



LAVARDIN MODEL ISx REFERENCE

INTEGRATED AMPLIFIER

The Lavardin Model ISx Reference integrated amplifier is entirely designed and manufactured in France, and takes over from the Model IS Reference, which was not only one of the company's longest-lived products (in continuous production from 2001 to 2016), and one of its best-selling amplifiers, but also one of the company's most highly-awarded and best-reviewed amplifiers.

Given that Lavardin is well-known for not updating its products, I was curious about the reason for the change, because it seemed to me that the only substantive difference was the provision of a remote control, plus a redesign of the front panel.

According to local Australian distributor, Audio Magic, I was not entirely wrong. The front panel change was apparently to allow the implementation of a remote control (though it remains a \$250 option—the base model still does not include a remote control).

According to Lavardin, it was not possible to retrofit remote control to the chassis of the earlier model. It would also appear that the front panel change has also enabled coloured anodising options that were not previously available.

However, there have been other changes, including that the ISx Reference has a different mains power transformer to the IS Reference, plus of course if you choose the remote option, there's a different Alps volume control installed (a motorised version, rather than the standard manual version).

Audio Magic also says that the circuitry has been changed in order to deliver '*improved musicality through more detailed micro dynamics*', though no specific details of those changes were supplied.

However, Jean Christophe Crozel, one of the two founders of Lavardin says: '*The improvement is so huge that a present Model ISx, with or without remote, on certain aspects, is more musical and transparent than the previous Model IS Reference or even the Model IT.*'

THE EQUIPMENT

The external appearance of the Lavardin Model ISx is, like all Lavardin models, quite unprepossessing, though obviously quite workmanlike. My sample was fitted with a red-coloured anodized 5mm thick aluminium front fascia that was bolted to a folded black anodized alloy chassis made of 3mm thick aluminium. The red anodizing is apparently offered as a free option. I rather liked the colour of the original anodized finish.

Source selection is achieved using the left-most knurled alloy rotary control on the front panel. Only four selections are possible, with the numbers 1, 2, 3, and 4 inscribed vertically on the front panel to help with selection, but a layout that means that the indent in the control knob does not always align exactly with the chosen input.

Volume control is achieved using the right-most knurled alloy rotary control. (Just out of interest, Lavardin Technologies—or rather the company behind Lavardin Technologies, which is called CEVL—makes all its own control knobs in-house.)

I can't think of any cost-effective reason for doing this, so I can only assume they're doing it solely to reinforce the company's claim that the amplifiers are made entirely in France... though, of course, many of the parts and semiconductors inside the amplifier are made in countries other than France.)

As you have gathered, you can order the Model ISx Reference with a manual volume control, or one that's able to be operated remotely, via infra-red.

If you choose the remote control option (and why wouldn't you... being able to adjust volume from the comfort of your listening position is a no-brainer) you'll be interested to find that CEVL says it has designed its remote control circuitry so that it is '*completely passive*' whenever a remote signal is not being received. The company says that the infra-red circuitry found in all other remote controllable amplifiers is constantly active, and as a result affects the audio circuitry within those amplifiers.

A statement from the company advises (verbatim): '*There is no permanent clocking signal to be used by the IR decoder inside the amplifier. The receiver and the decoder are « passive » and the clocking of the IR signal is made in the emitter only and when signals are sent only. Thus there is no permanent signal pollution inside the amplifier due to the permanent clocking of ALL classical IR receivers and decoders.*'

Midway between the two rotary controls is a cut-out in the front panel that is backed by a metal plate that contains the IR sensor (left), and a red LED to indicate that the mains power is on (centre). The circular feature at the right appears to be just that—a circular feature that balances the appearance of the plate.

The Model IS Reference was one of the company's longest-lived and most highly awarded products

The standard Lavardin Model ISx Reference comes with four line-level inputs, all able to be controlled via the volume control. You can, however, ask for a 'Bypass Input' to be fitted, in which case the factory will hard-wire Input 1 so that it bypasses the volume control circuitry and goes directly to the amplifier circuit, for the purpose of, according to Lavardin Technologies' 'User Guide', '*smooth integration of a surround processor into high end audio system*' (sic).

Another option available for the Lavardin Model ISx Reference is a moving-magnet phono stage. If this is fitted (as it was on the model I was loaned for this review) it 'takes away' one of the four line inputs (Input 4). This means that if you option in both the Bypass and the Phono inputs, you're essentially left with only two line-level inputs: Input 2 and Input 3, which may or may not be sufficient for your needs, depending on the number of line-level sources you use in your system.

