AVONDALE AUDIO

Regulator Modules

PRODUCT BROCHURE

HCR200

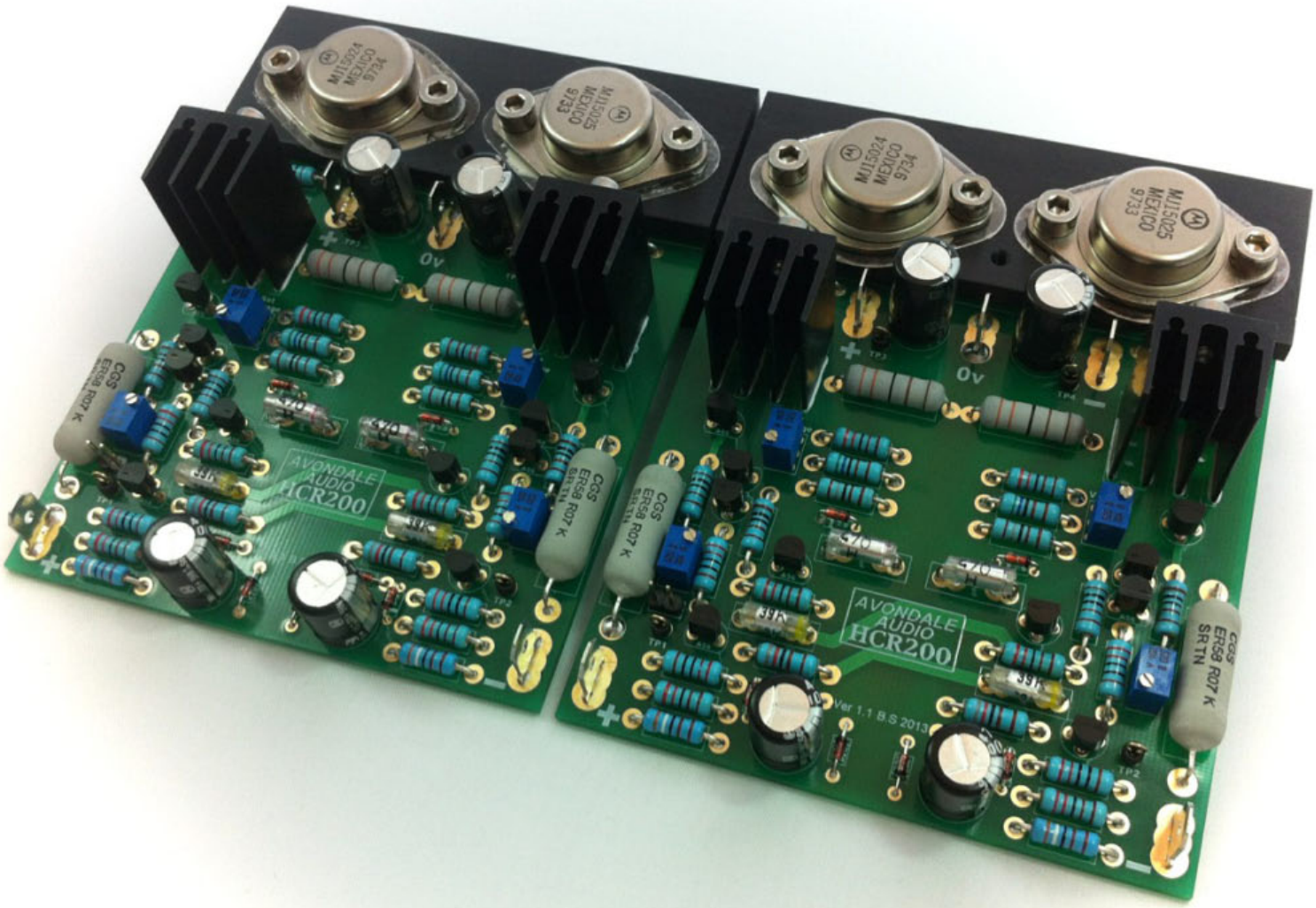
The new Avondale Audio HCR200 is being introduced for those listeners whom would like to experience the increased detail, transparency and overall musical insight brought forward by accurate regulation of the power supply. The power supply feeds the delicate circuits that deal with the signal, stable, precise power supply rails, even under heavy transient swings, result in clearer sound reproduction.

The circuit, carefully modified by Les Wolstenholme, is largely based upon the original 'NAPS' regulator circuit, that used in the well-known Naim NAP250 and NAP135 power amplifiers.

