

# Chordian Knot



The power supply of an amplifier is what determines its character – that's the philosophy of the Chord company. The faster, the better: that's the recipe the founder of the enterprise, John Franks, used when building aircraft electronics in the past. And the same recipe applies when he now throws the endorphin switch in the listener's head ...

by Stefan Schickedanz

**M**en love aeroplanes; at least as long, as they're young and don't live on a flight path. Although living there may enable you to identify different aircraft by their sounds. The most sophisticated aircraft in regard of technology, however, can only be spotted on the pages of books or in TV reports. Just think of the legendary Lockheed SR 71 or the Stealth Fighter that were virtually invisible for the radar as well as to ordinary mortals.

You certainly cannot accuse British makers Chord disguise their products from the public eye by the styling which is really extraordinary. On the contrary, the components of the three product lines Chordette, Choral and Full Size look as similarly spacey as the Segway Personal Transporter. Yet, up to the present time, they have been performing their duties mainly far away from the view of audiophiles – in recording studios. Skywalker Sound (California), Sony Music (New York), Abbey Road and the Royal Opera House in London are just some

of the distinguished names in their comprehensive customers' register. You have to search for a while before you find another manufacturer of common hi-fi equipment having such strong references and, at the same time, such a low public awareness.

Still something of an insider's tip over here, the story of Chord began in 1989 with amplifier technology (see page 82).



**Two pairs of gold-plated loudspeaker terminals are available for bi-wiring. The power amplifier can be driven either symmetrically or asymmetrically.**

**Full Size is Chord's largest product line. Evocating futuristic architecture, the supporting construction nevertheless gives the SPM 1050 an impression of lightness.**

We also start with amplifier technology to gingerly approach this company. The CPA 3000 pre-amplifier and the stereo SPM 1050 power amplifier still reflect the spirit of the early days when Chord found their way into the recording studios with arguments such as sound precision and reliability. (Power efficiency wasn't of huge interest at that time). Compared to the flat oval devices of the Choral series, the Full Size Line, which, as indicated by the name, sports more common dimensions, looks almost conventional. But just almost. Lathed from solid metal and reaching along the full height of the device, the feet are attached to the casing by lateral poles. In its own individual way, every Chord component looks as if it were taken from a science fiction film, a fact that is underlined by the slogan 'Inspired by Tomorrow'.

At 15 kilograms, the power amplifier is comparably heavy – yet in spite of that fact, it lacks precisely that component which presses other amps down on the scales: Thanks to the switch-mode power supply, the SPM 1050 does without a large transformer and its heavy core. That's a side benefit of the high switching frequency of the power supply that considerably reduces the dimensions of the required transformer. Based on the groundbreaking power supply of the Tornado jet fighter, Chord have developed a high-end power supply solution with an extremely short response time by using an opulent stock of capacitors and heavy-duty MOSFETs. For this purpose, the alternating mains current is first filtered, rectified and buffered by a number of capacitors. The direct current of up to 340 volts is then 'chopped' into a high-frequency wave form of 80 kHz by MOSFETs – frequencies significantly above the acoustic range – and converted back by a special ceramic core transformer, fast-switching diodes, a coil and small capacitors. The resulting direct current is then transferred to capacitor storage via Chord's Dynamic Coupling, where it waits for its utilisation by the power amplifier. The exact description of Dynamic Coupling is neither simple nor concise, but the effect can be illustrated in few words: The principle is sup-

posed to ensure an equal supply, unaffected by ground potentials, for both signal ranges with symmetrical positive and negative half-waves. Moreover, this procedure helped Chord delegate the stability of the power amplifier to the power supply section. In doing so, the British developers succeed in reconciling operational safety and a signal path unaffected by the switching frequency. The power amplifier has a variable bias current and processes most of the signals in Class-A operation before switching to Class-B for very loud sections.

The CPA 3000 pre amplifier is far simpler – or more purist – in terms of use than you might think. While it contains a display and electronic source selection,

there isn't as much to select as you might reckon at first glance. Balance, for instance, is controlled by a separate rotary button; there are no hidden menus and the input level of the individual sources cannot be adjusted (only the larger models, from the CPA 5000 upwards have this feature). Finally, the 3000 does not have an electronic volume control, as the level display might suggest, but utilises a motor-driven Alps controls instead. As well as a number of symmetrical input and output sockets, the pre amplifier has a couple of unusual features: The VU button activates an input level display with garish LEDs. This may be convenient to some, but with a noble pre amplifier such as this, it looks as sty-

**The enormous stock of capacitors takes up almost all the room within the power amplifier. This configuration makes it clear where the focus lies: to create a fast amplifier via the ultra-quick switch-mode power supply, not to**





XLR plugs dominate the connector panels of the CPA 3000. Nevertheless, unbalanced cables offer more drive. A practical detail: the processor connection for bypassing the volume control.

