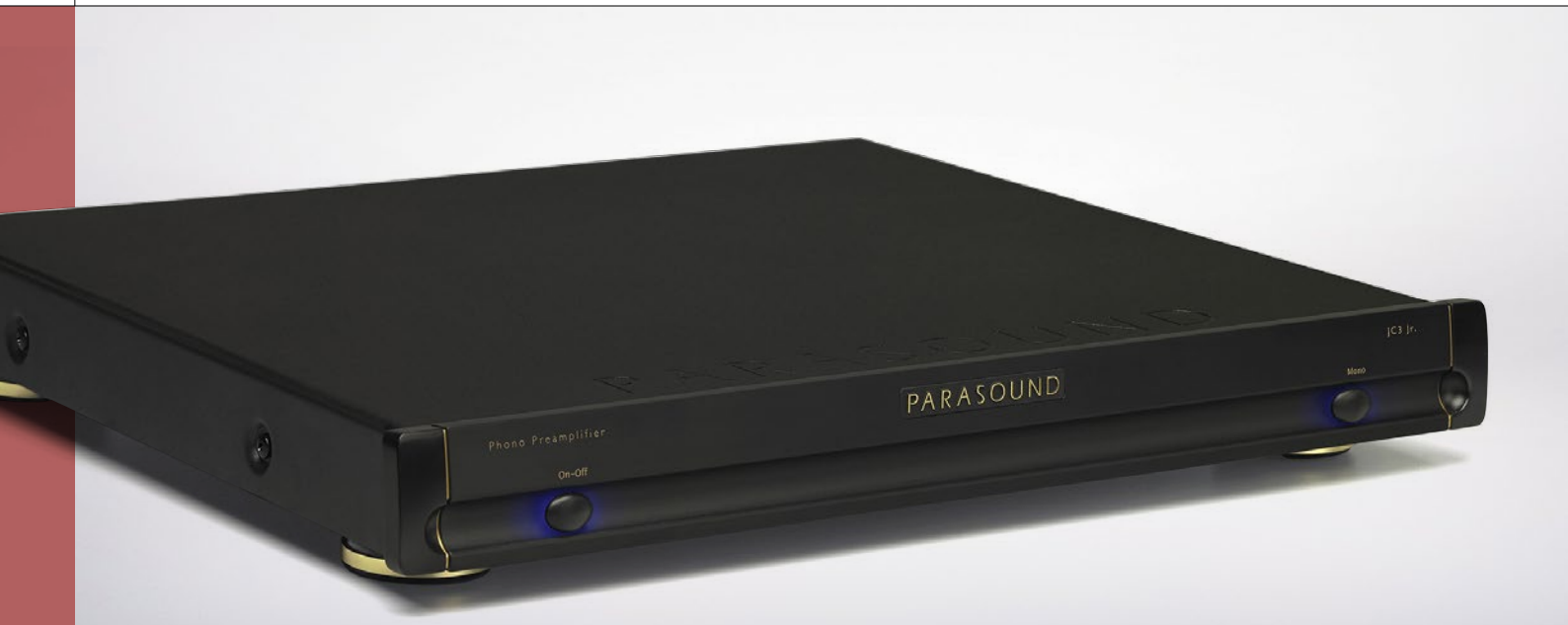

PARASOUND
JC 3 JNR

PHONO PREAMPLIFIER

Maybe Parasound should provide 'Work in Progress' signs with its JC 3 phono preamplifier, because it's definitely a work in progress, with both Parasound's owner, Richard Schram and his designer, John Curl, now on the third iteration, with both apparently unwilling to jettison the original 'JC 3' model number. So in the beginning there was the JC3, which begat the JC 3+, which begat the JC 3 Jnr. However, the JC3 is no more, leaving only the JC 3+ and the JC 3 Jnr extant.

