OAD UltraFidelity UP1

Phono Preamplifier

Pros
- Exceptional stereo imaging
- Superb response
- Super-low noise

Cons
- No Balanced input
- No DIP switch tool

RRP $2,799

Jon De Sensi, the founder, owner and lead designer of the all-Australian, Melbourne-based brand OAD UltraFidelity has been exceptionally busy of late, bringing to fruition models that have been in the pipeline for many years, including the Vajra power amplifier and Padma preamplifier, which I have previously reviewed for *Australian Hi-Fi* magazine.

The OAD UP1 reviewed here was apparently designed as a direct result of requests from De Sensi's network of hi-fi retailers, though he told me that most of the pressure came from the owner of a famous salon in Melbourne. I know who it is, but I've been sworn not to name names!

The design brief that underpinned the development of the OAD UltraFidelity UP1 stated that it be affordable and have sufficient flexibility to accommodate any moving-coil cartridge on the planet. According to De Sensi, in the more than three years the UP1 has been available, many hundreds have been sold and so far, he says, "every customer has found one resistive loading appropriate for their MC cartridge".

As for whether the design brief included that the UP1 should deliver exceptional sound quality, well, if you're aware of De Sensi's track record in this department, you would already know that that went without saying!

THE EQUIPMENT

One of the ways OAD has kept the price low is by minimizing the size of the chassis, which it has done in two ways. Firstly, the 240V step-down transformer is completely separate from the phono preamplifier itself, which means that high-voltage AC is kept separate from the sensitive phono circuitry, via a two-metre-long umbilical cord. This, in turn, has meant that the chassis of the preamplifier can be small — only 210mm wide, 183mm deep and 95mm tall. When you pick it up, however, you will immediately feel that its small size belies its weight, because thanks to its very thick (5mm and in some places more!) CNC-machined anodised alloy chassis, it weighs in at a hefty 2.3kg.

The power supply for the UP1 is somewhat smaller and lighter than it, measuring 114 x 130 x 63mm (WDH) and weighing 1.25kg.

Another of the ways OAD has kept the price low is by minimising the colour palette of the chassis. You have only the option made famous by Henry Ford: black, black, or black! The only pity about this choice of single finish is the fact that the rather good-looking OAD logo inscribed in the UP1's front panel is not only exceptionally difficult to see but also almost impossible to photograph… hence the 'black box' appearance of the UP1 in the images accompanying this review. You'll have to take my word for it that the UP1 looks better in the flesh.

In normal daylight (or room lighting), the logo is visible, but when lit in such a way as to make the logo visible in a photograph, it almost appears as if the enclosure is coloured light grey rather than black. Trust me, it's black. There is, however, a tiny smidgeon of colour in the design, because when the unit is switched on (using the 240V switch on your wall's mains outlet; there is no power switch on the power supply or on the UP1 itself) a tiny LED on the front panel lights up to show the UP1 is up and running.

As you've no doubt already guessed, all of the action takes place around the back, where there are user adjustments for load impedance, load capacitance and gain, enabled by manually moving DIP (Dual In-line Package) switches.

As far as load impedance is concerned, if you're using a moving-magnet cartridge, you have only one option: 47 kiloohms. That's the only

option you'll need, too, since all MM cartridges require this load. Some, however, require different load *capacitances*, so the UP1 offers you two options: 100pF and 220pF, which you can add to augment the standard 100pF inherent in the design.

For a moving-coil cartridge, you have seven options available to you: 22, 30, 50, 100, 200, 430 and 1,000 ohms (though you could also use the 47 kiloohm setting that's more typically used for MM). As luck (or design!) would have it, these seven will, as De Sensi claims, be all you need for any moving-coil cartridge, because the rule of thumb is that load impedance should be 10x the cartridge's internal impedance. In practice, though, you're better off providing the load the cartridge manufacturer recommends, which will sometimes be different to this 'rule of thumb' (which I guess is why they call it a 'rule of thumb'!).

