MC Pro by Michael Fidler Moving Coil Phono Stage Reviewed - Audio Appraisal

Ashley

I try not to let my derision for the audio industry show, but it's becoming harder by the day. As prices rise, whether by necessity or a convenient excuse, and consumer audio marches ahead in leaps and bounds, I fear the audiophile industry may soon find itself in hot water. The audiophile industry preys on the gullible, with blatant lies and false advertising perpetuated by the press to sell psychological 'upgrades' at vast profits. Unscrupulous manufacturers rely on technical terminology incomprehensible to the general consumer to sell product 'upgrades' to fix deficiencies in devices that weren't adequately designed in the first place. And that's to say nothing of the perfidious practices of certain hi-fi 'dealers' over the last few decades, press handouts and favouritism. It's all a bit of a mess. No wonder the younger generation aren't showing an interest.

Some have offered your humble writer five-figure bribes to make their products appear favourable. I have taken none of them up on those offers, nor will I. I prefer to sleep soundly at night. No amount of testing by ear or analyser can differentiate between two cables, for example, once psychoacoustics are taken out of the equation. But money talks. Some, on the other hand, let their product speak for itself. Firmly in the latter camp are Classic Audio, a UK outfit run solely by owner, designer and manufacturer Michael Fidler from his workshop in Kent.

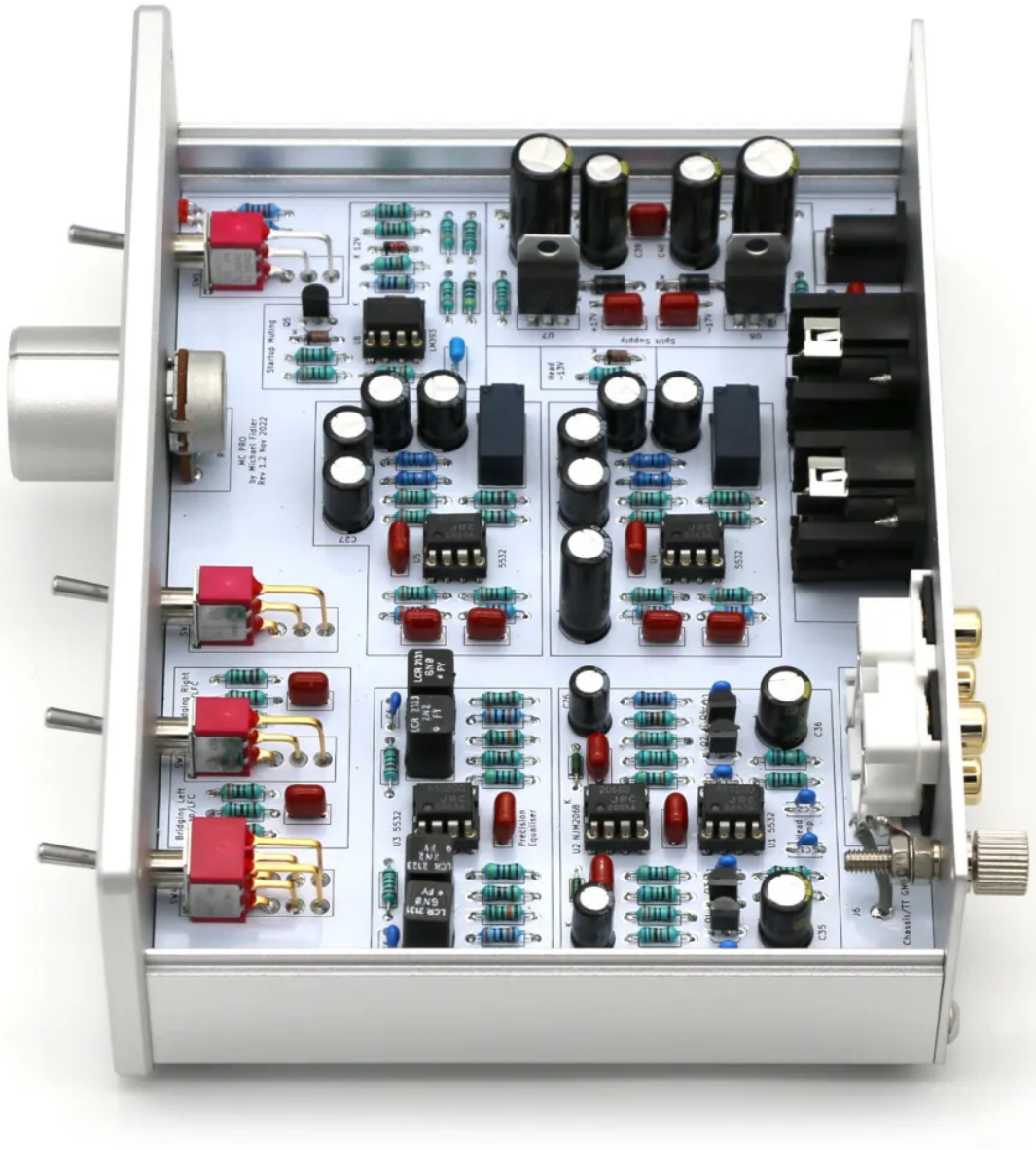
Michael's first products, the Spartan series phono stages, were launched to wide acclaim. He's now following up with the Pro series, units that take his key 'design-first' values even further. The result, he says, is better performance; and for the first time in a classic audio phono stage, low-output moving coil compatibility. "mastering the art of MC amplification" is the claim – a bold one indeed.

