

Step up! Aqua Hifi's La Scala MKII Optologic DAC



by John H. Darko



Back in **March 2014**, Aqua Hifi's visually unassuming La Scala MKII D/A converter not only **took out** a DAR-KO Award but landed pole position on the **Darko DAC Index**, beating out contenders from **AURALiC**, **Resonance Labs** and **PS Audio**.

Without trading in on vibrant acoustic mass or tonal colour intensity, albums like Fila Brazillia's Maim That Tune, decoded by the La Scala MKII, maintained their deeply-rooted, sometimes micro-dynamic, rhythmic urgency and inside-out pressurisation without weight loss to basslines or a cooling of the album's Ready-Brek glow. In a word, *bellissimo!*

In (under-)scoring this success Aqua R&D man Cristian Anelli bucked modern DAC trends at almost every turn: 1) a ladder R2R decoder with 4 x Burr Brown PCM1704-K silicon laid out in fully-balanced, dual mono configuration with; 2) On-chip digital filters bypassed in favour of the Milan company's own logic-gated, non-oversampling Direct From Decoder ('DFD') circuitry. 3) fully discrete I/V conversion; 4) a hybrid output stage with 2 x ECC81(12AT7), each with two MOSFETs apiece. 5) Optocouplers separating analogue and digital boards.

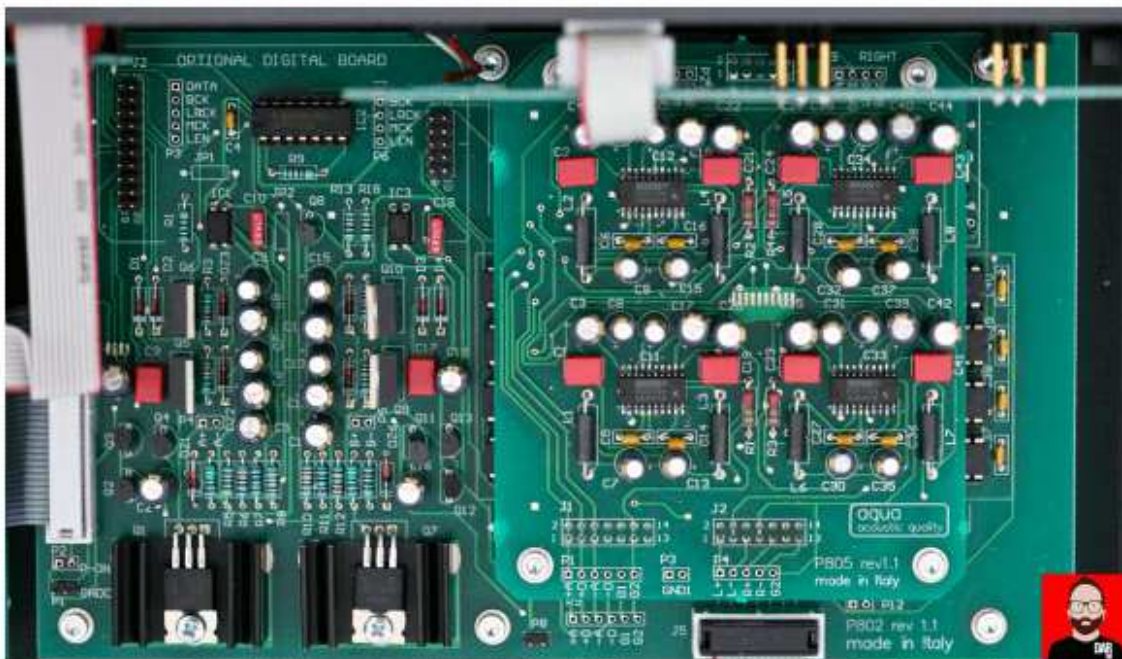
At €4890, the then top-flight Aqua offered more attainable high-end performance. For pragmatists, a considerably more nourishing take on Redbook material made the hit to broader file format compatibility – no DSD, no PCM above 192kHz – a cinch to absorb.



September 2015. Anelli struck DAR gold again, this time at a lower price point with the **La Voce S2**: a pair of Burr Brown PCM1704-K R2R ladder chips running in dual mono. The entry-level unit lacked the “true differential” chip config of its bigger bro and sported a less sophisticated DFD circuit. The results once again spoke for themselves; a DAC seemingly built to hold back some of the brutal truths of contemporary (read: non-audiophile) music's highly variable recording and mastering quality. An ideal fit for Future of the Left, The Hold Steady, The House of Love's (proper) debut, Guided By Voices and The Mountain Goats.

Also withheld from the La Voce S2, a glass n' gas / MOSFET output stage, thus highlighting this Aqua-man's pragmatism – Anelli couldn't be accused of a singular approach to DAC design.

This pair of over-achievers have since remained references at DAR, deployed according to mood and (especially) music preference. For deep insight into Sandwell District's intergalactic journeys or Thomas Dolby's melancholic *The Sole Inhabitant* or Eno/Hyde's *High Life*, the La Scala MKII gets the hook-up. For Suede or Joy Division, the La Voce S2 gets the nod.



