

iFi audio iPhono3 Black Label

## **Beauty and Beast**



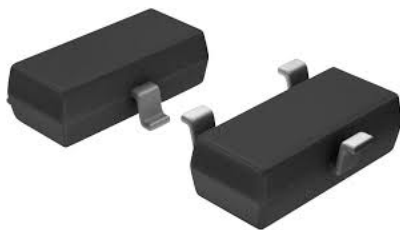
### **iPhono3 Black Label over other phono stages**

- One of the quietest phono stages. Bar none.
- Ultra-low distortion. High gain of 72dB en par with flagship phono stages.
- Computer-matched high-gain bi-polar input transistors and more.

## All new specifications

- Dynamic range improved by 5dB to 108dB. 36-72dB gain.
- 85dB A-weighted SNR is 3dB quieter (re 0.5mV/5mV per Stereophile standard).
- The increase in the power-supply voltage of the external iPower X ultra-low noise adapter for iPhono3 Black Label to 15V allowed for greater undistorted signal levels for LPs like the legendary (and often unplayable) Telarc 1812.

All-new hand-matched Burr-Brown Soundplus® J-FET type operational amplifier. The Burr Brown is complemented by Panasonic Japan-made ECPU Film Capacitors designed for audiophile applications with vanishingly low distortion of (<0.005%!), infusing the iPhono3 Black Label with dynamic range performance that is second-to-none.



Computer matched pair complementary planar high gain bi-polar input transistors means 6dB lower output noise. The planar transistor is constructed by an etching and diffusion technique in which the junction is never exposed during processing, and the junctions reach the surface on one plane; characterized by very low leakage current, high gain and very low noise. These transistors being matched pairs, is labour intensive and expensive.

The iPhono3 Black Label is packed with the latest generation of surface-mounted components. By eliminating multiple joins between parts and lead-out and reducing the size, parasitic behaviour across the board has been drastically reduced over classic leaded parts.

The iPhono3 Black Label features for the first time, audiophile-grade Nichicon capacitor, providing lower ESR, faster speed, and deeper bass. Complemented with the new hand-matched bi-polar transistors, it lowers noise and distortion even further.



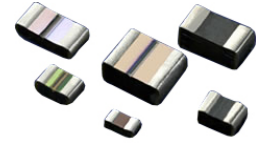
It uses Panasonic OSCON totaling 14,800uF. This gives very-low Equivalent Series Resistance (ESR), excellent noise reduction capability and frequency characteristics.



## the Tech

Southport, UK – May 2020  
iPhono3 Black Label  
micro series

It is packed throughout with TKD Japan made COG type capacitors. Capacitors owning the COG specification have lower thermal drift and distortion than Polystyrene capacitors. The iPhono3 Black Label uses them for the actual equalisation AND power supply bypass capacitors.



ELNA Japan made Silmic Capacitors are used for the power supplies. These use special silk fibre paper for the isolating barrier resulting in decreased odd-order distortion and reduced micro-phonics/mechanical resonance.

Vishay MELF type thin film resistors, these resistors show dramatically decreased noise and distortion compared to the standard surface-mounted resistors. Previously, just like COG specification capacitors, they were reserved for the most critical positions.



## Design highlights

*EQ curves. Even the same LPs may not have the same equalization*

Because as LPs even from different pressing plants can have a different equalization curve.

Descending from the AMR PH-77, the iPhono3 Black Label has impressive DNA. One of the key aspects is the ability to precisely 'correct' the recording with the intended equalization curve. There are 6 curves on the iPhono3 Black Label that are trickle-down technology from the PH-77 which had a total of 22 EQ curves!



Not all LPs have been equalised using the same RIAA equalisation, additional equalisation curves are needed. At the introduction of the Long Play record (LP) in 1948, most record companies implemented their own particular equalisation curves and continued to experiment with equalisation in order to extract the best performance from the new medium. This led to a baffling array of different and incompatible equalisation curves being applied worldwide.