By way of example, Hana recommends that the MC cartridges it makes, which have an internal impedance of 30 ohms, should ideally see not a 300-ohm load but a 400 one. However, Ortofon recommends that the MC cartridges in its Quintet series, which have DC resistances of either 5 ohms or 7 ohms, should be loaded by "≥20 ohms"! (I want to emphasise that the addition of the exclamation mark is mine as essentially Ortofon is suggesting that *all* load impedances higher than 20 ohms would be equally suitable, which is likely not going to be a captain's call once you exceed about 200–400 ohms). The only thing that can be positively said about load impedances that are too high for a specific cartridge is that they won't cause any damage to the cartridge, just the sound you hear from that cartridge.

Rothwell Audio Products, a UK firm that's been around for more than 30 years and has been measuring the actual impedance of phono cartridges for as long as it's been building step-up moving-coil transformers and phono preamplifiers, says: "Most modern moving-coil cartridges have a source impedance of about 10 ohms, and the 'load impedance ten times the source impedance' rule suggests 100 ohms is a good choice for load impedance and causes less than 1dB of signal loss. This is well in line with the recommendations from many cartridge manufacturers [which suggest that] anything above 100 ohms should be equally suitable and that the exact value is not critical as long as it is well above the cartridge's source impedance."

Many audiophiles claim that a cartridge's tonal balance changes as a result of load impedance. This is certainly true if we're talking about moving-magnet cartridges, but is not necessarily the case when it comes to moving-coil cartridges. Any sonic changes you hear are more likely not a result of the load impedance *per se*, but because the specific load has caused the circuit to resonate at a specific (very high) frequency, which in turn has affected the circuitry inside the phono preamplifier itself.

The only thing that is always true when choosing a load for a moving-coil cartridge is that it should *never* be the same as the cartridge's impedance! Advocates offering this incorrect information usually quote the well-known 'maximum power-transfer theorem' which states that to transfer the maximum amount of power from a source to a load, the load impedance should match the source impedance. While this is true in many circumstances involving electronic components, it does not apply to phono cartridges/phono stage matching for reasons too complex to go into in this short review.

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In addition to providing the correct load for whatever cartridge you use, you also have to provide the correct gain and, in the case of the UP1, this is also selected via a DIP switch. Inherent gain is initially selected by choosing between a gain of 40dB (moving-magnet cartridges and high-output moving-coil cartridges) and 60dB (low-output moving-coil cartridges), which is achieved simply by moving the appropriate switch on the DIP (the left-most switch on the left and right channel 'Load' DIPs) to the correct spot. You can add an additional 20dB of gain in 5dB steps using the switches on the 'Gain Adjust' DIPs (again it is necessary to do this for both left and right channels).

The signal input to the UP1 is via a pair of gold-plated RCA terminals, but the ground terminal is a standard plated steel post with a knurled plastic knob. I can appreciate that this post design keeps costs under control, but in this case I would've gladly paid a few bucks extra if it meant I could have a gold-plated knob that screwed down a gold-plated thread.

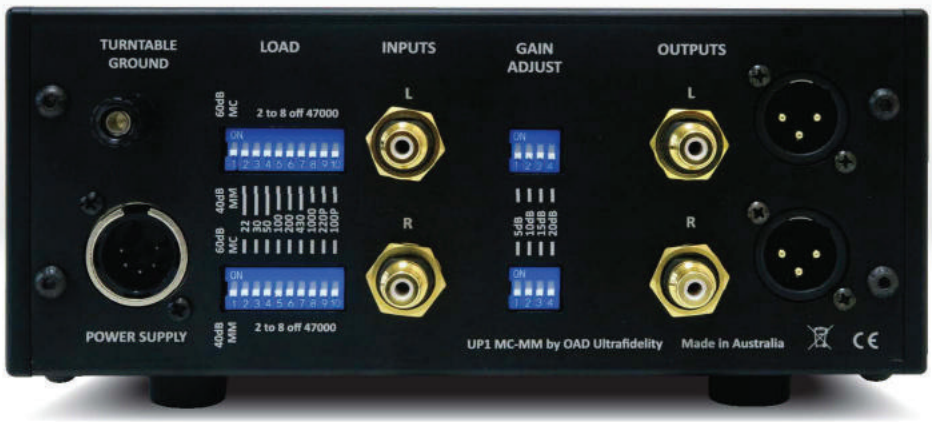
Signal output is provided in unbalanced form via gold-plated RCA terminals or balanced form via gold-plated XLR terminals. Given that turntables with balanced outputs are starting to appear on the scene, OAD might like to consider making a version of the UP1 with balanced XLR inputs. I say 'a version' because considering the tiny market for phono stages with balanced inputs, it would not make economic sense to include them on the UP1 as standard.