Michael's values are clear to see. Offer a quality product at reasonable cost, backed up by impeccable electronic circuit design and the best components. The design comes first, the aesthetics come second, the cost comes later – and there aren't any incredulous marketing claims, or customer-fleecing upgrades on offer.

Michael's preference for old-school design techniques – physical switches, through-hole components, linear power supplies – are evident throughout Classic Audio's product range. All products use the best possible modern components – that is to say the best components for the job, which are not always the most costly.

THere’s not a microcontroller or surface-mount device in sight. Nor will you find components that are ‘audiophile-grade’, ‘ultra-fast’, ‘deep cryogenically treated’ or any such nonsense. Both components are supplied with 9V linear wall-wart power transformers, running a ±17V split-rail power supply in the phono stage itself. Idle power is about 0.1w, and the power supplies don’t give off spurious radio frequency interference nor irritating whistling sounds, and won’t break in a few years time.

The chassis design is a larger version of the chassis debuted in the Spartan 5. It comprises a two-part aluminium extrusion body with black anodised front and rear panels, printed with raised lettering and secured by neat hex bolts. The front panel is a solid 6 mm slab through which protrude four toggle switches for power, LFC, gain and stereo / mono. A chunky aluminium knob, fronting a precise conductive plastic track potentiometer, controls the LFC turnover frequency with a central detent and clear indication line. Most products make do with cheap potentiometers which over time become noisy, impairing their tracking which usually isn’t very good in the first place. The pot used here is rated to endure a minimum of 100,000 cycles. The circuit is configured as a single-gang bridge, both channels sitting across the pot to make any tracking error and crosstalk irrelevant.



The toggle switches are made especially for Classic Audio and are rated for 50,000 cycles (as opposed to a more typical 10,000 cycles). They have a satisfying mechanical ‘clunk’ in operation and feel reassuringly stout. As much as I am a fan, proponent and even developer of microcontroller interfaces, there is something extremely satisfying about this strictly analogue, no-frills interface.

Around back are single-ended input and output connections on gold-plated RCA jacks, with a 4 mm ground terminal that will accept stripped wire, a fork connector or a banana plug. There’s a set of balanced outputs on XLR connectors with a 75Ω shield ground, though no accompanying balanced inputs.

Michael doesn’t believe that balanced inputs are advantageous – quite the contrary in fact, citing the increased noise by virtue of the two additional channels of input amplification required as the primary reason. Even though a moving coil cartridge is inherently balanced by design, His logic is sound. A tonearm cable should be fairly short anyway, especially if a moving coil cartridge is employed, to minimise voltage loss. This is especially important as the signal from a moving coil cartridge is in the range of a few hundred microvolts. The cable should be screened, in which case the chance of it picking up noise is negligible.