If you don't option in the phono circuit, the price of the Lavardin Model ISx Reference (including remote) drops to \$6,200 (RRP).

What is *not* available, either standard or as an option, is a headphone output. These days, with so many people using headphones for listening—sometimes even as a preference over loudspeakers, it's rare to find an amplifier without a headphone socket... even if it's sometime rather inconveniently located on a side or rear panel, so the Lavardin Model ISx Reference is definitely an outlier in this regard.

Turning to the rear panel of the Lavardin Model ISx Reference, quite frankly I found it—and the fittings on it—not at all what I'd expect to find on any commercial amplifier, and most certainly not one stickered at close to \$7,000. Firstly, rather than screen-printing identifiers on the rear panel, CEVL is instead using low-cost stick-on aluminium labels to identify the inputs and outputs, as well as to provide model number and regulatory information. One of the labels on my sample was not even attached straight. Also, as you can see from the photograph of the rear panel, CEVL has made one of the two stick-on labels 'multi-purpose' by printing 'Phono' under 'Line 4' and 'Bypass' under 'Line 1', so when you specify an option, the technician who assembles your unit simply crosses out with black ink the word(s) that do not apply. Aluminium labels are very inexpensive, so if you're going to use them, rather than a properly screen-printed panel, why not have four different labels?

As for the fittings on the rear, the speaker terminals—albeit gold-plated—are a low-cost type that is sold in Australia by the hobby

electronics retailer Jaycar. Above them are four holes that have been plugged with plastic inserts, which smacks of amateurism. It may be that CEVL is re-purposing this chassis from another model as a cost-cutting measure, or is intending to offer a bi-wired version at some point in the future, but none of this is what I expect to see on an amplifier retailing at the ISx Reference's price. At the far left there's even a hole in the chassis that isn't plugged at all... it's just a hole. I assumed it was for the ground post that usually accompanies the fitting of a phono circuit, but although my amplifier had been fitted with just such a circuit, as mentioned, there was no ground post on my sample.

What you also may have noted from the picture of the rear panel is that the speaker terminals are not identified as positive or negative, though I'd guess that red is positive. More importantly, they aren't identified as 'Left' or 'Right' either. Neither are the RCA inputs identified as being 'Left' or 'Right', though they do have very tiny coloured collars, with the row at the top having red-coloured bands and the ones at the bottom having black coloured bands. I assumed that red=right and black=left, but when I hooked the amplifier, the right-most speaker terminals were actually the left channel if I used this hook-up system! And just in case you were wondering, there are no explanations or illustrations in Lavardin Technologies' 'User Guide' either... you're on your own working out what's what. (Editor's Note: *Your hi-fi dealer would be able to advise you about all these points... which is an excellent reason to make sure you buy only from an authorised retailer.*)

Internally, almost all the circuitry is contained on a single PCB. Rather unusually these days, that PCB is populated entirely by through-hole components rather than surface mount devices. Incoming a.c. from the shielded encapsulated toroidal power transformer is rectified by four discrete diodes, rather than a diode bridge, and the resultant d.c. is smoothed by four small electrolytic capacitors. Because these capacitors are mounted vertically directly to the main PCB their size is necessarily limited by the height of the chassis, so they're only 10,000µF, 40VW types.

One 'feature' of the PCB is the use of encapsulated circuitry that is involved in eliminating in the Lavardin ISx Reference what the late Gérard Perrot (the other co-founder of Lavardin) referred to as '*memory distortion*.' The epoxy encapsulation is presumably intended to prevent industrial espionage of the 'memory distortion' circuitry, but it also makes it impossible for

a third party to repair the amplifier in the event that one of the encapsulated components fails. This might mean the amplifier has to be returned to France (easy if you live in Australia) or that you have to replace an entire PCB... which would also be expensive. Of course any failures within the first year of ownership would be repaired for free by whichever retailer sold you the amplifier, but outside this period, it will be the owner who has to bear all the costs.

It's because of this encapsulated circuitry, that I personally think Lavardin should follow the lead of other amplifier manufacturers and offer a 10-year or preferably a 20-year warranty on its amplifiers.