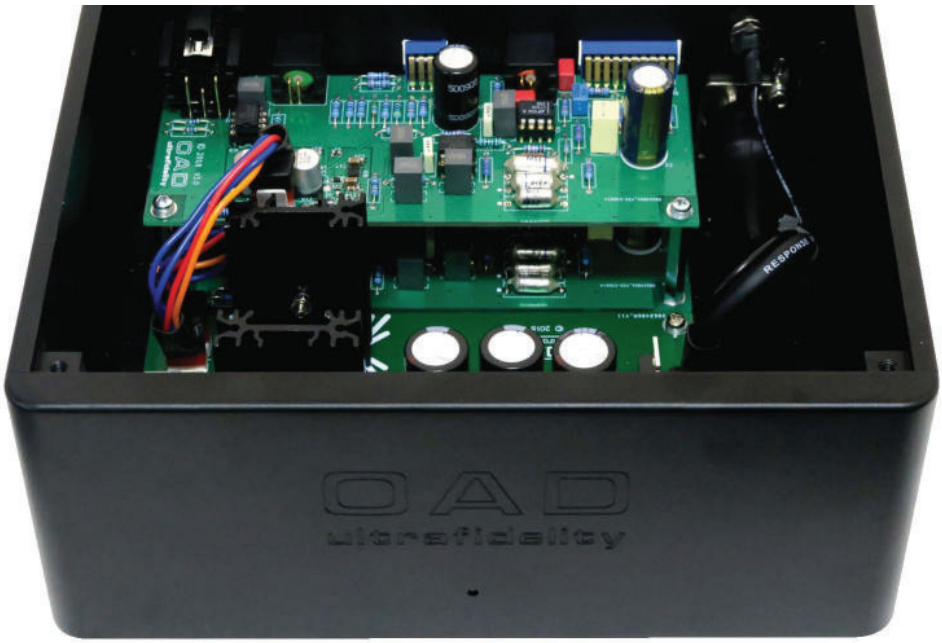
INSIDE THE UP1

Open up a UP1 to peek inside (I'm not recommending you actually do this, it's just a turn of phrase) and you'll discover that the circuits for the left and right channels are not only completely separate but they're on completely different printed circuit boards, so the one you can see in the photo overpage is only for the left channel — the identical PCB for the right channel is directly underneath it.

The UP1's circuitry includes three integrated circuits — two ultra-low noise, low-distortion operational amplifiers (an LT1115CN8 and a BB OPA2134PA) and a Burr Brown DRV134PA which uses operational amplifiers to convert a single-ended output to a differential output pair (that is, the line driver for the balanced outputs). This device uses — deep breath — on-chip laser-trimmed precision resistors to provide accurate gain and optimum-output common-mode rejection. It has a high-output drive capability too, meaning it can easily drive the large capacitive loads associated with long audio cables, in the event you might be using these.

All six ICs are socketed, rather than soldered, so in the extremely unlikely event of a failure they are at least easily replaceable. And if superior versions become available, as is likely, the socketing makes it possible to upgrade them in just a matter of minutes.





The other PCB you can see in the photo to your right is home to the power supply storage and smoothing circuitry — as mentioned earlier, the multi-tapped mains power transformer is in its own, separate case, connected to the UP1 via a five-core cable with a five-pin female connector at either end. The circuitry for the power supply includes ultra-low noise voltage regulators and six 47,000µF electrolytic capacitors — so no shortage of storage/smoothing capacity here!