I can see the reason for their attachment to the 'JC 3' model number. The JC stands for John Curl, of course, but long (and I mean long... it was 'way back in the 70s) before he started designing for Parasound, Curl was designing for Mark Levinson, for whom he designed the JC-1 head amp and JC-2 preamp. I guess that if you're working for someone else, and they get to put their name on it (as in Mark Levinson, who owned the company back then, but sold it to Harman, which is now owned by Samsung, and still makes products carrying the Mark Levinson brand), it's only fair that your creative input be acknowledged by including your initials as part of the model number. So why didn't Curl's initials appear on the products he designed for Vendetta Research, I hear some neophytes asking? Quite simply because John Curl owned Vendetta, it was his company, so no need for initials!

(Though if he had added his initials, it might have boosted the second-hand prices of old Vendetta Research products.)

THE EQUIPMENT

In case you can't tell from the photographs of the JC 3 Jnr in this review, it's a full-width component, the 'standard' 437mm wide. It's also a full-depth component, the 'standard' 375mm deep. The only thing that is not standard is the height, which is a mere 64mm. And just in case you're wondering why I put the inverted commas around the word standard in the first two measurements, and not in the third, it's because these days, I don't think there *is* any real standard in the width or depth of components—dimensions are all over the shop. However, the dimensions are certainly the same as other Parasound products, so you'll be able to 'stack' the JC 3 Jnr neatly if that's what works for you. The size of the product does mean that there's a lot of empty space inside the JC 3 Jnr, but in the end I'd personally prefer to own a full-sized phono stage rather than a tiny little itty-bitty one crammed with circuitry that was not even remotely the size of any of my other equipment. However the size of the case has a significant technical advantage, because it allows Parasound to keep the power supply circuitry a long way from the phono circuitry.

Despite the height of the JC 3 Jnr, Parasound has included its trade-mark shallow scallop that runs across the full width of the front panel, and into which the only two front-panel controls are fitted—a power switch at the left and a mono/stereo switch at the right. Although you can turn the power to the JC 3 Jnr on and off via this switch (der...), you can optionally elect to do this switching by applying a 12 volt input from another component, for auto switch-on. However, if you do this, the front panel switch is then disabled.

As for that mono/stereo switching, it's something that's often left off phono preamplifiers, but it's absolutely essential if you play mono LPs. However, weirdly enough, I've found that switching to mono can eliminate the weird 'phasing' effects that sometimes happen when you play well-worn LPs and can even reduce the surface noise of noisy LPs though I really don't know why, and would always recommend you remove LP noise by cleaning the record, rather than relying on an electronic 'fix'.

Around the rear of the Parasound JC 3 Jnr you'll find there are gold-plated unbalanced input and output RCA sockets, and also rhodium-plated balanced XLR outputs (made by Neutrik).

Rather than simply provide 'MM' or 'MC' switching (which in these days of high-output moving-coil cartridges and low-output moving-magnet cartridges is no longer a really accurate way of describing which input you should use), the JC 3 Jnr simply allows you to select (via toggle switch) between 'fixed' input impedance (47kΩ) and 'variable' input impedance (50–500Ω), plus also select between three gain settings:40dB, 50dB and 60dB (gain selection is also via toggle switch).

The 'variable' setting is truly variable, because it's accomplished via a rotary potentiometer—an arrangement I can't recall ever having seen used before for this purpose: it's more usual to find DIP switches or PCB links. The problem with using potentiometers is that they're inherently noisy (which is why state-of-the art designs use resistor ladders to control volume, instead of potentiometers). Parasound solved this problem on the JC 3+ by asking Alabama-based component manufacturer Vishay to develop a custom-made low-noise potentiometer specifically for the purpose of adjusting cartridge load resistance, and then using two of them—one for each channel. Unfortunately, these were so expensive that Parasound couldn't include them on the JC 3 Jnr, which uses just a single 'off the shelf'—but very high-quality—potentiometer.