What is 'memory distortion'? According to the Lavardin website: '*Memory distortion is the property that is the dominant factor in causing solid-state amplifiers to sound shrill and mechanical. Tube technology allows electrons to travel through a vacuum which leaves no storage or memory effect, but solid-state amplifiers use silicon components which keep a trace of current flow that has gone through. New electron flow is continuously affected by the pattern of the immediately preceding electron flow. As soon as the memory effect of these solid state circuits is reduced, all the improvements that transistor technology brings, such as high output power, accuracy, very low harmonic distortion and extended and linear frequency response, can be added to the most alive and silky musical rendition of the best single-ended monodiode designs.*'

CEVL claims that it is the only company in the world that can measure memory distortion: '*The memory distortion of components was discovered entirely by Lavardin Technologies engineers, as are the procedures for measuring the very audible distortion which results from it*', and that because of memory distortion, all laboratory measurements are meaningless: '*the classic measurements made all over the world for the last decade are meaningless when considering the musical quality of an amplifier*,' writes Lavardin Technologies on its site.

All of which might account for the choice of the output transistors used in the Lavardin Model ISx Reference amplifier: two pairs of TIP142/147 (the ones fitted to my sample being made by STMicroelectronics). These devices are actually Darlington pairs which means that although each one looks like an ordinary transistor, with three terminals (base, emitter, ground), each one has inside two transistors, two resistors and a diode. These devices can handle 5 amps and 100 volts and are renowned for their ruggedness, which finds them oft-used in linear and switching industrial applications, but they're also popular with DIY builders due to their low cost.



The speaker terminals are not identified as positive or negative, nor are they identified as 'Left' or 'Right'. The RCA inputs are not identified either.

The output transistors (and, in turn, your loudspeakers) are protected by fast-blow 2A fuses. This means that when continuous

current draw exceeds two amperes the fuses might blow. Music signals are not continuous of course, so average output power would have to be very high for a fuse to blow, but 2A seemed a fairly low value for an amplifier that is rated at 104-watts into 2Ω. When I checked Lavardin Technologies' User Guide, it seems that this claimed output power is actually only a theoretical value, because the User Guide specifically states that the amplifier 'is intended to partner with loudspeakers whose impedance is 5 ohm or more.' This being the case, it would rule out the use of speakers with nominal impedances of 2Ω... or even 4Ω... with the Model ISx Reference.

Instead of using a conventional finned heat-sink extrusion to keep the output transistors at the correct operating temperature, CEVL has clamped the four output devices to an L-shaped section of aluminium alloy that is riveted to the base of the chassis, essentially using the entire chassis of the amplifier to dissipate heat, which is why there are no cooling vents in the chassis.

If you order the remote control version of the Lavardin Model ISx Reference you may be disappointed to discover that you can only use it to adjust volume. You cannot use it to switch sources... indeed there isn't even a mute function. As you can see from the photograph, neither does it look like a professionally-made product. Indeed I would not be the first reviewer to remark that it looks like it was built by a high-school student for a Design & Technology assignment, because a reviewer for that well-known UK publication *What Hi-Fi?* already beat me to it. [www.tinyurl.com/ISx-Ref-Rev]

The Lavardin ISx Reference integrated amplifier is neither large nor heavy, measuring 700×430×306mm and weighing 6kg.

IN USE AND LISTENING SESSIONS

Connecting the Lavardin Model ISx Reference to my reference system was a little trickier than usual, due to the lack of identification on the rear panel and the equal lack

of information in the 'User Guide'. These shortcomings could easily be remedied by Lavardin Technologies and it's expected that the company will do so in the very near future, but in the interim it meant that I had to use test equipment to establish beyond any doubt the absolute phase of the speaker terminals, and also to establish that the left channels (both from my CD player and my turntable) were in fact delivering information via the amplifier to my left channel speaker. (That said, it could be worse: Some years ago, *Australian Hi-Fi Magazine* reviewed a valve amplifier built by a famous Italian manufacturer whose clearly marked left channel was actually the right channel, and *vice versa*!)

Rather unusually, Lavardin says that all its amplifiers 'are fully ready to deliver all their musical quality within 5 or 10 minutes of function at domestic temperature. No burn-in is necessary once the amplifier is released (sic) by the factory,' which suited me fine, as I was able to play 'Self Talk', which is currently one of my high-rotation albums, straight away. Self Talk is by Melbourne-based singer/instrumentalist Olympia, whose real name is Olivia Bartley. It's a (mostly) densely multi-layered work, with sounds and sonic effects firing at you from all directions, but with Olympia's fabulous voice always at the fore, and many times accompanied by her own voice *solus*, chorused, or *asided*. I don't know how many hours she spent in the studio, but it must have been thousands... and it was certainly time well-spent. The track *Blue Light Disco* is probably my favourite—sonically surreal with a foggy, atmospheric sound that captivates every sense and a good aural taster if you don't want to audition the complete album.

