



SoulNote

A-2 Integrated Amplifier



- Superb sound
- High power
- Flexible operation
- Build quality



- Standby circuit
- Temperature at top
- Rear panel switches
- No headphone output



\$10,250

SoulNote's Japanese designer, Hideki Kato, would appear to be the odd man out in the realms of high-fidelity audio design. Whereas the majority of high-end audio brands seek to eliminate vibrations and resonances from their products, Kato actively encourages them. That is why, if you press down on either of the front edges of the A-2's top panel you will find that they move under your touch. And if you tap the perforated plating underneath that top panel (which is essential in order to remove the considerable amount of heat generated inside the A-2 when it's operating), you'll find that it clangs very loudly indeed!

That clanging sound is something Kato is quite proud of. "After much thought and trial and error, I finally succeeded in creating that top cover that rattles when you push on it," he says. Kato claims his unique top cover design improves the sound of the A-2 — a claim he says can be proved by placing weights on it. "When weight is placed on the top cover, the sound instantly loses its openness and becomes boring and ordinary high-end audio sound," he says.

THE EQUIPMENT

Although the top cover of the A-2 rocks and rattles, the same can't be said for the remainder of the chassis, whose front panel and sides are comprised of very thick, fluted aluminium castings. I really like the way the fluting on the front panel continues down the sides of the amplifier, because it gives visual continuity and ensures the amp looks coherent from any angle, which can't be said of a great many audio amps. However, it appears that should you not like this effect, you can optionally fit wood side panels instead. And if you're not a fan of silvery aluminium finishes, there is always the option of black instead.

As is very obvious from the photographs that accompany this review, there are only three controls on the front panel of the SoulNote A-2: a single power button that has been cleverly integrated with the fluting, a rotary input source selector and a rotary volume control. That's it.

Both the input source selector and the volume

control are connected to relays, rather than directly into the circuit path, so as you rotate either control (both of which have a click-stop rather than a smooth rotation) you will hear these relays clicking from inside the amplifier.

The input source selector has six red LEDs arrayed in a horizontal row above it that illuminate to identify your selected input. The knob has no stop points at either end of its rotation, so if you start at Input 1 and rotate the knob right until you get to Input 6, you'll find that if you then make a further rotation to the right, you'll be back at Input 1. This makes input selection faster than it would otherwise be and is therefore a good thing!

Interestingly, you cannot select an input source directly from the remote control, because

"After much thought and trial and error, I finally succeeded in creating that top cover that rattles..."

although it has numeric buttons (1 to 9) these buttons are not actually supported by the A-2; they're for use with other SoulNote components. You instead have to use the +/- rocker switch on the remote to select the input you want.

Inputs 1, 2 and 3 are all balanced inputs which use standard XLR connectors, while Inputs 4, 5 and 6 are unbalanced inputs that use gold-plated RCA terminals. All these inputs are line-level, so if you use a turntable, you're going to have to factor in the cost of an external phono stage. I see this as a good thing as an external phono stage is always going to ensure superior sound quality and flexibility than a built-in phono stage, and if you *don't* use a turntable you're then not paying for an input you won't use. The same could be said of the fact that the A-2 doesn't have a built-in headphone amplifier. Again, an external headphone amplifier will ensure superior sound

quality and flexibility over one that's built in.

As for the volume control, it has no markings on it at all. Volume level is indicated by a two-digit LED readout buried beneath the rectangular block of red Perspex in the centre of the front panel. The display ostensibly reads from 00 to 35, but in fact when 00 is displayed there is no output at the speaker terminals at all — it's effectively a 'mute' position.

I discovered a small issue with the volume level display early in the review process, because the remote control that is usually supplied with the amplifier had inadvertently not been included with my review sample, so the only way I could adjust volume was by using the on-unit control. My small issue was that because I'd placed the A-2 down on the floor, I found that the volume display was recessed so deeply that my kneeling eye level was still so high above the amplifier and the tops of all the numerals were not visible. I had to lean right over so that my head was nearly touching the floor in order to see the numerals in their entirety.

I say it's a small issue because if you are using the remote control to adjust volume, as you would normally, you'll easily be able to see the display, even if the amplifier is on the floor.

You certainly won't have any problem seeing the display if you're correctly positioned because it's rather bright. Happily, if it's too bright for you it can be turned off via a button on the remote control. However, if you do turn it off you'll still see a lot of red light issuing from the amplifier, because inside it on the top-most circuit board are eight very bright red LEDs. The brightness of these can't be altered because they're the constant voltage element for the bias circuits in the voltage amplification stage (constant current is maintained via 2SK209s).

