

HERTZ

COMPACT POWER

BIG SURPRISES COME IN SMALL PACKAGES

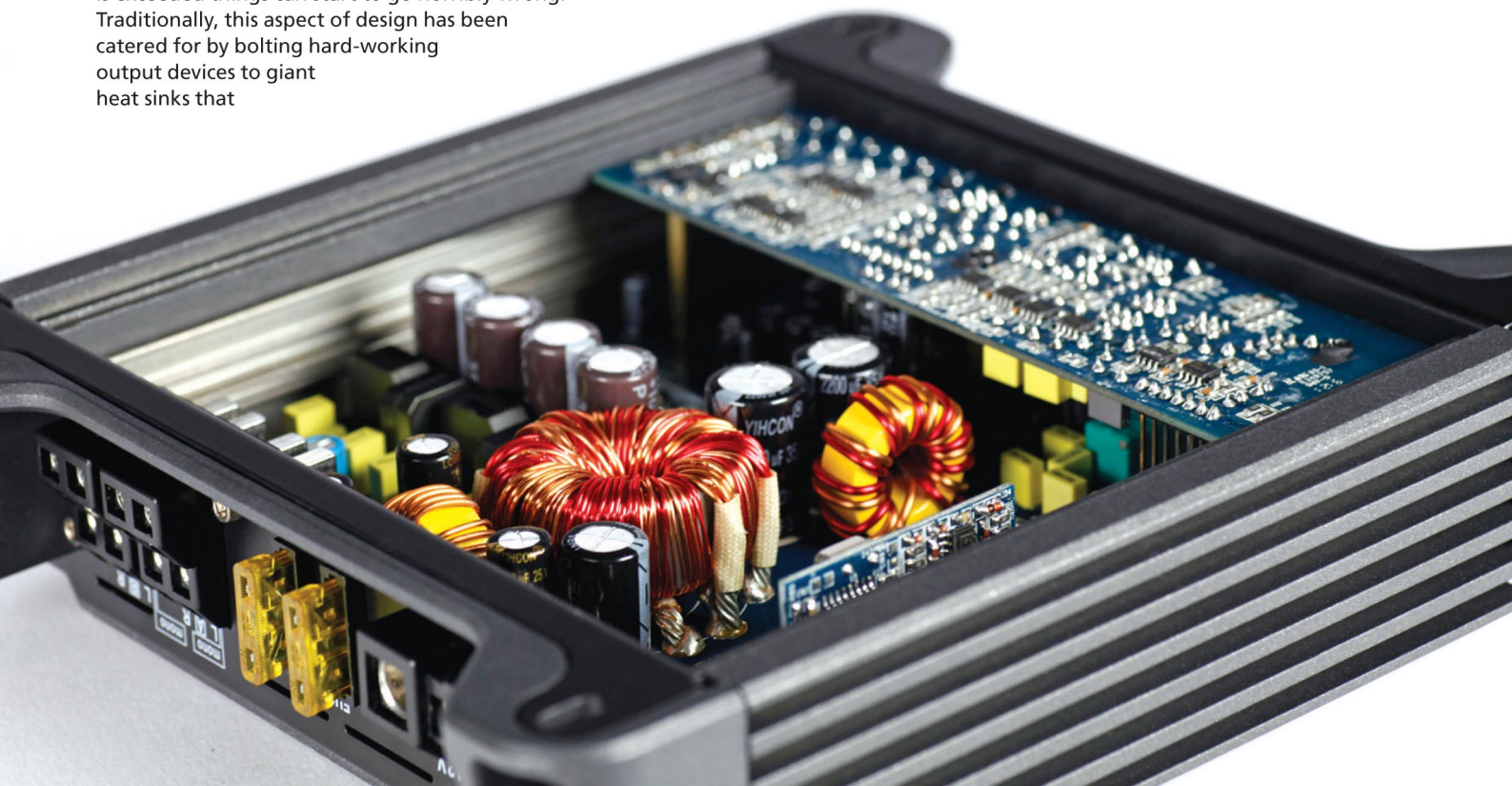
A perfect amplifier should not have a “sound” but as the perfect amplifier is probably not achievable it is often other attributes that draw attention. We take a tour around the Hertz Compact Power (HCP) 4-channel to discover the relationship between sound, power, cost and size.

Starting with the cost. Hertz calls the HCP range of amplifiers an “entry-level” line but of course, this is all relative. The entry-level product from Rolls Royce costs considerably more than the entry-level Hyundai so we must not confuse this phrase with the word cheap! Hertz make quality products. They invest more in research and development than most other manufacturers as it’s inherent belief is that if a company is not breaking new ground it is merely imitating what has been before and therefore helping to stagnate the market. This said, a lot of research goes into the cost effectiveness of implementing it’s new technologies therefore guaranteeing that this technology is deliverable to a ready market willing and able to afford it.

Amplifiers are extremely sophisticated with sensitive circuitry required to improve on those that went before it. One of the biggest challenges amplifier designers face is providing consistent performance across a huge temperature range. Most electronic devices have an optimum operating temperature and when this is exceeded things can start to go horribly wrong. Traditionally, this aspect of design has been catered for by bolting hard-working output devices to giant heat sinks that

dissipate heat by means of thermal convection or by putting fans in the case to blow hot air away. But as cars continue to become smaller, space becomes a major issue. More thought therefore, has to be given to cooling as both of the above solutions affect size. Fans carry cost implications as they have to be controlled to deliver just the right amount of cooling and the systems employed to do this can be almost as complex as the amplifier circuitry itself. Furthermore, installation can become a little more complex as you can only force air out by allowing the same amount of air in!

