REDGUM MAGNIFICATA

AMPLIFIER SYSTEM

Redgum's seemingly strangely-named Magnificata system (comprising two monobloc power amplifiers and a stereo passive preamplifier) released to celebrate the occasion of Redgum's 21st birthday, is not exactly a new design, since the power amplifiers are heavily based on the company's 'Signature Series' RGM300ENR and the pre-amp on the one found in the company's Splendens system.

I'm not privy to any of the minor changes that have been wrought by designer Ian Robinson, but he says the major changes to each monobloc include larger (1kVA) power transformers with a higher current capability, the use of 12×250-watt MOSFET output devices (up from just 4), and an increase in the size of the power supply's capacitor bank to 100,000µF (up from 40,000µF)… all of which mean higher power output and the ability to drive speakers with impedances as low as one ohm (1Ω). The most visible change is the addition of Redgum's 'sine wave' heat sink which is located (somewhat controversially, which I'll discuss later) underneath the power amplifiers and passive pre-amplifier.

THE EQUIPMENT

Let's get the reason for that 'strange-sounding' name out of the way first. Being a proud Aussie, who lives and works in rural Victoria, Robinson named his company after a tree that is Australia's most widely distributed eucalyptus species, the river red gum *[Eucalyptus camaldulensis*]. After many years of toying with using letters and numbers to identify the different Redgum amplifiers (see above!), the company switched to naming models in its Amplifolia range after other Eucalyptus genuses: *stellulata*, *articulate*, *splendens* etc., hence this particular amplifier was named for the Eucalyptus genus *magnificata*. One can only suppose that that company's promotions manager, Lindy Gerber, is something of a botanist… or an arborist. (Redgum still uses numbers and letters to identify its 'Black Series' amplifiers which it makes in China. All Amplifolia models are made in Australia.)

Redgum also manufactures the front panels of the components that are used on components in the Amplifolia range from river red gum. This means the front panels look superb, but it makes them tricky to attach to the underlying metal chassis, and also that when labelling is required to identify controls (volume, source switching, etc) it must be in the form of 'stick-on' labels which, no matter how well they're done, always look as if they're 'stuck on'. Alongside the Redgum logo (also stuck on) is a keyed switch. This switch once used to be used to turn Redgum's amplifiers on and off, but these days, it's only a secondary switch: the main power switch is located on the rear panel. (The reason why Redgum used a key rather than a switch in the first place is fascinating: you can read all about it at *www.tinyurl.com/redgum-interview*

In addition to its unusual choice of switches, Redgum also uses an unusual method of enabling users to adjust channel balance.

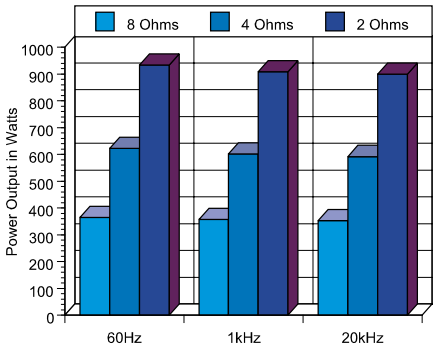
Rather than provide a balance control, like most other manufacturers, many Redgum amplifiers have two volume controls, one for the right channel, and another for the left channel. By adjusting these individually, it's then possible to adjust the balance between the channels, and therefore there's no need for a separate balance control. Unfortunately, this also makes it almost impossible to adjust the two controls for identical gain, something some reviewers have criticised. On the Magnificata, Redgum has addressed this issue by motorising the volume controls, then providing a microprocessor that, once you have set the level in one channel, can be instructed to automatically adjust the volume of the other channel to deliver exactly the same gain (or at least to better than ±0.1dB, according to the specifications). However, this is only an option on Redgum models that are able to be remote-controlled. If you choose a non-remote control version, it's suggested you wrap an elastic band around the two volume controls, so that moving one moves the other. Talk about Heath Robinson (no relation)! My alternative suggestion would be to order your Redgum with only a single volume control which, because each one is built by hand by the designer himself, is entirely do-able.