The 'variable' setting is truly variable, because it's accomplished via a rotary potentiometer

Although Parasound couldn't keep the JC 3+'s Vishay pots, it did keep almost everything else from the JC 3+, including what is fundamentally the same circuit topology, the same passive components in the RIAA equalization circuitry, the FET followers after the power supply that reduce noise from the voltage regulators and, also to reduce noise, the high speed/soft recovery bridge diodes.

Apparently both Schram and Curl were worried about this until they saw and heard the results of the PCB layout developed by Carl Thompson, who designs all Curl's PCBs. Says Schram: *'We fretted over the design and built numerous prototypes before we were satisfied. Merely "great" was not an option, and Carl Thompson played a large role with circuit layouts that are inspired, with outstanding separation and vanishingly low noise. The JC 3 Jr. specs are amazingly close to the JC 3+ specs that far surpass nearly any other phono stage.'* It's for this reason that all the publicity for the JC 3 Jnr says '*Circuitry designed by legendary John Curl. Circuit board layout by Carl Thompson*.' Maybe they should have called it the JCCT 3 Jnr?

The JC 3 Jnr is available in silver or black finishes and there's a rack-mount kit available for it as well.

IN USE AND LISTENING SESSIONS

Power-up the Parasound JC 3 Plus and you'll find that both front-panel buttons have bright, deep-blue backlighting. In Stand-By mode the lighting for the power button dims slightly, while if you switch to 'Mono' the lighting on the Mono/Stereo button changes to a burnt orange colour. There are also loud 'click' sounds when you press the buttons, so you don't have to be looking to know you've pressed hard enough.

I should state at this point that I was initially a bit biased against using a potentiometer to adjust load impedance, not so much because of the introduction of noise, but because of the seeming lack of precision, because although the control has marked positions for 50 to 550Ω in 10Ω increments there is no guarantee that the setting will be exact, whereas with a DIP switch, if you need an exact 110Ω load, you simply switch in the 110Ω setting and it *will* be exactly that.

However, after discussing the relative merits of fixed vs. variable impedance adjustments, I changed my thinking. The most compelling reason I changed is that after looking at actual laboratory measurements of the impedances of a variety of phono cartridges, I realised that although a cartridge might be specified as having an impedance of, say, 10Ω, variances in the coil-winding process mean that its actual impedance might be anywhere between 5Ω and 15Ω. Also, whatever its actual impedance, it's only going to be that at one frequency because impedance, by definition varies with frequency, so a nominally 10Ω cartridge might actually have an impedance of 6Ω at 1kHz, and 14Ω at 10kHz. Also, of course, the impedance of one channel of a phono cartridge will rarely be the same as the impedance of the other channel—which is precisely why Parasound puts two potentiometers on the JC 3+.

Once I'd changed my thinking on this matter, my decision was set into concrete when I started setting up the JC 3 Jnr, because I realised that the huge advantage (and it is a huge advantage) a potentiometer has over DIP switches or links is the ease with which it's possible to fine-tune the impedance 'on-the-fly'. So when setting up for my Kiseki Blue NS, for example, which has a d.c. resistance of 40Ω, and therefore requires a minimum load impedance of 400Ω (the rule of thumb for load impedance is 10× the d.c. resistance of the cartridge), I was able to turn the pot to the 400Ω setting and then, while actually listening to an album, 'tweak' the pot left and right by small amounts until I found the setting that sounded the best. This kind of 'fine-tuning' is impossible to do with DIP switches, and very time-consuming to do with links. (And, to prove the point, the best-sounding setting for the Kiseki was, indeed, slightly higher at 460Ω.)

With so much of the JC 3+'s DNA inside the JC 3 Jnr, you might be asking yourself what didn't make it? Well I already mentioned the Vishay pots, but whereas the JC 3+ uses large, separate power supplies for each channel, the JC 3 Jnr uses a single and smaller power supply for both channels and whereas the left and right channels of the JC 3+ are on completely separate PCBs, the same PCBs share the channels on the JC 3 Jnr.