Careful attention has been given to the linearity of this circuit and during the design stage, the 'quasi complimentary' configuration of the original design was deemed impractical so therefore, a fully complimentary circuit was developed. The original design was limited by the non-availability of high current PNP devices so the use of a pair of NPN had to do. What this means is that one of the rails of the power supply relied on a pass transistor connected in reverse.

This strategy worked to a degree with the downside that the 'back-to-front' transistor in the negative power rail had much less gain and therefore speed, than its equivalent device in the positive rail. To relate that this arrangement has to be consigned to the dustbin is an understatement and therefore we decided from the outset to eliminate this potential performance bottleneck. We have therefore incorporated completely identical semiconductor arrays for both rails.

An important but seemingly insignificant addition to this circuit is the incorporation of connection point for a thermal trip device. In operation, this non-intrusive inclusion means that a low current thermal trip device may be added to any point of the amplifier requiring overheat protection. The HCR200 will shut down under overheat conditions and will automatically reset once normal temperature is resumed. This method of protection is far superior as it is much less intrusive on the sound quality than the traditional, more crude method of incorporating a thermal trip into the main supply to the transformer.



Stable, high current Power Supply

Power rating is often the first thing people look for in an amplifiers specifications, hundreds of watts of power output, however, is no guarantee of good sound. High current availability for the amplifiers output transistor collector is a far more important factor, crucial for accurate reproduction of the high energy peaks prevalent in audio sources.

As the HCR200 has proved to be unconditionally stable under all service condition, we've been able to increase the available output current by a significant margin for improved transient performance.

The addition of a series of carefully calculated networks of components to bring about unconditional stability at every frequency completes this project after two years of research and critical audition.

A 'drop in' module for the NAP250 using identical fixing and wiring layout.

Presenting this improved design, the highest grade available components and painstaking layout means we are proud to bring you the new High Current Regulator - the HCR200

A few of the features in the layout and materials are:

· Thick 2mm PCB substrate with gold plated pads
· Double thickness copper track for reduced impedance
· Tight tolerance metal film resistors
· Premium Polystyrene capacitors
· High grade Panasonic electrolytics
· Significantly raised current capability (over 67% extra)
· Non-intrusive, independent thermal cut off implementation

Suited to the Naim NAP180, NAP250, NAP135 though the modular design lends itself perfectly to those who would like to try them in their own build. The combination of the HCR with the NCC modules has to be heard to be believed.

TPR4 - Dual Precision Tracking Pre Regulator

A short while ago, Naim Audio announced the introduction of an advanced regulator system, presumably in answer to the many aftermarket systems now in the marketplace, many of which eclipsed their own basic system of the venerable LM317 adjustable regulator IC, an industry favourite for many years.

The DR as it is christened, is not available, as far as is known, to the DIY sector or indeed, to any agency outside the Naim organisation. It has to be supplied and fitted by an authorised repairer of which there are few in the UK and even fewer in foreign countries. Add to the above, the high cost and the possibilities of owning a power supply equipped with such a device becomes financially out of reach for many of us.

In considering how such regulators operate, we have many things to consider: speed of delivery, noise levels, settling time etc.