Lifting the lid reveals a printed circuit board with impeccable layout. I appreciated the aesthetic symmetry (which will pay dividends for audio too) and the obvious attention to detail in the hand-assembled board. To the left is the power supply section, in the middle is the output section and the input stage is over on the right. There are three gain stages. A discrete input makes up the first 20dB of gain, driving a separate equaliser stage, and fully balanced outputs based on NE5532s. Distortion is a vanishing <0.0005% (20Hz – 22kHz) at the full output of 21V RMS!

Classic Audio phono stages are almost impossible to overload, and certainly impossible to overload with any combination of cartridge and record. This is no exception. Maximum input level at 63dB gain is 7.3mV RMS at 1kHz, and 35mV RMS at 10kHz. At 73dB gain those figures are 2.3 mV RMS and 11.3mV RMS at 1 and 10kHz respectively. These figures are millivolts (mV), not microvolts (µV), and represent a design that can handle the largest dynamic swings and surface imperfections (pops, crackles, scratches) without ever approaching the point of overload.

Unusually, the last 6dB of gain is realised in the 3rd order subsonic filter which prevents any subsonic disturbances eating into the headroom. The subsonic filter rolls off at 23Hz to -23dB at 10Hz, and exists to reduce subsonic noises caused by warps in the vinyl, noise from the turntable and external environmental interference that can cause excessive loudspeaker excursion, and overload amplifiers (or the phono stage itself) causing clipping and distortion.

Clipping damages tweeters and some amplifiers, and distortion is undesirable. Subsonic noise can damage bass drivers if the subsonic frequency means excessive driver excursion in reflex-ported and transmission-line designs, which account for the vast majority of loudspeakers currently on the market. Infinite baffle or ‘Acoustic suspension’ loudspeakers aren’t at risk here as the air behind the driver inside the sealed cabinet prevents over-excursion. Unwanted low-frequency energy also causes heat in the voicecoil, and causes diffraction and breakup in the cone surface, however, to which acoustic suspension loudspeakers are certainly not immune. The subsonic filter here is a much better implementation than you typically see and will ensure that power in the system is kept solely for dynamic swings in music, not harmful byproducts of vinyl that can’t be heard anyway.

flicking the power switch activates the two muting relays after a period of roughly 5.5 seconds (±10%) during which the MC head circuit stabilises. The timer and dropout sensing circuitry are based around a precise comparator circuit with its own independent voltage reference for accurate rail sensing, as unlike op-amp based inputs the discrete head is very sensitive to voltage fluctuations which will cause undesirable noise as it powers down. This is all to prevent any thumps, whistles or bangs through the speakers on startup or shutdown and works effectively.

The relays themselves are high-durability Panasonic devices rated for telecoms and medical applications. Maximum Power draw in operation is around 6 watts and in normal usage is somewhat less. Like all of Michael's phono stages, the pro series are also well-behaved without a load connected so swapping headshells or cables with the phono stage powered up is perfectly acceptable, and they will also handle turntables with inbuilt muting circuits such as most parallel trackers.

Frequency Response

The RIAA standard is a means employed during the cutting process to shape the power-frequency distribution of the music to match the physical limitations of the vinyl medium. RIAA equalisation amplifies treble frequencies above 2122Hz and attenuates bass frequencies below 500Hz, for optimal groove spacing, tracking performance, and noise shaping. If the phono stage doesn't precisely invert the RIAA curve, then it can't approach the ideal of a neutral frequency response characteristic as far as the content of the recording is concerned. Adherence to the RIAA curve, or a lack thereof, is probably the biggest cause of colouration in most phono stages which quote average RIAA accuracy figures of 0.5dB or worse.

This doesn't seem like much, but 2122Hz is firmly in the midrange where our hearing is most sensitive. Thus any boost or cut here is very noticeable indeed, especially when given an accurate reference for comparison. And while most cartridges roll off at the extremes of the audioband or beyond, many if not the majority have a very flat response through the midband when loaded correctly.

