

# hi-fi

WORLD

APRIL 2005

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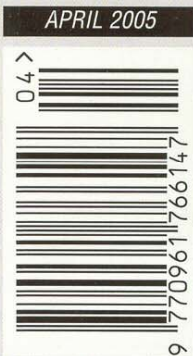
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# diy supplement

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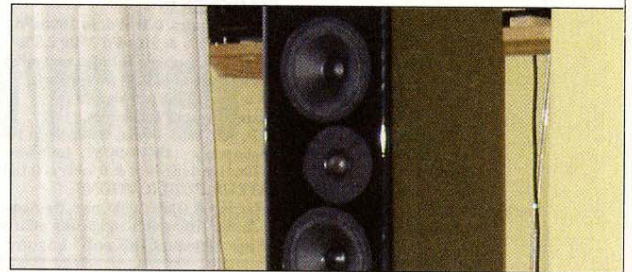
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# The ProLogue One AABB Upgrade



**Making the Good even Better. Neville Roberts investigates.**

drivers feeding a pair of EL34s running in Class AB push-pull mode to deliver the 35W output. The quality of finish of the amplifier is very high. Herman achieves this level of quality by having them built in China.

The power supply uses solid state rectification, but employs a smoothing choke. The only printed circuit board used is for the fixed bias components. This is the board that will be replaced by the Adaptive AutoBias Board, or AABB. The upgrade consists of replacing the fixed bias board with this board. However, before attacking the ProLogue One with my soldering iron, I connected the amplifier into my system and settled down for some listening tests with the unmodified unit.

My initial reactions were most favourable. With no signal and my ear close to the bass unit of my somewhat inefficient transmission line loudspeakers, I could detect no hum whatsoever - quite a feat for a valve amplifier! Starting off with some baroque music, the amplifier had the distinctive 'valve' sound with a warm but clear top end. At normal listening levels, the strings sounded melodic and flowing with no

packed a punch, but the clamouring of the bells in the conclusion made me feel that the amplifier was having a little difficulty in keeping up with all that was going on!

On the lighter side, Thelma Houston's vocals in the Sheffield Labs direct-to-disk recording "I've Got the Music in Me" had a presence that was quite captivating and the bass was very well extended, but here again it tended to be a bit muddy if you turned the wick up.

All in all, it is a very good sounding amplifier, perhaps best suited to either rock music or small musical ensembles and for the price, it is very hard to beat.

## THE ADAPTIVE AUTOBIAS SYSTEM

For valve output stages, either fixed bias or self bias (auto bias) is used. Fixed bias is used in the original ProLogue One as it is efficient and has minimal effect on the signal. Self-bias requires a large capacitor to bypass the cathode resistor and this arrangement has the potential to affect audio quality more than fixed bias and also tends to waste power. However, fixed bias has problems too as the circuitry is unable to track the valves' changing characteristics over time. It can also exhibit non-linear behaviour under standard conditions, adding distortions and unwanted signals to the audio signal.

In an effort to get rid of these drawbacks with Fixed Bias, Marcel and his team have developed the Adaptive AutoBias system. The system is inherently linear and presents no reactive load to the valve circuitry whatsoever. It is also completely stable under all normal temperature and voltage conditions. They have achieved this by employing high quality parts throughout the circuitry that have precisely defined

**H**aving read the review of the splendid £800 ProLogue One by Dominic Todd in the August 2004 issue of Hi-Fi World magazine, I was delighted to hear from Herman van den Dungen that he had just produced an upgrade for this amplifier. Herman is the man behind the Ah! brand that gave us the amazing Njoe Tjoeb 4000 valve CD player and he is now designing and marketing valve amplifiers under the name of PrimaLuna. They are available from Absolute Sounds in London (020 8971 3909). The ProLogue One is the first of the range to be produced

"My initial reactions were most favourable"

and Dominic scored it as 'Excellent' and also good value for money. However, he did indicate that it had a few shortcomings and I was hopeful that some of these would be addressed by the upgrade.

The amplifier is as heavy as you would expect with quality transformers, weighing in at 35.5lb. The valve line up consists of Electroharmonic 12AX7 and 12AU7

harshness. Image placement was very good indeed, although there was not the depth to the sound that I was used to.

Moving on to a full orchestra, the bass drum in the opening section of Stravinsky's The Firebird Suite was clearly there, although it did seem a little uncontrolled. Pulling out all the stops with the infamous Telarc digital recording of Tchaikovsky's 1812 Overture, the live cannon certainly





**Beautiful design revealed when the cage is removed.**

temperature coefficients.

The other problem to overcome is that a fixed bias system does not compensate for the valve's tendency to use the audio signal as an extra bias voltage, especially at high levels and low frequencies. The fixed bias, as the name implies, keeps on injecting a fixed voltage upon which the audio signal rides. This can result in moments of impoverishing the valves, pinching them off slightly, producing instances of rapidly elevating crossover distortion and compression, bringing a certain harshness to the sound. This could be the cause of the criticisms I found with the unmodified ProLogue One.