In the mid-1950s, as all its members agreed to adopt the RCA Orthophonic equalisation curve, the Recording Industry Association of America (RIAA) promulgated this curve as a common standard that became known as the 'RIAA equalisation'. However, as this was essentially an American standard, it had little impact outside of the USA. The RIAA equalisation only became a truly international standard by the mid to late 1970s when European recording labels slowly and finally began to adopt the RIAA equalisation. It was even later when some Asian



recording labels joined the bandwagon and adopted the RIAA standard. Right up to the fall of the Berlin Wall in 1989, many Eastern European recording labels (including Russian recording labels) were still, using their own CCIR equalisation.

To further complicate matters, even after officially agreeing to implement the RIAA equalisation curve, many recording labels continued to use their proprietary equalisation, even well into the 1970's. Columbia is one such prominent example in the USA, and Decca/Telefunken/Teldec in Europe is another.

The choice is there for the customer to choose 'by ear'. Or alternatively, simply leave it on RIAA permanently too.

*A most delicious irony is that the actually quite excellent and ground breaking sound quality of early Decca and Deutsche Gramophone digitally mastered LPs tends to be considered as "strident" and "digital" by many audiophiles, which is of course true when replayed using an RIAA equalisation stage, as the mastering EQ used was Decca FFSS which boosts the high frequencies around 2db more than RIAA.*

*The reason for the objectionable sound quality of these LPs is not the digital mastering at all, but the equalisation. In fact, since the early 1970s practically ALL LPs were cut with the aid of a so-called cutting computer to maximise playtime, which involved passing the analogue signal to be cut onto the LP through a Digital Delay system with 16-Bit/48KHz A2D and D2A convertors. Hence, virtually ALL commercial LPs since the early 1970's are in fact "Digitally Mastered", not just those that explicitly employed digital recording and production systems and hence stated this on the Label.*

*Replay the same "bad digital sound" LPs using the correct equalisation and a most glorious and natural sound quality is revealed, which was always there, just hidden by a lack of tone controls or adjustable equalisation.*

#### Short but sweet summary

Columbia\*: most Columbia/CBS, Epic, EMI (records originally issued under Columbia) etc.

RIAA: standard EQ curve for all records issued after 1980s and some after 1950s.

Decca\*: most Decca, London, Deutsche Grammophon (DG), Archiv, EMI, Argo, NAB etc.

\* For pre-1980 records

*Tip: If an LP sounds overly bright, edgy, thin and lacking scale and body via RIAA EQ, please try Decca EQ.*

*If an LP sounds both too bright and with muddy overblown bass, please try the Columbia EQ.*



**the Tech**

Southport, UK – May 2020

iPhono3 Black Label

micro series

## Sub-sonic filter

The iPhono3 Black Label's sub-sonic filter is well designed and implemented. Why is it needed? A warped track or record will cause a large signal output in the subsonic region, typically well below 20Hz.

For example. A 33 1/3 RPM album with a single warped section can create a signal in the pickup at 0.55 Hz ( $33.3 \text{ RPM} / 60 = 0.555 \text{ Hz}$ ). This is a signal that will cause significant cone movement, and is very undesirable. By 'nailing' this issue at the root cause stage, the rest of the system will sonically benefit.

## X-Powered

The iPhono3 Black Label demands the ultimate power supply. That means the newly launched iPower X. Just like the rest of the power supply range, it has an exceptional noise floor of  $<0.1\mu\text{F}$  which is lower than what the Audio Precision measures to.