Not only do you get two volume controls, you also get three remote controls! Don't get excited, because two of them aren't particularly flashy, but the other is quite a nice touch-screen learning remote made by Sunwave into which Redgum has pre-programmed all the Redgum codes. The other two are low-cost 'credit card' style remotes that use a button-style CR2032 battery. So why are there three remotes? Originally, only the small remotes came with the unit, and a spare was included just in case you temporarily 'lost' one down the back of a couch. Then, after the company switched to providing the Sunwave remote, some customers thought it was too difficult to use, so Redgum started supplying all three. But wait, there's more!

Redgum then developed another option, which was a free app you could load onto your mobile phone, so you could control the system with your phone. This had the drawback that it was only available with phones that had infra-red 'blasters' built in, which ruled out all iPhones and many Android phones. However, assuming your Android phone has an IR blaster, you can certainly use it to control the Magnificata. But, in news hot off the press, very soon you'll be able to use any mobile phone at all, because at the time of going to press Redgum had commenced development of a Bluetooth remote control option which may be available by the time you read this review. And, remember, despite all these remote control options, you can always operate the system manually, from the front panel.

Bluetooth remote control may be available by the time you read this review, making a total of five remote options...

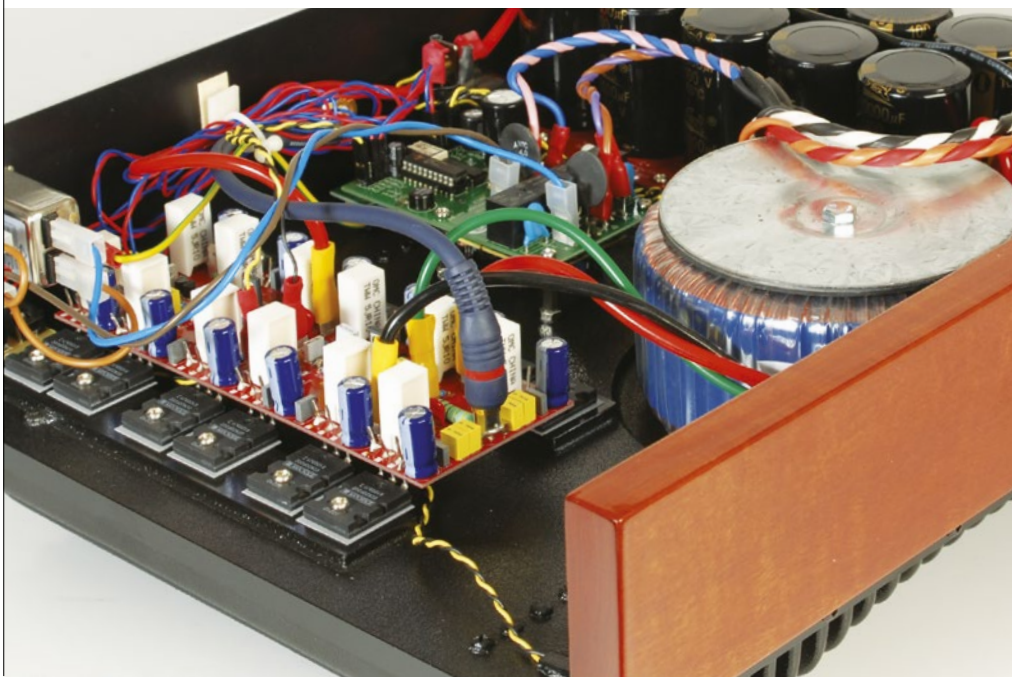
Time now to explain the controversy surrounding Redgum's 'sine-wave' heat sink, which is the curved finning that's visible under all three Magnificata components. This finning is controversial on several counts. Firstly, it's *underneath* the power amplifier,



a location that is—thermally speaking—the worst place to put a heat sink. Ian Robinson admits that it's illogical, but says it's there because he likes the look of it there, and that it's so big—and therefore so thermally efficient—that it really doesn't matter where he locates it, because it will dissipate heat from the output devices (the MOSFETs) so effectively that it will, in his words: '*never get hotter than blood-warm*'.

