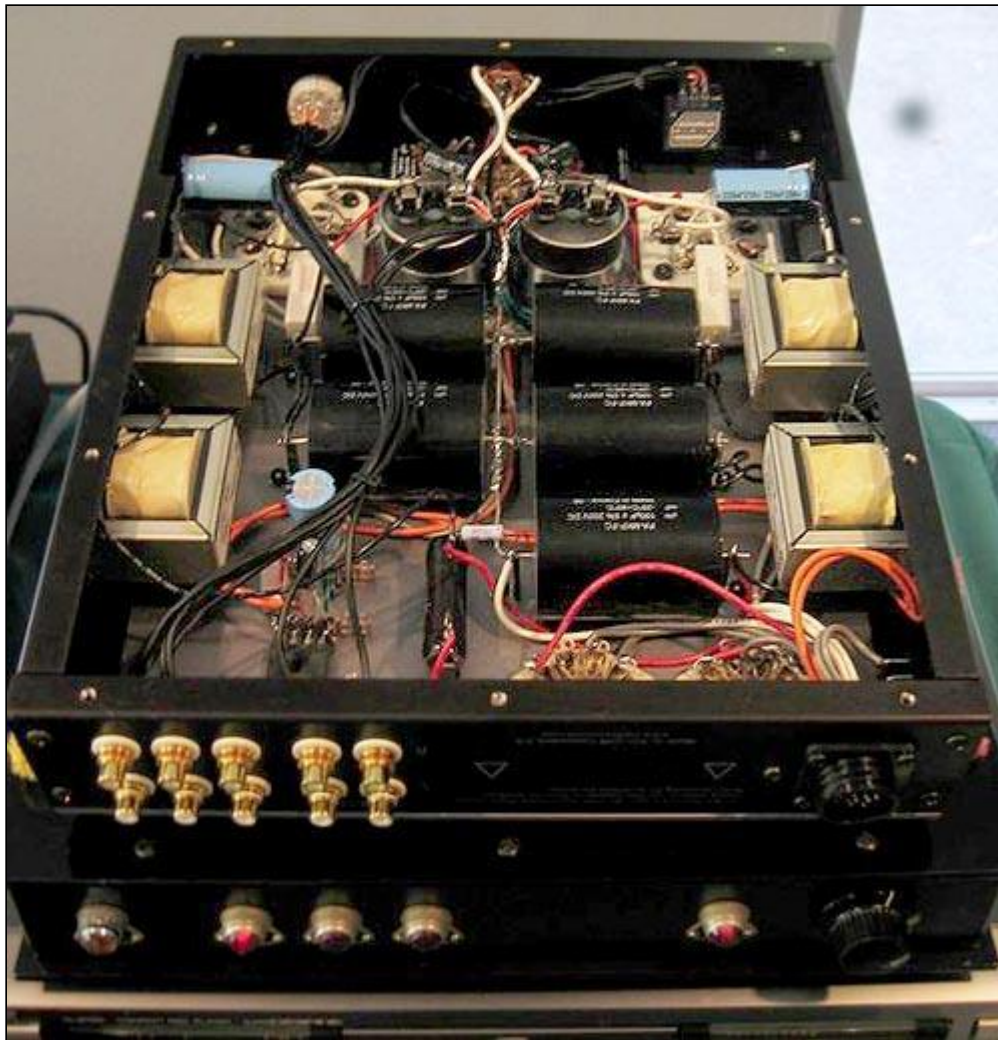


amps were with the Ray Samuels Raptor and the SinglePower PPX3 Slam. Both use 5687 tubes in a push-pull cathode-follower configuration. While both are high performers that offer subtle differences (the Raptor a nudge more speed and detail, the SinglePower more texture and warmth), both were far closer matched than either was to the Zana Deux. Neither exhibited its speed, agility or dynamics, sounding instead compressed, slow, thick and *tubey* in comparison. In order for drums to convey the same impact and force, the Raptor's volume had to be raised



considerably while then congesting and compromising musical enjoyment on a whole. The Slam's warmth and texture got in its way, sounding slightly laid-back and not matching the Zana's adrenaline. I asked Craig to highlight the design of the Zana Deux, to hopefully articulate the differences in his OTL from previous OTLs I was accustomed to:

"The Zana Deux topology is a single-ended class A OTL. The output tube was chosen for its low plate resistance and high current capacity. Most tube headphone amplifiers use cathode followers in some form or another. By definition, a cathode follower is a 100% feedback device which has a gain of less than 1 and a low source output resistance. Cathode followers share a sonic signature which can be characterized as large, thick and even mellow. Some describe the sound as tube like. The 100% feedback also tends to sound compressed. A more musical solution is to take the signal from the plate circuit. This has the disadvantage of a higher output resistance but will sound better if the load is much larger than the plate resistance.