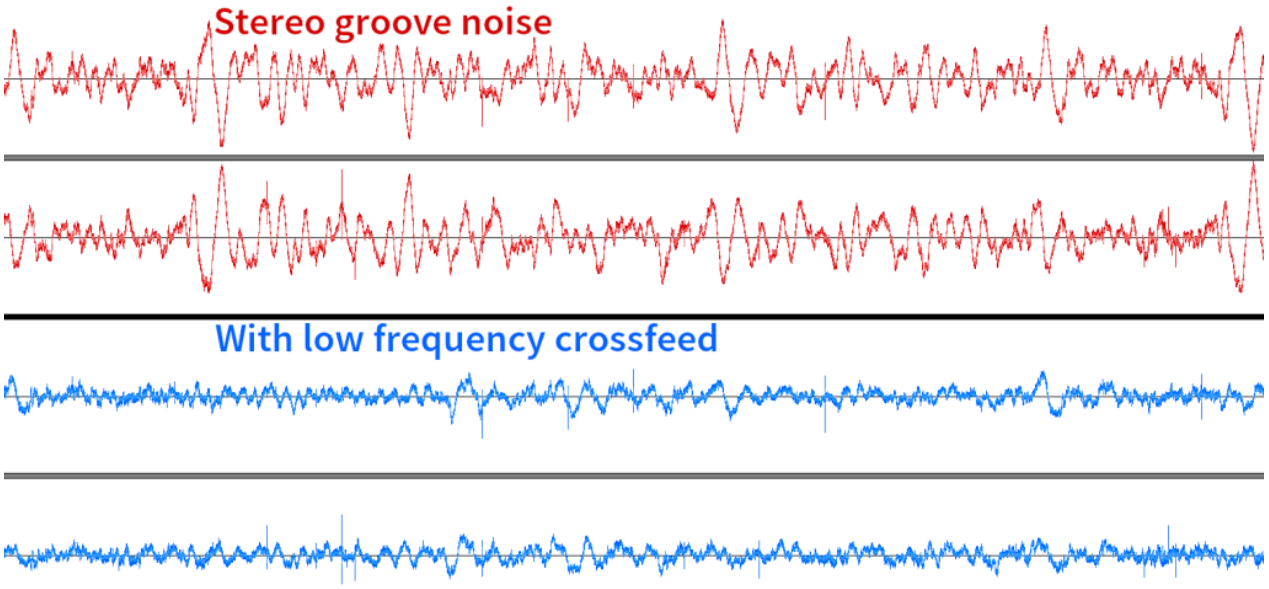
It amuses me greatly, as it does Michael, that audiophiles are quick to shun tone controls yet oblivious to the level of inaccuracy caused by the poorly implemented RIAA networks in their phono preamplifiers, with low tolerance components causing 1dB or worse of variance through the critical midband. To put this into perspective, most tone controls give you 10dB of boost or reduction at their specified turnover frequency. So 1dB of error in your phono stage is roughly equivalent to the difference you hear if you alter the tone controls on a typical amplifier by 10%.

Here The RIAA network is implemented using parallel and series 1% tolerance resistors and film capacitors, achieving a linearity of at least 0.1dB from 40Hz to 22kHz. Placing resistors in parallel improves the tolerance even further and allows resistance values to be combined to get closer to the optimal network value. This is the minimum specification the unit will deliver and in reality the RIAA accuracy is better, though exact figures will vary depending on the exact measurements and matching of the components within their specified tolerances. A flatness of 0.1dB is beyond the threshold of human perception anyway.

The RIAA equalisation stage is implemented downstream of the input amplifier, keeping distortion low throughout the entire frequency range. A conventional design where the RIAA network is a part of the input amplifier can require upwards of 60dB of gain at 50Hz, challenging most op-amps and thus increasing low-frequency distortion. The MC Pro's RIAA network adheres to the RIAA curve well into ultrasonic frequencies and beyond, doing so with an accuracy far below the threshold of audibility. Essentially, a perfect frequency response, and inversion of the RIAA curve.