IN USE AND LISTENING SESSIONS

The first thing you have to do when setting up the OAD UP1, even before turning on the power, is set up those DIP switches. One issue I had with this is that the otherwise excellent and informative manual that came with my UP1 wasn't actually crystal-clear on how these DIP switches might be set, leaving some room for misinterpretation, particularly with regard to the available load values for MC cartridges. While clarifying this with De Sensi, he agreed that the manual's wording could be subtly changed to avoid any potential confusion, and advised that a new version of the manual with these changes would be produced by the time this review is published.

The heart of the issue I had with the manual is that after reading it, I thought some users might assume that the switches on the 'Load' DIP can be used in combination, so that by switching both the 100-ohm and 100-ohm switches to 'On' would introduce a load of 300 ohms. This is not the case. You can select only a single value from the seven available, and if you don't select any at all, the load will be 47 kiloohms.

When it comes to adjusting the DIP switches, I was able to use my special DIP switch tool. And I *was* going to suggest that you buy one at the same time you buy your UP1, because many people don't like doing what is often recommended by manufacturers, which is to use a ballpoint pen, a paper clip or a Jeweller's screwdriver (either because they don't want pen-marks on the switches, or to run the risk of potentially damaging a switch).

The only problem with me recommending you buy your own special DIP switch tool is that I discovered that the place I got mine yonks ago (Jaycar) no longer sells them. Neither, it seems, does anyone else! The only readily available tool I could find was a device rather unfortunately called a Grayhill '90 Dipstick'. Mouser Electronics sells these for just $3.25… but postage costs $24 (they ship via UPS Worldwide Express!), after which there's $2.73 for GST to add, bringing the grand total to $29.98 — a bit excessive for what is essentially a plastic stick! So I guess you will have to settle for a ballpoint pen, a paper clip or a screwdriver, though I do think that a plastic swizzle stick might work well! (It also occurred to me that OAD including a DIP switch tool as an accessory in the box would be a nice touch.)

Unlike many phono preamplifiers, the OAD UP1's internal design means that the levels of distortion and noise in the audio signal will be identical irrespective of how little or how much gain you use, so De Sensi recommends you choose whichever gain setting allows your main amplifier's volume control to operate within a range similar to that of your other music sources — which seems to make sense.

The majority of my auditioning with the OAD UP1 was made with a moving-coil cartridge — the Dynavector DV-20X2, to be precise. Because it's the low output version (nominally 0.26mV at 5cm/sec), I used the maximum gain available (80dB) to compensate for its very low output. And, although Dynavector specifies the DV-20X2's DC resistance at 5 ohms and recommends you load it with "≥30 ohms", and both 30-ohm and 50-ohm settings are available on the UP1, I prefer to use it with a load of 100 ohms. I was, therefore, pleased to see this setting on the UP1. In fact, I have to say that the load resistances available on the UP1 are exactly those I would've chosen myself had I been asked to provide a list of the seven most useful values when using a moving-coil cartridge.

The very first LP I played was Pink Floyd's 'Wish You Were Here', for no other reason than it's almost always the very first album I play when reviewing anything vinyl-related. The lead-in track's mysterious sonic build-up (a bit reminiscent of Vangelis' music for 'Bladerunner') was delivered impeccably by the OAD UP1. The purity of the guitar riff around two minutes in was exceptional, with lovely sustain. The high-frequencies in the background around four minutes in were clearly audible — something that I find is rarely the case. The depth and power of the kick drum and bass guitar at around the five-minute mark were awesome, and I was impressed by how the cymbals sounded so shimmery despite the amount of music being created.

The fact that the left and right channels of the OAD UP1 are totally separate was evident the moment the stylus settled into the grooves of the second track, *Welcome To The Machine*, where first the sound pans from the right channel to the centre, and then the bass guitar notes alternate back and forth between the two channels. The OAD UP1's reproduction of this effect was amazingly good — so good, in fact, that I reckon few phono preamplifiers could even *approach* its level of performance. This entire track is replete with left/right FX that you can only appreciate if your equipment is capable of reproducing it… and the UP1 is certainly more than capable!

