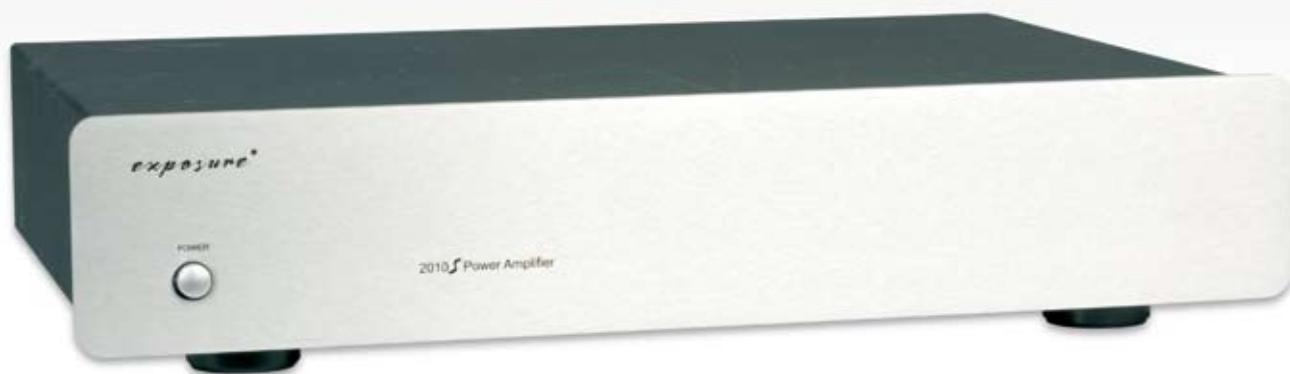
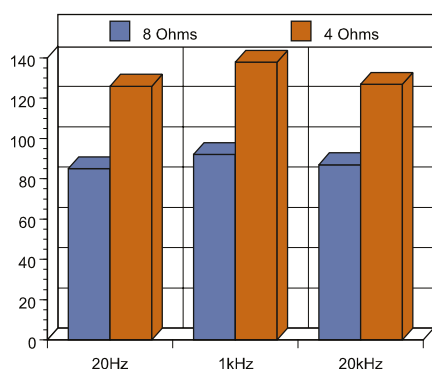




Exposure

2010S Power Amplifier

The Brits have a funny idea as to what constitutes a 'super-power' amplifier. I guess that when many of your country's most famous amplifiers have power outputs of less than 50-watts per channel, any amplifier with a power output above this figure is considered to qualify for the 'super' superlative. But coming at a time when other British companies, such as Musical Fidelity, whose last three amplifiers had power output ratings of 500-watts, 750-watts and 1,000-watts, have started producing truly high-powered amplifiers, calling a 75-watter a 'super-power' amplifier—as Exposure does—is a big call...



Power Output: Single channel driven into 8-ohm and 4-ohm non-inductive loads at 20Hz, 1kHz and 20kHz. [Exposure 2010S-PA]

The Equipment

Exposure's 2010S power amplifier is obviously built on the same chassis as its 2010S integrated, and it has the same front-panel finish. Called 'titanium' it's actually only anodised aluminium, but it looks a treat nonetheless—which is lucky because as you can see from the photograph, the front panel is just a sheer expanse of flat sheet aluminium, broken only by a small 2010S logo, the model identification number (with its rather horribly stylised 'S') and a power button. *[Editor's Note: I strongly disagree with Chris about that 'S'! It has very obviously been designed to reflect the script used in the Exposure logo, which I find rather elegant.]*

The rear of the amplifier is almost as bare as its front, with just a single pair of gold-plated signal inputs, two sets of paralleled speaker outputs (to make it easy to bi-wire), a 240V socket and a mono/stereo mode selector. It's this mode selector that betrays the fact that you can use the 2010S in 'mono' mode, which turns the normally stereo low-current amplifier into a high-current mono power amplifier. The speaker terminals are not the usual multi-way types. Instead Exposure uses totally recessed banana sockets designed to accept either ordinary banana plugs or the unusual fully-shrouded banana plugs.