There are certainly plenty of sounds on Self Talk that can be used to highlight the Lavardin ISx Reference's own performance, which I found to be exceptionally good. On the track *Opening Hours* the Lavardin ISx Reference delivered a perfectly paced performance, so I was able to clearly hear the complex cross-rhythms that permeate it. At the same time, the perfect clarity of the amplifier—and the separation between the channels—meant I was hearing the deliberate sonic distortions in the right channel whilst at the same time hearing the equally

deliberate purity of the sound in the left channel as purely as freshly fallen snow.

The depth and luxuriousness of the bass the Lavardin ISx Reference could deliver was easily evidenced on *Honey*, a song which Olympia says: 'is essentially about the influence we have on each other, and that moment when something happens and you have this, is-that-who-I-am? moment.'

I find the whole album to be rather like a meditation. Once it's playing, you can't help but move deeply into the music and become completely absorbed within it. If it's a telling point—and I think it is—I have to say that when listening using the Lavardin ISx Reference, I was able to enter the meditative state smoothly, easily, and very quickly.

I am a great fan of using spoken word to evaluate speakers and amplifiers and I've finally found a spoken word album—of sorts—that's also lots of fun to listen to, which is helpful if you're listening over and over again trying to pin down the finer points of a component's sound quality.

That album is Kate Tempest's 'Let Them Eat Chaos'. Tempest is a UK performance poet who works with music as her background... in much the same way as Patti Smith when she started out. The Lavardin ISx Reference proved itself able to deliver the tone of Tempest's voice with supreme accuracy and incredible intelligibility. And when she gets into structured rapping, her pacing is delivered with total exactitude by the Lavardin ISx Reference.

On *Picture a Vacuum*, which sets the scene of what's to come (the tracks describe seven people who live on the same street but who have never met, after which a storm causes them to meet and see each other for the very first time), the 25-second prelude is spoken against a silent background, giving ample opportunity to appreciate the total lack of circuit noise from the Lavardin—this is one silent amplifier. It's an impressive album, and the Lavardin ISx Reference gave an equally impressive performance of it.

By now you're probably asking: 'But can the Lavardin ISx Reference rock 'n' roll?' You bet it can! I fired up 'Beggar's Banquet', which contains one of my all-time favourite Rolling Stones songs... no, correct that, one of my all-time favourite songs: *Sympathy for the Devil*. I only have to hear that unmissable piano/bass/conga introduction and I'm straight out of my

chair to sing along with Mick the lyric that has to be one of the greatest in rock. Wyman's bass line matches Watts' syncopation yet he also manages to colour it by throwing in extra lines from left field. And the (apparently serendipitous) 'woo woos' that kick in afterwards become increasingly intoxicating.

But it isn't only the music of *Sympathy for the Devil* that is so captivating. The words are so poetic and masterful—and so full of imagery and esoteric historic references—that I still sometimes wonder if they were really written by the band or by some mysterious unnamed lyricist. There's certainly little other like it in the Stones' *oeuvre*... think about the lyrics to *Satisfaction* or *Jumpin' Jack Flash* by way of comparison. How can 'I can't get, no o o, sat-is-faction' (repeat *ad infinitum*) possibly compare with 'And I was 'round when Jesus Christ/Had his moment of doubt and pain. Made damn sure that Pilate/Washed his hands and sealed his fate'?

The Lavardin ISx Reference just nailed this song... it nailed the whole album in fact. Yep, this amplifier can really rock!

But if you are wanting the Lavardin ISx Reference to rock at head-bashing levels, you'd better make sure you have efficient loudspeakers, because I could drive the amplifier's output stage into clipping if I

wound the wick up... though admittedly I was using inefficient (84dB SPL) speakers with a fairly high (8Ω nominal) impedance. Interestingly, although I could hear the clipping, the fuses didn't blow, so there are unlikely to be any 'false' detections that would necessitate annoying fuse replacements (which would also invalidate the warranty if they were to be user-executed). And the volume level I had to play in order to cause the amplifier to clip was so high that I'd say that as long as your speakers are somewhere in the ballpark of 90dB SPL efficiency (and preferably have a nominal impedance of 6–8Ω) you'll easily be able to play the Lavardin ISx Reference at levels that will be 'too loud for comfort' in all but the largest of listening rooms.