LFC

The LFC (low-frequency crossfeed) circuitry is a clever circuit that aims to filter out the inherent distractions in vinyl replay, particularly for headphone users. Essentially it is a gradual sloped 1st order differential high-pass filter that sums all content below a given frequency to mono. Vinyl roar, for example, is the combination of several things; mechanical noise from the turntable itself, the sound of the stylus dragging across the vinyl, mechanical noises produced by the cutting lathe, and defects and irregularities in the vinyl – either in the pressing or the material itself.



These noises exist on both channels and through headphones especially can be distracting, pulling the listener's attention to either side of the stereo field and to the rear of the three-dimensional image. Summing those frequencies to mono effectively puts them front and centre, removing the distraction and effectively hiding the unwanted noise beneath the desired musical content in the stereo field.

LFC was first seen in the Spartan 10 and was set at a fixed 140Hz frequency, rolling off to around -12dB at 60Hz. The Pro series takes the content further with a variable turnover frequency between 65 and 600Hz, rolling off to -4.3dB / -21.6dB at 50Hz respectively. Naturally a 600Hz turnover frequency is quite high for most recordings. Maxing out the LFC turnover pulls certain instrumentation, guitars, some vocals and the low octaves of the piano for example, in toward the centre of the sound stage. I found backing off LFC to where the widest stereo image was achieved gave the best results in terms of noise filtering, but for most of my listening I left it centred on 120Hz. The centre position of the pot is indicated by a detent. At 120Hz there was no impact on stereo imaging with any of the records I tried.

The Pro series also implements mono switching. I wrote in detail about my discovering this phenomenon in my review of the Classic Audio Spartan 5, during which I greatly enjoyed discovering just how quiet and clean a mono record, and even a stereo record with monaural content, played back in mono could sound. Mono switching is shown to even greater effect in the pro series as the phono stages are quieter. Mono recordings are one-dimensional by nature, but really they aren't. When there's so little noise, and so much clean dynamic range, you realise that a good mono recording has depth and height far beyond the boundaries of a single point source.

The MC Head

All of this detail applies also to the MM Pro moving magnet preamplifier. What doesn't, naturally, is the MC head employed by the MC Pro which realises the first stage of gain in a servo-stabilised input amplifier. Traditionally, moving-coil cartridges were mated to moving-magnet inputs by step-up transformers (SUTs) to give an increase in input gain. They are capable of good noise performance if the windings are carefully designed for very low series resistance, but suffer inescapable problems of low-frequency distortion, high-frequency transient overshoot and the need for screening to avoid 50Hz mains pickup.

Nowadays, combination phono stages which offer moving magnet and moving coil compatibility simply place an MC head to optimise load characteristics and make up some gain before the moving magnet input. This isn't optimal either. Noise has a power spectrum, and the wider the spectrum the more noise you'll see. Typical head noise density is about 0.5nV/sqrtHz at the input, which translates to 5nV/sqrt Hz after the 20dB of gain required to bring a 500uV MC cartridge output to a 5mV moving magnet level, while an optimised MM input density is about 5nV/sqrt Hz, so the MM input contributes as much noise as the head, doubling the effective input noise power.

By contrast the MC Pro is a purpose-designed moving coil preamplifier. It implements a rather unique circuit design, with the front end very loosely based on a circuit published by Douglas Self in the December 1987 issue of Wireless World. This is not, however, a cookie-cutter ripoff of that design. Fundamentally, it's a single-ended PNP transistor input with low-impedance current feedback using a servo-stabilised op-amp (5532) to provide the gain and drive for the low impedance feedback network. The low impedance keeps resistor values low and therefore minimises thermal noise contribution. Self's circuit has a gain of 200x (46dB) with resistor attenuation taps in the feedback network for gain adjustment (minimum 20dB). However, this causes the head to clip prematurely at high frequency with overload margin compromised from 14kHz onwards for an overall gain of 63dB – Pretty poor performance given an MC cartridges with an extend high-frequency response!