INTERNAL CIRCUITRY

The power supply inside the A-2 includes a 600VA bifilar wound toroidal transformer which the company says is "the most powerful in SoulNote's history". Downstream storage and smoothing is provided not by the usual few high-value capacitors but by multiple small capacitors connected in parallel, which the company says "helps control and optimise



frequency characteristics and mutual capacitance". The output stage uses matched paralleled Sanken NPN/PNP transistor pairs (2SC2837/2SA1186). Although an older design, these output transistors are exceptional devices, rated at 150 volts and 10 amps and with a transition frequency (70MHz) that is far higher than that of more modern equivalents. There is much that is interesting about the circuit design of the A-2, but it's far too lengthy for inclusion in this review. You can read a full explanation by designer Hideki Kato here: <https://tinyurl.com/katophilo>.

REAR PANEL

The rear panel is rather more complex than most because the A-2 is not a 'conventional' stereo amplifier: the left and right channels can be configured in multiple ways, so that although the amplifier can certainly operate as a standard stereo integrated, it can also switch through all the following configurations:

- stereo integrated amplifier
- bi-amp mono integrated amplifier
- BTL, mono, integrated amplifier
- stereo power amplifier
- bi-amp mono power amplifier
- BTL mono power amplifier

In the two BTL (balanced transformerless) modes, the amp is reduced to single-channel operation, as it is in the bi-amp modes, but in BTL mode power output increases to 400 watts (though this increased power deriving from the BTL mode also means that the recommended

minimum nominal loudspeaker impedance doubles from 4 ohms to 8 ohms.

Switching between all these modes is accomplished using small slider switches that all sit proud of the rear surface and are very easy to move, so it would be possible to accidentally switch one of them to an incorrect position if one were, say, dusting behind the unit. I really think it would have been better if the switches had been recessed into the rear panel so they could not be moved accidentally, or maybe replaced with switches that need a tool in order to be moved.

The A-2's user manual has a diagram (page 8) that shows the various switch configurations that should be selected for each mode, and to which terminals your loudspeakers should be connected for that particular mode (connections for BTL are different from those for Stereo). The manual makes everything quite clear, but it uses tick symbols to indicate when a speaker terminal should be connected, and simple dashes to indicate when a terminal should not be connected. I think it would be far better for crosses to be used in place of the dashes.

As for the speaker terminals themselves, they are absolutely fabulous! I can't recall seeing this particular design before, but the terminals are fully shrouded so there's no possibility of loose wires shorting out or a plug twisting and shorting with another, plus the posts accommodate spades, bare wire and banana plugs. Also, no matter what type of connector you use, the clamping action is excellent, which ensures a superior electrical connection.

I was pleased to see that alongside the speaker terminals SoulNote has included the information that although the minimum speaker impedance that should be used with the A-2 in Stereo mode is 4 ohms, that minimum increases to 8 ohms if you're using the amp in its BTL mode.

Two features you won't find on the rear panel are a mains power switch and a subwoofer output terminal. This latter would have been extremely useful for anyone using the amplifier in its BTL mode, while the former would have allowed the front panel switch to become a 'standby' switch.

As you can see from the photo of the rear panel accompanying this review, it does not have a mains power cord attached to it but instead a socket that accepts a standard IEC 240V/10-amp three-pin plug. That's quite standard. What is not quite so standard is the warning included with the A-2 that states: "Do not use any electrical contact cleaner or the like in the AC inlet. Doing so could cause damage to this unit." Apparently this warning has been included because SoulNote established that "commercially available electronic equipment cleaners and contact rejuvenation products could damage the resin components of SoulNote AC inlets".

Although the A-2's feet are obviously not on the rear panel, I feel obliged to mention them. First, there are only three of them rather than four, meaning the amplifier won't wobble if it's placed on an uneven surface, which would otherwise cause the plate at the top to make a noise, but that does mean that if you push the amplifier downwards at the top left or right of the front panel, it will move quite a long way. Second, rather than being rubberised, the feet are made from solid metal, so if you try to move the amp over a surface without first lifting it you will likely damage that surface (and at 20.5kg, lifting it is a two-person task!). Included with each A-2 amplifier is a second set of three feet, but these ones are spiked!

DIFFERENT A-2 VERSIONS

For reasons best known to itself, SoulNote uses different model numbers to describe what, functionally, is exactly the amplifier. The versions that are sold in countries that have 120-volt mains power carry A-2 labelling. The models that are sold in Europe (and other countries with 240-volt mains power supplies) are labelled A-2E ('E' for Europe). However, you will also find the same amplifier with an 'S' or a 'B' designator, with the additional letter indicating whether it has a silver or a black finish, so the amplifier may be designated an A-2S, or A-2B or an A-2SE or A-2BE. I can see the sense in this from a stock control point of view, but I also see the potential

Even from cold and not fully run-in, the A-2's sound was beautifully fluid, transparent and extended

for some audiophiles to think the models are actually more different than they are. For example, I thought that the 'SE' on the sample I received stood for 'Special Edition', as this is what these letters usually mean when appended to hi-fi component model numbers.

