



Brains over Kilos

That is something you do not get every day - the countless ideas implemented are in such stark contrast to the size of the housing as with the Waversa preamplifier / power amplifier combination WminiHPA MK2 and WminiAmp MK2.

Michael Lang

Innovative hi-fi is now assumed to be available in almost every corner of the planet, but South Korea is almost

certainly an intelligence source, even for those connoisseurs. Nevertheless, the still relatively young company led by owner and head of development

Dr. Junho Shin is striving to change this in the near future. In Germany, the traditional distributor ATR - Audio Trade, which has made it its business to give the products more attention and recognition from the trade, press and customers than in the past, has been helping for some months. The fact that the products can be seen and heard qualitatively, STEREO determined last in expenditure 5/20 with the test of the network player WNAS 3, which earned itself plentifully test laurels. In terms of price and dimensions, the WNAS 3 was clearly more compact, but also had high technological standards and clever ideas. Thanks to our initial ideas, we now had a combination that made it a little easy to take these HiFi devices seriously as high quality products. However, the more intensively one reads the technical description and the longer one indulges oneself in the sounds produced by the two lightweight units, the more thoughtful one becomes

especially when you are usually dealing with equipment that requires strong muscles, a healthy back and a stable shelf..

Nothing off the shelf

Here we are dealing with a technology that converts every incoming signal into a digital PCM signal with an extremely high resolution of 32 bit/384 kHz from the very first moment. The difference between PCM and most other Class D amplifiers starts here, because they usually convert the incoming analog signal into a so-called PWM, a pulse-width modulated signal in which the width of a pulse is varied - instead of the amplitude of the incoming analog signal as in PCM. The higher the amplitude, the wider the PWM pulse. This principle is well known: The first to try this technique in a commercial scale product were Sony engineers they used it on the famous and easy to repair TA-N 88.

With Waversa, however, the entire signal processing is completely digital, even before the Class D end stage. As if that weren't enough, the Koreans have given some more thought to how the energy efficiency of a Class D amplifier can be used without having to accept its disadvantages such as limited bandwidth and frequency response changes depending on the impedance of the connected loudspeaker. After the analog signal has been converted, it goes into a chip developed and programmed at Waversa, which masters a lot of arithmetic and converts the PCM signal into PWM form.

The chip which has this task is called Waversa Audio Processor, short WAP/X. Regarding his arithmetic skills, which are the things that he has mastered all in real time include upsampling to 768 kHz, but also things like improving sound quality by achieving a linear and broadband frequency response up to 160 kilohertz, which is a record for Class D amplifiers. All these calculations take place directly on the chip.

Resistors or even coupling capacitors can be saved in this way. And the WAP also does something else: It forces the PWM signal to the clock of the PCM signal - a safe method of eliminating jitter and other interference.

His programmers have also given him one last feature, which they are proud to point out: the ability to improve the accuracy of detail and spatial representation, independent of volume. Among other things, this is achieved by reconstructing even-numbered harmonics of real music up to the 32nd harmonic - something that is only possible through various digital processes. The HPA 2, weighing only 2 kilos as a headphone amp, offers all this, only minimally slimmed down in some cases, and even has a symmetrical design. It also serves as a full-fledged streamer and preamplifier, it can handle DSD, MQA, and with external USB memory it also has a NAS function, and all this leaves the viewer astonished.

Digital and balanced

However, there is no pause for breath - because the WminiAmp MK2 is just as compact and fully balanced as the analogue and digital amplifier. It weighs just 3 kilograms, delivers 100 watts per channel at 4 ohms, can be bridged, is load-stable up to 2 ohms, but has reached its frequency response limit at 20 kilohertz in classic Class D tradition, despite up-sampling to 24 bit/ 768 kHz.

It accepts analogue signals via Cinch or XLR before it converts it to PCM.

In the case of digital delivery, it only accepts deliveries via coax in 44.1 kHz. The loudspeaker terminals are solid and can tolerate Bananas, cable lugs or plain cable. It is short-circuit proof, protected against DC and overload and is also equipped with the highest possible operational safety, which drives our measurement technology towards blazing heat, because some of the measurement results that you are used to from us simply could not be recorded - which did not really detract from the listening pleasure once you had figured out how to get sound out of the lightweights.

THIS IS WHAT WE HEARD

Blicher Hemmer Gadd: Omara



Wonderfully relaxed trio jazz in superb recording quality!