Internally, you'll see there's a single large printed circuit board, laid out in a symmetrical 'dual mono' format, though both channels share the same 2,000VA toroidal power transformer and power supply components (a discrete diode bridge for rectification and just two electrolytics for smoothing). As you can see from the photograph, there is no heatsinking. Instead, the Sanken bipolar output devices are fastened to a hefty chunk of aluminium that is in turn attached to the aluminium chassis, which then dissipates the resultant heat.

The 2010S measures 90×440×310mm (HWD) and weighs 7kg.

Listening and Operation

I was a bit surprised to find there is no turn-on delay at all when using the 2010S. Press the power button and it's action stations from the word go. The same isn't true if you accidentally short the outputs, in which case you'll hear the click of an internal relay (or two—I couldn't quite be sure) after which you need to turn the Exposure off, then on again, then wait 30–40 seconds until the reset circuit gets its act together. Obviously, you should try not to accidentally short the speaker outputs, though it's nice to know that there's protection if you do...

Having owned quite a few English amplifiers, I confess I was expecting a rather 'genteel' performance from the Exposure, veering on the 'sense and sensibility' side of musical excitement, but the 2010S proved that I couldn't have been more wrong. It stepped right up to the mark, delivering performance that was as

ing two-way bookshelf or 2-1/2-way floor-standing designs, but when driving three-way floor-standers with large woofers, I felt there was a slight loss of deep bass control.

Having been supplied just the one 2010S, I was not in a position to try the mono mode with anything other than a monophonic signal (and just the one speaker!) but I dutifully did so, using a variety of mono recordings, mostly from the '50s and '60s. I am happy to go on record as saying that the sound remained as sweet and pure as I noted in its stereo mode, but I thought the deep bass became a little tighter, which seemed to give more impact to bass lines, and more 'thwack' to transients.

Conclusion

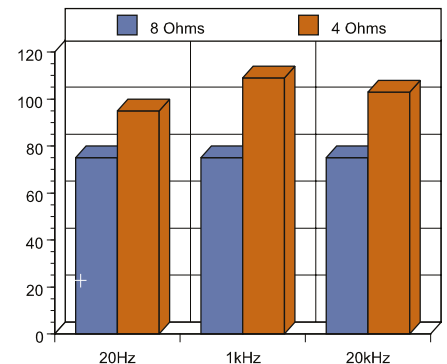
As I hope I have endeavoured to make quite clear throughout this review I was most impressed by the all-round high performance of the 2010S, but am somewhat at a loss to

"I confess I was expecting a rather 'genteel' performance from the Exposure, veering on the 'sense and sensibility' side of musical excitement"

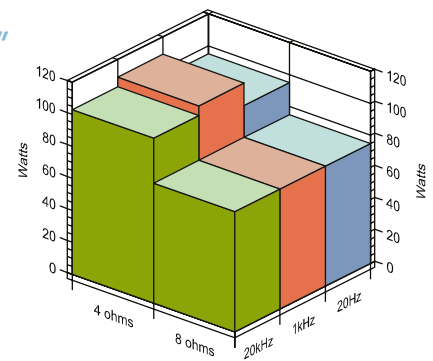
quick and accurate as it was unfailingly precise, with no hint of high-frequency roll-off, or of any tendency to sound 'plummy' across the midrange. Neither was the instrumental sound too sharp, as if someone had taken a strop to the edge. It instead had a lustrous sheen that hinted at purity without being totally transparent. The result was a rather glorious, room-filling spread of sound that was enthralling to listen to. The very deep bass, while never failing to satisfy, had a slight change of character, depending on speaker choice. I couldn't fault the bass when driv-

recommend which readers would be in a position to make best use of it. The audiophiles I imagine who would be most interested are those who already own a high-quality pre-amplifier (or an integrated amplifier with pre-amp outputs whose power amplifier stage has failed) and are in need of a tidy, clean-sounding power amplifier, but not too much in need of a particularly high power output, either because their speakers are very efficient, or in a small room. In all such situations, Exposure's 2010S would be an ideal choice.