"In the case of the 6C33C-B, the tube is biased for a plate resistance of about 90 ohms. With a small amount of global feedback, the source output resistance will drop to about 12

ohms [the Raptor and Slam PPX3 are both around 30 ohms - Ryan]. This is a low enough source resistance coupled with the high idle current of the 6C33C-B to do a better job driving headphones than most cathode follower topologies. The Zana Deux uses the 6SL7 dual triode for voltage gain and to bias the 6C33C-B. There is only one coupling capacitor per channel and that is the output coupling cap. Every capacitor has a sonic signature. The coupling cap for the Zana Deux is custom made and the best available for this topology. It uses three dielectrics - paper, polypropylene and soybean oil. The last element in the equation is the power supply. Because the plate-loaded SET-OTL topology has very low power supply rejection, one could say we are listening to the power supply - or that at the very least, the power supply contributes to the sonic signature. The ZD uses a classic passive RC, LC, LC filter per channel. High quality film capacitors, a custom toroidal power transformer and *four* custom power inductors make up the basic power supply to provide clean direct current to the output triodes. Because of their high output current capacity and slow turn on characteristics, vacuum tube damper diodes are used for the AC rectifiers. To further minimize sonic attributes caused by magnetic fields, the power transformer is outboard and the Zana Deux chassis is made from aluminum."



One of my favorite albums of all time is the Beach Boy's *Pet Sounds* (DCC, GZS-1035). Brian Wilson's use of dynamics throughout the entire album displays his amazing ability to translate his symphonic prowess into a pop recording. On "Wouldn't it be Nice", a soft ethereal intro is suddenly brought down to reality with a loud drum whack dead center. Over the Zana, this effect is positively startling, the difference between loud and soft amazingly articulate. On "Don't Talk (Put Your Head On My Shoulders)", the strings swell up and down, rising and falling in dynamic crests like the waves of an ocean. There is a moment where the lyric

heartbeat is set by a rhythmic quarter-time pattern in the bass followed by a huge crescendo in the strings. The energy and vitality brought forth through the Zana Deux were breathtaking, the sensation one of a pulse waxing and waning along with the beat, the heart of the music pumping blood throughout the entire performance.

With headphones of various impedances and the volume pot turned to the max, the Zana remained utterly quiet, betraying not a whisper of hiss, hum or noise for the perfect background against which the music could rise. Microphonics too were notable only by their absence even when the chassis was tapped in various locations. My Moth S2A3 for example exhibits a very small level hum on the lower-impedance Grados. The Moth has the power transformer inside the main chassis relatively close to the output transformers. The Zana relegates its power transformer off-board, linked to the circuit via a multi-pin umbilical.



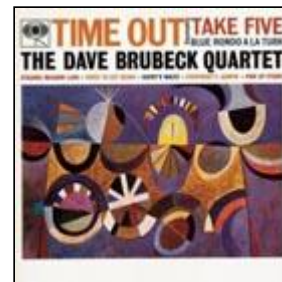
When an amp is truly dead silent, sounds should seem to appear out of nowhere, with images emanating from a dead black oily canvas and possessing a striking sense of color and vibrancy. The Eddie Current HD-25 by comparison to the Zana Deux sounds dull and lifeless, its image outlines blurring into the background. The HD-25 sounds confused like a hazy dream where I can't remember any of the details. The Moth S2A3 is much closer to the Zana Deux in that regard as its transformer hum is quite low and actually below the noise floor of virtually all my recordings. The Moth's beefier power supply showed its sonic superiority over the HD-25 easily. The Zana's sound too really begins with its power supply, creating

that black oily canvas to lead to a higher plateau of detail and resolution than either of my output transformer-coupled options.