CONCLUSION

The Lavardin Model ISx Reference integrated amplifier has a smooth and enchanting sound quality that's entirely musical and beautifully detailed, while also being truthful in terms of tonal rendition. It's a superb-sounding amplifier in every aspect. *—Tony Simonetti*

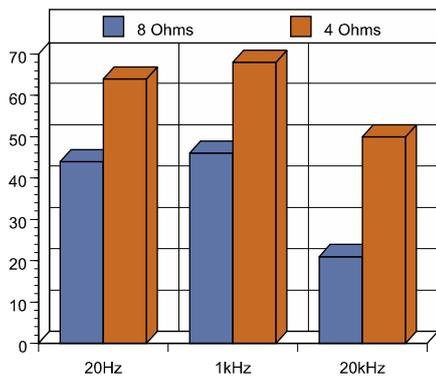
LABORATORY TEST REPORT

Newport Test Labs measured the power output of the Lavardin ISx Reference as exactly 40 watts per channel at 1kHz, both channels driven, which is somewhat lower than the 45-watts per channel claimed by Lavardin Technologies. The difference might be caused by the fact that *Newport Test Labs* measures power output at the point where output distortion is 0.1%. Some manufacturers allow higher distortion levels when stating power output, while others measure at the point at which the output stage just shy of clipping, where distortion can be as high as 1.0%.

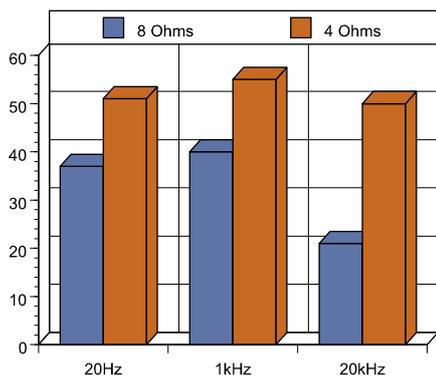
Under the same conditions the Lavardin ISx Reference delivered only 37-watts per channel at 20Hz and 21-watts per channel at 20kHz. As you can see from the tabulated results, power output into 8Ω loads was higher when a single channel was driven at 20Hz and 1kHz, but remained the same at 20kHz. According to the relevant Australian amplifier power output standard, a stereo hi-fi amplifier has to be able to deliver its rated output while both channels are driven and also at all frequencies between 20Hz and 20kHz. So in Australia, the Lavardin ISx Reference should be rated as having an output power of 21-watts per channel.

When *Newport Test Labs* attempted to measure the Lavardin ISx Reference's output into 4Ω loads, the test was thwarted by the amplifier's 2A fuses blowing well before the amplifier was able to deliver 40-watts into a 4Ω load. To get around this, the lab replaced the blown fuses with higher-value 3.15-amp fuses, after which the ISx Reference delivered 55-watts per channel, both channels driven into 4Ω loads, at 1kHz but only 51-watts per channel at 20Hz and 50-watts per channel at 20kHz.

It was decided not to test the output power into 2Ω loads, because this would have required an even-higher fuse value, and because the 'User Guide' says the amplifier is designed to work with impedances greater than 5Ω. [Editor's Note: When questioned about the 2A fuse value, CEVL replied via email: 'As a matter of fact 2A provides a real protection when playing music and never made any problem to any customer for the past 19 years.'



Power Output: Single channel driven into 8 ohm and 4 ohm loads at 20Hz, 1kHz and 20kHz.



Power Output: Both channels driven into 8 ohm and 4 ohm loads at 20Hz, 1kHz and 20kHz.

Readers interested in a full technical appraisal of the performance of the Lavardin ISx Reference Integrated Amplifier should continue on and read the LABORATORY REPORT. 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.

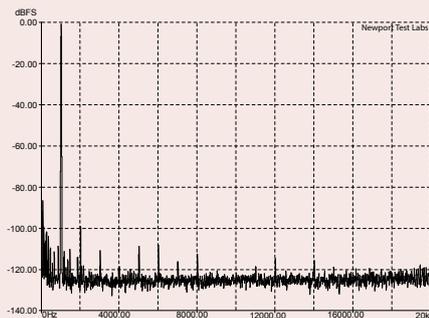
CONTACT DETAILS

Lavardin Model ISx Reference

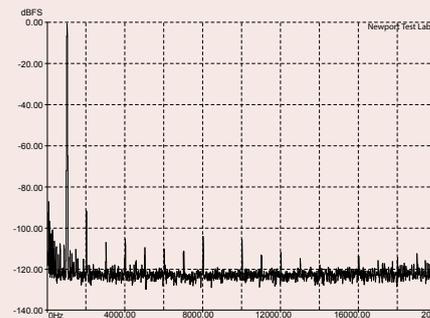
Brand: Lavardin
Model: Model ISx Reference
RRP: \$6,950 (with phono stage and remote)
Warranty: One Year
Distributor: Audio Magic
Address: 23/22 French Avenue Northcote VIC 3070
T: (03) 9489 5122
E: info@audiomagic.com.au
W: www.audiomagic.com.au