Hertz has tackled this conundrum by designing thermal convection attributes into the actual case of the HCP amplifier. The high power devices are sandwiched between the circuit board and the case of the amplifier, which conducts heat efficiently to the extruded aluminium heat dissipating fins on the side. This results in an amplifier with highly effective heat dissipation properties that keeps the performance of the amplifier stable even at high operating levels.



**TOP 5 DRIVING
SOUNDS:**

SOMETHING GOOD | ALT J

**(I KEEP THINKING ABOUT) A
NEW THING | FIELD MUSIC**

INHALER | THE FOALS

**YOU NEED ME, I DON'T
NEED YOU | ED SHEERAN**

**IF YOU'RE NEVER GONNA
MOVE | JESSIE WARE**



The audio characteristic of an amplifier is a very contentious area. In theory an amplifier should simply collect a low-level signal and make it bigger without adding anything or taking anything away. However, although that is simple to say, it is incredibly hard to achieve. In fact, since Lee De Forest invented the first recognised audio power amplifier in 1909, designers have been trying to develop the first sonically invisible amplifier. When solid state amplifying devices (Transistors) came along, many different configurations were tried to find the best compromise between efficiency, cost and size and the circuitry most used is the class AB push-pull amplifier. There are wonderful online resources, which will explain chapter and verse on this topic. They make great bedtime reading, but would not fit within this magazine let alone the two pages we have for this feature! However, by way of a brief introduction, Class A is generally considered to be the ultimate configuration as it works across both positive and negative phases of an audio signal and produces amplified signals with great integrity but it is incredibly greedy power-wise and will draw lots of current from it's power source to simply maintain a state of readiness. Class B works best with low level signals as it uses separate devices to amplify the positive and negative phases of the audio signal and is prone to an effect called crossover distortion which could be disturbing at high levels but is not very noticeable at low levels. Combining classes A and B the best of both worlds is achieved (i.e. low current consumption and high signal integrity) There, a potted cure for insomnia!

Hertz uses other clever electronic circuitry to maintain sonic integrity including balanced inputs. A balanced input ensures that any noise picked up especially by long runs of cables, is cancelled out before being amplified. This is an extremely good idea when running cables in cars which inherently have lots of electrical "noise" going on that can get into audio systems causing hums, whirs, clicks, pops and in

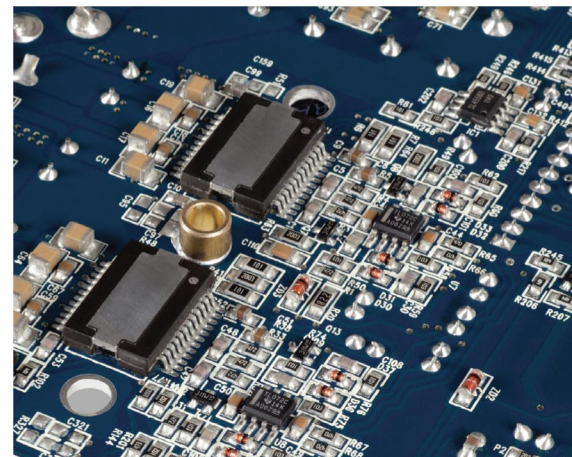
extreme cases, bangs! The HCP range has an auto turn-on circuit on it's speaker level inputs which senses when signal is being fed to the amplifier and automatically powers it up. This saves the installer from having to run a separate ignition feed to the amplifier. Hertz calls this feature ART (Automatic Turn On/Off)

A 4-channel amplifier can be a versatile beast and maybe configured to run two stereo pairs or two channels can be connected together to drive a subwoofer – Subs are much harder to drive than full-range speakers and require more power. Therefore, the ability to connect a pair of outputs together which can effectively double the power available, is a very desirable thing for lovers of the classic hi-fi format of full-range stereo up front and subwoofer in the luggage compartment. Sub-bass as we never tire of explaining is non-directional to our ears and therefore, subs can be installed pretty much anywhere within the vehicle and sound will still seem to come from in front. In order to configure for this use however, an installer needs to direct only the appropriate signal to the right speakers. Subs are generally only fed signals below 80 – 150 Hertz (cycles per second) although the ability to select a frequency that matches the install requirements including customer's preference is desirable. Hertz provides the HCP 4 with an in-built Lo-Pass filter (only allows low signals through) which has an adjustable frequency range from 50 Hz – 500 Hz and also adds an additional 0-12 dB of gain (volume) allowing the installer to make comprehensive adjustments to balance the bass with the rest of the system.

Similar filtering (hi-pass) is provided for full-range speakers. By removing sub bass from these, you eliminate the possibility of swamping critical mid-bass with sub-bass offering far more accurate sound reproduction. This filter blocks everything from 80 Hz downwards. Both Hi-pass and Lo-pass filters use a 12 dB per octave filtering curve the explanation for which

can induce Sleeping Beauty – scale sleep patterns to those interested in finding out more! In potted form however, the curve is like a hill with the more dB per octave equating to a steeper hill for the rejected frequencies to try and climb. 12dB per octave is steep enough for most purposes.

There are many other ways in which a system may be configured and perhaps an article dedicated to active versus passive operation of speakers would be a good idea for the next issue. In the meantime,



it is enough for you to know that such a thing is possible with the HCP 4 amplifier. Your local FOUR MASTER is of course, the best person to advise you on such things as he/she will know what it means and will know whether the results would suit your requirements and bring you audio joy.

The Hertz HCP 4 amplifier provides a fantastic match for Hertz Energy speakers. For those thinking about a path to Audio Joy in their cars, the HCP range is extremely accomplished. Clear, distortion-free sound is implicit and a long and joy-filled relationship with your music collection in your car is guaranteed!