The closing moments to *Welcome to the Machine* are also a perfect vehicle for finding out just how quiet your playback chain is, and I'm here to tell you that the UP1 is more than whisper-quiet: it's totally silent. You will not hear any noise from it at all, only remnant surface noise from the vinyl or any noise your turntable might be making. In this regard, the OAD UP1 is absolutely perfect. (And just in case you think I'm banging on about *Welcome to the Machine*, you should know that its opening vocal line is my ringtone for when my son calls me… he's also a Floyd fanatic.)

More glorious channel separation moments kick in with the intro to the title track, as well as another demonstration of the complete lack of background noise. However, it also demonstrates the perfect level-matching between the left and right channels, as that disembodied guitar is not only precisely centred but also 'floating' out the front of the soundstage like a wraith. It truly doesn't get much better than this.

What's also miraculous is the way the UP1 reveals the true nature of each of the many instruments playing on this track, no matter how distantly or how briefly they appear. The sound of the Steinway is a perfect example of this.

With the benefit of hindsight, it's a miracle that recordings of this quality were possible back

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in the '70s, so for my next album it was another one from that decade, 'Best Friends', those best friends being Cleo Laine and John Williams, both of whom are, amazingly, still with us! (Well, maybe not so much for Williams as he is only in his eighties.)

The album's opening track, *Feelings*, features a superbly played intro by Williams, with some of the best fret-stopping I've ever heard, and the UP1 delivers it in all its perfection. The charm, warmth and depth of Laine's voice are instantly obvious from the very first word she sings. It's a tribute to her talent that you'd only need to hear one word of any of her intros to know you were listening to her. Her tonality was unique, which is rare amongst vocalists. The purity with which the UP1 delivers her voice is indeed indicative of the lack of distortion in its circuitry.

Laine's almost four-octave range was also unique, not least because of her ability to deliver a pure-sounding G above high C. I think other vocalists have since exceeded her range (and too her highest notes), but I don't think anyone has ever delivered such musicality across that range. The UK's *Sunday Times* reviewer Derek Jewel once said of Laine that she was "quite simply the best singer in the world". She was also fun, often singing (and scatting) simply for her own amusement. Their version of *Before Love Went Out of Style* on this album is a masterclass in performance art.

Wave, which closes out Side 1, is yet another outstanding performance piece. Just listen to Laine's enunciation of the word 'together' after she first sings '*two can dream a dream*'. Her scatting on this track is also extraordinary. Side B opens with a superb version of Lennon and McCartney's *Eleanor Rigby,* before continuing to equally superb covers of *Awake My Love* (Ross/Moore) and *If* (David Gates), and then an original (*Charms*) written by Laine and her late husband, John Dankworth. It's worth having this album on vinyl simply to experience it. Second-hand Mint and VG+ copies will set you back around $50, but if you're not prepared to risk second-hand vinyl then I suggest you get the CD from Amazon instead, for somewhat less. The music, guitar-playing and singing are all to die for in any format.

CONCLUSION

I cannot help but feel that it's the sheer simplicity of the OAD UP1's design, combined with its state-of-the-art internal components and outboard power supply, that is the secret to its superior sound quality. The OAD UP1 is a superb phono stage that, despite being built here in Australia by technicians being paid award rates, is priced at a point where it's going to undercut any competitors I can think it might have when it comes to outright performance.