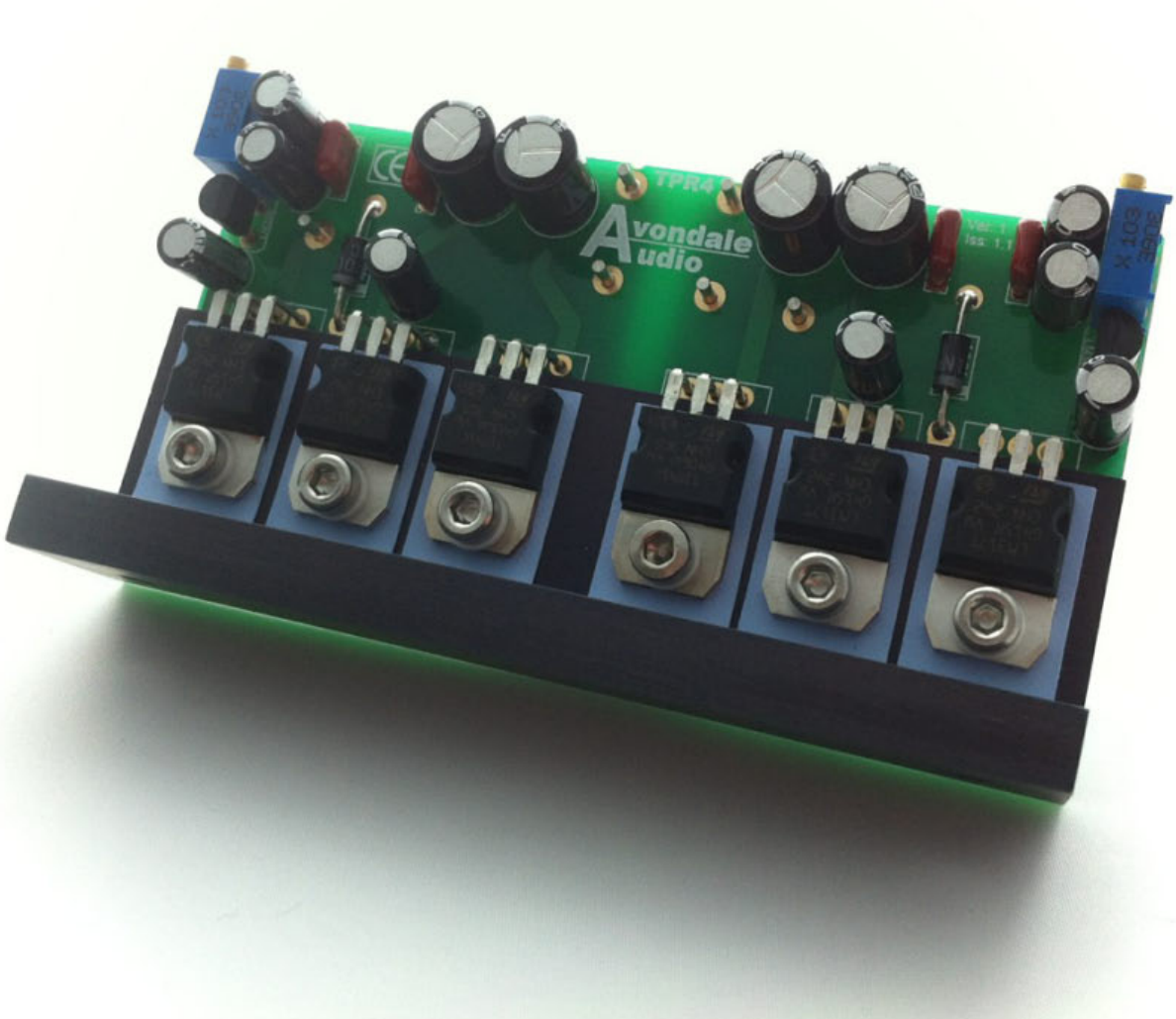
Avoiding exotic circuits with masses of feedback is stock-in-trade for the Avondale team and in taking the existing TPR circuit, long regarded as much improved over a single LM317, we set about designing a module to take on the DR at its own game.

