

Keeping Balance

Pro-Ject's Phono Box RS2 gives Noel Keywood balance issues.

This, for me, is a deeply exciting product – a balanced Phono preamplifier for LP. And that means – specifically – with balanced inputs. I designed one some time ago because it's the only way to go for top quality sound, especially from moving coil (MC) cartridges. Pro-Ject now offer one in their RS2 that I'm reviewing here, so hang on to your seat for some deep discussions about all this!

The RS2 is a fully discrete, fully balanced amplifier with no OP amps

(silicon chips) Pro-Ject say. Designing such an amplifier is an analogue horror story only the best design engineers can tackle. That's why they are so rare – both the amps and the engineers! You'll see from our internal pic a massively complicated circuit board, explaining its price of £1300. A bargain methinks, considering the sweat to design such a thing. But why would you want it?

In a nutshell, a pickup cartridge is a fully floating generator that is best connected into a balanced input to cancel noise and interference.

Meaning no hum, no common-mode RF interference or other nasties. With a low output moving coil cartridge this is potentially a great benefit.

So far, so good, but there is another more prosaic difficulty – turntables do not come with balanced output wiring terminated with XLR plugs. It only takes a nifty re-wire to do this but that means either a DIY job or a dealer able to do so, or even our columnist and repair man Dave Tutt (see his column for contact details). Importers Henley



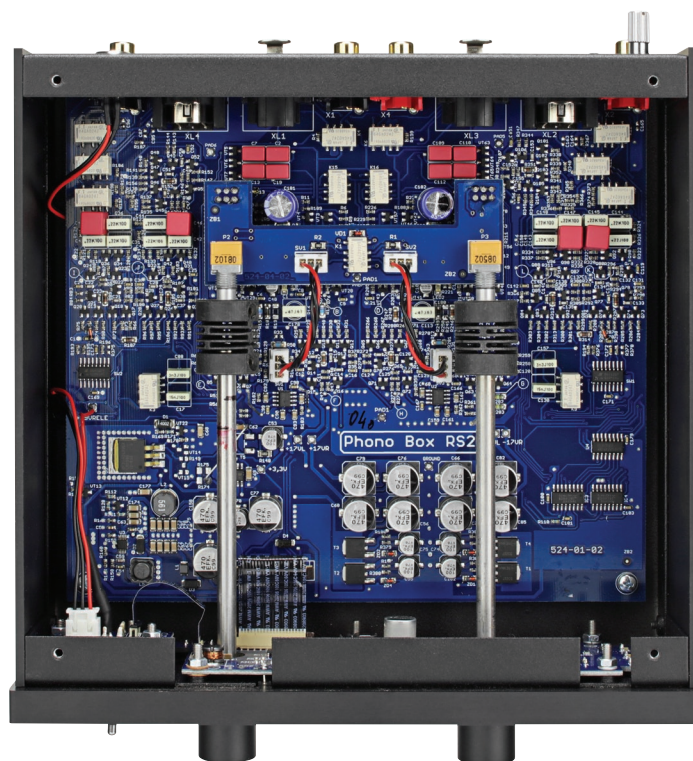
Audio, based in Didcot (UK), work closely with Pro-Ject (Austria) and can also provide solutions; perhaps best to phone or e-mail them about this unusual issue if running a balanced record deck interests you.

I run a Garrard 401 with SME312S arm that I wired balanced long ago for my own prototype balanced preamplifier – so was very happy to receive the RS2. My prototype was just that: designing the servos to keep discrete transistor pairs balanced was going to take more time than I had available; it never reached completion. Also, being a valve man, I ran the output at high voltage (50V) to avoid gain switching and needed to use a four-channel switched-resistor volume control to handle it, a serious complication. The RS2 does not have a gain/volume control, avoiding such difficulties, but that does mean it cannot drive a power amplifier direct.

What does it have? The exciting bit was balanced XLR input and output sockets on the rear panel! But there was no disappointment either at all its facilities and the user interface, which was slick beyond all else.