<https://ifi-audio.com/products/ipowerx/>

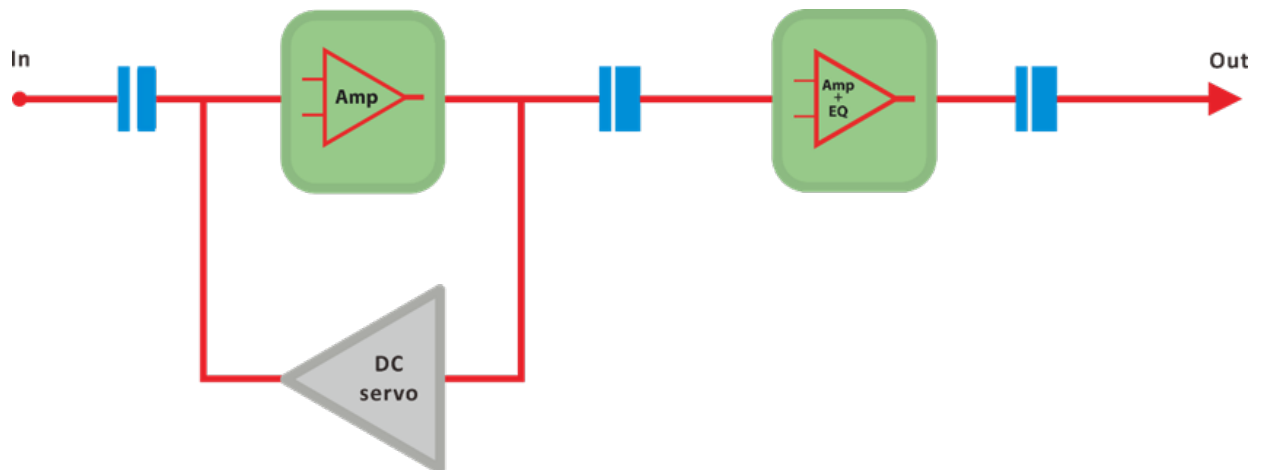


## Circuit highlights

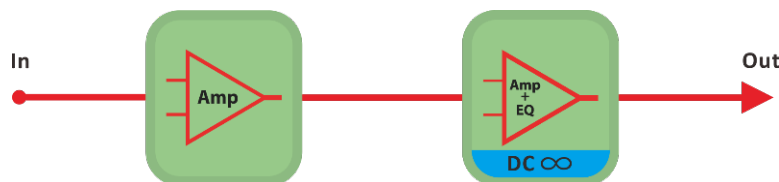
*DC coupled thanks to DC-Infinity*



Direct Drive Servoless is an important element of the audiophile experience, which is not visible in measurements, but is quite audible. Unlike a standard phono stage design, the iPhono3 Black Label continues the special design tradition of being direct coupled (i.e. no coupling capacitor) from cartridge to output and it does so without requiring a conventional DC servo. Below is what a standard phono stage looks like:



In iPhono3 Black Label the unique 'DC-infinity' circuit boosts the circuits DC gain to approach infinity (it is approximately 1 trillion one million times one million;  $10^{12}$ ).



Once the feedback loop is closed, this near infinite DC gain cancels all offset voltages to deliver a direct-coupled output with 0V DC offset. The key to the 'DC-Infinity' circuit is that it only changes the gain below approx. 0.01Hz, while leaving the AC behaviour of the circuit at higher frequencies unchanged, injecting neither noise nor distortion into the audio signal.



Any noise and distortion of the DC-Infinity circuit happens at the same signal level as the output signal and is by design, 100 times less than the noise and distortion of the actual amplifier circuit. Noise and distortion it effectively disappears.

### *Class A TubeState® Circuit*

At AMR/iFi we have always loved the sound of tubes and have produced tube equipment under the AMR brand name in the ultra-high end arena. However, tubes run hot, take up a fair bit of space and cost a pretty penny. Solid-state can be designed as a small and affordable circuit, as well as running cool.

Wouldn't it be great if we could get 'tube sound' from solid-state gear? Okay, maybe not an exact replica of real tubes but as close as it can possibly get. Now most people would tell you that "Tube sound with solid state - that's just impossible". But it is possible and it really is worth it.

The TubeState® technology is the result of nearly four decades of research by our Chief Designer Thorsten Loesch on tube and transistor gear. He started his audio



## the Tech

Southport, UK – May 2020

iPhono3 Black Label

micro series

engineering journey by building his own kits at a young age. Thorsten continued exploration of the audiophile realm by repairing and refurbishing classic tube gear, HiFi tubes, guitar and bass amplifiers as well as pro-audio devices. His international fame was gained mostly through extensive publishing. Many years of personal experience were complemented by advanced research, development and testing at AMR/iFi putting into production acclaimed designs in both Tube and Solid-State circuitry, analogue as well as digital.

