

Striking A Chord

Chord Electronics' latest CPA 3000/SPM 650 pre/power amplifier combination makes a lasting impression on Andrew Harrison...

Stacking components directly on top of each other is frowned upon in serious hi-fi circles. After all, one of the vaunted advantages of dividing an amplifier into two boxes is to keep sensitive preamp electronics apart from the hot and heavy power amplifier. Separate shelves are usually the order of the day to keep the partnership at a respectful distance. But the sight of Chord's distinctive new CPA 3000 preamplifier resting above its SPM 650 power amplifier will make you want to bring this £7,500 combo closer together.

Fortunately, the solid pillars of milled and finely polished aluminium, so called 'Integra legs', provide a substantial scaffolding to support the sophisticated electronics within. If Chord amplifiers' only distinguishing characteristic from other high end products was their styling, it would still be enough to ensnare a few potential buyers, but fortunately there's more - their real magic is out of sight, as they sound every bit as good as they look...

There are several things that set a Chord Electronics power amplifier apart from the crowd, and top of the list must come the power supply. Whilst these days practically every consumer electronics product, from PCs to the charger for your mobile phone, all use some form of switching power supply, Chord manage to successfully implement them for hi-fi use where so many others before have failed. The company has built its reputation around PSUs that provide huge reservoirs of clean DC voltage to drive the various amplifier stages, and ultimately the speaker drivers themselves - after all, it's the power supply's rectified output that essentially drives every loudspeaker.

This 'high frequency power supply' technology, as applied to audio power amplification, was the breakthrough made by Chord Electronics founder and designer

John Franks in the early nineteen eighties. After much research and development to refine the principle, it won approval for use by the BBC and recording studios worldwide.

Chord now uses three main types of modular HF power supply, sized to suit various power amplifiers' requirements. For this 130W SPM 650 power amp, its smallest conventionally boxed model (we'll discount the compact Choral amps), there's a 1kW-spec'd PSU. Next up the range, the SPM 1050 and SPM 1200e both take a 2kW supply, while the SPM 1400e monoblocks are treated to a 4kW module for their single channels, resulting in a comfortable 480W output rating. By the time you get to the flagship SPM 6000 and '14000 Reference monoblocks - 2,000W into 4 Ohms, anyone? - you'll find three 4kW supplies in each chassis, probably stockpiling enough reserve energy to warp time and space if the available joule cache was released in one hit...

Another novel technique Chord adds is a dynamic coupling of the supply rails. Here, the positive and negative rails are mutually coupled using magnetic flux. Rather than make a stiff, fully regulated power supply, Chord has deliberately set it to be more flexible, able to draw power from either rail when required, thereby able to absorb huge demands from the amplifier without actually 'snapping', as a more rigid topology may do.

Chord's use of its proprietary PSU technology also allows it to improve overall fidelity by removing traditional output protection circuitry. Instead of some invasive devices around the amp's output stage, it senses potential fault conditions back in the advanced power supply, monitoring flux differences between voltage rails, with the PSU switching off supply to the amp when, for example, a short circuit or troubling DC offset is detected.



Many modern power amps build their output stages around bipolar transistors, with the MOSFET still less commonly favoured. Chord Electronics nonetheless stands by the virtues of these devices, applied in classic linear Class AB mode, but found as a custom-made pairing of two transistors in one package, a technique that allows good thermal tracking between silicon devices.

For its CPA 3000 line-level preamp, Chord also uses a high-frequency supply and, like its flagship CPA 5000 model, adds horizontal VU meters on a blue-lit vacuum-fluorescent display. Large letters here give easy read-out of which of the four XLR balanced or two RCA inputs are in use. Tape in/out on phonos is also provided, as is a unity-gain A/V input on XLRs. Main pre-outs comprise one pair each of RCA and XLR balanced sockets. On the fascia sits a large chromed knob for volume, a smaller version for balance, while the preamp can also be controlled via the supplied learning remote handset. The power amp also sports both balanced and unbalanced inputs, and a single pair of screw-down 4mm posts for speakers.