Moving magnet (MM) and moving coil (MC) cartridges can be handled. There are four gain settings for each that cover all possibilities. Curiously, the specs say XLR adds +6dB but measurement showed it doesn't, gain being identical from XLR-in to XLR-out, or phono-in to XLR-out. XLR has double the output swing so gives +6dB greater overload margin, but in this design gain remains the same.

The XLR output maintains low noise through a balanced cable to an accompanying amplifier; good for long



A heavily populated internal circuit board full of discrete components, but some chips also (bottom right), likely for control purposes. The unit works from 20V d.c. of external power, so no internal power supply.

loading from 10 Ohms to 1000 Ohms. Best to set it at 100 Ohms and turn down slowly for a better damped sound (volume will decrease slightly), but I have never been convinced by low loading an MC, the few times I have done it. It may well be that some MCs will benefit.

No need to turn loading up except for high output MCs (e.g. Clearaudio) that need a 300 Ohm load. Good to have the ability to make such a continuously variable

The RS2 measures 206mm wide, 72mm high and 200mm deep, so it is compact. There is an external power supply of usual switch-mode type that runs from 110V-240V, 50/60Hz, delivering 20V at 3A through a slim cable. Distance from mains plug to the RS2 input plug is 2m with cables supplied, so this is maximum distance from a mains outlet unless a longer mains lead, terminated in a two-pin calculator plug, is used. Weight of the RS2 alone is 1.6kgs.

SOUND QUALITY

I used the RS2 with the Creek iA20 amplifier also reviewed in this issue, fed from our Timestep Evo modified Technics SL-1210 Mk2 Direct Drive turntable. Connection from RS2 to iA20 was through Chord Company Epic balanced XLR-terminated cables. Loudspeakers were Martin Logan ESL-X hybrid electrostatics. The Evo has conventional unbalanced phono plug terminated cables, as it must for review purposes. Cartridges used were an Audio Technica VM750 SH MM and OC9X SH MC.

To assess the balanced inputs I ran the unit at home with my Garrard 401 and SME3012S arm that has balanced cables, plus an Ortofon Cadenza Bronze MC cartridge. The

"a richly detailed, natural and engaging sound, free from sharpness or sheen"

cable runs especially, but that does mean to best appreciate the RS2 it needs an amplifier with balanced XLR inputs that run through a volume control (some do not). There is a conventional RCA phono socket output too.

For MM cartridges load capacitance values can be selected, from 50pF to 400pF. For MC cartridges there is a continuously variable control to set resistive

adjustment available all the same, unique to the RS2 I believe.

Another nice touch is a switchable balance control to compensate for the differing left/right outputs of pickup cartridges. And there is a sharp roll-off switchable warp filter that does not attenuate low bass, plus Decca EQ for old Decca London LPs, as an alternative to RIAA. This is a very well thought out phono stage, that's for sure.



A simple rear panel that almost uniquely carries balanced XLR input sockets for connection to a turntable wired with a balanced output cable. There are conventional phono socket connectors too. The balanced XLR outputs have higher overload (x2) than the phono socket outputs, so are best used.

amplifier was a World Audio Design 300B (valve) feeding Martin Logan Electromotion hybrid electrostatics. Unbalanced Chord Company Epic cables connected the RS2 to the amplifier.

Here's the basic outline: the RS2 offers a richly detailed, natural and engaging sound, free from sharpness or sheen, a tapestry of analogue detail. Also, bass quality is superb.

Ignoring bass quality for the moment I'll talk about the LP that nailed a lot of what it does – Marianne Thorsen playing Mozart Violin Concertos, backed by Norway's Trondheim Soloists. This is a very high quality recording (DXD 386) from 2L of Norway, and Thorsen is a sublime player. The RS2's contribution was to reveal her violin as a strongly embodied instrument, one with a feeling of weight and size, as well as tease out all the textural detail within its body and strings. I got to hear a large and fruity rendition then, backing strings of the Trondheim Soloists similarly having a weighty presence. When they suddenly pitched in behind her, there was a sense of strong dynamic push to an orchestra comprising humans with instruments! The RS2 resolved the dynamics of this performance nicely, making for an engaging listen and my listening notes talk about "rich insight into strings".