With the Zana Deux, music shone more brightly and enjoyed clearer, sharper image outlines. I played recordings that have been part of my sonic vernacular ever since I remember listening to music, say Dave Brubeck's *Time Out* [Legacy 65122]. I know it inside and out to the point where I can comp along on the piano and nail the chord changes perfectly in time. Through the Zana Deux, the sound brought back memories of how I felt when I first listened to the album. In "Blue Rondo a la Turk", Brubeck's opening rhythmic pattern possessed a fire and sense of urgency that I never realized was actually there. The opening passage always had suggested a laid-back feeling, the sound of a man opening up to the

song slowly by introducing the 9/8 time signature. Brubeck appeared to take it easy until the Zana opened the floodgates to what I sensed was the true meaning of that opening motif, which now sounded like a man ushering in a new sound that was cool and hip, profoundly contemporary and forward thinking. I should have already figured out how progressive this Jazz album really was since the critics had all bashed it for not being a jazz album at all due to its non-traditional time signatures that borrow heavily from African percussion music.

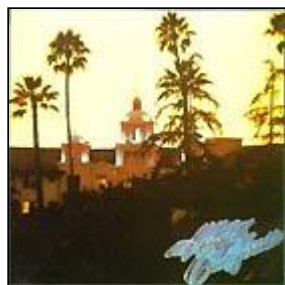
Time Out was like a book that I thought I had read and analyzed over and over again only to realize that more secrets remained to be discovered. That opening passage exploded with vigor, accentuated further with the hard bass to the left and jagged cymbal crashes dead center in the soundstage. Finally, when the traditional 4/4 swing section kicks in, the Zana articulated the groove exceptionally well, contrasting the opening section against the more traditional swing. By recapping the opening 9/8 theme, Brubeck seemed to be saying, "This is the sound we have been accustomed to and this is where I want to take it." With every other amp before, I simply never understood this yet the Zana Deux made it clear as day. The Zana reveals its superior level of resolution not by bringing micro details into the foreground but by accentuating the subtle contrasts that are apparent in any decent recording and performance.



After listening to the Zana Deux longer, I felt the biggest reason for its uncanny transporter ability was its soundstage portrayal. Tubes seem to have those goods more often than transistors, especially with headphones. Well executed tube amps seem to create the illusion on headphones that sound is projected in front of you in real space. The Zana clearly casts a soundstage that extends in front of the listener as well as to the sides, above, and below - 360 degrees, truly fascinating.



Tonally, the Zana Deux does not make its tube colors as obvious. It is full of body and weight but I would not call it warm. Accuracy is what comes into play. Play a bright, harsh recording like Radiohead's *Ok Computer* [Capitol 55229] and you will hear a bright, harsh sound. Take a warm analog album like Wilco's *Yankee Hotel Foxtrot* [Nonesuch 79669] and hear its sonic deficiencies of compression and brittle guitar tone loud and clear. The Zana won't play tricks in this regard. Just like the stated purpose of the original Moth Xana, Craig won't compromise the design by making it less accurate to romance an extra degree of musical enjoyment from such recordings.



The Moth S2A3 is more enjoyable in that regard by not highlighting sonic errors in such recordings as intensely as the Zana Deux does. However, when fed with the right recording, the outcome with the Zana Deux was pure sonic bliss. I played the DCC Hoffman mastering of The Eagles' *Hotel California* [DCC, GS-1024] and was treated to warm, full-bodied sonic delights. Prodigious bass with thick, snappy drums were easily apparent. The squeal from guitar feedback biting into my nervous system was just enough to create the necessary tension to really feel the *rock* in Rock'n'Roll without becoming unduly harsh and abrasive. The lead voice sounded fresh



and vibrant, a trait shared in the majority of Hoffman-mastered recordings. A great example is Nat King Cole's *Love is the Thing* [DCC GZS-1104]. His "When I Fall in Love" really puts me in a good mood. When played on my Moth Cicadas, his voice comes alive and sounds like he is right there with you. On headphones it takes a bigger leap of faith to recreate that feeling but the Zana Deux performs amazingly well in this critical part of the midrange. Nat's rich husky baritone was a solid image clearly delineated from the swelling strings supporting him. The Moth S2A3 by contrast appears to present Nat's voice and the supporting cast closer together in size and scope, lessening the distance between them to shrink space for two different sonic effects, one that I perceive to be more *accurate* and one which makes the claim of being more *musical*.