Chris Croft



Power Output: Both channels driven into 8-ohm and 4-ohm non-inductive loads at 20Hz, 1kHz and 20kHz. [Exp. 2010S-PA]



Power Output: Single and both channels driven into 8-ohm and 4-ohm non-inductive loads at 20Hz, 1kHz and 20kHz. [Exp 2010S-PA]



- Start-up time
- Insulated bi-wire terminals
- High-current output in mono



- Volume control
- Output power
- Remote power switching

Exposure 2010S Power Amplifier

Brand: Exposure
Model: 2010S
Category: Power Amplifier
RRP: \$1,799
Warranty: One Year
Distributor: RVM Australia Pty Ltd
Address: 112 Cutler Road
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 WA 6164
T: (08) 9417 9944
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E: sales@rvm.com.au
W: www.rvm.com.au

LAB REPORT

Readers interested in a full technical appraisal of the performance of the Exposure 2010S Power Amplifier should continue on and read the LABORATORY REPORT published on the following pages. All 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.



Test Results

Distortion at one watt was relatively low and the structure of the distortion components remarkably similar irrespective of whether the amplifier was loaded with 8Ω or 4Ω during the test except for the level of the third harmonic. You can see from the graphs (*Graph 1* is the 8Ω graph and *Graph 2* is the 4Ω one) that in both cases the second harmonic is sitting at around -95dB (0.001%), the fourth harmonic at around -115dB (0.005%), a fifth harmonic at -110dB , and a sixth at around -120dB . The major difference between the two is that the third harmonic sits at around -98dB (0.001%) when the amplifier is driving 8Ω loads and increases to -83dB (0.007%) when it's driving 4Ω loads. The noise floor sits at around -130dB for both loads and there's not a lot of low-frequency noise.

Distortion increases by about 20dB at rated output, but again the spectral distribution of the distortion components is fairly similar no matter whether the amplifier is being driven into an 8Ω or a 4Ω load except that the higher-order odd-order distortion components get boosted by approximately 10dB when the amplifier is driving the lower-impedance load. Also, inevitably, there are more higher-order distortion components visible on the graph. The small 'spikes' clustered around the test frequency at 1kHz—and the following harmonic distortion components—are indicative that the power supply is operating at its limit and modulating the audio signal, so each spike is accompanied by sidebands spaced 50Hz apart. As you can see, this is particularly evident on the 4Ω graph (*Graph 4*), where the amplifier is delivering 120-watts into the load (single-channel). However, it's as well to remember that the graph's scale makes the level of distortion appear more significant than it really is. The summed total harmonic distortion plus noise figures tell the story here, with the Exposure 2010S Power Amplifier returning results of 0.004% THD+N at 1-watt output and 0.020% THD+N at rated output.

Testing for CCIF intermodulation distortion (*Graph 6*) revealed a regenerated 1kHz signal at a level of -85dB (0.005%). The sidebands clustered around the 19kHz and 20kHz test signals are more than 90dB down and would be completely inaudible.

Channel separation was better than specified by Exposure and remarkably uniform across the frequency range, starting with

Exposure 2010S Power Amplifier - Test Results for Power Output

Channel	Load (Ω)	20Hz (watts)	20Hz (dBW)	1kHz (watts)	1kHz (dBW)	20kHz (watts)	20kHz (dBW)
1	8Ω	85	19.3	92	19.6	87	19.4
2	8Ω	75	18.7	75	18.7	75	18.7
1	4Ω	126	21.0	138	21.4	127	21.0
2	4Ω	95	19.8	109	20.4	103	20.1

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

Exposure 2010S Power Amplifier		Test Results
Test	Measured Result	Units/Comments
Frequency Response @ 1 watt	6.2Hz–35kHz	–1dB
Frequency Response @ 1 watt	3.5Hz–66kHz	–3dB
Channel Separation	66dB / 66dB / 55dB	(20Hz/1kHz/20kHz)
Channel Balance	0.04dB	@ 1kHz
Interchannel Phase	0.02 / 0.01 / 0.22	deg (20Hz/1k/20k)
THD+N	0.004% / 0.02%	1 watt/rated o/p
S/N Ratio (unweighted/weighted)	93dB/102dB	dB re 1 watt output
S/N Ratio (unweighted/weighted)	112dB/120dB	dB re rated output
Input Sensitivity	186mV/1.61V	(1 watt/rated output)
Output Impedance	0.3 Ω	OC = 2.8292V
Damping Factor	26.6	@ 1kHz
Power Consumption	NA/14 watts	Standby/On
Power Consumption	38 watts /266 watts	1-watt/Rated O/P
Mains Voltage Variation	241–245 volts	Min–Max