- Smooth sound
- Excellent bass
- Stereo imaging
- Headphone output
- Number of inputs
- Design

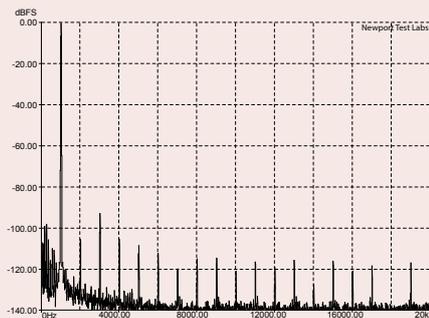
Graph 1: Total harmonic distortion (THD) at 1kHz at an output of 1-watt into an 8-ohm non-inductive load, referenced to 0dB.



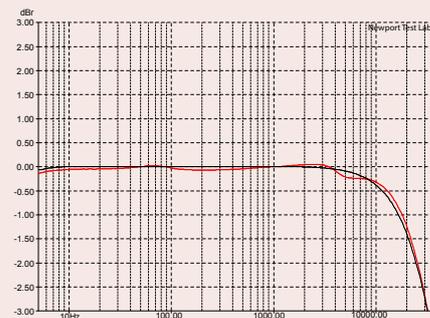
Graph 2: Total harmonic distortion (THD) at 1kHz at an output of 1-watt into a 4-ohm non-inductive load, referenced to 0dB.



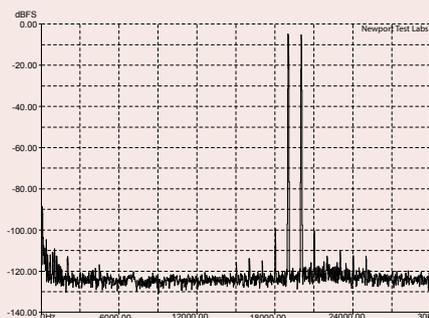
Graph 3: Total harmonic distortion (THD) at 1kHz at rated output (45 watts) into an 8-ohm non-inductive load, referenced to 0dB.



Graph 4: Frequency response of line input at an output of 1-watt into an 8-ohm non-inductive load (black trace) and into a combination resistive/inductive/capacitive load representative of a typical two-way loudspeaker system (red trace).



Graph 5: Intermodulation distortion (CCIF-IMD) using test signals at 19kHz and 20kHz, at an output of 1-watt into an 8-ohm non-inductive load, referenced to 0dB.



‘When it is about max power measurements with continuous sinus signals, of course it is different. We are not sure that measuring a few watts more or less, dealing with 0,5dB more or less sound pressure at max level will better describe amplifiers.’ Needless to say you should NOT replace the 2A fuses with 3.15A types, as this would invalidate the warranty and could potentially result in damage to the amplifier itself and/or your loudspeakers.

At an output level of one watt, with a 1kHz test signal (Graph 1), distortion was very low. There’s a second harmonic component at -100dB (0.001%), a third harmonic at -111dB (0.00028%), a fourth at -119dB (0.00011%), then fifth and sixth harmonics at around -110dB (0.00031%), followed by a seventh at -115dB (0.00017%) and an eighth at -117dB (0.00014%). The few other higher-order harmonic distortion components are all more than 116dB down (0.00015%). The signals visible at the extreme left of the graph are low-frequency signals from the power supply: 50Hz and the related harmonics thereof. All of this sums to a total THD+N figure of 0.016%, as you can see on the tabulated results, which is excellent—well below the threshold of audibility.

Distortion at one watt into 4Ω (at 1kHz) was a little higher than into an 8Ω load, but still very low. The only real differences are that the second harmonic increases to -92dB (0.00251%) and that a 10th harmonic (at 10kHz) appears at a level of -106dB (0.0005%). Another difference is a slight increase in the noise floor at the lower impedance. Whereas at 1-watt output into 8Ω the noise floor averages around -125dB, it increases to about -122dB into 4Ω (referenced to 1-watt output).