The other part of the controversy is that because all the internal components are located above the heat sink, those components will run hotter than they otherwise would. Robinson's answer to this is that he makes sure that all the components he uses—capacitors, resistors, diodes, capacitors, etc—are operated well within their manufacturer's

Newport Test Labs measured temperatures after one hour continuous operation at maximum heat production power and the the hottest point on the heat sink was measured at 78°C and the coolest point at 55°C. The temperature of each of the ten capacitors (which are rated at 105°C) in the power supply was also measured and although the temperatures differed very slightly on each capacitor, the average was 49°C.



temperature ratings, and points to Redgum's seven-year amplifier warranty as proof of reliability. Somewhat less controversially, but nonetheless noteworthy, is that the sine-wave heat sink fitted to the Magnificata's passive preamplifier is completely unnecessary, since there is no heat to dissipate. It's there only to maintain cosmetic uniformity across the three components that make up this system. That said, if you stack the three components on top of each other, the passive preamplifier's heat sink *will* be dissipating heat from the power amplifier underneath it, so perhaps not totally unnecessary after all. However, I certainly would not recommend 'stacking' these amplifiers: the lead photograph for this review, which shows the three components that comprise the Magnificata stacked one atop the other, was for illustration purposes only. Place them on separate shelves on your equipment rack! (Which, by the way, should be well-built, because all-up, this Magnificata system weighs 60.5kg.)

IN USE AND LISTENING SESSIONS

Firing up Redgum's Magnificata system is a whole load of fun, because after applying mains power you will first hear a 'beep' then a 'whooping' sound whose pitch slowly increases, followed by some more 'beeps', the number of which indicates which version of firmware is being used by the microprocessor that's performing all these tricks, followed by a further series of clicks as that same microprocessor tests all the relays and circuits for correct operation prior to full voltage being applied to enable operation. At the same time the microprocessor checks the position of the volume controls, and if they're set more than half-way up, rotates them backwards, to below one-quarter rotation. It also sets the active input to CD1.

This same microprocessor does lots of other fancy tricks, such as remembering the volume level you've set for each input, ramping the volume up and down, maintaining a balance off-set if you've set one, adjusting between normal muting and variable muting, and more. And if you use the special 'Magic' button on the remote (or on the App), the microprocessor will reset all options to the factory default, after which it plays a series of tones that is the motif of the children's song 'Baa Baa Black Sheep.' (And no, I'm not kidding… I told you this amplifier was a whole load of fun!)

But what really brought a smile to my face is when I started listening to the Magnificata, because it sounded truly amazing. My first impression was of there being effortless power on tap. Nearly all people—and more than a few audiophiles—are unaware that even if you listen at fairly low playback levels, if you don't have a powerful amplifier, musical peaks won't be reproduced accurately. And, of course, if you listen at loud levels, it's absolutely essential that you have a high-power amplifier! I can happily say that it won't matter what speakers you use, how large your room is, or how loud you listen to your music, Redgum's Magnificata amplifiers will provide all the power you will ever need… and then some! I fired up Prince's *Purple Rain* with the volume dialled to the max and wow did the sound of the drum kit power through! Equally impressive was the sense of air around the sound, particularly in the introductory bars, and the wail of Prince's guitar was truly inspirational. The speed of the Magnificata was proved with yet more Prince (*Sign 'O' the Times*) thanks to the syncopated beat and synthesised sounds, which the Magnificata reproduced exactly… so exactly that it was really exciting listening. So exciting, in fact, that I started adding additional percussion via the arm of my chair in my enthusiasm for the sound.