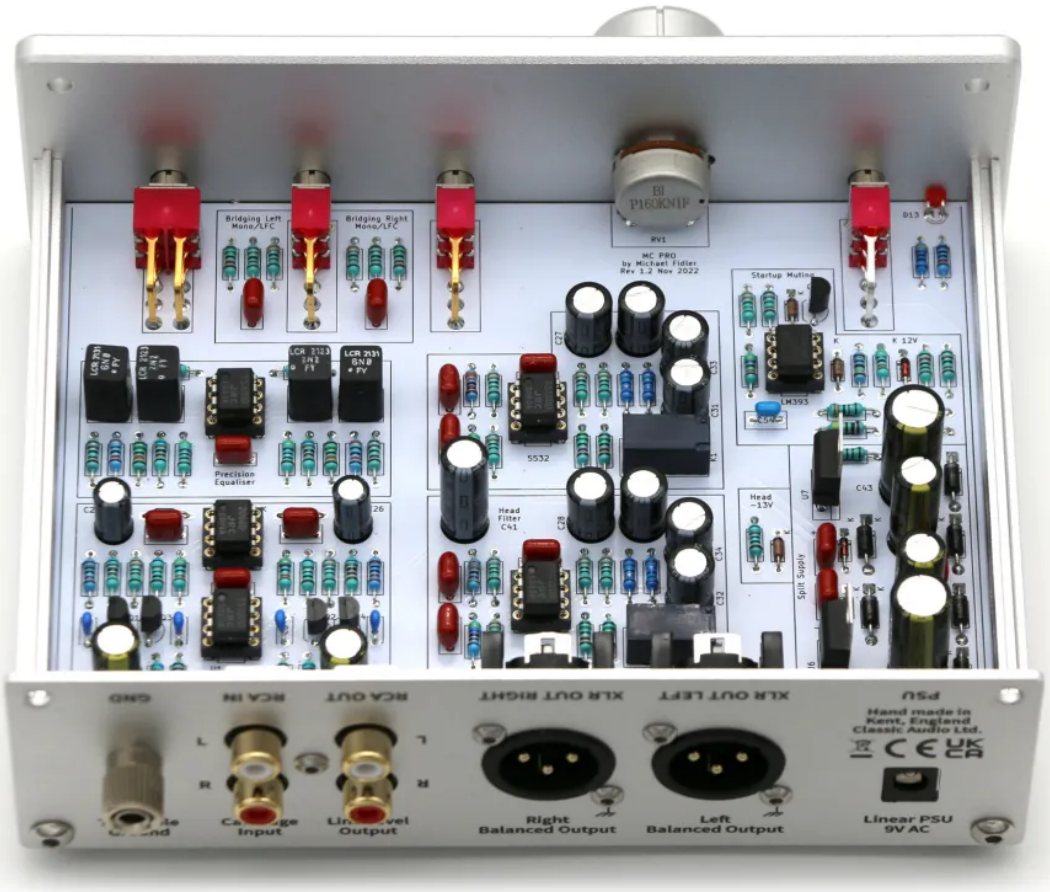
The MC PRO head circuit has a gain of just 40.1dB so doesn't reach overload against the RIAA curve at 63dB of gain until 28kHz, with a maximum input of 100mV that continues up to 80kHz. Gain is adjusted by increasing current into the shunt-feedback equaliser stage downstream to maintain that performance even at higher (73dB) gain.

Self's circuit uses 3 2N4403 PNP switching transistors on the input in parallel to lower noise, something which Self makes quite the deal of in much of his writing. These devices exhibit very low noise as an unintended consequence of their intended application for fast switching – the high base area and corresponding low resistance allows for parasitic charges to be very quickly depleted for high switching efficiency, but this also greatly reduces input voltage noise caused by the base resistance. This quirk was quickly noticed by Quad in the 1970s and used in their own moving coil inputs.

The MC PRO uses BC327s, intended low-power high-quality audio output stages in the 1990s, such as those found in Roberts table top radios of this era. They exhibit a lower base resistance than the 2N4403, with superior linearity and less input current noise as a result of their much higher current gain. A couple of these devices in the MC Pro therefore beat the noise performance of the original 3 2N4403s, with less parasitic capacitance around the input. The MC Pro circuit also specifies a larger input coupling capacitor to reduce low frequency noise, with better filtering on the rail that powers the discrete input to eradicate hum.