January 2016. A tube upgrade to NOS Telefunken, as suggested by Aqua's US handler Well Pleased AV and since adopted by the manufacturer, **took** the La Scala MKII's audible performance up a notch; between the La Scala MKII and heel-tapping rivals, more distance was driven.

May 2016. The first kink in this (thus far) PCM1704-K-centric narrative. At Munich's High-End show, Aqua Hifi spilled with news of – and gave a first public outing to – a new flagship D/A converter, the **Formula** (€12,500).

The big news was that the TI/Burr Brown silicon had made way for in-house developed ladder R2R network boards, once again combined with the optocouplers previously seen in the La Scala MKII (i.e. 'Optologic'). In one hit, Aqua would sidestep dwindling supplies (and higher pricing) of the long discontinued PCM1704-K chip and potentially better their sound quality by (also) minimising electrical noise interference.

The Formula's formula: two R2R modules per channel, one for each half of the sine wave, with all incoming digital data marshalled by a proprietary algorithm located on an FPGA chip.



Also new, a revised USB board – XMOS input, i2S output – that would extend PCM compatibility all the way out to 384kHz PCM. That's twice the ceiling height imposed by the outgoing Burr Brown.

Once again, Aqua's DFD would stand in for the usual digital filter. According to Aqua's softly-spoken and camera shy marketing man Stefano Jelo, DFD is one way in which the Italian company maintains a certain degree of house sound.

The Formula's audible aim? (An even more) vivid reproduction of music.

More info can be extracted from this video:



Like the La Scala MKII before it, modular upgradability would be baked into the design.

Some two years prior to the Formula's Munich launch, Cristian Anelli wrote of the La Scala MKII: "What is important for a modern DAC is to avoid obsolescence: Aqua's philosophy allows all previous customers to replace the conversion modules (and new PCB releases) as easy as possible."

The upshot? The Optologic R2R and Xilinx Spartan FPGA housekeeping modules would soon be adapted to the La Scala MKII.

October 2016's RMAF saw Aqua Hifi **make good** on this Munich-made promise. Mark Sossa of Well Pleased AV had the Stateside scoop (as well as some DJ Shadow):



Not a full point upgrade to MKIII status but a MKII Optologic revision. Price? €6600. Existing owners could dial up a factory-fitted upgrade for €1000.

January 2017. From the outside, the Optologic and Burr Brown models look identical.

On the front panel of each unit, we see the same power switch, the same source selector, the same digital phase inverting toggle and the same slit window for tube heat dissipation.

Out back, the same inputs (AQ Link i2s, USB, coaxial, BNC, AES/EBU) and the same outputs (single ended RCA and XLR balanced).



To observe real differences, lids would need to be popped. Sitting the open Optologic box next to its predecessor, we see how the Formula's four separate ladder DAC boards, populated with "low noise precision resistors", have been distilled into a single slab that sits top right as we observe the Optologic DAC from front to back.

Below that, some minor changes to the analogue board: twice the number of (blue boxed) capacitors; no more trim pots; and the LEDs are now green where once they were red. The tubes are the aforementioned Telefunksens.



Transformers on the new fella's XLR outputs means a little more daylight sits between balanced and unbalanced listening. At least, that's the way I heard it with an all-balanced chain from PS Audio BHK 300 monos back to PS Audio BHK pre-amplifier with ELAC Uni-Fi F5 loudspeakers working the business end but confirmed by the PS Audio's pre's headphone output driving Sennheiser HD800S: the Optologic's balanced output seasons its sauce with a little more vitality. The upshot is a little more audible flexibility for the end user should s/he demand it.

Formula trickle-down also meant a revised USB board (top left) with broader file format compatibility; the Optologic La Scala MKII can decode PCM up to 384kHz as well as DSD64 and DSD128 – another reason why Aqua's ditching of PCM1704-K DAC chips makes marketplace sense.

To its USB socket I connected the newcomer to the Sonore's microRendu network streamer with AudioQuest Carbon wire and pulled up Robyn Hitchcock's *A Star For Bram* via Roon. Then Robag Whrume's *Wuppdeckmischmampflow*. Then David Bowie's *Aladdin Sane*.



Much has changed in the digital audio world since we first met the original La Scala MKII. Chief among the bigger developments is MQA and its recent landing on Tidal.

Streaming the MQA-d version of *Aladdin Sane* via Meridian's Explorer2 (US\$299) reminds us that the DAC matters more than file encoding/encapsulation methods. Moving from either Aqua (with ordinary 16bit/44.1kHz streams) to the Meridian with MQA, we lose soundstage height, tonal colours show up as more diluted and layers congeal.

Then there's the increasing popularity of FPGA-fuelled D/A conversion, most notably from the UK's Chord Electronics and the USA's PS Audio. The latter's DirectStream DAC recently returned to the DARhaus for an extended European vacation. At US\$5995, it plays in the same field as the original La Scala MKII and Optologic newbie.