REMOTE CONTROL

Although the infra-red remote control that comes supplied and is included with the price of the A-2 looks full-featured, most of the buttons on it are used to operate other components in SoulNote's range, as I mentioned previously. The remote does, however, offer you access to some features that aren't accessible from the front panel, such as the ability to turn off the front-panel display, as I noted earlier, as well as the ability to mute the speakers. When the speakers are indeed muted, the volume display flashes to indicate this.

As a remote control was not included with my review sample, I could not check for the correct operation of the muting circuit (it should switch off automatically when either the front panel volume control is turned clockwise, or the + side of the volume rocker switch on the remote is pressed).

I also could not check the quality of the two AA batteries that power the remote, but since the manual specifically states that "*the supplied batteries are only for an operation check. Replace them with new ones as soon as possible*", it seems you should follow this advice and install branded, high-quality, leak-proof alkaline batteries straight away. (And then remember to replace them annually. Doing this on your own birthday is the best way to remember.)

BEHIND THE SCENES

SoulNote is a high-end audio brand of CSR Corporation, which is based in Sagamihara, Kanagawa, approximately 30 miles southwest of Tokyo, almost halfway to Mt Fuji. It was founded by Norinaga Nakazawa, a former director of Marantz Japan.

Norinaga is also the President and Managing Director of CSR Inc, founded in 1991, which imports and distributes high-end audio products in Japan, one such being PMC loudspeakers (from the UK). However, CSR Corp not only manufactures high-end audio products; it also builds radio communications equipment for Japanese fire and rescue services, karaoke equipment, including wireless microphones and amplifiers, and also electronics for use in educational institutions.

SoulNote equipment is designed by Hideki Kato who, after graduating from Tottori University in 1989, was recruited by NEC to work in its audio engineering department. When NEC departed the audio business, he moved to Marantz Japan where he was made responsible

for the development of non-feedback power amplifiers for both the Marantz and Philips brands. In 2005, Kato moved to CSR where he designed the SoulNote dc1.0, da1.0, sa1.0, sc1.0, SA710 and SC710.

He was appointed Chief Engineer of SoulNote in 2016, a position in which he says he is solely responsible for all product planning, electrical and structural design, sound quality management, and public relations.

IN USE AND LISTENING SESSIONS

One benefit of using relays for source switching and volume control is that this technique allows the A-2 to 'remember' the last-used input source and the last-used volume setting, which it does even if you have turned off the power to the unit completely, by switching it off at the 240-volt wall socket. I was, however, pleased to discover that SoulNote has built a fail-safe into this memory circuit so that if you've been listening at a level which required the volume display to show a value of 26 or higher, the A-2 will automatically reset itself to '25' whenever it is powered-up.

Since my review sample didn't have a lot of hours on it, I made sure to run it in before starting any serious listening, during which time I found that the perforated top plate also becomes very hot indeed, despite the number of slots cut into it to allow heat to escape from inside the amp. That said, even after many hours of auditioning at a wide variety of listening levels I found I could

keep my fingertips pressed against the metal for extended periods of time with only minor discomfort. Because of this, even though I doubt this level of heat constitutes a safety hazard, I would personally recommend leaving the A-2 switched off whenever you are not using it.

The necessity to meet a deadline meant that despite the fact that I did warm up the amplifier before doing any serious listening, I started listening to it from the moment I had finished installing it in my system. Even from cold and not fully run-in, the A-2's sound was beautifully fluid, transparent and extended, not to mention wonderfully rich and full, right from switch-on. The amplifier's performance was immediately relaxing and super-easy to listen to, such that it was akin to the pleasure you get from slipping on a comfortable pair of slippers after a long day on your feet.

To help with the burn-in process, I played lots of music at extremely high volume levels — those far higher than any at which I'd usually listen — and during these early sessions, when I might have expected to hear some congestion or compression during transients, the SoulNote sounded as clean as a whistle. Indeed, rather strangely, when I deliberately over-drove the output stage in order to evoke some clipping and generate even greater heat in the output stage, the A-2 responded to the overdrive very gently, sounding more like a valve amplifier than a solid-state one. Although, given the power on tap — especially into lower-impedance speakers





— I really doubt you'll ever be able to drive the A-2 into clipping, it is reassuring that if you do, the sound of that clipping will be more on the 'soft' side as opposed to 'hard'.

The first bass-tester I fired up was *I Can't Stop* by Flux Pavilion, despite not being a huge fan of so-called electronic music, because not only does it have some impressively deep synthesised bass lines, it also has some identical sounds that 'ping-pong' from one channel to the other, allowing you to hear how well something is separating the sounds, and whether the sound is identical from one channel to the other as it should be. For all these tests, the SoulNote A-2 came up trumps. Scads of deep bass power, scads of separation, and absolutely spot-on identical sonic signatures for the two channels.