Greg Borrowman

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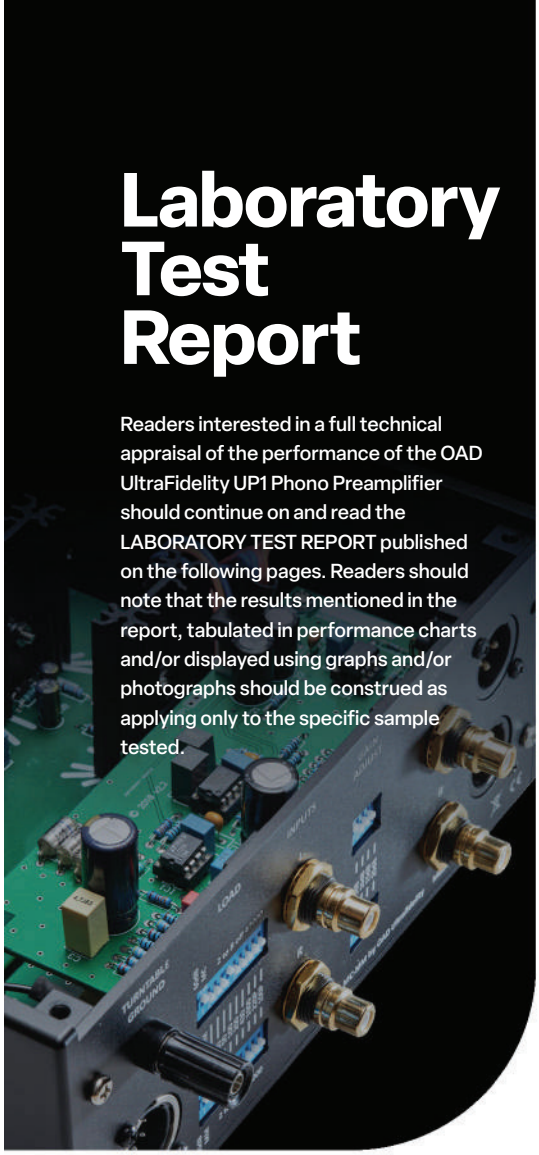
See the following page with the Laboratory Test Report

Laboratory Test Report

Readers interested in a full technical appraisal of the performance of the OAD UltraFidelity UP1 Phono Preamplifier should continue on and read the LABORATORY TEST REPORT published on the following pages. Readers should note that the results mentioned in the report, tabulated in performance charts and/or displayed using graphs and/or photographs should be construed as applying only to the specific sample tested.



The frequency response of the OAD UP1 proved to be incredibly flat and linear when it was tested by *Newport Test Labs*. The frequency response between 20Hz and 20kHz is shown in Graph 1, and you can see that for the most part it tracks the 0dB horizontal graph line, dipping below it from 45Hz up to 800Hz by only about a maximum of 0.1dB centered around 100Hz. Below 45Hz there's a slight lift to +0.3dB at 20Hz, while at the other end of the audio spectrum, the response is just +0.3dB high at 20Hz. So, when normalised across the audio band of 20Hz to 20kHz, the OAD UP1's measured frequency response is within ±0.22dB of a straight line.

The UP1's frequency response is flat above and below the audio band as well, with *Newport Test Labs* measuring it as being 0.61dB down at 5Hz and 40kHz. Channel separation at 1kHz was a superb 103dB. I'm not sure the lab has ever measured a better result than this for a phono stage! Channel balance was equally good, coming in on test at just 0.023dB at 1kHz, which means the quality control on the left- and right-channel printed circuit boards is amazingly good. There was no phase error between the channels at all — that 0.0-degree result shown in the tabulated results table to the right isn't a misprint, it's indicative of a zero phase error at 1kHz.

Distortion was very, very low, as you can see from Graph 2. You can see that to the right of the test signal at 1kHz there is a second harmonic distortion component at –98dB (0.0012% harmonic distortion), a third harmonic component at –102dB (0.0007% HD), and fourth/fifth harmonic components at –115dB (0.00017% HD). The sixth and eighth harmonics are right down at –118dB (0.00012% HD). The 'grass' on the graph between 0Hz and 4kHz is 240V mains noise and its harmonics, which is inevitable when testing at the low voltage levels required to test phono preamplifiers. That there is no noise in the UP1's output above 4kHz (at least none higher than 120dB) is an outstanding result.