This 10× rule means that the maximum d.c. resistance of any moving-coil cartridge you use should be at least 50Ω, which I am certain will cover more than 90 per cent of the low-output moving-coil cartridges available. Note, however, that the 10× rule is not really a 'rule' because in the past I have found that moving-coil cartridges with impedances in the region between 5–10Ω, which the rule would suggest should sound

In the end, it's the sound that counts, and the sound of the Parasound JC 3 Jnr is breath-takingly beautiful!

best with 50–100Ω loadings, actually sounded the best when I used a 200Ω load impedance. Just saying. You can't harm the cartridge—or the phono preamplifier—with an incorrect setting, so feel free to experiment as much as you like. (Danger Will Robinson! You can, however, damage your phono cartridge by trying to measure its d.c. resistance with a multimeter! In fact you'll completely destroy it if you try, so don't even try it. You have been warned. Twice.)

Straight out of the box, without any warm-up at all, the Parasound JC 3 Jnr sounded great. Even while I was tweaking the cartridge load impedance setting I was hearing 'good' 'better' 'best' as I made my adjustments—never once did I hear anything that made me think 'whoa, go back the other way fast!'

Sounding 'great' meant that I was hearing an extended frequency response, so I was able to take advantage of the superior high-end response of LPs—particularly those that had been half-speed mastered, which really makes a difference when you're listening to any instrument whose harmonics extend above 20kHz, and that's quite a few of them, not just violins and cymbals and pianos and harpsichords and synthesisers and flutes and piccolos… and more.

Generally these high-pitched sounds are rather a long way back in the mix, so the fact that I was able to hear them so clearly was not just down to the Parasound JC 3 Jnr's excellent high-frequency extension, but also because of its really low noise… so low, in fact, that I couldn't hear any noise at all that I could attribute to the JC 3 Jnr when I was playing LPs. I even tried playing an acetate master with nothing recorded on it at all to see if I could hear any noise being contributed by the Parasound and came up empty-handed. The end result being that with the JC3 Jnr you are going to hear everything the recording engineer has captured in the groove, and nothing more.

The Parasound JC 3 Jnr was equally good at low frequencies. The Kiseki has an outstandingly good bottom end, and the JC-3 allowed me to enjoy every bit of it. In fact it made my Kiseki sound even better, at least partly because I haven't quite got my tonearm/cartridge resonance tuning exact, so although I can't hear it because the frequency is too low, I can see my woofers moving as a result of this resonance, which I figure means I must be getting some Doppler distortion. With the Parasound JC-3 in my rig, the woofer movement was much less, so I guess Parasound must be rolling off the very lowest frequencies a bit. Since this is happening at frequencies lower than I can hear (so less than 15Hz) this worked for me, because it means less Doppler distortion and that my amps aren't wasting any power trying to amplify infrasonics I can't hear.

Before going on I should note that one 'feature' the Parasound JC 3 Jnr does not have is selectable equalisation curves—you get the standard RIAA curve and that's it. I mention it because I am perfectly happy with standard RIAA equalisation, because I don't own any discs pressed before 1975.

If you're reading this review, you most likely own a turntable and LPs but I guess you might not know what an RIAA curve is, since it's so rarely mentioned these days, so I'd better explain before going any further.

When creating a record by cutting a master disc, the groove that's created is an analogue of the sound. So when the sound is loud, the width of the groove gets bigger, and when the frequency is high, the 'wiggles' in the groove are closer together. The problem is that the dynamic range of sound is so great that without adjustment, it could not be contained on a disc (or traced by a stylus, for that matter). So in order to ensure the disc is playable, the volume of the low frequencies is reduced prior to cutting the disc, and the volume of the high frequencies is increased. This is called 'pre-emphasis'. It follows, therefore, that during replay, the volume of the low frequencies needs to be boosted back to the correct level, and the level of the high frequencies reduced to the correct level. This is called 'de-emphasis'.