My second tester continued the 'electronic' theme but added in some real instruments, in the shape of Tame Impala's *Let it Happen*, the lead single from the band's third studio album, 'Currents', from back in 2015. The bass line (guitar with sub-bass beneath) that is the foundation of this track was delivered to perfection by the A-2, though surprisingly I found that through the SoulNote the track sounded 'airier' than I have heard it previously. In particular, listen to the airiness of the echoed vocals that follow the deliberately deadened instrumentals, as well as to the track close-out to best hear what I am trying to describe.

For a real instrument with super-deep bass, what better to use than Bach's *Passacaglia and Fugue in C minor*? J.S. being my favourite composer of all time, I have several versions from

which to choose for evaluation. This time I used the one by E. Power Biggs, ('E. Power Biggs Plays Bach In The Thomaskirche'), which is a sentimental favourite because it was performed in the same church in which Bach played (though not on the same instrument, of course!) and as a bonus also has Biggs playing the famous *Toccat & Fugue in D-Minor*, as well as the *Prelude & Fugue in C-Major* and the *Prelude & Fugue in G-Major*. However, if you're a Bach fan and would prefer a rather grander-sounding organ and a more nuanced performance, I would instead suggest Lionel Rogg's 'Intégrale De l'Oeuvre D'Orgue.'

The SoulNote A-2 had absolutely no problems sustaining the sound of the lowest organ pedal notes at any volume that I cared to use, and the tonality of the deep bass sound was exceptional. The sounds of the higher notes on the manual were insanely well-reproduced, such that I was able to hear the true sound of each stop, with absolutely none of the unwanted 'shrillness' or 'shrieking' that can be introduced by lesser amps. The musicality of the A-2 is first-rate.

To test the SoulNote A-2 with female vocals, I used my newest favourite singer/composer, the fantastically named Celeste Epiphany Waite. I have no idea why her debut album, 'Not Your Muse', didn't launch her to instant stardom (OK, so it did make No 1 on the charts in her homeland UK, but elsewhere, not so much...). This album is beautifully recorded — there's not a second-rate track on it, and it has so many outstanding tracks that a full list would take several paragraphs to list... plus it runs for 78 minutes, so maximum enjoyment for your money!

Celeste's voice is a moveable feast that can be pure as the sound of a rubbed crystal glass, as smoky as a nightclub at 3am, or as edgy as a precipice. She also varies her accent depending on the lyric of the song. The emotion she introduces to her delivery of hit single *Strange* epitomises heartache, while the lyric itself is stunningly insightful: '*Isn't it strange? / How people can change / From strangers to friends / Friends into lovers / And strangers again.*' Her writing is wise beyond her years, but since most tracks have

co-writing credits, it's difficult to be specific about who contributed what to the lyrics.

Although the uptempo tracks seem to have captured the general public's imagination, and I am certainly a huge fan of those tracks, I find I rather prefer the slower bluesier and jazzy numbers. The title track is a particular favourite, and the A-2 delivered the lovely guitar sound crisply and accurately while the spacey effects reverberated around my listening room to deliver an all-enveloping musical experience. *A Kiss* is another stand-out track for me — the tone of that bass is to die for! *Some Goodbyes Come With Hellos* is a masterpiece of a song, too, with Celeste's voice working against the acoustic guitar to deliver a stunning soundfield. Her phrasing in this song is almost Sinatra-like, which is no small praise... she's hugely talented.

Could the SoulNote A-2 rock? I didn't doubt it but decided to prove it anyway by spinning up Turnstile's 'Glow On' from last year. Indeed, right from the very first (and handily best!) track, *Mystery*, I was enveloped in hard, driving rock. The signature driving bass, the raw drums, the screaming lead guitar — all were epically delivered by the SoulNote A-2. *Holiday* is also an amazingly difficult track for an amplifier to deliver, with FX thrown around with abandon, but the A-2 never once felt like it was losing its grip on the sonics. Truly superb.

CONCLUSION

If you take the time to read the Hideki Kato's design philosophy (and you'll need time, because it's a long read!) you may find, like me, that you're not totally on board with some of his design concepts — those that reference 'trapped air', 'slack-strings', 'Fourier's curse', 'Sushi mush' and 'ferrite beads' stick in my mind! — but as the old saying goes, the proof is in the pudding, and in this case the pudding is the SoulNote A-2 and the proof is that it is very powerful, very quiet and — most important of all — sounds absolutely gorgeous. — **Greg Borrowman**

...more complex than most because the A-2 is not a 'conventional' stereo amplifier

CONTACT INFO

Brand: SoulNote
Model: A-2 (or A-2SE, see copy)
RRP: \$10,250
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Readers interested in a full technical appraisal of the performance of the SoulNote A-2 integrated amplifier should continue on and read the LABORATORY TEST REPORT published on the following pages. 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.

