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PURISTISCH VERSTÄRKT

Die revolutionären Verstärkerkonzepte von Octaves Single-Ended bis Devialets stärkstem A/D-Hybrid



Full Circle

Octave mastermind Andreas Hofmann is always good for a surprise. Now the obsessively perfectionist audio nerd has, en passant, revolutionised the single-ended design. And created a sensational amplifier.

After all, we don't know what pushed him to take this decision. Because normally A. Hofmann swears by his own principles. And these would actually prohibit him to even think about single-ended valve amps.

Way too little output power, barely acceptable distortions and an HF frequency response similar to that of a rotary phone. And let's not forget the hardly tolerable hum and, to make things worse, a bass roll-off which – in the eyes of a perfectionist – is nothing but a disaster. So the bottom line would be a definitive no-go for Octave. Because Octave valve amplifiers must be demonstrably as perfect as their builder is known to tick.

And now look at this: a single-ended headphone amp which is also an integrated amplifier. Sure, only with the usual 8 to 12 single-ended watts, but this will do, provided you've got the right loudspeakers. Or the "wrong", technically very incorrect headphones, whose operation would actually require the power of a toaster. All this is no problem for the brand-new Octave V 16 Single Ended, which even reduces the familiar Octave look to absurdity, coming along as a chunky portrait format cube with a felt 20 kilogrammes. So we may now won-

der what audio demon got into A. Hofmann. Did he fall for the single-ended virus? Or purchase horn-loaded loudspeakers?

None of those things is true. On the contrary, Andreas Hofmann had an idea. More precisely: an idea which can be used to free the single-ender

from its notorious shortcomings, hitherto carved in stone. The result, to come straight to the point, is nothing short of an acoustical sensation.

The single-ended amplifier is the world's oldest amp design. In fact the very first, to be precise. It dates back to the ear-

liest days of electrical engineering, i. e. the 1910s and 1920s, when people had just started exploring the properties of the newly developed electronic valve. Within a surprisingly short period of time, the most brilliant heads of that epoch managed to cast the physics of those valves into figures and formulas ▶

A lot of little electronic helpers organise and protect the puristic valve technology in the signal path, which is designed around the affordable, robust KT120 workhorse.



while developing radios and amplifiers around this new component. The fundamentally simple structure of a dual or triple stage SE amp dates from this era. And it is – or more exactly: has basically remained – unchanged since then. And from the outset it has railed against a seemingly unsolvable problem (more details on this in our info box further below). We’re talking about the inevitable preload and magnetisation of the output transformer in the SE amp due to the anode current flowing through the primary winding. Until now this required a transformer with an air

gap whose properties have to be balanced out painstakingly between all parameters. In a nutshell: a transformer with an air gap is not exactly the dream of an audio designer. There are indeed several methods of getting rid of the anode current, but usually they only cast out the devil by Beelzebug (cue: parallel feed).

Gapless transformer

With his “magnetic-field compensated output transformer“ Andreas Hofmann has now succeeded in squaring the circle or more precisely: in closing the magnetic circuit. He conceived

a single-ended circuitry to compensate the magnetic preload of the output transformer, thereby making an air gap obsolete. The result is a very much more compact transformer with far better properties in every respect. It goes without saying that Octave doesn’t shout it from the rooftops how this is exactly done. Yet the result doesn’t only speak for itself in terms of sound. For instance, the V16 boasts a frequency response which traditional single-enders can only dream about, sort of. There’s virtually no roll-off in the deep bass range, while the therefore super fast amp

cracks the 100 kilohertz HF limit hands down. This may also be credited to a sophisticated driver circuit which, just like the actual power stage, can draw on fully stabilised power supplies and makes use of only a slight dose of negative feedback.

The enclosure format is not a design quirk, but rather due to a construction which uses all kinds of tricks to bring down the signal-to-noise ratio to much lower than a sensational minus 100 decibels. This has such a positive effect on both the headphone and the loudspeaker ope-

Transformer, core material, saturation and air gap

In a valve amp the output transformer matches the high valve impedance of several kilohms “down“ to the low speaker impedance. Only that way the valve amp can actually drive the speakers. Moreover, the transformer, whose primary and secondary winding are not in a galvanic connection, keeps the operating voltage away from the load. In the output transformer (a mains transformer is also an output transformer for a fixed frequency) the power – in the form of alternating current – “flows“ from the primary winding through the core material into the secondary winding. The magnetically soft core material, a silicon-iron alloy, accomplishes this by a reversal of magnetisation (passing through the hysteresis curve). “Magnetically soft“ means that in an electrical field the material constitutes a magnet. The power to be transmitted meets its natural limit in the maximum possible magnetic flux density in the iron core, which is roughly 1.8 tesla in a modern core