Behind the noble, nickel-plated knobs that were milled from solid metal, you find high-quality Alps potentiometers for balance and volume.

lish as wearing loafers with a dinner jacket. What I find really great is the bypass switch for the volume control. If you own a CD player with a high quality variable output, you may circumvent the additional control and indulge in purist enjoyment. This function becomes really useful if you mix your high-end audio system with a surround system (as I used to do), and don't wish to make any compromises in sound. If, for example, you loop an AV processor through the pre amp, the central volume control can directly access the connected power amplifiers of the two front channels. Thus, Chord owners

can make convenient and loss-free use of the main channels of their audio system as the backbone of their surround system.

Although the Chord components have no tone controls of their own, there are ways of exerting a subtle influence on the fine-tuning of the sound. This is achieved via the cabling. Those who like a sound as warm and homogenous as possible, will be fully satisfied by using balanced XLR cables. The sound pattern created in connection with the new KEF Blade reminded us of recording sessions – say, at MDR in Leipzig using Geithain

monitors. Dry as a bone the English combo came to the point – not merely in regard of the control over the bass range, but also the room. Even live recordings such as Alicia Keys' 'Unplugged' ('Falling') or Toto's 'Absolutely Live' ('Rosanna') sounded almost like studio productions; however, the volume controls had to be turned up remarkably far. Yet, even with high volumes, in the region of full power, the attack was restrained, the playback rather 2-dimensional.

It's hard to believe what a difference switching to unbalanced (standard RCA) cables then meant. Now, the little Brits were clearly more spirited, say as a London banker having exchanged his bespoke tailored suit for the colours of his local football club. The touches of the piano in 'Falling' sparkled fresh and without inhibition, the whole focus improved. Suddenly, the voice of Alicia Keys was much brighter. At the same time it had more shades and more power. The entire attack increased and was now able to satisfy the highest expectations. Regarding the accurate reproduction of subtle details and the retracing of instrumental shapes, the two Chord components drew attention far beyond their class.

Now it became clear where the high esteem of sound engineers for the devices from South England comes from: as if watched under a magnifying glass, the devices clearly show everything that is in a recording, without chopping it up as switching transistors do with the current in the power supply. No range is favoured; high differentiation prevails from the highest harmonics right down into the deepest, most cavernous bass, where many a rival tends to go lumpy. Of course, you shouldn't be persuaded by their ruthless candour with normal unbalanced cables to combine these amps with a speaker that tends towards austerity; otherwise any less perfect recordings would sort of fall flat. After all, most of us aren't sound engineers; we rather prefer to have fun with the music we love.

### Pre amplifier Chord CPA 3000

List price: €7,775

Warranty: 5 years

Dimensions WxHxD (cm): 42 x 8,8 x 36

Weight: 10 kg

Cabinet design: body and feet in silver or black, nickel feet at an extra charge

Connectivity options: 8 x high level inputs (3 x RCA, 5 x XLR including 1 x processor), 2 x pre amp outputs (1 x XLR, 1 x RCA), 1 x tape out (RCA)

### Power amplifier Chord SPM 1050

List price: €6,040

Warranty: 5 years

Dimensions : 42 x 13 x 36

Weight: 15 kg

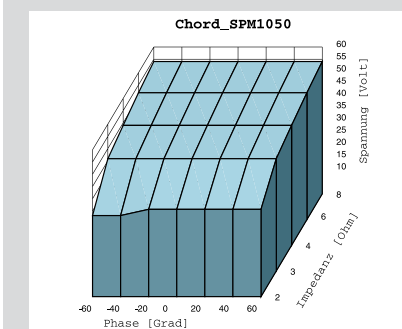
Cabinet design: body and feet in silver or black, nickel feet at an extra charge

#### Distribution:

Dynaudio International GmbH  
Ohepark 2, D-21224 Rosengarten,  
Telephone: +49 (0)4108 / 4180-0  
www.chord-electronics.de

## Measurements

### Voltage diagram



The SPM 1050 power amplifier delivers a very high, reliably stable voltage, unaffected by phase rotation or low loads. The exemplary frequency response of the two amps is contrasted by a less-than-flawless noise spectrum (not illustrated).



## Test CD

Alicia Keys:  
MTV  
Unplugged

Beautiful, atmospheric music, well recorded. Has more drive than other unplugged discs, a lively piano, wide dynamic range in the voice, and crunchy drums. Without tons of studio effects, the qualities of this musician come to the fore.



## The author

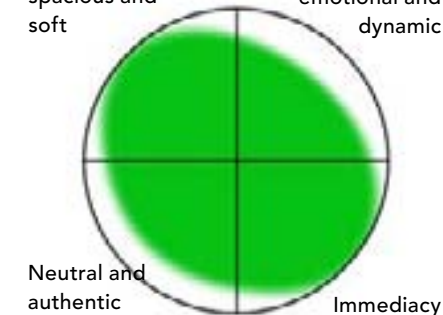
Stefan  
Schickedanz

Has long since maintained his liking for British hi-fi. Privately he favours Naim components and speakers from Acoustic Energy. Exceptional but from Germany: his four-channel pre-post-combo from Phonosophie, optionally available for consequent bi-amping or fully active operation.