The MC PRO uses the NJM2068 as the servo amp giving 5 times less voltage noise injection than the TL072 used in the original Self design. It is also critically damped (no resonances), where the original design exhibits unwanted ringing at 1.6Hz.

Why is there no adjustable loading? The MC Pro's input impedance and capacitance are fixed for best RF performance and minimal insertion loss, the latter significant with level adjustment given a typical input voltage of less than 0.5mV. The fixed loading is optimal for most, if not all, current moving coil cartridges on the market.



I ran the balanced outputs into one of the balanced inputs of my Topping A90D head / preamp, running its output into the new Hypex Nilai 500 monoblock power amps which are essentially the cleanest, quietest and most neutral amps you can get. They simply don't have a sound of their own, and neither does the topping preamp. The Topping has an unusually low input impedance of 2kΩ which presents a challenging load to some source components and can, in some cases, affect their frequency response. The MC Pro had no problem driving the Topping to its full potential, and its 21V RMS balanced output would have no trouble driving the Topping beyond full power, into clipping if the input signal was high enough.

I loaded the MC Pro with an Audio-Technica OC9X-SL moving coil cartridge fitted to my Technics SL-1200G turntable, using a perfectly decent cable comprising Van Damme cable and Neutrik plugs, around 60 CM in length. As above, the MC Pro has no loading adjustments. Input loading is a fixed 120Ω.

The first thing you notice is just how quiet the MC Pro is. There's hardly a hiss, even with my preamp approaching full gain where the music would be too loud to be in the same room. In practical terms noise is not an issue. As such, any noise you hear will be from the record itself, or from components downstream of the MC Pro. I've been using the MC Pro for nearly 3 months, and am continually surprised by how little noise is present on some discs. There will always be a degree of vinyl roar and tracing noise, but it's negligible, really.

From such a quiet background come startling dynamics. This is about the only thing I can say about the sound of the MC Pro as it really doesn't have a sound of its own, it is entirely neutral. Describing the character of the MC Pro would in fact be describing the character of the connected cartridge. In the case of the Audio-Technica OC9X-SL, mostly neutral but somewhat bright would be my summation. But the dynamics. They are astonishing.

There's a whole new level of stereo imaging unveiled by the lack of noise. Inside those sonic images, you can almost hear the echos in space surrounding musical layers. Then out of nowhere comes the music, entirely unhindered in dynamic range. The quietest, most delicate passages are just so. The loudest passages are without limit, often to a startling degree. It is a thrill that simply has to be experienced.

I could delve into my box of audiophile cliches and tell you how the MC Pro has air, rhythm, timing, detail etc in spades. Or I could triple the length of this article listing the records I've played through it and give you a play-by-play commentary on how the MC Pro lifted each to new heights. Or I could simply tell you that the MC Pro has been a key component in realising the best sounds I have ever heard from a vinyl record. It's that simple.

I have spent the past three months trawling through every phono stage on the market, trying to find something with a specification that comes close to that of the MC Pro. In that time I have played numerous albums with several cartridges, and not once has this little box provided anything less than stellar performance. It's not going back.

My search of the market left me empty-handed. The MC Pro currently offers the finest technical performance of any phono stage I can find on the market at any price. It is a product that will shake up this stagnated industry for the better. It demonstrates that real-world performance is not wizardry or pseudoscience, but competence and ability. The audio industry needs more of both if it is to stand a chance of survival, and Michael Fidler is a clear frontrunner. If you're stepping onto the MC ladder and considering a step-up transformer to use with your existing phono stage, buy the MC Pro instead. If you're at the top of the MC ladder and you're eyeing up some multi-box, five-figure esoterica that needs a rack of its own, consider its technical performance and buy an MC Pro instead. The MC Pro by Michael Fidler earns my whole-hearted, entirely unreserved recommendation. It is available to order directly from Michael by Clicking Here.