SOUND QUALITY

In my experience, it's the freedom from time smear and unnecessary bass emphasis that gives the characteristic Chord Electronics amplifier tone. Lean and fast, their neutrality almost takes the amplifier out of the circuit as far as low end coloration goes. In my experience, this makes them ruthless revealers of supporting components, both source and loudspeakers, so you'll need suitably capable ancillaries.

There's certainly an uncluttered feel to these amps, pulling apart the strands of the music while keeping the relationships between instrumental lines very much intact. Never is this more clearly spelt out than when challenged with varying bass content under repeating sample loops, such as heard on Massive Attack's 'Inertia Creeps'. After an electronic middle-eastern bazaar of an intro with droning pipe samples and rattling tambourines tapping out the pulse, a one-note bass

pattern gives way to a grumbling low frequency line that wanders through the lower octaves - think 'Bach cathedral organ pedals' underpinning trip-hop mash-up. Not a problem for the SPM 650 though, as it held fast to the pitch of every note, even at neighbour-frightening levels. The stop-start capability of these Chord amps provides the kind of control that ensures recorded music still sounds like a live event.

Openness and air were found to be a consistent *forté*, contrasting with some solid-state amplifiers that sound like they've been tied down through heavy-handed levels of overall feedback, often added to keep distortion in check. Treble was always clean, uncluttered and extended. This Chord pairing was more than capable of throwing wide, deep stereo images from suitable source material, a prime example being classical orchestral from LP. With string sections set stages left and right, woodwind and horns

were held fast centre back when called upon in Tchaikovsky's 2nd piano concerto (Sylvia Kersenbaum's piano backed with the Orchestra de l'ORTF). Again, what impressed was the manner in which rippling piano lines held so stable, regardless of the relative volume of the full orchestra, dynamically shaded from whisper to whirlwind in the extended first movement alone.

With over 100W on tap, and given relatively sensitive loudspeakers, in many a system the '3000/650 combination will be sufficient to bring realistic levels to most rooms; but what would a more highly rated power amp bring to the party? As a long-time Chord user, I had to see how the SPM 650 stacked up against my familiar SPM 1200C.

Set against the circa-300W SPM 1200C, the SPM 650 could be heard to have a little less headroom, perceived not so much as a compression of available dynamics at high volume, more a hint of

POWER PLAY

High frequency switching power supplies have been used in audio since the late nineteen seventies, but with varying degrees of success – even giant consumer electronics companies like Sony have tried and failed, to get the technology to sound good. Chord Electronics, by comparison, have built their reputation around their ability to get it right, and this comes from founder John Franks' aerospace background.

A highly resourced industry where performance needs meets cutting edge technology, aerospace applications require reliable, high-power electrical supplies that must be light to earn their place in an airframe. Franks was a director at various aerospace companies, including Astec, Raytheon and AT&T, before he applied his specialised knowledge to build a new type of hi-fi amplifier, then started Chord Electronics in 1989. By the early nineties, the BBC started trialling a modified SPM 800 for use as a replacement for the venerable Quad 405 (the de facto partner for the BBC LS5/8 Grade 1 monitor). Word spread, and Chord amplifiers appeared at Abbey Road, later the Royal Opera House and Skywalker studios.

Chord's high-frequency supply works by rectifying 240V/50Hz into 300-350V DC, storing this power in a bank of high-tension capacitors, then chops this into an alternating supply using high-voltage MOSFETS running at around 80kHz. This waveform passes through a small ceramic-core transformer, before conversion to DC again by high-speed rectifiers. It's here that the voltage rails are dynamically coupled by a strong magnetic flux, resulting in a flexible supply with enormous reserves of instantaneous power. Spend time listening to a Chord power amp, in contrast to the 'sound' of a 50Hz PSU trying to keep the pace when stressed, and many traditional amps sound slow and out-of-time in comparison.

hardness from the midband and up. But I do mean 'hint' as, even with the challenging and reactive load of my low impedance B&W 802 reference loudspeakers, the SPM 650 never strayed into gross clipping. Moving upscale two models in the Chord power amp department to the 1200C also brought more scale and stage depth to the sound picture, laying the stage further back behind the speakers and letting through a little more richness in acoustic instrument timbre. Yet the family trait of spatial precision and bass grip remained a welcome fixture between amps.