All that power on tap was just crying out for some organ music, so I fired up Christopher Wrench's recording of Bach's Organ Sonatas, beautifully recorded on SACD by Melba. The sound of the Carsten Lund organ (in Garnison's Kirke, Copenhagen) is fabulous. The tonal quality of the Nasat 3' stop Wrench uses in the *Sonata No 4* is outstanding, and a true work-out for any tweeter. Also, listen to the sound of the rare Quintadena 8' stop in *Sonata No 3*. Glorious! The deep bass was also exceptional, particularly the 16' Sub-bass that Wrench uses in preference to the Principal 16-footer. The lowest notes of the Sub-bass were a tad more forward than I'm used to, so I suspect Robinson has tweaked the low-frequency response—as he is wont to do with all his amplifiers—but as the overall sonic balance was actually improved, this suited me just fine.

CONCLUSION

Yes, Redgum's Magnificata is pricey, but you're buying a unique, quirky—and extraordinarily powerful—three-piece amplifier system that is personally hand-crafted in Australia by the designer, so it's more a work of art than a piece of electronics. G.B.

Readers interested in a full technical appraisal of the performance of the Redgum Magnificata Power Amplifier should continue on and read the LABORATORY REPORT published on the following pages.

CONTACT DETAILS

Brand: Redgum Audio
Model: Magnificata System
RRP: $24,500
Warranty: Seven Years
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Address: 401 Belgrave-Gembrook Road
Emerald VIC 3782
T: (03) 9001 6788
E: info@redgumaudio.com
W: www.redgumaudio.com

⊕
- High power output
- Low-impedance capability
- Hand-made in Oz

⊖
- Stick-on labels
- Industrial design

ALSO SEE LAB REPORT ON P 40

LABORATORY TEST REPORT

Redgum Magnificata Power Amplifier Power Output

Channel	Load (Ω)	60Hz (watts)	60Hz (dBW)	1kHz (watts)	1kHz (dBW)	20kHz (watts)	20kHz (dBW)
1	8 Ω	378	25.7	378	25.7	353	25.5
1	4 Ω	622	27.9	625	27.9	621	27.9
1	2 Ω	933*	29.7	968*	29.8	960*	29.8

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

*Protection circuitry activated at indicated power output level.

Redgum Magnificata Power Amplifier — Lab Test Results

Test	Measured Result	Units/Comment
Frequency Response @ 1 watt o/p	*6Hz –82 kHz	–1dB (*See Copy)
Frequency Response @ 1 watt o/p	*6Hz – 116kHz	–3dB (*See Copy)
THD+N	0.01% / 0.01%	@ 1-watt / @ rated output
Signal-to-Noise (unwghted/wghted)	77dB / 91dB	dB referred to 1-watt output
Signal-to-Noise (unwghted/wghted)	103dB / 115dB	dB referred to rated output
Input Sensitivity	68mV / 1.27V	(1-watt / rated output)
Output Impedance	0.02Ω	OC = 3.291V 8Ω = 3.2101V
Damping Factor	400	@1kHz
Power Consumption	N/A / 74	watts (Standby / On)
Power Consumption	43 / 547	watts at 1-watt / at rated output
Mains Voltage Variation during Test	241 – 249	Minimum – Maximum
Heatsink Temperature (Degrees C)	40˚	@ 1-watt continuous

Since the Redgum Magnificata System uses two monobloc amplifiers, *Newport Test Labs* measured only one, as the results for the other would be identical. In terms of power outut, the Redgum Magnificata delivered 378-watts continuously into 8Ω loads at 60Hz and 1kHz, with output dropping just 0.2dB for a maximum power output at 20kHz of 353-watts. Since Redgum specifies power output of the Magnificata as being 350-watts into 8Ω, all these results are better than specification. Into a 4Ω load, *Newport Test Labs* measured power output at 625-watts at 1kHz, 622-watts at 60Hz and 621-watts at 20kHz—once again all very comfortably higher than Redgum's specification of 550-watts.