In the earliest days of recorded sound, each record label boosted and cut frequencies by different levels, so if you played a record pressed by Columbia, you'd need to use a Columbia de-emphasis filter. If you played one pressed by Decca, you'd use a Decca de-emphasis filter. These filters were on circuit boards that you'd 'plug-in' to the rear of your amplifier. Obviously this system rapidly became unworkable, not least because of the advent of low-cost portable machines, so the Record Industry Association of America (RIAA) decided that all companies manufacturing LPs should standardise on one particular filter that then became known as the 'RIAA equalisation filter', allowing electronics manufacturers to build the filter inside their products, and eliminating the need for multiple 'plug-in' filters. The graph that shows the amount of boost and cut that applies at each frequency is the RIAA curve—one curve for pre-emphasis and then an equal but opposite curve for de-emphasis.

So getting back to my original statement that I'm quite happy that the Parasound JC 3 Jnr has only the standard RIAA equalisation because I don't own any discs pressed before 1975, this is because every LP pressed after this used RIAA pre-emphasis. In fact, pretty much every stereo disc ever made was recorded using RIAA equalisation. Even if you're playing mono LPs, it's likely that they were recorded using RIAA equalisation, unless they were recorded in the early 1950s, or earlier, in which case they might use one of the proprietary equalisations.

If you regularly play LPs that require non-standard equalisation (Decca, Columbia *et al*) and you demand exactitude, you might prefer to buy a preamplifier that has switchable de-emphasis, but LPs recorded with non-standard equalisation will play back perfectly well through the JC 3 Jnr—you'll just get slightly different levels of bass and treble to what the record producer originally intended.

The stereo imaging of the Parasound JC 3 Jnr was superb. It will easily be able to deliver all the separation available from any phono cartridge, so you'll enjoy not only maximum

stereo imaging, but also maximal channel isolation, so that if a sound is recorded solely in the left channel, you won't hear it from the right channel, and *vice versa*. The channel separation of the Parasound JC 3 Jnr is so good that I can't imagine the Parasound JC 3+ would be able to improve on it at all… though admittedly I did not have one on hand to make the comparison.

Musical delivery is impeccable. I just loved the way the Parasound JC 3 Jnr delivered the *electronica* of the The Presets' latest LP, 'Hi Viz', it pulsed with such vitality that I played it several times over before I remembered to record it to digital whilst its grooves were still pristine. The choral echo on *Downtown Shutdown* was just so clean and real, then when the percussion and effects join in the sound is amazing. The looped sounds (beautifully delivered by the Kiseki by the way) were equally beautifully reproduced by the JC 3 Jnr. I called it 'electronica' but apparently Julian Hamilton and Kim Moyes prefer to label it 'pub rock techno'— a label that isn't on the 'Genre' list of my music library. You only have to listen to *Do What You Want* to hear the 'techno', but I'm not so sure about the 'pub' bit. Maybe 'dance floor' or 'rave'? Great album though, just a pity we had to wait so long for it… and despite the love I've espoused for it, I do prefer 2012's 'Pacifica'.

Piano is definitely one of the greatest instruments for assessing audio equipment, because of its enormous dynamic range and its extended frequency range, but I get a bit bored with delving back into the established repertoire, so I can report my latest and greatest find (and a gift to modern piano music) is the album 'Solo' by pianist Nils Frahm. Before being introduced to the album (thanks Frank!) I'd never heard of Frahm, and I'd certainly never heard of the piano he's playing, which is a Klavins M370 that's apparently more than three metres tall long (yes, 'tall'—not long—it's a vertical piano) that has 10-foot strings. It was designed and built by a German-Latvian piano maker David Klavins. Recorded in 2014, 'Solo' is an eight-track improvisation that Frahm recorded in a single take, without any overdubs, that's now available not only on LP, but also in 24-bit/48kHz digital. The sound is astonishing. I've never heard piano sound like it, and I don't think I've ever heard a commercial recording like it. I won't swear to it, but I'd bet serious money there's no compression, no limiting, and no post-production at all… just what was captured by the microphones. From the reality of the acoustic of the recording venue to the resonances from piano, the humming of the strings and the sheer sonority of the sound, the whole experience is truly hypnotic and a true *tour-de-force*. If you're into audio—and sound—you really need to own this album in whatever format takes your fancy, but if digital's your bag, you can download it for free here: *http://www.nilsfrahm.com/works/sol/*