Graph 3 shows distortion at the Lavardin ISx Reference’s rated output power of 45-watts (a measurement made possible because only a single channel is driven when testing distortion levels). Although almost all harmonics (odd and even) are present in the output, with the exception of the third harmonic at -94dB (0.00199%) the first five harmonics are more than 100dB down (0.001%) and all of the others are close to or more than 110dB down (0.00031%). Low frequency mains-related noise (extreme left of the graph) is very low, and the overall noise floor of the amplifier has dropped to -140dB (referenced to rated output). Again, this is a truly excellent result, with the summed THD+N figure being an exceptionally low 0.0071%.

Intermodulation distortion (CCIF-IMD) was spectacularly low, as you can see from Graph 5. There are only two significant sidebands either side of the 19kHz and 20kHz test signals, and both are 100dB down

(0.001%). There is an unwanted regenerated signal down at 1kHz, but it’s right down at around -110dB (0.00031%). It appears there is also unwanted signal at 2kHz, but this is at -114dB (0.00019%), so not at all significant, since it would be inaudible.

The frequency response of the Lavardin ISx Reference, as measured by Newport Test Labs, was beautifully extended at low frequencies, extending to well below 1Hz, but not quite so much at high frequencies, where it was measured as being 1dB down at 16kHz, 1.4dB down at 20kHz and 3dB down at 32kHz. Two frequency response traces are shown in Graph 4. The black trace shows the Lavardin ISx Reference’s response into a standard 8Ω non-inductive laboratory test resistor. The red trace shows the Lavardin ISx Reference’s frequency response when it’s driving a load that’s representative of a typical two-way loudspeaker system. (Essentially this circuit is the one originally developed by Kenneth E. Kantor (*Acoustic Research, NHT, Tymphany, ZT Amplifiers*) but modified by John Atkinson (*Stereophile*) with a Zobel network, the schematic for which can be found here: www.tinyurl.com/sim-ls-load You can see that the trace into the simulated load is very similar to that into a resistive load, indicating that the Lavardin ISx Reference will be load-invariant so far as frequency response is concerned. It also predicts a high damping factor, meaning that this amplifier will be able to maintain good control over the unwanted motion of large loudspeaker cones. As you can see from the tabulated results, the test for output impedance showed that of the Lavardin ISx Reference to be 0.12Ω, resulting in a damping factor of 66 at 1kHz.

This is not excessively high, but it's more than required to produce results that are indistinguishable with higher damping factors in listening tests... at least according to extensive research conducted by Floyd E. Toole when he was working for the National Research Council in Canada.

Channel separation was far greater than will be required to deliver perfect stereo imaging, and remarkably uniform, averaging around 74–75dB irrespective of test frequency. Channel balance was also excellent, at 0.13dB (at 1kHz).