Redgum is one of the very few manufacturers these days that not only builds amplifiers capable of driving 2Ω loads, but are also capable of delivering their full rated output into 2Ω loads. As you can see from the chart, the Magnificata was able to deliver nearly one kilowatt of power into 2Ω loads: 933-watts at 60Hz, 968-watts at 1kHz and 960-watts at 20kHz.

Technically-minded readers paying attention to detail might have noticed that the low-frequency power measurements were made at 60Hz, rather than 20Hz, which is the usual frequency for low-frequency power output testing. This was because the Magnificata has inbuilt protection circuitry that starts limiting continuous power output below 60Hz, with the level of protection gradually increasing with decreasing frequency, so that at 20Hz, maximum *continuous* power output into 8Ω is limited to 171-watts. However, the circuit only triggers with continuous signals, such as the sine waves used for testing. With music signals, the protection only starts cutting in at 350-watts (8Ω), 550-watts (4Ω) and 900-watts (2Ω).

Protection circuitry is also used to limit the Magnificata's low-frequency response to 6Hz, as you can see from the tabulated figures which show the –1dB response as extending from 6Hz to 82kHz and the –3dB response as extending from 6Hz to 116kHz. Although these are the points at which the high-frequency responses are 1dB and 3dB down respectively, the low-frequency response of the Magnificata is boosted at low frequencies, as you can see on Graph 6, where it's +0.09dB at 160Hz, +0.7dB at 50Hz, +3.0dB at 20Hz and +7dB at 8Hz. So a 'normalised frequency response, which would include both 'plus' and 'minus' dB variations, would be 20Hz to 116kHz ±3dB.

Graph 6 shows the Magnificata's frequency response into both an 8Ω non-inductive laboratory test load (black trace) and when the amplifier is driving a simulated loudspeaker load (red trace). You can see that both traces are virtually identical, which means the Magnificata's 'sound' will remain the same no matter what the impedance (and irrespective of variations in that impedance) in the loudspeakers you use in conjunction with it. The low-frequency response of those speakers will, however, be gradually and very slightly boosted below 160Hz, as shown. Note that although the low-frequency rise looks a little alarming on the graph, this is merely a consequence of the graph scaling. The rise is so minor that if music were playing at, say, one watt, the result would be an output of only two watts at 20Hz. (**Editor's Note**: *See Breakout Box 'LF Rise in Redgum Anps' on page 42 for Redgum's reason for this rise.*)

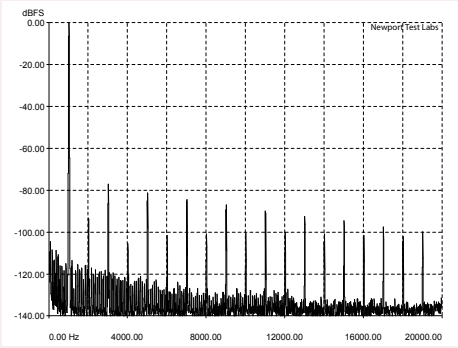
The output impedance of the Magnificata was measured at 0.02Ω at 1kHz, putting the amplifier's damping factor at an outstanding 400—far in excess of what would be required to keep even the largest bass drivers under control.

Distortion is shown in Graphs 1 through 4, the first two showing distortion at one watt into 8Ω and 4Ω loads, and the second two showing distortion at rated output into both loads. Overall distortion was slightly lower into 8Ω than into 4Ω, but the differences were minor. As you can see, when driving an 8Ω load, with the exception of the third harmonic at –78dB (0.0125%) all other harmonics were below 80dB (0.01%) with the odd-order harmonics predominating.