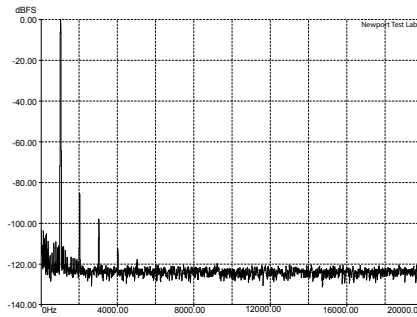
Laboratory Test Report

Newport Test Labs measured power output only for the SoulNote A-2's conventional stereo mode, the results of which are shown in the 'Power Output' table accompanying this review.

At 1kHz, both channels driven into standard 8-ohm loads, the SoulNote amp delivered a maximum undistorted power output of 117 watts (20.6dBW), which very slightly exceeds the manufacturer's specification. Driven into 4-ohm loads under the same conditions, Newport Test Labs measured a power output of exactly 200 watts per channel, which was exactly as specified by SoulNote for this impedance.

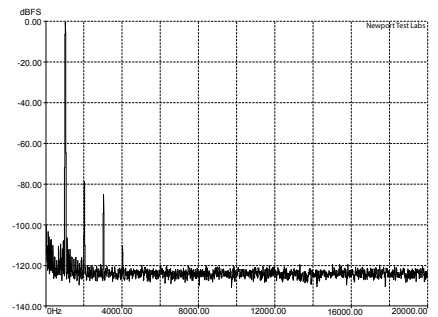
Look closely at the tabulated results and you will notice that the SoulNote A-2's output increases compared to the both-channels-driven figures when only a single channel is driven, suggesting an unregulated power supply, but you can also see that when both channels are driven using a low test frequency (20Hz), the power output drops a little, to just 111 watts per channel when both channels are driven into 8 ohms, and to 169 watts per channel. This may have been due to the mains voltage dropping during testing — Newport Test Labs does not keep constant voltage on the basis it doesn't represent a 'real-world' situation — but it is not significant, since it's still higher than specification at 8 ohms, only

Graph 1



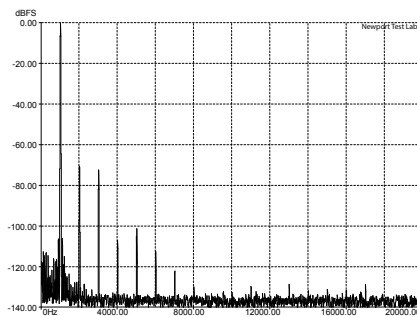
THD at 1kHz at 1 watt into 8 ohms.

Graph 2



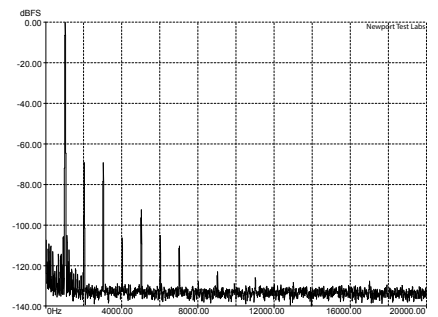
THD at 1kHz at 1 watt into 4 ohms.

Graph 3



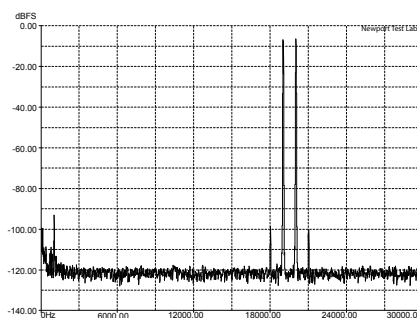
THD at 1kHz at 20 watts into 8 ohms.

Graph 4



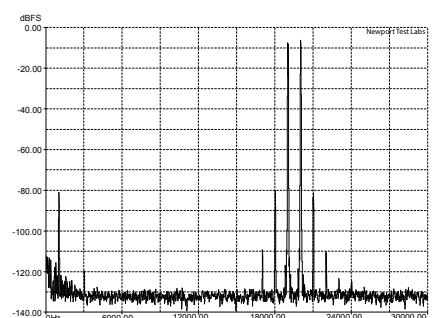
THD at 1kHz at 20 watts into 4 ohms.

