



EMC1 CD player

Electrocompaniet EMC1/EC4.7/AW180

True to its aims for nearly three decades now, Norway's audiophile brand offers a hearty new CD/pre-/power-amp combination

PRICE	£2249/£1099/£3999 pair
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Norwegian audiophile company Electrocompaniet was established in 1973 by four enthusiasts who were all involved in the music industry in some way or other – in performance or production. All were keen audiophiles and each had found himself dissatisfied to some degree with the available product. Together they resolved to do better. One of the four, Per Abrahamsen, became and remains the chief designer.

They began with amplifiers. Matti Ojala's work on Transient Intermodulation Distortion (TIM) had revealed limitations in conventional laboratory testing of amplifiers. TIM was associated with the then common dependency on high levels of negative feedback to iron out response anomalies and minimise harmonic distortion in solid-state circuits. Ojala demonstrated that time delays in the feedback loop can cause intermodulation distortion with transient signals, the effect linked with smeared

imaging and a hard edge to the sound. Controversial in its questioning of accepted measurement practice, TIM was nevertheless recognised in most quarters as significant and feedback was soon relegated from its role of universal panacea to one of fine tuning.

Abrahamsen's first design, a 25W/ch amplifier incorporating Ojala's thinking, proved so successful that it remained in production until 1980. The general trend towards less sensitive speakers brought a corresponding need for more amplifier power, but it was not until 1985 that Electrocompaniet (held back by the need to identify suitable output devices) produced a bigger amplifier. Simplified to three blocks, its circuit comprised input stage, transconductance amplifying stage and a transresistance output stage. No feedback was required for the differential input stage (which can accommodate a balanced input signal with no additional circuitry) and the output stage was only local parallel feedback, and thus a very low stage input impedance, to prevent back-EMF from the loudspeaker infecting the wanted signal. Only a simple first-order (6dB/octave) filter was required in front of this stage to limit the high frequency reach of the amplifier to prevent the onset of TIM or SIM (Slewing Induced Distortion).

Amplifier designs often evolve using the standard laboratory bench power supply, only to be let down by an inappropriately-specified power supply in production. The only tenable approach is a holistic one: an amplifier includes, and is to a significant extent defined by, its power supply. As Abrahamsen expresses it, the impedance of the supply must be equal to demand at all signal frequencies, not just DC. He goes on to identify the reactive aspect of a transformer, discussing how this is a factor in conventional usage due to the way the return current passes through it. Electrocompaniet devised a different configuration which it terms Floating Transformer Technology (FTT), providing better current capability and lower impedance for any given transformer rating; this is now used in all Electrocompaniet amplifiers and in the EMC1 CD player. Reservoir capacitors are chosen for their impedance behaviour as much as their size, the latter also found to be crucial in matching supply to demand.

So to the review units, beginning with the EMC1 CD player (£2249). Electrocompaniet makes comparisons here with the analogue turntable in that both systems employ a motorised turntable and tonearm/pickup. Just as arm resonances and vibration are troublesome in

LP replay so, it argues, they are in the transport system of a CD player. Most use some kind of suspension for the transport but Electrocompaniet developed a proprietary mechanical filter, refined in a series of listening tests. Here the transport is mounted on a large, extremely heavy and centrally located block which is in turn held above the chassis floor on stressed (tuned) and damped rubber bushes. The result, it is claimed, is higher resolution, bigger sound stage and tighter bass. The transport itself is a Philips parallel tracking unit, but instead of the usual motorised loading tray the disc is loaded from the top, placed on the spindle by hand and clamped by a magnetic puck. In play it is hidden by a manually-positioned sliding cover. A sensor ensures that the disc will not play until the cover is closed.

Two toroidal mains transformers are used, each with multiple secondary windings and wired in FTT configuration. From these are derived separate DC supplies for the digital processing, drive mechanism, control circuitry and analogue output stage. This last is on an entirely separate board, on the right hand side of the chassis, shielded by the transport block and its fixed and sliding covers; interestingly it uses only discrete components. Integrated circuits are of course central to the digital circuits and are held on two boards on the left, one piggy-backed on to the other; the D/A converter is a 24-bit/96kHz type. A further board holds the blue-filtered fluorescent display and associated circuitry. The analogue circuitry is fully balanced throughout and the output is on XLR sockets, as well as unbalanced on gold-plated RCA phonos. A digital output is provided, also on XLR and phono; there is no optical alternative.

All the Electrocompaniet units are very impressively built, the chassis here of 2mm thick crackle black painted sheet. The player sits on three adjustable feet and a spirit level is provided since levelling is considered paramount for best performance. House style is a distinctive 10mm thick transparent acrylic panel through which can be seen the plain black fascia, the somewhat austere effect relieved by gold coloured fixing screws, control buttons and legending, by the blue of the display and in this case by an



➊ Manual top-loading: the 'puck' (on felt holder to the right) must be placed on the disc by hand. Handset is a standard Philips RC5 type

➋ Loaded disc and circuit board

illuminated stylised 'e' logo on the top cover. It certainly looks special. Less special is the standard RC5 remote control handset, whose 26 buttons duplicate the four-button cluster on the fascia (which provide only Play, Stop, Next and Previous track) and offer the usual array of additional convenience features, including direct track access, alternative time displays, programming, random shuffling of tracks, repeat, A-B repeat,



input is linked with balanced XLR inputs (they are mutually exclusive) as is the main output. There is no facility to record one input signal while listening to another and there are no channel

Rated at 180W, the AW180 monoblock power amplifier is a massive beast weighing 22kg

and scan (plays the first 10 second of each track in turn). Incidentally, the Previous track button does exactly that; to restart the current track one presses Play. This is logical but uncommon. The player is normally left powered (the mains on/off switch is at the rear) and brought in and out of standby by a pushbutton on the fascia.