If you have the LP and you're auditioning a Parasound JC 3 Jnr, pick a quiet time, drop on the LP, turn up the volume, settle back and let it rip! Two tracks in and you'll have forgotten all about the Parasound JC 3 Jnr and just be revelling in the density of the soundfield. But you'll need to remember it's the Parasound JC 3 Jnr that's allowing the sound to be this good. It has an incredibly flat frequency response, so all those harmonics and resonances are transferred perfectly to your loudspeakers. Frahm is currently on a world tour (in Australia next month) but if you want to go, get in early, because he usually sells out months in advance of his concert dates.

CONCLUSION

In common with all Parasound's products, the JC 3 Jnr isn't fancy-looking on the outside—though it's pretty fancy on the inside—but in the end, it's the sound that counts, and the sound of the Parasound JC 3 Jnr is breath-takingly beautiful. *Hugh Douglas*

CONTACT DETAILS

Brand: Parasound
Model: JC 3 Jnr
RRP: $2,995
Warranty: Five Years
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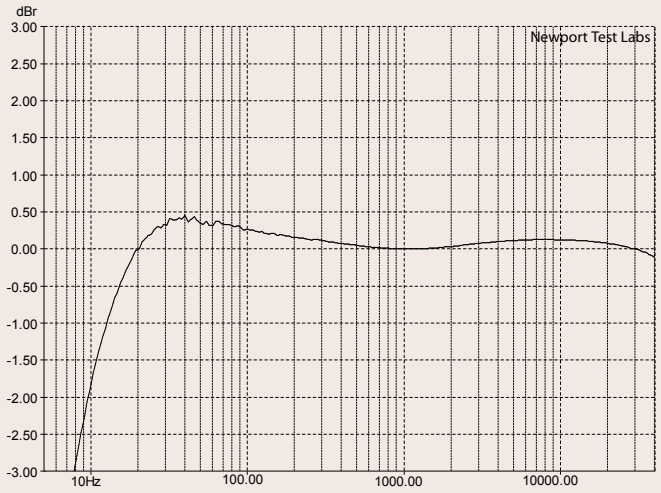
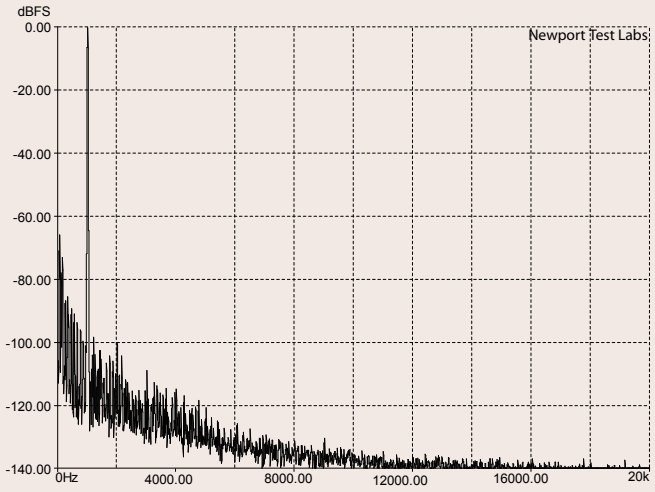


Graph 1. RIAA-corrected frequency response, unbalanced output.



Graph 2. THD @ 1kHz, 5mV in, 500mV out.

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.