The Adaptive AutoBias system avoids these problems by reading the audio signal and making infinitesimal adjustments to the bias voltage which, Marcel claims, results in far superior valve behaviour and dramatically reduces distortion levels by more than half. So much for the theory, but will it work in practice?

## INSTALLING THE AABB

Figure 5 shows the upgrade parts that Herman sent me from Holland. Everything needed was in the kit of parts, including a pair of resistors and heat-shrinkable tubing to enable a small modification to the global feedback network to be made and four resistors fitted to the ends of each wire going to the EL34s to improve stability and reduce HF distortion. Plugging in my trusty soldering iron, I set to work on the ProLogue One. Firstly, the power supply capacitors were checked with my multimeter to ensure they were completely discharged; otherwise a 100ohm, 9W resistor applied across the terminals does the job far less painfully and more effectively than my fingers! Now the original fixed bias board could be removed. This entailed unsoldering 8 wires from the valve sockets, two power supply wires from the board and removing the two screws that held the board

in place.

Now it was time to fit the new AABB. This was a bit more fiddly as it involved cutting, stripping and re-routing leads from the power supply to accommodate the new board - 7 connections in all. The board could then be screwed in place and finally the 12 wires from the AABB had to be connected to the appropriate valve

socket pins.

Finally, the global feedback network was removed from its original location, to allow the additional resistor to be installed in its place. The feedback network was then re-installed closer to the valve by wiring it directly onto the valve base. That completed the installation of the upgrade.

The upgrade board needs initial adjustment. All that is required is to connect a multimeter set to the 2VDC range to pin 8 (the cathode) of one of the EL34s and switch on. As the amplifier warms up, the voltage should start to slowly rise to about 0.6V, then drop to around 0.2V and finally settle on 0.35V. If the voltage is too low, the potentiometer should be adjusted to set the final voltage to 0.35V. The remaining three valves can be checked to see if they behave in the same way to ensure that the board has been wired in correctly. No further adjustment of the potentiometer should be required.

It is interesting to note the behaviour of the circuit when checking the remaining valves as this entails switching off the amplifier, moving the multimeter to the next valve's cathode and switching on again. Since the amplifier has already warmed up and given that solid-state rectifiers have been used in the power supply, one would normally expect the output valves to conduct fully for an instant at switch-on, with a fixed bias design. This would shorten the life of the valves. However, the AABB includes circuitry to compensate for this and when power is re-applied, the voltage (from the residual charge stored in the power supply capacitors) drops to zero for a couple of seconds, before slowly rising as before. All clever stuff!

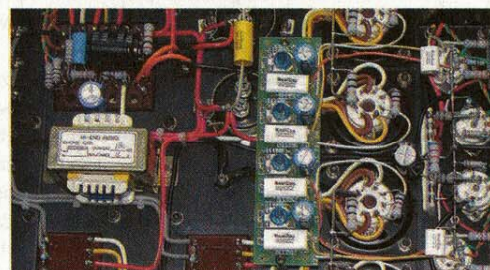
## LISTENING TESTS

Now it was time to settle down to do some serious listening tests. I was

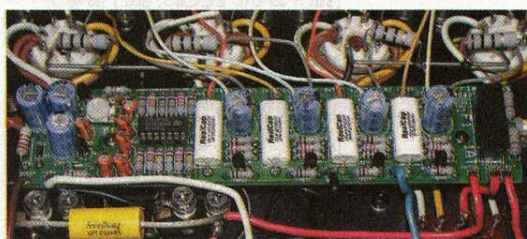
hoping to hear improvements, such as greater clarity and tightness of bass and a reduction of harshness. I was not disappointed: the improvement was nothing short of amazing! The overall difference with the AABB installed is considerable, and almost unbelievable when you take into consideration that it was the same amplifier, but biased more intelligently.

The strings positively sparkled with clarity and had lost the harshness that I had previously detected at higher volumes. Baroque music now sounds cleaner and clearer. As for the bass, it was still tuneful, but was much more controlled and tight. My recording of the 1812 Overture with live cannon was breathtaking and the clamouring of the bells in the conclusion was clear and uncluttered - no problem for this amplifier now! The bass drum had clearly been tightened up in the opening section of the Stravinsky. One criticism I had of the unmodified amplifier was that it seemed to have difficulty in coping with the complex sound of a full orchestra. The AABB had solved that problem completely. Organ music sounds superb - totally clear with clean bass registers and a transparent top end. The vocals of Thelma Houston were so much clearer, even at high volumes, and did not sound boxed in as they did previously.

The AABB will add about £100 to the cost of the ProLogue One. I would say that, at £900, this is even better value than the original ProLogue One at £800. It is beautifully made and looks splendid, especially with the valve cover removed (who would want to keep them covered anyway?)



**The unmodified inside of the ProLogue One.**



**The finished upgrade.**