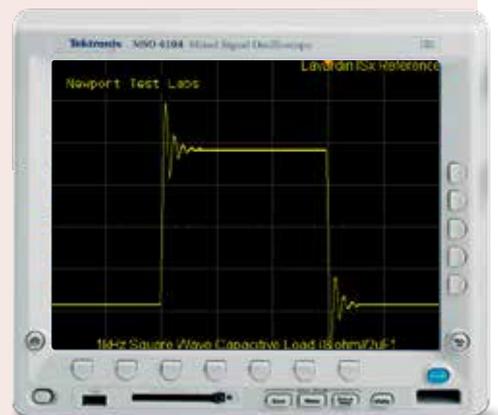
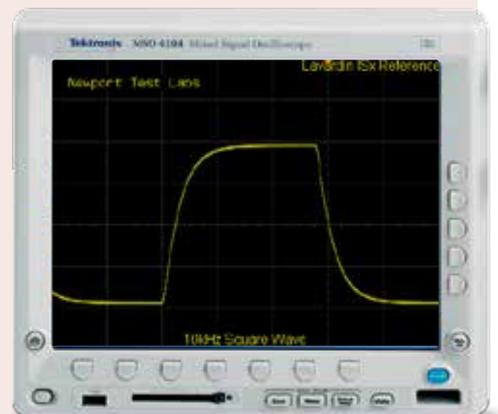
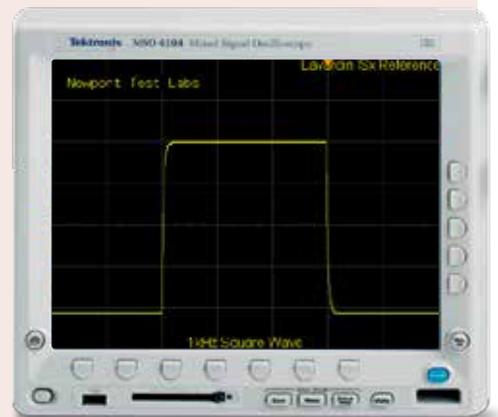
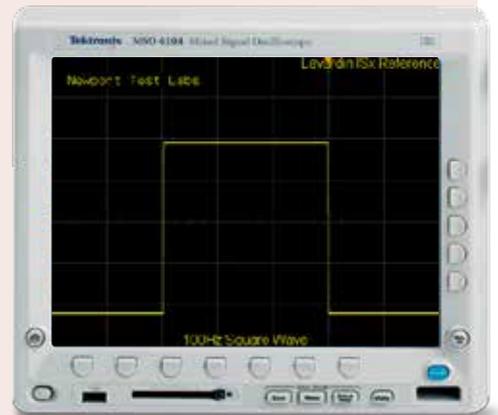
Newport Test Labs measured the signal-to-noise ratio of the Lavardin ISx Reference as 85dB A-weighted when referenced to a one-watt output, and 97dB A-weighted when referenced to its rated output. These are very good results, particularly the 97dBA result, as it's referenced to the rated output of just 45-watts. (When a signal-to-noise ratio is referenced to rated output, the result will always 'improve' for amplifiers that have a higher rated outputs, which is why *Australian Hi-Fi Magazine* always includes a S/N figure that's referenced to an output of one watt, as this is the only figure that puts all amplifiers

on an equal footing when you're comparing signal-to-noise ratios.)

The Lavardin Model ISx Reference's performance with a 100Hz square wave was exemplary, as you can see for yourself in the oscillogram accompanying this report: absolutely no tilt at all. The 1kHz square wave shows a little rounding, as only to be expected given the amplifier's early-ish high-frequency roll-off, while the 10kHz square wave's leading edge is severely rounded—a direct result of the aforementioned high-frequency roll-off. Into a highly reactive load the square wave shows around three cycles of ringing, each one being progressively damped, after which complete stability is achieved: a result that's fairly typical of a well-designed integrated amplifier.

The idle power consumption of the Lavardin ISx Reference was measured as 23.78 watts, so it will draw about the same as a single halogen light bulb from your 240V mains supply whilst ever it is switched on (there is no stand-by power feature).

When you're using the amplifier, it will pull between 36 and 165-watts from your mains, depending on how loudly you're playing your music. *Warwick Marsden*



Lavardin Model ISx Reference Amp – Test Results – Power Output

Channel	Load (Ω)	20Hz (watts)	20Hz (dBW)	1kHz (watts)	1kHz (dBW)	20kHz (watts)	20kHz (dBW)
1	8 Ω	44	16.4	46	16.6	21	13.2
2	8 Ω	37	15.6	40	16.0	21	13.2
1	4 Ω	64	18.0	68	18.3	50	16.9
2	4 Ω	51	17.0	55	17.4	50	16.9

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

Lavardin Model ISx Reference Amplifier – Laboratory Test Results

Test	Measured Result	Units/Comment
Frequency Response @ 1 watt o/p	<1Hz – 16kHz	-1dB
Frequency Response @ 1 watt o/p	<1Hz – 32kHz	-3dB
Channel Separation (dB)	74dB / 74dB / 75dB	(20Hz / 1kHz / 20kHz)
Channel Balance (Direct/Tone)	0.13	dB @ 1kHz
Interchannel Phase (Direct)	2.27 / 0.08 / 1.03	degrees (20Hz / 1kHz / 20kHz)
THD+N	0.0167% / 0.0071%	@ 1-watt / @ rated output
Signal-to-Noise (unwghted/wghted)	75dB / 85dB	dB referred to 1-watt output
Signal-to-Noise (unwghted/wghted)	88dB / 97dB	dB referred to rated output
Input Sensitivity (Input 1)	51mV / 340mV	(1-watt / rated output)
Output Impedance	0.12Ω	at 1kHz
Damping Factor	66	@1kHz
Power Consumption	NA / 23.78	watts (Standby / On)
Power Consumption	36.61 / 165.62	watts at 1-watt / at rated output
Mains Voltage Variation during Test	240 – 248	Minimum – Maximum