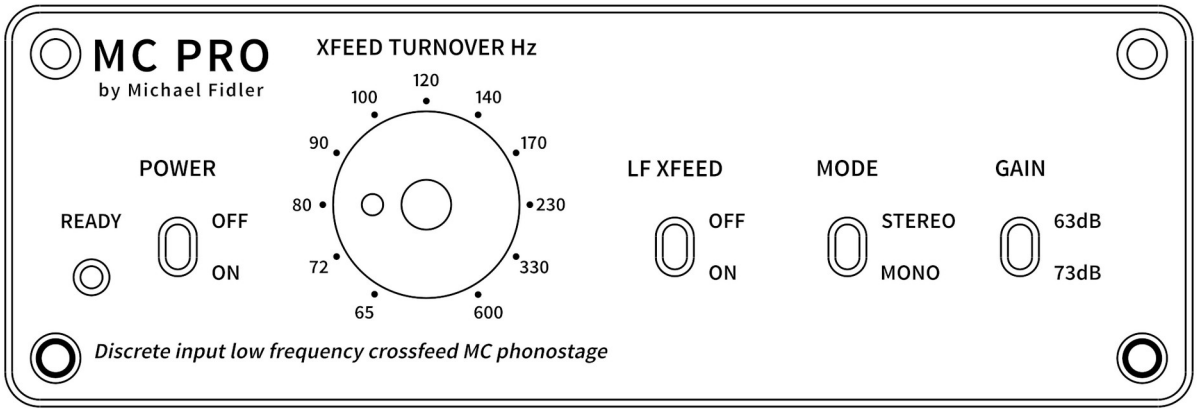

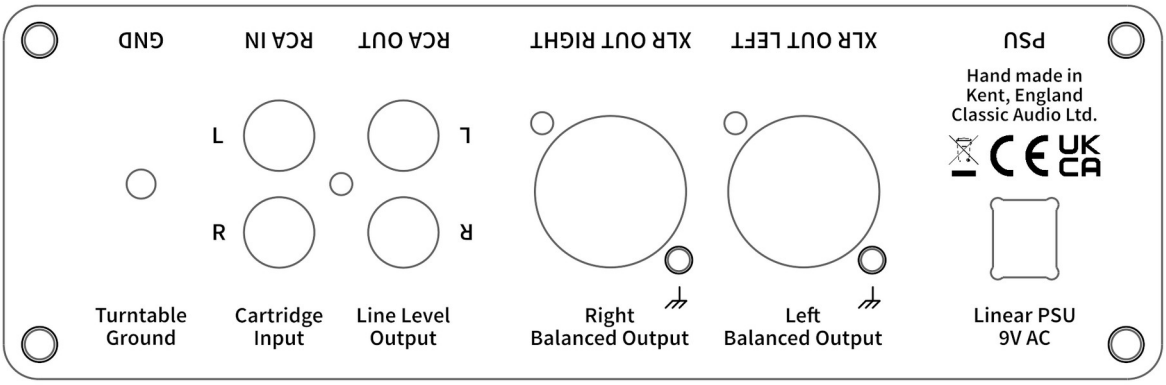

User Guide

RIAA Accuracy	**±0.1dB, 40Hz to 22kHz**
Channel balance	**±0.1dB at 1kHz**
Signal to noise ratio (220Hz-22kHz flat)	**81dB, at output ref 500uV, 10Ω cartridge**
Total harmonic distortion	**<0.0005%, 20Hz to 22kHz, 21V RMS output**
Maximum output (20Hz-28kHz)	**21V RMS (XLR), or 10.5V RMS (RCA)**
Maximum input at 1kHz	**7.3mV RMS at 63dB, 2.3mV RMS at 73dB**
Maximum input at 10kHz	**35mV RMS at 63dB, 11.3mV RMS at 73dB**
Overload margin ref 500uV, at 1kHz	**23.3dB at 63dB gain**
Overload margin ref 150uV, at 1kHz	**23.8dB at 73dB gain**
Gain at 1kHz (nominal gain), RCA	**63.17dB, 1440x, or 73.1dB, 4520x**
Gain at 1kHz (nominal gain), XLR	**69.19dB, 2880x, or 79.12dB, 9040x**
Minimum load impedance	**1kΩ (RCA), 2kΩ (XLR)**
Output impedance	**75Ω (RCA), 150Ω (XLR)**
Input impedance	**120Ω**
Subsonic filter	**23Hz, 3rd order, for -23dB at 10Hz**
Low frequency crossfeed	**65Hz to 600Hz, 4.3dB - 21.6dB at 50Hz**
Dimensions (W*H*D)	**172*60*155mm**
Power consumption	**6W max powered on, 0.2W standby**

Introduction

Thank you for your vote of confidence in buying the MC PRO. This unique design, intended for low and very low output MC cartridges, was realised through many months of research into ultra-low noise discrete hybrid amplifiers, resulting in a new triple-stage circuit architecture that avoids the compromises made by conventional moving coil combination phonostages. Consequently, it offers exceptional RIAA accuracy, vanishingly low distortion, and an even better signal to noise ratio than the best moving magnet amplifiers, despite amplifying a source voltage 10 times smaller. All of this is done using standard, readily available parts.

The MC PRO pushes the boundaries of performance further, to improve over conventional phonostage architecture by carefully distributing gain through the signal path. It carries over the well-received low frequency crossfeed function that allows for significant reduction of vertical 'vinyl roar', while adding the option of a variable turnover so that the level can be adjusted according to taste. When enabled, an intermediate filter stage gently blends the two channels together, permitting a progressive cancellation of vertical noise, that rises as the frequency drops. This reveals bass detail otherwise swamped in noise and seriously enhances longer listening sessions with headphones on.