STORAGE

The matching NAS is also available.
Price: 1,450 euros



We even found room for an XLR output - the connectivity-friendly rear panel of the HPA2 (above). Unusual: digital input of the power amplifier (bottom).

We tried pre and power amps separately and jointly, in different combinations and with different speakers. The listening impressions described in the following were mainly collected on a Gauder DARC 100 and we were first of all busy getting the scissors out of our heads that a 3 kilo power amplifier cannot possibly be able to drive the Gauder. But far from it: after the hurdle of connecting the loudspeaker cabinets to the large and heavy Audioquest William Tell speaker strip was overcome and we had set the volume, which can also be adjusted in 63 steps on the power amplifier, to maximum by remote control, the tiny speaker proved to be surprisingly agile, although the speakers are not easy to handle. The small Waversa amp had the bass under control, which was nicely gnarled but not muffled to death on Michael Blichers "Omara" album. Also the distinction between studio and live atmosphere, whether at Blicher or Led Zeppelin, was made in fractions of a second - and whether the live performance took place in an intimate setting or in a larger location was not hidden from the listeners either. This went very well up to rather neighbor-unfriendly levels.



REMOTE A classic for a long time: the Apple remote control

Only when one wanted to risk the very last remainder of harmonic cooperation, the up to then closed, neutral and harmonic sound image tipped over, drifted spatially apart, poisoned a little and above all lost control in the bass. But, this has to be emphasized again at this point, for that one had to "wood" quite a bit.

Separated and together

The combination of pre- and final stage showed, compared to a fully-developed, much more expensive pre- and final combination, where the limits of these compact Allrounders reach. However, with a high-quality headphone amp, which even includes a balanced connection option, blen-dend has succeeded in combining converters and streaming functions with a preamplifier at a price of less than 2,000 Euros - especially since the sound can still be adjusted using the most diverse resolutions, both for PCM and the DSD format, both on the device and via the Apple remote control as well as directly on the computer. When listening intensely, however, it became clear what a mature High End preamplifier like the Aes-thetix Calypso Signature can do even better. But of course the American tube colossus also costs almost a fortune in comparison. When one sees how much effort the Koreans have put into the technical foundation, equipment, comfort and the workmanship in the noble, rounded aluminum garb, one has to send a big congratulation to Asia and at the same time thank the German importer ATR - Audio Trade for having the courage in these uncertain times to offer German hi-fi fans a product that is completely unknown up to now and has what it takes to thoroughly throw common views on hi-fi equipment overboard. For people who enjoy their favourite music mainly over headphones, the HPA2 should come pretty close to an ideal solution, while the power amplifier is perfectly suited to not only make the hi-fi heavy metal fans, i.e. the fans of large, classic amplifier formats, think about the HPA2, but also about the fact that the HPA2 is the ideal solution for the hi-fi enthusiast. To bring the combination of the two devices might then be very attractive which is an understatement ■

Waversa WminiHPA MK2

Price: 1950 €

Dimensions: 15x5x19 cm (BxHxD)

Warranty: 2 years

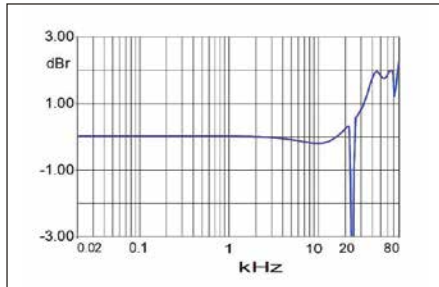
Contact: ATR - Audio Trade

Phone.: +49 208 882660

www.audiotra.de

Ein rundum verblüffendes Gerät: winzig klein, klangstark, vielseitig, exzellent verarbeitet und mit eigenständiger Technik. Wer nicht nach Kilo pro Euro Ausschau hält, liegt hier richtig.