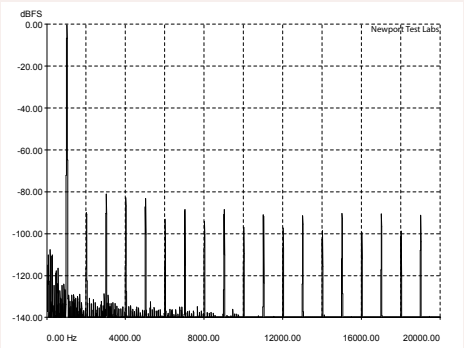
Distortion at rated output was similar in magnitude to that at one watt (Graphs 3 and 4) and again with the 8Ω result displaying marginally lower distortion than the 4Ω result. This time, however, rather than the odd-order harmonics predominating, the odd-order and even-order harmonics are more balanced. The most obvious difference is the much-lower noise floor, as you'd expect, though some low-frequency, mains-related noise is still visible at the far left of each graph.

Newport Test Labs measured the signal-to-noise ratio of the Magnificata at 77dB unweighted and 91dB A-weighted, referred to an output of one-watt, and 103dB unweighted and 115dB A-weighted referenced to rated output. Input sensitivity was 68mV for a one-watt output and 1.27-volts to achieve rated output, and the amplifier will pull 547-watts from your 240-volt mains power supply when operating at maximum output.

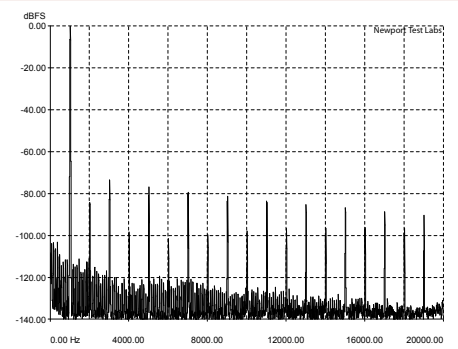
Newport Test Labs usually measures and reports on power amplifier heat sink temperatures, and for the Magnificata, after one hour of continuously operating with a sine wave at an output of one-watt, that temperature was just 40°C. Although this power output is far higher than would be used domestically, the lab then measured the temperatures after the amplifier had been operating at 100-watts for



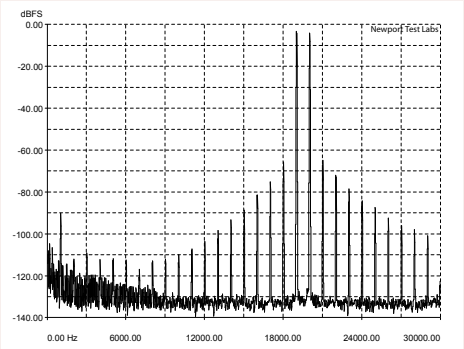
Graph 1: Total harmonic distortion (THD) at 1kHz at an output of 1-watt into an 8-ohm non-inductive load, referenced to 0dB. [Redgum Magnificata Power Amplifier]



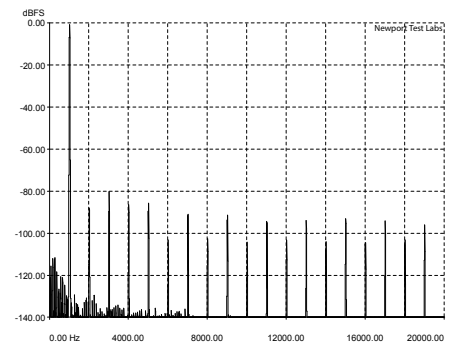
Graph 4: Total harmonic distortion (THD) at 1kHz at an output of 550-watts into a4-ohm non-inductive load, referenced to 0dB. [Redgum Magnificata Power Amplifier]