BC327 audio output transistors, chosen for their extremely low noise and superb linearity, make up the front-end of the servo-stabilised input amplifier, which uses the NE5532 op-amp as a workhorse to provide drive and linearity through a very low noise feedback network. Unlike other MC head designs, the head utilises the extra gain from the transistors to linearise the IC core, so it can amplify the tiny signal 100 times in one loop without distortion. This makes the signal far more immune to noise and interference downstream of the head.

The head drives a low impedance, high precision, shunt-feedback equaliser using 1% tolerance polystyrene telecommunications capacitors. Unlike a common moving magnet equaliser/amplifier, it can equalise the RIAA curve much more effectively at high frequency without a 'correction pole'. As the equaliser operates with no common-mode voltage and with less gain burden than a moving magnet amplifier, it is exceptionally clean.

Further downstream, the subsonic filter uses capacitors hand-selected to within 1% of each other on each channel, ensuring excellent stereo balance and response flatness. It purges component tolerance effects that have caused other subsonic-filtering phonostages to randomly fray the low end response. The last 6dB of gain is then made up after the subsonic filter, which prevents subsonic disturbances from eating into the final headroom.

Finally the MC PRO runs off a split ±17V linear power supply, guaranteeing noise free use for decades to come, with over 10V RMS of single ended output on tap. A startup mute relay is used to prevent startup transients getting through as the head stabilises over 80dB of gain at low frequency. Gold-plated turned IC sockets are used to house the professional standard audio amplifiers that do most of the legwork. I hope you'll enjoy the end result!

Happy listening,

Michael Fidler – Classic Audio Ltd.

Test results

Serial number		
Power up and noise tests		
Low frequency tests		
RIAA and linearity tests		
Crosstalk test		
Date of test		

Instructions

Having exercised the wise discretion in purchasing this product over many others, in spite of marketing budget differences, it should be a given that the user knows what they're doing. However, for the sake of completeness, instructions for basic use are as follows:

- **Remove the unit from its packaging and place in proximity to your turntable setup**
- **Attach the turntable ground wire to the 'GND' post on the rear of the MC PRO**
- **Connect the turntable output leads to the RCA connectors labelled 'RCA IN'**
- **Connect either the 'XLR OUT' or 'RCA OUT' connectors to your line input**
- **Connect only the supplied 9V AC power adapter to the 'Linear PSU' socket**
- **Select the correct gain setting for your cartridge and amplifier sensitivity***
- **Switch the MC PRO on by moving the 'POWER' toggle switch to the 'ON' position**
- **After 6 seconds, the circuitry will stabilise and the 'READY' LED will illuminate**
- **For mono discs, great abatements in noise and distortion from the record can be obtained by moving the front panel switch downward to the 'MONO' position**
- **On stereo pressings, the LFC function will allow significant reduction of 'vinyl roar'**
- **Adjust the 'XFEED Turnover' knob to suit your preference, noting that increasing the turnover frequency past 140Hz will decrease stereo separation below 24dB at 1kHz**
- **Hot-swapping of cartridge head-shells is possible while the phonostage is powered on**

***Most moving coil cartridges will yield a strong line output after 63dB of gain. So as to avoid overload, the 73dB setting should only be used for very low cartridge outputs below 200μV. The signal to noise ratio on the output remains the same at both settings, due to the optimal circuit gain structuring. A *better safe than sorry* approach is therefore advised to preserve headroom. It is possible to apply 63dB with sub-200μV cartridges if your amplifier is more sensitive, or the level is a better match when switching between other sources in your setup.**

Try to keep the MC PRO as physically close to the turntable as possible, preferably right next to the tone-arm side, therefore minimising the lengths of the turntable output leads to avoid hum pickup. It helps to coil and then flatten the excess length with a cable tie to minimise the magnetic loop area. If using the RCA outputs, choose as short a cable as possible between the MC PRO and the amplifier, to once again minimise the size of the potential ground loop and avoid hum pickup. Similarly, keep as much distance between the input cabling and mains or digital cables so as to avoid interference.

The MC input loading is fixed at 120Ω//800pF, which provides the best trade-off between insertion loss and the absorption of radio frequency interference. After a brief period of research, it was found to be unnecessary to make this variable. It can be reduced below this value using loading cables, but there isn't any benefit to be had other than pulling the level at the sensitive input down and degrading signal to noise ratio. Speculatively, it's only popular because it can be implemented with almost no electronics knowledge...

Cautions

Some of these appear obvious but have to be included for the usual reasons:

- **To avoid mutual destruction of both the MC PRO and an inappropriate power supply, use only the optimal 9V AC power supply included at sale**
- **Keep the linear AC adapter away from water, in a well ventilated space**
- **Do not use the MC PRO outdoors, it is quite shockingly intended for indoor use only**
- **For best results keep the MC PRO out of close proximity to switching/power electronics to preclude interference. Likewise, keep as much distance between the MC PRO and the AC adapter as possible to realise the full magnetic advantages of a remote PSU**
- **Make sure that the connectors are clean before making connections, as dirt on the connectors may abrade the connector plating, reduce the effective contact area, and introduce noise and blocking distortion in extreme cases**

On a more technical note, it may be very tempting to try swapping the op-amps in the MC PRO, as unfortunately this ill advised habit has become a popular online hobby. The 5532s and 2068 were chosen specially for the design as the best for the application. Their relatively low cost is due to the economy of scale generated by their excellence and practicality, and there are no magic results to be had by interchanging them for LM4562s, OPA2134s, AD797s etc. Substituting more exotic devices may provoke excessive noise, distortion, or even instability and failure. Unstable circuits are quite able frying power amplifiers and speakers!

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