Many inexperienced audiophiles believe that the 'tube sound from solid-state' focuses on emulating the characteristic distortion of tube circuits, but we have long stressed that there is much more to just replicating the harmonic distortion of the tube sound in solid-state. Adding distortion only 'mimics' of one aspect of the 'tube sound'. The extent to which the result of this operation reaches the result of a real tube circuitry experience varies widely, but in many cases the words 'hilarious dummy sound' come to mind. We would be one of the first to admit this. *The key is not to add distortion, but to avoid certain types of distortion.*

Once it is understood that specific distortions are endemic to solid-state circuitry and are pernicious with respect to subjective sound quality, we can eliminate these from solid-state circuitry, without adding on tube-like distortion and noise.

**Class A<sup>®</sup>**  
**TubeState**

To enhance the audiophile experience, the iPhono3 Black Label employs a simple Class A buffer circuit. The Class A buffer minimises the loading of the amplifier circuit AND at the same time reliably biases the output stage of the integrated circuit amplifier into single-ended Class A (it normally operates in Class AB). Incidentally, all other stages in integrated circuit amplifiers operate in Class A. This is why biasing the output stage into single-ended Class A and adding the Class A Buffer is so effective to improving sound quality.

Tube-state does not mean to add a lot of synthetic harmonics, but to emulate core features of tube circuits in solid-state. The result is a sound that combines the best features of the tube sound (lack of grain, edginess and naturalness of sound) with the best of modern solid state (low distortion, low noise).

For the iPhono3 Black Label there is a third-generation upgraded circuit that has at the heart top-notch op-amps & hand-matched PNP bipolar transistor Class A Tube-state Buffer. By virtue of the J-FET component it has a very high input impedance approaching the 'zero loading' a tube grid provides ever more closely, while the increased drive ability allows the iPhono3 Black Label to drive 1V into 600 Ohm loads with 0.005% THD, (dominated by low order harmonics, just like it is the case with exceptional tube circuits. On top of lowering THD, these state-of-the-art op-





amps will also provide faster transient and broaden the spectrum of the dynamic range.

## Technical Specifications

Freq. Resp.:	10Hz – 100KHz ( $\pm 0.3$ dB) 20Hz – 20kHz ( $\pm 0.2$ dB)
Dynamic Range:	MM (36dB): > 108dB (A-weighted) MC (60dB): > 106dB (A-weighted)
Signal-to-Noise Ratio:	MM (36dB): > 85dB (A-weighted re. 5mV) MC (60dB): > 85dB (A-weighted re. 0.5mV)
Overload Margin:	MM (36dB): > 26dB (re. 5mV, @ 1% THD) MC (60dB): > 22dB (re 0.5mV, @ 1% THD)
Crosstalk:	<-71dB(1kHz)
Maximum undistorted output:	7V (Load $\geq$ 600 Ohm, THD $\leq$ 1%)
Total Harmonic Distortion (THD):	<0.005% (MM 36dB 1V out 600R Load)
Output Impedance:	<100 $\Omega$
Input Voltage:	15V/1.2A, AC 100 -240V, 50/60Hz (with iPower X)
Power Consumption:	< 5W (ships with iPower X 15v – do NOT use any other power supply)
Dimensions:	178 x 64 x 26 mm 7.0 x 2.5 x 1.0 inches
Weight:	265g / 0.58 lbs





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## **BLACK LABEL** *iPhono3*

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### **About iFi**

iFi audio is part of AGL and is headquartered in Southport, UK. It owns the hifi brand Abbingdon Music Research (AMR). They respectively design and manufacture portable and desktop 'ultra-fidelity' audio products and high-end audio 'home-based' components. The combined in-house hardware and software development team enables iFi audio and AMR to bring to market advanced audio products.