Graph 5



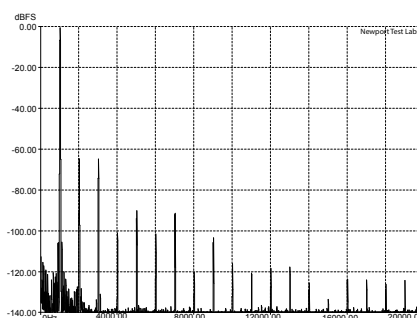
CCIF-IMD (19/20kHz 1:1) at 1 watt into 8 ohms.

Graph 6



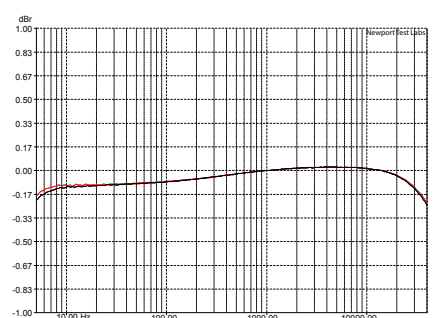
CCIF-IMD (19/20kHz 1:1) at 20 watts into 8 ohms.

Graph 7



THD at 1kHz at 100 watts into 8 ohms.

Graph 8



Frequency response into 8-ohm non-inductive load (black trace) and sim spkr (red trace).

0.8dB shy of spec at 4 ohms, and begs the fact that the amplifier will never be called on to deliver rated power at 20Hz at 4 ohms when driving speakers in a hi-fi system.

Graph 1 shows total harmonic distortion at 1kHz when the SoulNote A-2 is delivering one watt into a standard non-inductive 8-ohm load. But before looking at distortion, you should first look at the noise floor, which is very low indeed, sitting more than 120dB down across almost the entire audible range of frequencies. Even the noise from the 240V mains and the harmonics thereof (the spikes at the extreme left of the graph) are more than 100dB down. This is an excellent performance.

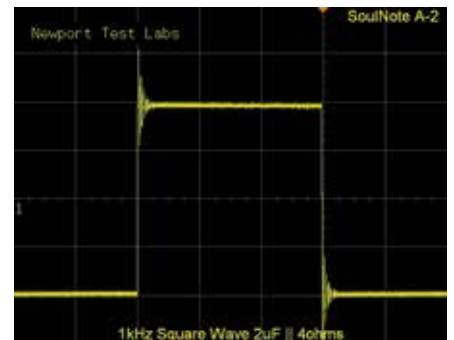
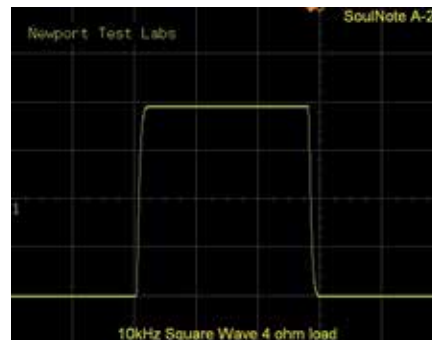
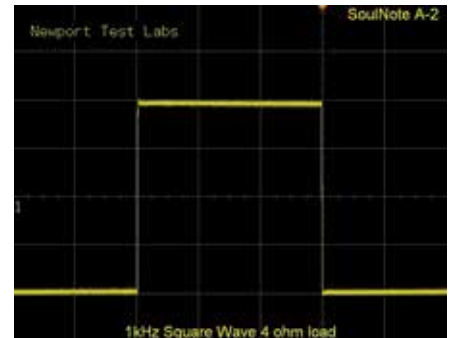
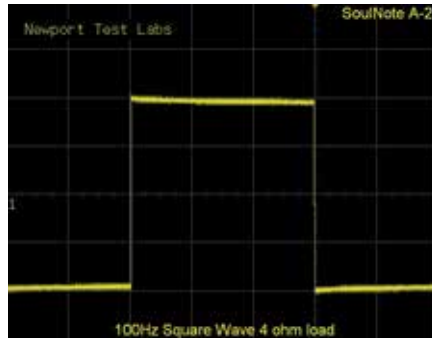
However, you should note that this result does *not* mean the total noise of the A-2 is more than 120dB down, only that the noise at any particular frequency (not counting mains noise) is more than 120dB down. Overall, *summed* noise referenced to rated output of one watt was measured as 98dB unweighted, and 104dB with A-weighting applied (about which more later).

You can see on Graph 1 that there's very little harmonic distortion in the A-2's output, which would suggest to me that the design does involve feedback of some sort, despite SoulNote claiming the use of "perfectly balanced non-NFB technology" and its further claim that "voltage feedback has been completely eliminated in the output stage, the voltage amplification stage, and in the power supply circuits".