Measurement results



Distortion factor at 0,03/0,3/1 V	0,1 %/0,016 %/0,01 %
Intermodal at 0,03/0,3/1 V	0,04 %/0,006 %/0,002 %
S/N ratio at i 0,3/ 0,03 V	73 dB(A)/53 dB(A)
Input Sensitivity for 1 Volt off	1031 mV
Overload resistance	6,1 V
Headphone jack	38 Ohm/Volt
Output resistance RCA/XLR	41 Ohm/77 Ohm
Output voltage RCA/XLR	5,9 Volt/11,9 Volt
Upper cut-off frequency	40 kHz
Volume control, synchronization error	-60 dB 0,1 dB
Power consumption. Stby/Leerl. (bei)	/7,5 W/226 Volt

Laboratory Comment

Partially unusual measurement results, which are due to the special circuit technologies; connected loads, however, practice-oriented. (see interview)

Features

Room-ready; streaming function & DAC; headphone jack 6.3, 3.5 mm (unbalanced) & 2.5 mm (balanced). 4 digital inputs: 1x coax, optical; Ethernet, USB A & B. XLR & RCA output; control via Smartphone, Tablet and computer; AirPlay, DLNA, MQA and WNDR (Waversa LAN protocol); Apple remote control

STEREO - TEST	
KLANG-NIVEAU	95%
PREIS/LEISTUNG	
★★★★★	
ÜBERRAGEND	

Waversa WminiAmp MK2

Price: 1750 €

Dimensions: 15x5x20 cm (BxHxD)

Warranty: 2 years

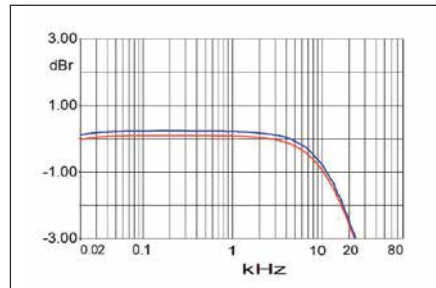
Contact: ATR - Audio Trade

Phone.: +49 208 882660

www.audiotra.de

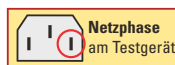
Sehr kompakte und leichte Endstufe, die auch als spartanischer Vollverstärker einsetzbar ist. Erstaunlich kräftig und laststabil, spielt er selbst an kritischen und teuren Boxen überraschend musikalisch.

Measurement results



Dauerleistung (8 Ohm / 4 Ohm)	Schutzschaltung
W/Schutzschaltung W	
Impulsleistung 4 Ohm (1kHz)	Schutzschaltung W
Klirrf. 50mW/5W/1dB Pmax	0,1 %/0,12 %/Schutzschaltung %
Intern. 50mW/5W/1dB Pmax	0,04 %/0,13 %/Schutzschaltung %
Rauschabstand bei 50mW/ 5W	49 dB/68 dB
Obere Grenzfrequenz (-3dB/40hm)	22 kHz
Übersprechen Line 1 > Line 2	73 dB
Gleichlauffehler Volume bei -60dB	0,1 dB
Leistungsaufn. Stby/Leerl. (bei)	3,9 W/7,8 W/226 Volt

Labor-Kommentar



Netzphase
am Testgerät

Wegen Schutzschaltung einige Messergebnisse nicht ermittelbar; andere Ergebnisse durch die spezielle Schaltung teils gut, teils mäßig. (siehe Interview)

Ausstattung

Endstufe mit Lautstärkeregelung; Mono brückbar; je ein symmetrischer und unsymmetrischer Eingang; Display für verschiedene Funktionen; ein koaxialer Digitaleingang (S/PDIF); A/D-Wandlung 24Bit/176,4kHz; Upsampling auf 24Bit/768kHz; LS-Buchsen f- Bananas, Spades, blankes Kabel; externes Netzteil

STEREO - TEST	
KLANG-NIVEAU	73%
PREIS/LEISTUNG	
★★★★☆	
EXZELLENT	

TEST-GERÄTE

Plattenspieler:

Voyd „The Voyd“ m. Benz LPS; Oracle Delphi 5/MK2 m. DS Audio DS-002

CD-Spieler/

Wandler:

Teac P30/Exogal KometPlus

Streamer:

Bluesound Vault 2i; Lumin D2; x-odos; Brinkmann Nyquist

Vorverstärker:

Aesthetix Calypso Signature; Genuin Audio The Pearl

Endverstärker:

Audio Research Classic 120; Krell KSA 100

Lautsprecher:

DALI Epicon 6; Gauder DARC 100

Kopfhörer:

Sennheiser HD 800S; Dali IO6; T+A Solitaire P

Kabel:

Audioquest William Tell; XLO Reference; NBS; HMS



INTERVIEW

Jetzt online:
Interview mit Dr. Junho Shin, CEO von Waversa Systems