I queried Craig about his opinion on OTL vs. transformer outputs since he has traditionally focused on the latter by utilizing excellent iron - my Moth S2A3 uses the Electraprint TM3K-B, legendary iron known for its great sound and linearity especially with the 2A3 output tube:

"OTL versus OPT. In the SE world, it is easier to make a good



coupling cap than a good transformer. If the transformer was perfect and the coupling cap too, the OPT would sound better because it can have a lower source resistance, better drive and less loading of the tube. In reality, it is very hard to wind a transformer with good coupling, which is what translates to wide bandwidth and low distortion. There is no perfect transformer and in the case of SE output stages, the transformer is degraded

further because the DC bias current has to be present on the primary, magnetizing the core. With a capacitor it is dissipation factor or the ability to act as a perfect electrostatic pathway. Capacitors are never perfect and the late Dean Jensen once said, "No cap sounds like no cap." He of course was a transformer designer. The Zana Deux distortion, square wave response and bandwidth are better than any transformer-coupled amp. That is not to say someone could not prefer a transformer-coupled amp over the Zana but the Zana will be more accurate. So there is the crux of the problem. The old classic battle between measurements and what the ear likes."

My ear likes and appreciates both. The Moth S2A3 is slower and thicker, with darker images that blend more together. The Zana Deux is faster, more agile and limber, with sharper outlines and brighter tonal colors. It highlights the musical message by shining more light in the recording, digging deeper and separating out each performer from the other. The best analogy is something gleaned from fellow moonies Paul Candy and Srajan, by stating that the Moth S2A3 with its Electraprint iron caters more towards the *space traveler* type of listener with its flowing billowy textured sound whereas the Zana Deux caters more to the *adrenaline junkie* looking to be actively engaged with the music. At the end of the day, it really comes down to personal preferences. Considering that my Moth S2A3 is also an integrated amp that drives my Cicadas and will soon drive my Omega Superhemps, I am in no rush to sell the Moth for the Eddie Current - nor do I see myself ever getting to that point.



Headphone matching was very simple with the Zana Deux. I drove various Grados and Sennheisers and every single can performed well. I did not experience issues with lack of drive, dynamic constriction, loose bass or hardening of timbres. Yet the differences in each headphone were clearly articulated. The HP-1000 offered uncanny neutrality from the midband on up, providing a transparent and accurate presentation perfect for monitoring or hearing deeper into a recording. The GS-1000 was all about soundstage, with sounds clearly projected a greater distance in front of the listener than the rest of my cans. The Grado RS-1s brought forth rich tonal color with strings and woodwinds, which the Zana helped tighten, focus and control into a very cohesive sound whereas on lesser amps, the RS-1 can sound wild and fuzzy. The

Sennheiser HD600 with Cardas and HD650 with Equinox showed the differences within the same family clearly and precisely. The 600/Cardas combo excelled in its articulation of transients whereas the 650/Equinox offered more weight, heft and lower mid-band warmth than my other cans. Each combo showed off its own flavor, with the headphone itself contributing most of it, the Zana Deux merely strengthening its personality by tightening and focusing the sound.



If the Zana could drive speakers, it might be my perfect amplifier. In my current situation considering space constraints and budget issues, it makes most sense for me to have one box that does it all. The Moth S2A3 performs exceptionally well as both a headphone and speaker amp. For a change of flavor or to extend tube life, I have the solid-state EC/SS to keep me company. I did utilize the Zana as a preamp into the 2A3 but the Moth integrated performed better solo for speaker duties. In this scenario, simpler sounded better. Yet the Zana is an exceptional headphone amplifier that brought new life and vitality to every single recording I threw at it. I haven't really played around with balanced headphone amps but with my listening experience, the Eddie Current Zana Deux is the finest performing single-ended headphone amp to ever seduce my ears. It is more detailed, accurate, resolved, faster and energetic than my Moth or any other headphone amp I have heard to date. This amp has drive and forces you to engage with the music you love and enjoy. It performs quietly and without fuss and offers 3 inputs and 2 preamp outputs, enabling an eventual expansion into a speaker-based system. The Zana Deux does not inject artificial warmth or bloom into recordings. Coupled with my Meridian G08, the Deux soundstaged second to none, projecting sounds in an eerily three-dimensional space around me. In short, it's a massive success of a design at the very top of what's presently available in this component sector.



Ryan Clarin

Manufacturer's [website](#)

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