Not only is there very little harmonic distortion in the output, but also the distortion that is present is mostly of the benign 'good-sounding' variety — that is, the distortion components are low-order rather than high-order. The second harmonic is sitting at around -84dB (0.0063%), the third harmonic at around -97dB (0.0014%), the fourth harmonic at around -111dB (0.0002%) and the fifth harmonic at around -117dB (0.0001%). Remember that any audible contribution from the second harmonic would be perceived as the octave of the fundamental (that is, the same musical pitch but an octave higher) and the third would be perceived as a musical fifth above the fundamental — and both are euphonious.

Distortion increases very slightly when the SoulNote A-2 is driving a 4-ohm load (Graph 2), but not by much. The second harmonic comes in at around 79dB (0.0112%), the third at -85dB (0.0056%) and the fourth at -110dB (0.0003%) while the fifth (if there is one) is now below the noise floor. As you can see from both the dB ratios and the percentages, these distortion levels are gratifyingly low.

At higher power output levels (20 watts), the level of the low-order distortion components increases, as one would expect and also higher-order distortion components creep in. Graph 3 shows the distortion that results when the



SoulNote A-2 Integrated Amplifier Laboratory Test Results – Power Output

Channel	Load (Ω)	20Hz (watts)	20Hz (dBW)	1kHz (watts)	1kHz (dBW)	20kHz (watts)	20kHz (dBW)
1	8 Ω	128	21.0	128	21.0	128	21.0
2	8 Ω	111	20.4	117	20.6	117	20.6
1	4 Ω	222	23.4	234	23.6	234	23.6
2	4 Ω	169	22.2	200	23.0	200	23.0

Note: Figures in the dBW column represent output level in decibels referred to one watt output.

SoulNote A-2 Integrated Amplifier – Laboratory Test Results

Test	Measured Result	Units/Comment
Frequency Response @ 1 watt o/p	<1Hz – 75kHz	-1dB
Frequency Response @ 1 watt o/p	<1Hz – 162kHz	-3dB
Channel Separation (dB)	72dB / 101dB / 73dB	(20Hz / 1kHz / 20kHz)
Channel Balance	0.028	dB @ 1kHz
Interchannel Phase (Direct)	0.02 / 0.04 / 0.77	degrees (20Hz / 1kHz / 20kHz)
THD+N	0.008% / 0.08%	@ 1-watt / @ rated output
Signal-to-Noise (unwghted/wghted)	80dB / 86dB	dB referred to 1-watt output
Signal-to-Noise (unwghted/wghted)	98dB / 104dB	dB referred to rated output
Input Sensitivity	84mV / 840mV	(1-watt / rated output)
Output Impedance	0.06Ω	at 1kHz
Damping Factor	133	@1kHz
Power Consumption (1)	NA / 218	watts (Standby / On)
Power Consumption (2)	236 / 488	watts at 1-watt / at rated output
Mains Voltage Variation during Test	239 – 245	Minimum – Maximum

SoulNote is driving an 8-ohm load. The second harmonic is now at around -72dB (0.0251%) and the third at -73dB (0.0223%). These distortions would be euphonious. The levels of the fourth, fifth and sixth harmonics are all more than 100dB down (0.001%) while that of the seventh-order is at -123dB (0.00007%). Some higher-order components are visible, but all are more than 130dB down (0.00003%)!

Graph 4 shows distortion at 20 watts into 4 ohms and you can see that it has a very similar 'signature' to that shown in Graph 3, the most significant difference being the increase in the level of the fifth distortion harmonic to around -93dB (0.0022%)... though one could hardly call such a low level 'significant'. Note that on both Graphs 3 and 4, the overall noise floor (again, not total noise!) has dropped down lower than -130dB across almost the entire audio spectrum, and that there's still very little noise from the power supply despite the increased demand placed on it.

Intermodulation distortion is a crucial factor in the sonic performance of any audio device, and you can see from Graphs 5 and 6 that the intermodulation performance of the SoulNote A-2 is outstandingly good, both at an output of one watt and also at an output of 20 watts.

Graph 5 shows CCIF-IMD at an output of one watt. The twin test signals to the right of the centre of the graph (at 19kHz and 20kHz), which on most amplifiers are accompanied by a slew of unwanted intermodulation products, stand almost alone, with only two intermodulation components, one at 18kHz and the other at 21kHz, both of which are approximately 100dB down (0.001%). The unwanted difference signal at 1kHz (at the left of the graph) is also very low, at around -93dB (0.0022%). As I said in the previous paragraph, this is an outstanding performance.

CCIF-IMD at an output of 20 watts is higher than it is at the one-watt level, yet still far lower than I usually see with most amps. The 18kHz and 21kHz components are now at -80dB (0.01%), and 17kHz and 22kHz components make an appearance at -110dB (0.0003%). The level of the difference signal has increased to -82dB (0.0079%). Despite the increases in the IMD components, this is still an outstanding result for this particular test.