## AUDIOphile Character

Effortlessly spacious and soft

Grippingly emotional and dynamic



## AUDIOphile Potential



## Recommendation

Even if Chords get on well with other components, brand loyalty is recommended. With 'aggressive' speakers, symmetrical wiring is obligatory; otherwise unbalanced RCA is the first choice.



# Chord Stories

John Franks is a lateral thinker: The high-frequency mains adapter forming the key piece of his Chord components, is based on a jet fighter, the head office of his enterprise is an old waterworks, and you mustn't photograph him while he's googling.



John Franks with sales manager Bill Livingston (left) venerate the history of the surrounding area. The bridge beside The Pumphouse was crossed by Oliver Cromwell's Army under General Fairfax during the English Civil War.

by Stefan Schickedanz

After becoming aware of the Chord story, I was keen in looking behind the scenes of Chord Electronics, a company that resides in an old waterworks in the south of England. In our brought-to-line, globalised world, such ideas are only born on this island that more and more becomes a kind of 'Jurassic Park' for small enterprises with highly philosophical aspirations and outstanding products.

Typical English manufacturers are often like super heroes out of a comic strip: They are completely normal in most respects, yet by a twist of fate one or two of their idiosyncrasies are particularly overdeveloped. This fact allows them to

achieve extraordinary feats. In Chord's case it's like in a picture book – or rather: in a cartoon. In his early life as technical director of Astec, a specialist for advanced power supplies, British engineer John Franks came into contact with high-frequency power supplies. This intense contact with the subject matter left a lasting impression on him. In 1989, he mutated into a lone warrior and founded Chord Electronics, today located in Kent at the river Medway in a building dating back to the 19th century. There he now resides in at least as cool a way as Batman in his high-tech dungeon. Whenever the name Chord is uttered, the insider feels the oscillating of the switch-mode power

supply that was the heart of all his products since the SPM 900 power amplifier in 1989. However, the beginning of the history of Chord is much more gripping. It's not that the founder, a sturdy man in his prime with a full beard and his team of engineers just fiddled around with some computers. Astec developed the power supply for the PA-200 Tornado, the European multi-role combat aircraft. The predecessor of the Eurofighter had a 115-volt circuit and a modularly designed cockpit with electronics chassis. 'The slots were positioned next to our power supply. During development, the computer people always demanded more room from us for their additional circuit boards, so we had to keep shrinking the power supply', remembers Franks. In the early 70s, with the development of the Tornado, which is still in use, switch-mode power supplies were a rare exception in computers. Their pulse was 20 kilohertz at most.

To reduce the size of the transformer until it could be packed into the remaining chassis space together with the power supply, the Astec team had to increase the switching frequency to 100,000 kHz. This step put such high demands to the components then common, that new transistors had to be developed. With these new devices, John Franks, who is also a music enthusiast, had found the basis on which to develop an amplifier with an 80-MHz high-frequency power supply. This design was able to overcome the existing limitations in the bass range and response character-



A man for any case: company founder John Franks also sets his hand to the assembly.

”

John Franks, founder

„ Normal amplifiers are very slow in power supply, a bit quicker in the middle section and very fast in the power stage, in order to keep them from oscillating. Our circuits are extremely fast throughout.“

istics by constantly rapid signal processing from the mains supply right through to the power amplifier, without getting into destructive oscillations.

In accordance with the common practice in the computer industry, Franks started in his garage. It must have been rather a large garage, however: In 1993 he succeeded in convincing the BBC to adopt his SPM 900 power amplifier. 'For application in the broadcast studio, they have each and every switch certified in order to avoid programme interrupts in any case. They even came to have a look at my company', explains Franks. The broadcasting people were so fascinated by his sound, that Franks got his certification almost immediately, something unheard of in the broadcasting world. Subsequently, word-of-mouth recommendation provided for illustrious customers such as the Abbey Road Studios and Skywalker Sound. Ray Charles picked

up his Chord electronics from the company in person.

But first he had to overcome some crises. In 1990 Franks returned to the Raethon aircraft company as a technical director in order to support his budding self-employment. In 1992 he was able to commit full time, and Chord Electronics went from strength to strength. In 1996 he purchased an old waterworks built in 1860 in the Egyptian (!) style in his hometown Maidstone and had the hulk ('everything was covered ankle-deep in pigeon droppings') converted into his head office, where, today, he employs a staff of 15. Meeting industrial standards, the relevant components are supplied to The Pumphouse, assembled, adjusted and, after a two-day burn-in phase, individually tested, with the boss himself lending a hand. Chord enjoy a good reputation not only as a highly specialised manufacturer but also for bespoke audio components. The British company indulge every whim with regard to colour. Unfortunately, I was not allowed to take pictures of the 500-units limited edition of the Chordette mini system specially manufactured as a business courtesy for merited Google employees: John Franks produced the equipment in the copyrighted Google colours (right down to the connection cables), and the systems and packaging were marked with the logo of the internet giant – in my opinion the coolest gadget since the iPod. As my plane departs from Heathrow, I start thinking about starting retraining as a programmer... <



Everything by hand: Installation of the circuit board, wiring, final assembly, and final inspection during several days testing.