LABORATORY TEST REPORT

Newport Test Labs measured the audio-band frequency response of the Parasound JC 3 Jnr as 20Hz to 20kHz ±0.2dB, which is exactly as specified by Parasound, and is shown in the accompanying Graph 1.

You can see from the graph that the response has a very slight boost at low frequencies (peaking at around +0.2dB at 40Hz) then slowly rolling off to to 1kHz, after which there's an even smaller boost in the response that 'peaks' at 8kHz, before rolling off to 20kHz. The response is certainly wideband, being 3dB down at 8Hz and at reference level out to 100kHz.

Channel separation was outstanding, with *Newport Test Labs* measuring a best result of 101dB at 1kHz, but it was still at or better than 93dB at 16Hz and 20kHz, as you can see from the tabulated figures. Channel balance was superb, at 0.009dB.

Total harmonic distortion was measured as 0.01%, and you can see the distortion spectrum in Graph 2. The second harmonic distortion component is at –100dB (0.001%), the third at –109dB (0.0003%), the fourth at –115dB (0.00017%), the fifth at –120dB (0.0001%) and the sixth at –128dB (0.00003%). Obviously this is a very clean, almost distortion-free amplifier.

Signal-to-noise ratio was measured at 73dB A-weighted, referenced to an output of 500mV out (with a 5mV input required to deliver this output). This was measured using the unbalanced outputs, so the balanced outputs will return even better figures. This figure is slightly lower than Parasound's specification of 85dB A-weighted, so I can only assume Parasound used a higher input voltage (and thus ended up with a higher output voltage) which will always result in a higher S/N ratio.

Channel separation was outstanding, with Newport Test Labs measuring a best result of 101dB at 1kHz

Gain was measured for all three gain settings, using the unbalanced output and, as you can see from the tabulated figures, was exactly 60dB at 60dB as claimed by Parasound, and very close at the other settings, with *Newport Test Labs* measuring gain for the 40dB setting as 40.91dB, and for the 50dB setting as 50.45dB.

Input sensitivity for a 1 volt output was 9.0mV at the 40dB gain setting, 3.0mV at the 50dB setting and 1.0mV at the 60dB gain setting. The input overload margin was an exceptionally good 24dB.

Power consumption was a miserly 9.63-watts, so leaving the Parasound JC 3 Jnr on all the time is not going to impact on your power bills, but if you go green (and I think you should) and switch to stand-by when you're not using it, it will consume just 0.66-watts, which is next to nothing, but still a tad over the 0.5-watt consumption target the Australian government will soon mandate.

Overall, the Parasound JC 3 Jnr returned outstanding performance on *Newport Test Labs'* test bench. *Steve Holding*

Parasound JC 3 Jnr Phono Pre-Amp – Laboratory Test Results

Test	Measured Result	Units/Comment
Frequency Response (20Hz – 20kHz)	20Hz – 20kHz	± 0.2dB
Frequency Response (Wideband)	8Hz – 100kHz	–3dB
Channel Separation (dB)	93 / 101 / 95	(20Hz / 1kHz / 20kHz)
Channel Balance	0.009	dB @ 1kHz
Interchannel Phase	0.01 / 0.2 / 0.44	degrees (20Hz / 1kHz / 20kHz)
THD+N	0.01%	@ 1V out (500mV in)
Signal-to-Noise (A-weighted)	73dB	re 5mV inp, 500mV out (unbalanced)
Gain at 40dB/50dB/60dB settings	40.91 / 50.45 / 60.00	dB (unbalanced output)
Input Sensitivity for 1 volt output (unbal)	9.0mV	@ 40dB gain setting
Input Sensitivity for 1 volt output (unbal)	3.0mV	@ 50dB gain setting
Iput Sensitivity for 1 volt output (unbal)	1.0mV	@ 60dB gain setting
Input Overload Margin	24.2dB	@ 60dB gain setting
Power Consumption	0.66 / 9.63	watts (Standby / On)
Mains Voltage Variation during Test	238 – 245	Minimum – Maximum