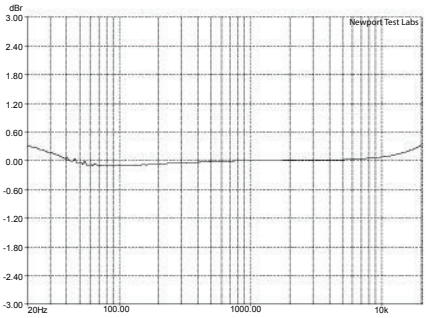
The signal-to-noise ratios measured by *Newport Test Labs* are listed in the tabulated chart and not only outstandingly good but also largely in accordance with OAD's own specification for the UP1. Note that the most impressive results were simply because of the high voltage output reference (10 volts). However, even with a more realistic 2V reference, the A-weighted results of 88dB (MC) and 96dB (MM) that were returned by the UP1 are stunning.

Newport Test Labs measured the absolute gain for the various gain settings, and all were exceptionally close to the stated gain settings, with the 45dB setting giving 45.9dB of gain, and the 50dB setting giving 49.8dB of gain, to give two examples. So not quite perfect, but *very* close to it.

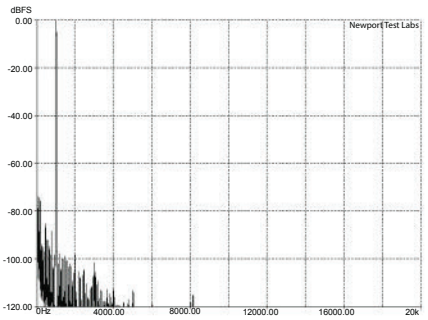
The trace in Graph 3 shows that OAD is using standard RIAA equalization inside the UP1, rather than the newer RIAA-IEC equalization. (The IEC version rolls off frequencies below 20Hz.) The provision of standard RIAA EQ is to be expected: all phono stages that offer only a single EQ curve (rather than both) offer the older version, so the UP1 is in good company.

Measured power consumption was a miserly 3.7 watts, which is not going to impact your power bill, or even be enough to warm the case, but I would still recommend switching the UP1 off at the 240V mains when you're not actually using it.

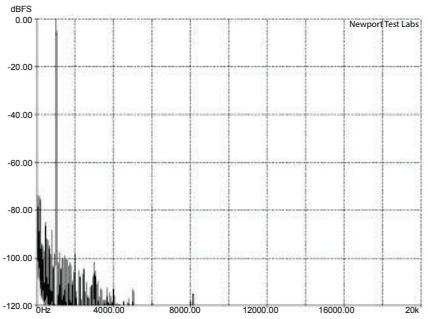
Overall, the measurements made by *Newport Test Labs* on the OAD UP1 revealed stunningly good performance... state-of-the-art performance, in fact! ***Steve Holding***



Graph 1. Frequency response MM input, 5mV input, 40dB gain



Graph 2. THD at 1kHz, 5mV input, 40dB gain



Graph 3. RIAA curve (MM input), 5mV input, 40dB gain

OAD UltraFidelity UP1 Phono Preamplifier – Laboratory Test Results

Test	Measured Result	Units/Comment
Frequency Response @ 1 watt o/p	20Hz – 20kHz (+/–0.22dB)	
Frequency Response @ 1 watt o/p	5Hz – 40kHz (+/0.611dB)	
Channel Separation (dB)	103dB	@ 1kHz
Channel Balance	0.023dB	@ 1kHz
Interchannel Phase (Direct)	0.00 degrees	@1kHz
THD+N	0.05%	@ 2V out
S/N Ratio MM (unwghted/A-wghted)	90dB / 96dB	dB referred to 2V out
S/N Ratio MM (unwghted/A-wghted)	103dB / 110dB	dB referred to 10V out
S/N Ratio MC (unweighted/A-wghted)	81dB / 88dB	dB referred to 2V out
Input Sensitivity (MM/MC Input) 40dB gain	4.60mV / 460uV	(MM/MC)
Output Impedance	50 ohms	@1kHz
Power Consumption	Not Applicable / 3.7-watts	(Standby / On)
Power Factor	+0.688	
Mains Voltage Variation during Test	239 – 242	Minimum – Maximum