material. To reduce eddy current losses, very thin, stacked metal sheets isolated from each other are used as core material. One of the classic designs is the E-I core (see diagram) which exists in various sizes, depending on its performance. High-grade audio output transformers usually employ more specific sheet laminations fitted with nested copper wire windings for enhanced properties. Whereas in a push-pull amplifier the inverse anode currents cancel each other, the single-ended output transformer is primarily traversed by the anode current which causes a pre-magnetisation that must be counteracted by an air gap in the iron core. This will in turn increase the magnetic impedance in the magnetic circuit and is rather undesirable. In order not to drive the core material into saturation by the direct current already, there must be enough “room“ for a further drive with alternating current. So for achieving usable frequency responses, the transformer core

should be adequately sized to offer enough headroom. For limit frequencies as low as possible the transformer must also have a sufficient number of windings on the primary side to ensure the inductivity is high enough. Hereby the magnetic load of the core considerably goes up with a dropping limit frequency: if, for example, 20 instead of only 50 hertz shall be transmitted, this results in a doubled or tripled magnetic load. Yet the upper limit frequency largely depends on the winding’s capacitance values, which are reduced by the nesting. However, the highest feasible degree of nesting is not an exclusive quality criterion for output transformers, either; they should rather be seen as an “artistic synthesis“ and, in view of the amp’s extremely modest output power, can prove to be very large, very heavy and very expensive in single-enders, but without equally impressing by their specs. So a normal single-ended output transformer is just nothing more than a bulky compromise ...



In order to preserve the typical spectrum of an SE amp, the KT120 is run in pure triode mode in the Octave V16.



Remote is a must: Octave's solid metal bar only sets the volume level by two keys.

ration with high sensitivity speakers that the V16 reveals details which, until now, are often drowned out by the noise. This goes along with an exemplary three-dimensionality, stupendous velocity, sometimes – for an SE amp – frightening low bass punch, the wonderful timbres of a top-notch triode single-ender and – subject to high sensitivity, high impedance speakers – unparalleled dynamics.

The V 16 Single Ended displays its utterly impressive abilities also as a headphone amp, which has even an easy job with headphone impedances below

ten ohms and can be load matched at the touch of a pushbutton. For his money the enviable future V16 owner will thus get two amplifiers in one enclosure. Combining a top-class headphone with an extremely efficient (fullrange) loudspeaker, an active or bi-amping system immediately suggests itself here. Please allow the completely baffled author of these lines a personal remark: this is undoubtedly the best amplifier I've ever listened to over my speakers. By the way, without any consideration for aspects such as valves, output power, and price ... **Roland Kraft** ■



Octave's power management automatically lowers the bias current of the output valve when the amp is in idle mode. Speaker and headphone operation is selected via a front panel pushbutton, other keys serve to match the amp to high or low impedance loads.

stereoplay Highlight

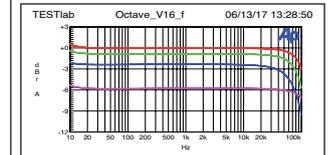
Octave V 16 Single Ended 8500 euros (manufacturer information)

Distributor: Octave
Phone: +49 (0)7248 3278
www.octave.de
Agencies abroad see internet

Dimensions: W: 22 x H: 33 x W: 33 cm [8.7 x 13 x 13 in.]
Weight: 19,1 kg [42.2 lbs.]

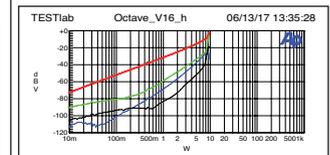
Measured values

Frequency responses



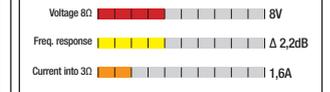
Extremely wide-band, ultra flat frequency response without any low bass or treble roll-off

Distortion analysis (k2 to k5 vs. power)



Up to maximum power evenly rising distortions, emphasis on k2

stereoplay compatibility chart

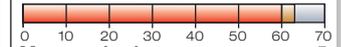


Speakers should demand little current and preferably be high-Z, voltage and stability are still good.

Sine output power (1 kHz, k = 1%)
at 8/4 Ω: 8/5 W
Music output power (60Hz-Burst)
at 8/4 Ω: 8/8 W
S/N ratio RCA 102 dB
Power consumption standby/operation
0/190 W

Rating

Sound (Integr./headphone amp) **60/63**



Measured values **5**



Practical use **8**



Value **9**

Octave's single-ended debut is a bombshell that raises the bar to a staggering height, not only for valve single-ended amps. Thus the V16 ranks among the exquisite handful of the world's finest amplifiers – and it can even “do” headphone.

stereoplay rating

Sound (Integr./headphone amp)
Abs. top class **60/63 points**

Overall verdict
very good **85 points**

Price/performance **high-end**