Graph 7 shows distortion at the SoulNote A-2's rated power output of 100 watts into 8 ohms. Again, the good-sounding second and third harmonics dominate the spectrum, but except for the fifth and seventh components, which are at around -90dB (0.0031%), three of the other higher-order components are more than 100dB down (0.001%), and the remainder are close to or more than 120dB down (0.0001%). Low-frequency noise is more than 120dB down, and across the midrange and high frequencies it is more than 140dB down.

Newport Test Labs measured the frequency response of the A-2 into both a standard non-inductive test load (shown as the black trace on Graph 8) and a load that simulates one that would be presented by a typical two-way bookshelf loudspeaker (red trace). As you can see for yourself, the two traces are almost indistinguishable from each other, showing that the frequency balance of the A-2 will remain the same no matter what loudspeakers you use with it. This is an excellent trait for any amplifier.

You can see that the response shown on Graph 8 does not appear to be 'flat', but you need to take into account the extreme vertical scale of the graph, where the top is $+1\text{dB}$ and the bottom is -1dB . You can see that between 5Hz and 35kHz, the frequency response is essentially $\pm 0.1\text{dB}$, which is an excellent result. Were this response to be shown on a more conventionally scaled graph, it would appear as a flat line.

The overall wideband frequency response measured by *Newport Test Labs* extended from less than 1Hz to 75kHz -1dB , and from less than 1Hz to 162kHz -3dB . These figures exceed the

Overall, the SoulNote A-2 returned outstandingly good performance... for all measured parameters

SoulNote specification for low-frequency performance but fall a little short of it for high-frequency performance. Being only 3dB down at 162kHz is still, however, a very extended high-frequency response... far higher than you'll get from any Class-D amplifier, and more than you'll get from most Class-A and Class A/B designs as well.

This excellent frequency response is reflected in the outstanding shapes exhibited during the square wave testing, despite the fact that for reasons I was not been able to determine at the time of going to press, they were obtained when driving a 4-ohm test load rather than an 'easier' 8-ohm test load, which is what *Newport Test Lab* usually uses for square wave testing. You can see on the 100Hz square wave that there's only a very slight tilt on the top of the square wave, showing non-dc extension and only fractional bending, so almost no phase shift.

The 1kHz square wave is exceptionally clean, with just the slightest glitch visible at the top of the leading edge of the waveform. This too is an excellent result. The 10kHz square wave shows

the inevitable rise-time limitation due to the -3dB downpoint of 162kHz and is otherwise perfect.

Performance into a highly reactive load (2 μF in parallel with 4 ohms!) was also excellent, with only a quarter wave-height overshoot and quickly damped ringing. This amplifier will be totally stable into any loudspeaker load.

Balance between the left and right stereo channels was excellent, with *Newport Test Labs* measuring just 0.028dB at 1kHz, and the channel separation at this frequency was outstandingly good (101dB). You can also see that channel separation diminished at the frequency extremes — to 72dB at 20Hz and 73dB at 20kHz — but these are still superb results and far, far more than you'll ever need to guarantee perfect stereo imaging and perfect channel separation when listening to music. Channel phase errors were vanishingly small.

Overall signal-to-noise ratios were excellent, as you can see from the table of Laboratory Test Results. Referenced to an output of one watt, the SoulNote A-2 returned an overall wideband figure of 80dB, which improved to 86dB with A-weighting. Referenced to rated output (100 watts), the wideband S/N ratio was 98dB and the A-weighted result was 104dB. This is a very quiet amplifier! (This latter measurement was a little less than SoulNote's specification, but this could be due to SoulNote measuring noise when the amplifier was set to 00, whereas *Newport Test Labs* had it set at 35.)

You certainly won't have any problems driving the SoulNote A-2 to its rated output with any source component I'm familiar with, because *Newport Test Labs'* measurements show that you will need only 84mV at the input for the amplifier to deliver one watt at its output, and only 840mV for it to deliver its rated output. Since most modern source components will deliver more than 2 volts at their output, the 'fit' will therefore be excellent.

Output impedance at 1kHz was a moderately low 0.06 ohms, which will ensure compatibility with all speakers with an impedance of 4 ohms or more, while the resulting damping factor (133) ensures that the amplifier will easily be able to control unwanted back-EMF from even the largest and heaviest bass drivers.

Power consumption at idle was almost double the specification, though SoulNote may have had the amplifier muted (at 00 volume level) to obtain its figure of 125 watts, whereas *Newport Test Labs* had the volume at 01 to obtain its figure of 236 watts. Either way, you'd be best advised to turn the A-2 off whenever you are not using it. Its high internal heat generation means it will warm up to operating temperature very, very quickly.

Overall, the SoulNote A-2 returned outstandingly good performance on *Newport Test Labs'* test bench for all measured parameters.

— Steve Holding