It's not the usual matching preamplifier for a £2,500 SPM 650 – that honour goes to the CPA 2500 – but the mid-range CPA 3000 preamp proved an excellent



foil for the entry-level power amp. Supremely quiet, as rated by that near-unconscious perception of between-the-notes blackness, it once again demonstrated the peculiar importance of finding a good preamplifier to get best system sound.

In close comparison with the benchmark of a Music First Audio Silver transformer passive, the CPA 3000 had an uncannily similar voicing, showing equal light and shade contrasts, and comparable revelation of very low-level detail. The MFA preamp had the edge in final transparency, but the Chord got close enough to make no real difference, and comes equipped with full remote control and other convenience features such as A/V bypass to make it an ideal match in a modern system.

CONCLUSION

By turning its attention to new entry point products like the SPM 650, Chord Electronics deserves to find new friends for its amplifiers. The pair seen here may still be far from accessible, but the money buys a remarkably capable combination, and one that can be even be built upon thanks to the traditional pre/power split. Ultimately, when stacked up, the CPA 3000 and SPM 650 aptly demonstrate the allure of one of the finest amplifier marques around. Chord amplifiers resolve

music like few others, and replay it with studio-like freshness. If you like clean, dynamic, fast, airy sound that can hold time when the music gets challenging, look no further.

REFERENCE SYSTEM

Linn LP12/Ittok/Ortofon MC Windfeld turntable
Graham Slee Era phono stage
dCS Verdi/Purcell/Delius CD player
MF Audio Silver Passive Preamplifier
B&W 802D loudspeakers

VERDICT

State of the art solid state pre-power combination, with all the associated strengths of speed, power, clarity, grip. Striking styling and superb build, too.

CHORD ELECTRONICS
CPA 3000 £5,000
CHORD ELECTRONICS
SPM 650 £2,500
Chord Electronics
+44(0)1622 721444
www.chordelectronics.co.uk

FOR

- super clean, fast, powerful sound
- breathtaking dynamics
- exquisite build and finish

AGAINST

- stiff competition at the price
- sound lacks romance for some!

MEASURED PERFORMANCE

Power from the SPM 650 was healthy at 128 Watts into 8 Ohms, increasing to 182 Watts into 4 Ohms. There was a bit more voltage droop than usual here, so supply regulation isn't quite in line with the market norm, likely due to Chord's use of a Switch Mode Power Supply. However, a very high damping factor of 102 suggests the SPM 650 power amplifier will keep a good grip on loudspeaker bass cones.

Distortion levels were low across the midband and also low at 1 Watt, 10kHz into 4 Ohms - normally a revealing test of crossover distortion. At higher levels high order crossover components started to appear, as our analysis shows. This may harden the sound somewhat if volume is turned up, level measuring 0.028%. Results were identical via the unbalanced or balanced inputs. Power amplifier sensitivity was normal at 1V, again through both unbalanced and balanced inputs. Bandwidth was wide stretching from 1Hz up to 80kHz within 1dB limits.

The preamplifier has a gain of x3 through its balanced input-to-output, but curiously x0.85 through its line inputs/ outputs, so the latter aren't so useful. If you use an unbalanced (phono) input but the balanced output to the power amplifier, then gain is x1.7, so the gain available depends upon the inputs/ outputs used. Otherwise, performance was similar through both inputs/ outputs, bandwidth measuring 1Hz-100kHz, noise a low -95dB and channel separation 97dB. Distortion levels measured 0.0007% in the midband, rising to 0.02% at 9kHz. Input overload occurred at 8V, although a red warning indicator lights at 2.4V.

This combo measures well. There are traces of distortion here and there, but nothing great, 0.02% being a maximum. They should be used with a balanced source for best results, meaning a quality CD/SACD player, or an all-balanced phono stage. NK

SPM 650 Power	128 Watts
CD/tuner/aux. Frequency response	1Hz - 80kHz
Separation	85dB
Noise	-99dB
Distortion	0.01%
Sensitivity	1V
Damping Factor	102
CPA 3000 Gain	
Bal-to-bal	x3
unbal-to-unbal	x0.85
unbal-to-bal	x1.7
Frequency response	1Hz - 100kHz
Noise (IEC A wtd.)	-95dB
Separation	97dB
Overload	8V

DISTORTION (SPM-650 - 4 OHMS)