a best of 66dB at 20Hz and staying at this level up to 1kHz, after which it diminished by 11dB, returning 55dB at 20kHz. Channel balance was an excellent 0.04dB. Inter-channel phase was very good at 20Hz (0.02°) and 1kHz (0.01°) and only very slightly out at 20kHz where it returned a still-excellent result of 0.22°. The amplifier's signal-to-noise ratio (referenced to rated output) was measured at 112dB (unweighted) and increased to 120dB with 'A' weighting. Both are outstanding results. Input sensitivity was 186mV (for one watt out) or 1.61V (for rated output), so you'll be able to drive this power amplifier not only from any pre-amplifier, but also from any line-level device (so long as that device has its own volume control!). The amplifier's damping factor proved to be quite low: just 26.6 at 1kHz. Many years ago, research by Canadian Floyd E. Toole demonstrated that in some circumstances, amplifiers with damping factors lower than 30 could be audibly distinguished from amplifiers with higher-damping factors, so I would suggest that the 2010S will perform better with speakers with relatively small-diameter woofers (in the region of 210mm) than with speakers that have large, heavy bass

drivers (305mm diameter or greater).

Newport Test Labs' measurements of power output showed that the Exposure 2010S power amplifier met its 75-watt per channel (into 8Ω) power specification right across the frequency band, whereas Exposure actually rates it for this output only at a single frequency: 1kHz. When only a single channel was driven, the 1kHz output at this same frequency was measured at 92-watts (19.6dBw), but at the frequency extremes of 20Hz and 20kHz, the amp managed just 85-watts (19.3dBw) and 87-watts (19.4dBw) respectively.

Exposure doesn't ever state power output into 4Ω loads, and Newport Test Labs found that the 2010S did not even approach the theoretical ideal of doubling its output, though it certainly broke into triple digit territory, with the test sample delivering 109-watts (20.4dBw) per channel both channels driven into 8Ω at 1kHz and only a little less (103-watts/20.1dBw) at 20kHz. At 20Hz power output fell to 95-watts per channel (19.8dBw).

When tested with 2Ω loads, the Exposure 2010S' current-limiting circuit proved to be very quick off the mark, activating so quickly after the 2Ω resistors were connected ►

and power applied to the test circuit that it actually proved impossible to make any measurements. As a result, I would suggest using only speakers whose minimum impedance does not fall below 4Ω , which would generally mean you'd have to use speakers with a 'nominal' impedance of at least 6Ω or (preferably) 8Ω .

The Exposure 2010S' overall frequency response was measured as 6.2Hz to 35kHz -1dB and 3.5Hz to 66kHz -3dB . Across the audio band, the response was 0.15dB down at 20Hz and 0.31dB down at 20kHz so normalised, the Exposure's response is 20Hz to 20kHz $\pm 0.15\text{dB}$. All these responses were measured when the amplifier was driving conventional non-inductive 8Ω laboratory-grade resistors. On *Graph-5* this so-called 'resistive' response is shown as the black trace. The other trace on this graph is also a frequency response trace, but this time it shows the Exposure's performance when driving a simulated loudspeaker load. Normalised, the Exposure 2010S power amplifier's frequency response under these conditions was measured as 20Hz to 20kHz $\pm 0.2\text{dB}$.

"I would suggest using only speakers whose minimum impedance does not fall below 4Ω "

Square waves can convey quite a lot of information in a compact format, and you can see that the 100Hz square wave from the 2010S is quite 'tilted' rather than 'square', which reflects the fact that the 2010S's low-frequency response does not extend to d.c. In general terms, the more severe the tilt, the less extended the low-frequency response. The shape of the 1kHz square wave is good, but you can see that the leading-edge is curved-off where the vertical meets the horizontal, which indicates the amplifier's high-frequency response limit, though this was quantified precisely in the previous paragraph. This limitation is also reflected in the shape of the 10kHz square wave, which is also rounded. Although all these square waves show the effects of the somewhat restricted frequency response, the lack of overshoot or ringing visible on the 1kHz square wave when the amplifier is driven into a highly capacitive load is remarkable. As I have noted on previous occasions, this characteristic has a high correlation with amplifiers that are judged to sound good in subjective listening tests.

Steve Holding