Electrocompaniet's EC4.7 pre-amp (£1099) is a DC-coupled, line-level only device offering six unbalanced inputs on gold-plated phonos and labelled CD, Tun, Tap, DVD, VCR and Aux. The CD

balance or tone controls or filters. Input selection is handled by a bank of board-mounted sealed relays situated near the rear panel socket array and switched by logic ICs under instruction from two pushbuttons on the fascia which cycle through the inputs in either direction. The only other controls are a mains power switch (the real thing this time, not a standby switch) and two pushbuttons which control the motorised volume control — an Alps potentiometer which again is set in the thick of the circuitry. A long rod extends forwards from this to the fascia to rotate a blue LED which partially orbits the fascia's 'e' logo, providing a visual indication of the level setting. The labels of selected inputs are each lit from behind by a pair of blue LEDs.

The circuit is built on one large PCB and is powered by a single toroidal mains transformer; the supply is elaborate and includes a bank of 24 electrolytic capacitors. The signal is handled entirely by discrete components and the many transistors run quite warm, implying heavy biasing towards, or into Class A. The handset has just nine buttons, giving direct access to the



➌ A light touch: the EC4.7 shows volume setting by extending a blue glow round the 'e' logo



inputs and volume, plus a Mute function which is unavailable from the fascia. For those needing to play LP records, Electrocompaniet makes a standalone m-m/m-c RIAA phono pre-amplifier, the ECP1, which retails at £499.

The AW180 monoblock is a massive beast weighing 22kg; price is £3999/pair. A Class A design rated at 180W into 8 ohms (350W into 4 ohms and 650W into 2 ohms), it uses a massive 650VA mains transformer and six 10,000µF reservoir capacitors (paralleled by an array of 4.7µF and 0.1µF caps to preserve the low impedance at high frequencies). Rather old fashioned in appearance, it uses three main boards: a mother board for the power supply and output relay, plus two sat vertically which form the amplifier proper, each mounted on the reverse of a large finned heatsink. Over-temperature and short circuit protection is fitted. A fourth board carries a delay circuit, feeder resistors and shorting relay to slow the in-rush of current at power-up.

Normal and inverted unbalanced inputs are provided, facilitating easy set-up for bridged

TECHNOLOGY

The amplifiers here are derived from circuits originally devised as a result of Matti Ojala's early 1970s findings on the deleterious effects of transient intermodulation distortion. Only local feedback is used in the three main sections of the power amplifier, with a low impedance input to the final stage to minimise the effects of back-EMF from the loudspeaker. Power supplies are precisely tailored to the individual requirements of each unit. Great attention has been paid to the stability and immunity to vibration of the CD transport.

KEY FEATURES

- Minimalist design
- Balanced operation possible throughout
- High-level audiophile credentials

◂ Inside the EC4.7 pre-amp

◂ AW180 monoblock

◂ Inside the AW180 power amplifier: vertical circuit-boards are mounted on the massive heatsinks



operation with a pair of AW180s per channel. For normal operation (one monoblock per channel) one would either use the non-inverted input, shorting out the inverted one with the dummy plug supplied, or, with a balanced output pre-amplifier such as the EC4.7, use the XLR input (a looped XLR output socket is fitted, again for bridged operation). The fascia here is formed of 20mm thick acrylic and the company logo is repeated on the top cover, illuminated in red.

A few gripes before I get to the performance.

I would have hoped to see the inclusion of a balance control and record-out selector...

Although distinctive in appearance the three units are inconsistent in their presentation. For example, the type size of the company name is determined on the CD player fascia by the width of the transport cover, whereas on the pre-amplifier it is not only larger but in a lighter version of the typeface. Conversely the 'e' logo is larger on the player. At the price I would expect consistency. Why, too, do the CD player and power amplifiers have an illuminated logo on their top covers but the pre-amplifier not?

The handsets are frankly poor: off-the-shelf plastics types, barely customised for the brand and different in size, shape and in the placing of the name and logo. Again this should be better, and why not a single handset to control the lot? But the audiophile community is no stranger to the chaos theory of cosmetic presentation.

When it comes to the nitty-gritty, though, they exhibit no foibles at all. Each is comfortably up with the best in its class. The CD player has a liquid clarity which can have you believing you have direct access to the master tape.

Wonderfully articulated, smooth and wide open, it is joy in every respect. A caveat? Only the faff of having to place a magnetic puck to clamp the disc and having to close the cover by hand. As a musical instrument it has few peers.

Similarly the pre-amplifier is a close to non-existent in terms of its sonic contribution. This is how it should be, although at the price I would have hoped to see functional minimalism waived for the inclusion of a balance control and record-out selector, neither of which need compromise

the sound. Again, this is a superb performer.

The power amplifier is as capable as one would expect, given its hefty power rating and Class A drive, and with the complete channel separation of two monos the imaging is utterly stable regardless of level or channel-specific transient demand. Control, ease and fluidity are notable characteristics and the rhythmic thrust — so-called timing — is impressive. Few amplifiers produce so beautifully rounded a sound and I can only think of one I've heard recently enough to recall sufficiently well — the new Veritas Tripath-based design reviewed last month — which has the edge in sheer definition and control. The AW180, on the other hand, is arguably a shade more relaxed. It is unequivocally musical.

In sum, this intriguing system is both a trial and delight. If you are untroubled by its presentation and the functional limitations of the pre-amplifier I can recommend it wholeheartedly. It is quintessentially audiophile both in aspiration and achievement.

WORDS IVOR HUMPHREYS