I started out however with Hugh Masekela's Hope LP (Analogue Productions) and Abangoma showed the RS2 delivers a strong, expressive bass line. Uptownship confirmed this, revealing air around the miked-up hand drums. Kick drum strikes were weighty and well resolved; I again got to hear the timbral properties of the instruments better than usual. It was a sophisticated sound.

Spinning Jackie Leven's Young Male Suicide Blessed by Invisible Woman, from Forbidden Songs of the

Dying West, his big-man vocals were just that: rich and full sized in front of me.

As I moved through our high quality review LPs it was clear that the RS2 has bottom-end power, the rolling drum work in Sing, Sing, Sing, from the Syd Lawrence Orchestra (a live recording) moving our listening room nicely due to easily expressed dynamics, but there was also atmosphere from the studio microphones. The brass section blared out, individual instruments being discernible.

All the above was from our in-house turntable connected unbalanced.

At home, using the balanced XLR inputs, all the strengths of the RS2 were magnified. There was greater

clarity and a sense of precision timing unbalanced never seems to quite manage, no matter what the context. With Ortofon's bass-powerful Cadenza Bronze in a Garrard 401 the RS2 was able to resolve their massive bass power and pace, making for dynamite dynamics. The 300B better resolved a sense of air and space the RS2 was able to offer.

CONCLUSION

A highly sophisticated phono stage, fully balanced and with all-discrete circuitry, for MM and MC cartridges, with loading options for both, the Phono Box RS2 has no equal. For those interested in running a fully balanced turntable to eliminate hum and noise this is the one. Great sound quality and easy to use as well.

MEASURED PERFORMANCE

Frequency response of Phono Box RS2 ran flat from 3Hz to 20kHz with MM and 8Hz-20kHz with MC at full gain – where gain loss can curtail subsonic response, but not here as our analysis of MC at full gain shows. The warp filter introduced sharp cut-off at 40Hz, attenuating warps signals at 8Hz by a massive -30dB.

Gain values were exactly as indicated, up to 50dB for MM (x316) and up to 70dB for MC (x3162). With 10V output available from the unbalanced phono sockets this gives input overload as 32mV and 3mV respectively, but double the values from the XLR output able to swing 20V. Good figures, raised by lowering gain as always.

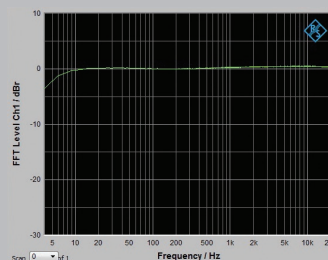
Equivalent input noise (MC at 60dB gain) measured 0.13µV, where 0.1µV is as good as it usually gets. So very good and good enough for hiss to be inaudible.

The Phono Box RS2 measured superbly well in all areas. It has been expertly engineered. **NK**

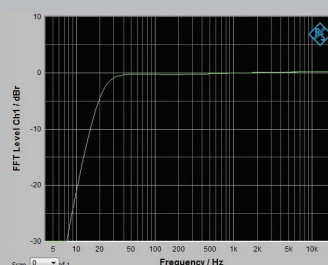
Frequency response 5Hz-20kHz
Distortion (24bit) 0.02%

Gain (MM) up to x316/50dB
Gain (MC) up to x3162/70dB
Overload (phono/XLR) 10V/20V out
Noise (MM/MC) -80dB/-78dB

FREQUENCY RESPONSE



WARP FILTER



PRO-JECT PHONO BOX RS2 £1300



OUTSTANDING - amongst the best.

VALUE - keenly priced

VERDICT

An advanced and superb balanced-input phono preamplifier with deeply insightful sound. A must-have for top quality vinyl replay.

FOR

- clear, clean sound
- cartridge matching for MM & MC
- balanced inputs and outputs
- warp filter

AGAINST

- no volume control

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