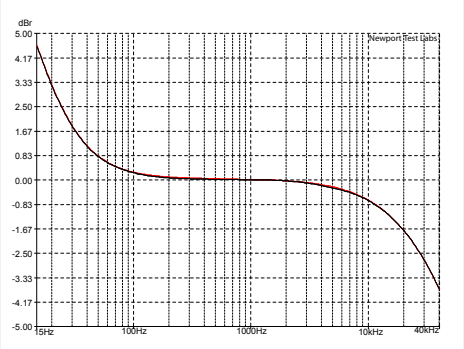
Graph 2: Total harmonic distortion (THD) at 1kHz at an output of 1-watt into a 4-ohmnon-inductive load, referenced to 0dB. [Redgum Magnificata Power Amplifier]



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, ref. to 0dB. [Redgum Magnificata]



Graph 3: Total harmonic distortion (THD) at 1kHz at an output of 350-watts into an 8-ohm non-inductive load, referenced to 0dB. [Redgum Magnificata Power Amplifier]



Graph 6: 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). [Redgum Magnificata Power Amplifier]

one hour (around one-third rated power, which is the point at which the amplifier's thermal efficiency is lowest and therefore a 'worst-case' scenario for heat). After one hour at 100-watts continuous output with a 1kHz sine wave, the hottest point on the heat sink was measured at 78°C and the coolest point at 55°C. The technicians also removed the casing from the amplifier immediately after the test and measured the temperature of each of the ten capacitors (which are rated at 105°C) in the power supply and found those temperatures differed very slightly on each, but the average was 49°C.

Redgum's Magnificata has very obviously been designed with sonic preferences prevailing over 'numbers' and also with a view to 'bullet-proofing' the circuitry to ensure the amplifier will be completely protected in all 'misadventure' situations.

The result is that it will certainly sound different to amplifiers whose designers are following the 'straight wire with gain' approach to amplifier design, but if one allows for this design philosophy, its actual electronic performance is excellent. *Steve Holding*

LF Rise in Redgum Amps

When we asked Ian Robinson the reason for the boost in the low-frequency response of the Magnificata he provided two responses, one short and simple, the other longer involving technicalities and psychoacoustics. **His short reply**: 'I consider that the introduction of a consistently graded lift is a much more accurate way of gaining a believable musical result.'

His long reply: 'I have yet to observe any speaker in any price bracket that can't benefit from a lift of +1dB at 40Hz or +3dB at 20Hz. So if we are to get anywhere near to attaining the desired "flat" response from a speaker (though that remains contrary to the laws of physics), it has to be approached via creating a flat response from the entire system. Take, for example, the effect at 20Hz. This being the same frequency range where conventional speakers are falling dramatically (if there is any response worth reporting at all), hooked up with a Redgum as part of the system, their response is 3dB up i.e. 3dB above the accepted range at a point where even the best speakers are usually 30–40dB down. Doing the maths, 30dB down, countered by 3dB up… maybe it is mathematically ambitious to consider that to be a rising response in the total scheme of things! Rather it can be seen as a slight moderating effect to the system. As to answering the question: "But why do it?", the drop in these frequencies are heading into the range where we feel more than we hear. So rather than being a countermeasure just to "extend the bass" for quotable specs, it is done for reasons of musicality. At these frequencies, feeling the impact of an instrument becomes more critical than hearing it for the perceived realism of the music. Despite what any speaker manufacturer claims, independent graphs always show a falling response of the bottom end. You can't beat physics! But you can work with it, as psychoacoustics has shown how the perceived realism of instruments is affected by changes in other/unrelated sections of the frequency range. Said not as a justification, but more as an industry reality check, … recently, I have become aware that speakers which are internally bi- or tri-amped often use this principle to extend the bass. So, yes, my design inclusion (but one focused on a systemic result) was implemented sooner, but for better reasons than just improving the look of the specs! Indeed, the presence of a similar "rise" has been a part of each Redgum amplifier's design over the past 22+ years. But it must be stated that considering the price point of the speakers that are likely to be used with an amplifier of this price, and thus their likelihood of having a decent extended frequency range, the "rise" in the Magnificata is an extremely subtle one in application. Simply put, as part of the interplay of a system, it is there to give "feeling" to the instruments.' *Ian Robinson*