The Optologic La Scala MKII doesn't play through as much humid warmth as its Colorado born rival. It sounds cleaner and more direct with considerably less obvious transient edge rounding. On large/r scale dynamic drama, particularly with electronic music, I'd rate these two DACs as equals.



Where the Optologic's presentation deviates further from Ted Smith's FPGA-er is in two key areas: 1) the Aqua shines more light between the notes – connective tissue isn't as thick as it is with the DirectStream; 2) there's a greater sense of speed in Italian hands – we feel as though rhythms drive us faster through the music when in fact we're just closer the road where surface textures are more palpable.

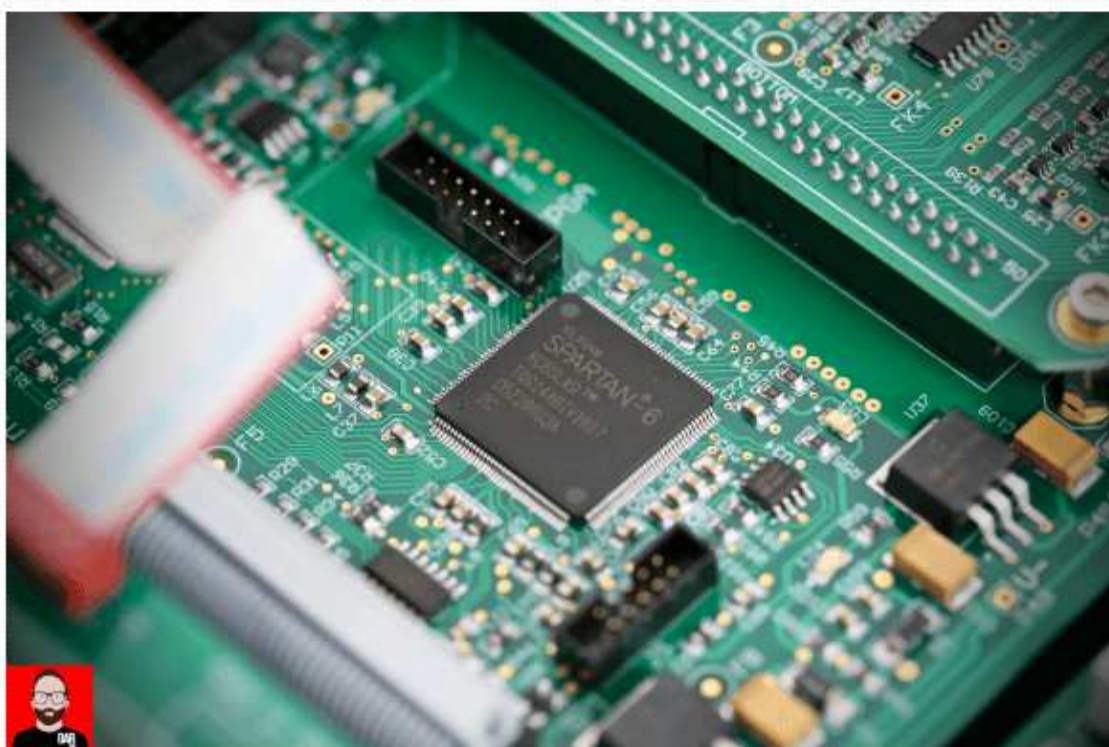
Which DAC is better? I prefer the Aqua but some of you may not. The DirectStream's warmer tonal balance makes it better suited for those moving from vinyl to digital world for the first time. The PS Audio also offers gives us more functional opulence than the Aqua: a colour touchscreen, a remote wand, a TOSLINK input (not to be undervalued) and the possibility for in-built Roon Ready network streaming.

However, the Aqua's talents in clearing space for the subtlest micro dynamic shifts and rhythmic rectitude make for a more invigorating listening experience. Think: sparkling mineral water vs. a milkshake.

Compared to the original La Scala MKII, the Optologic edit's first fundamental advantage is a deeper inking of tonal colour. One visual touchpoint might be an illustrator's shift from pencil to crayon.

Secondly, intra-note information enjoys more time in the spotlight at the hands of the in-house R2R-chipped variant. On Mike Garson's piano playing, we note more abundant ambient decay. The Optologic Aqua is the DAC for those who get off on micro detail extraction and copious amounts of recording space information – ingredients that sum to an altogether more immersive listening experience.

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Thirdly – and perhaps most importantly – the updated unit underscores and amps up the original's inside-out pressurisation. Music positively bursts into life. For the sinister jazz and macabre vocals that dominate Angelo Badalamenti's score for *Twin Peaks: Fire Walk With Me*, we hear more deeply etched player outlines delivered with nary a hint of rigidity. The all-important sense of effortless is maintained, especially with microRendu in play.

In other words, the most satisfying DAC heard by yours truly to date just got significantly better. Modularity coupled to a manufacturer upgrade programme brings owners of existing La Scala MKII in from the cold (should they wish to).

In its Optologic incarnation, the La Scala MKII cements further its position at the very top of the DAR-KO DAC Index and DAR-KO Award assignation becomes as easy as it has ever been. In a word, *primo!*



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