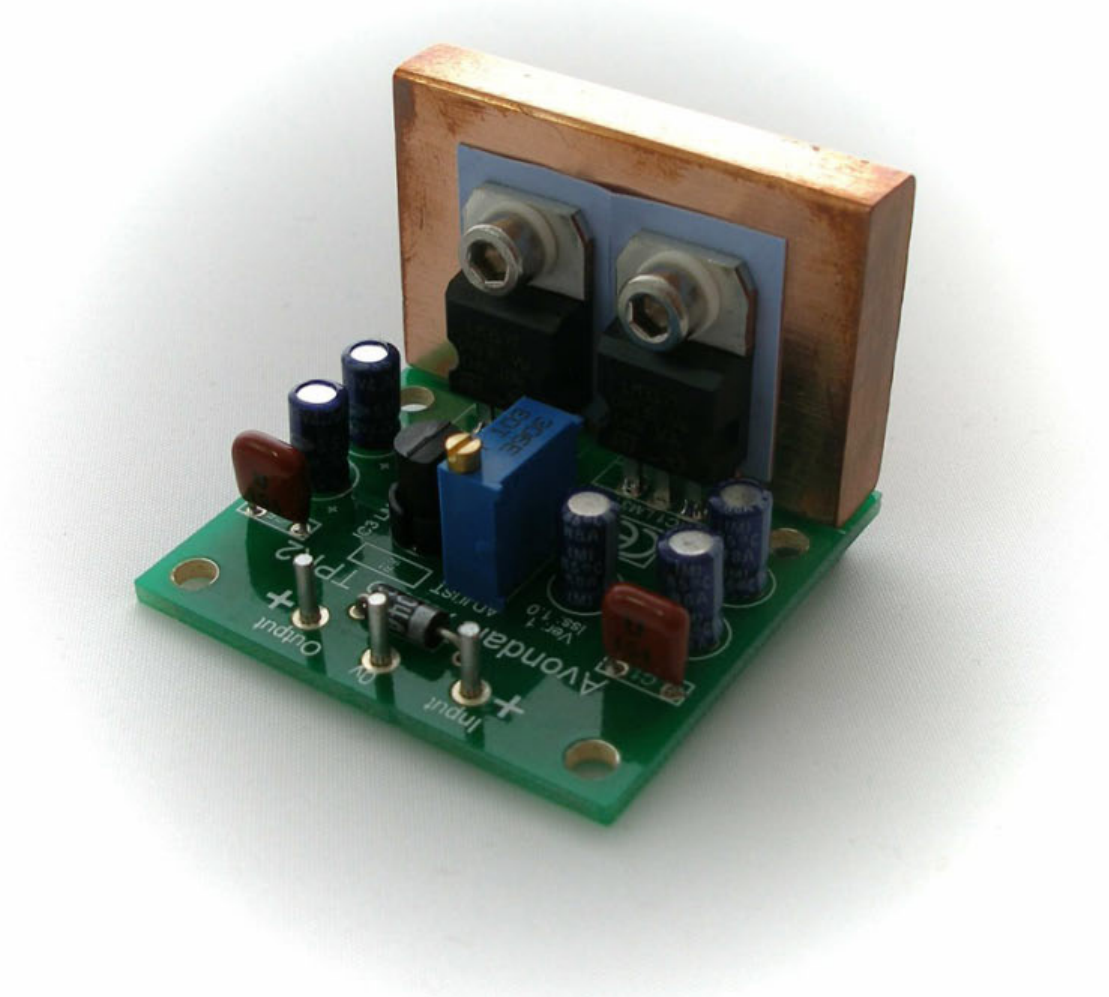
We took the TPR (Tracking Pre Regulator) system with its uniquely agile circuit and gave it a new kiss of life. Providing the circuit with a ground-plane strategy - well known in radio frequency deign as being essential for stability, we then added a pre-regulator system to initially smooth the incoming supply. Adding storage of the resulting smooth DC, we were then able to incorporate the TPR system surrounded by carefully calculated decoupling components for the ultimate in delivery of the entire audio bandwidth.

The result is one of the most accomplished regulator configurations we've produced. Deceptively simple, so often the way with the best designs, this module is designed to be a drop-in item for the Supercap and the 52PS power supplies. Simply installed by the average DIYer, this module has been said to improve even upon the DR from Naim.

Available to fit the Supercap and 52PS without any modification to these supplies, a second version, to suit the Hicap will shortly be available.

Exquisitely produced, this module will bring high-end performance to the power supplies by Naim Audio, better within the reach of the enthusiast.





TPR2 - Micro Tracking Pre Regulator

The simple monolithic regulator, the LM317, has given sterling service across the audio world for years untold. Easily installed as a 'one-device' component, the LM317 stands alone as the workhorse of the industry and indeed, forms the backbone of the power supplies developed by many audio manufacturers.

Using what is called a 'bandgap' reference to maintain a constant ouput voltage, this device relies entirely on an internal feedback system to ensure stability. Utilising a simple output capacitor as the compensation for constant frequency impedance, this design has been eclipsed by many and various designs over the years - some excellent, some not so. Some designs have become so complicated as to be impossible to implement by the DIY fraternity.

What we set out to achieve with the TPR2, (Tracking Pre Regulator), was to produce the simplest circuit capable of supplying clean DC current to an item of audio equipment with none of the drawbacks of the LM317 circuit while maintaining ease of use and set up within a modest footprint.

We've exploited the feedback system of the LM317 in such a way as to eliminate as many of the limitations of this device as is possible. Using twin LM317s in a configuration where the first device is used provide DC current to the second whilst at the same time, tracking the output of the second device in a precise way. Not content with this improved configuration, we've utilised a precision voltage source, impervious to fluctuations, to provide an all important stable voltage reference for the voltage regulators.

Capable of delivering over one Ampere with suitable heatsinking, the TPR2 offers rejection of line borne interference by an order of magnitude resulting in a blacker audio background than can be otherwise experienced and because the reaction times to deliver transient current are faster, musical notes have that extra precision in tempo. Even more crucial, is the ability of the TPR system to stop when the transient requirement has ended meaning less of the smearing effect sometimes noticed in heavy bass lines.

As is our policy, we offer the TPR as having being constructed without the use of ferrous materials and during development, we discovered the performance could be slightly enhanced by including a copper heat spreader, we now include this as standard.

Available as a 'drop-in' module suitable for many projects, the output is easily adjustable by the user to very fine limits between 10V - 32VDC according to installation.

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