

SOFT CONTROL, HARD THINKING

Digital/analog converters are where computers meet Hi-Fi – but in addition to the quality of the software, traditional hardware virtues also count at Accuphase, Exogal and NAD.



The Multi-Talent

The brand-new Accuphase DC-37 can handle all data formats – even DSD signals from its sibling players.



To date, celebrated Japanese manufacturer Accuphase has bucked the streamer trend, preferring to concentrate on music provided from a computer via USB – or “Macs and DACs audio”, as some describe it. So, beside the usual digital inputs – two optical and two coax – on the rear of the painstakingly built DC-37, you’ll also find a USB interface for data formats up to 32 bit digital word length at 384 kilohertz sample rate, or “double-rate DSD” with a 5.6 megahertz bandwidth respectively. That should probably be sufficient.

On top there’s also a proprietary “HS-Link” through which Accuphase’s own SACD players can transmit the normally disabled DSD data stream, although regrettably we’re missing a balanced AES/EBU socket.

A highly readable display to show what kind of file is being played, and when fed with a regular diet, e.g. from a CD player, this may not seem important. However, during our tests this information proved to be incredibly helpful.

We were playing from the iTunes library on our MacBook Air via the popular Audirvana Plus player utility, which greatly enhances the sound quality by taking over the computer and dedicating it its task while music is playing, for example disabling Apple’s annoying “Sound Manager”. At €59* the price for this tool is very reasonable – especially if €8500* has just crossed the dealer’s counter in return for the Accuphase DC-37!

Good though it may be, like similar tools Audirvana Plus offers multiple setting options and quite some pitfalls,

▲ You can push the Accuphase up to 384 kilohertz sampling rate and 32 bit resolution, while „1-bit format” DSD is accepted at up to 5.6MHz.

sometimes reducing the sample rate from 192 to 96 kHz without an obvious reason, so that display on the DC-37 proved extremely welcome as a means of keeping and eye on exactly what digital fodder we were feeding the DAC.

Can it upgrade a DP-550?

The front panel of the Accuphase keeps things very simple: apart from the on/off button there’s no more than selector switches for the six digital inputs, plus up/down pushbuttons to adjust the analogue output level. As it turned out the DC-37 had exactly the same level as the company’s DP-550 SACD player, which we were using to check the HS-Link – and also whether high-end lovers who already own this €10,000*+ player would find improvements when augmenting it with this external D/A converter.



▲ To the left are the DC-37’s six digital inputs, including two coaxial and two fiber optic connections. The analog output connectors are on the right, via RCA and XLR sockets.

*All prices listed are German retail prices incl. VAT valid at the time of evaluation.

Short answer: yes, they will!

Using Accuphase’s high-end C-3800 pre-amp with its remote-switchable inputs and a HMS Gran Finale Jubilee AF twin cable set, we were able to make convenient direct comparisons with perfect volume level matching right from the listening spot. And the family similarity between both player and DAC, which were even powered through identical mains cables, became obvious in the form of exemplary openness and definition of even the most subtle tonal or dynamic facets.

However, the DC-37 had a trump card to play, in the form of greater insight into the nuances of the music, and greater suppleness in the upper registers, therefore seeming more natural with voices or strings by the removal of that notorious grain – a refinement for which, as we all know, the die-hard listener has to dig deep into his pocket.

This was by no means a self-evident conclusion, since the DC-37 uses the same “MDS++” converter system as the DP-550 – well, almost – and very similar analog output stages. Accuphase has refined this “Multiple Delta Sigma” array, which reduces distortions and noise by cascading several converter ICs, over many years – but while the DP-550 uses six 32-bit chips from ESS Technology per channel, the DC-37 has eight, and thus claims even greater precision. Our laboratory reveals top-notch values.

When aiming for the ultimate performance, you mustn’t cut corners anywhere, and accordingly the Accuphase has fully independent power supplies for the digital and analog sections, and uses only selected components throughout.

In daily use, however, the reliable handling and operation are at least just as essential. And apart from the fact that



▲ This little multi-talent organizes the USB port of Accuphase for the most diverse formats.

SACD VIA HS-LINK AND LAN CABLE

As most hi-fi fans know, SACD players can output CD-quality audio in digital form, but not DSD – it’s all to do with historical worries about software piracy. However, the proprietary Accuphase “HS-Link” connection between its disc players such as the DP-550 (top) and the DC-37 allows an exception from the strict rule, by forming a secure connection between the two, preferably linked by a CAT-7 LAN cable of the highest possible quality.

This is exactly what we did, and found the connection worked instantly and ran with absolute stability – not always a given when dealing with music files and interfaces. The HS-Link also transmits CD data, so that no extra digital cable between player and DAC is required, and whichever format you choose to play simply appears in the DC-37’s display.



And above all the connection makes sense because via it the DC-37 it sounds even better.

minor problems in the communication between computers – be it a PC or a Mac – may arise anytime, the Accuphase got along instantly with our notebook and Audirvana Plus. Those slightly bumpy phases inbetween, when the Apple suddenly delivered reduced formats or fell totally silent, may also be due to the fact that we kept reconfiguring it for our comparison DACs.

In any case, the DC-37 stayed receptive all the way, while Audioquest’s Diamond USB interconnect ensured optimum data transport – just as in other digital connections, the cable grade is also a crucial factor with USB for optimal sound quality.

We fed the Accuphase with music formats starting from 320 kbit MP3 all

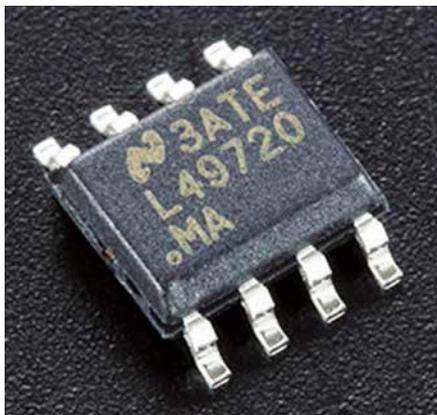
the way up to native PCM high-bit files in 24/192, as can be found on the STEREO Hörtest Editions, while with “double DSD” files transferred via “DoP” we went even further uphill. In the so-called “DSD over PCM” mode the single-bit data stream of the DSD format is sort of transmitted in a PCM envelope, and in this mode the display sometimes jumped to 32 bit showing sample rates beyond 300 kHz.

No surprise: everything great!

In the past the only digital sources were CD or DAT with the key figures 16/44.1 or 16/48 respectively; today many listeners have their music archived in the most diverse formats on their computers or NAS hard disks, to which the D/A

The analog and digital section each has its own power supply with transformer and filter capacitors. ▶





▲ High-precision operational amplifiers filter the signal currents for cinch and XLR completely separately.

converter has to adjust automatically. The Accuphase acts as a discreet butler, at the most clicking softly with format changeovers, along with a change of display.

We won't even try to pretend as if we were surprised at the DC-37's superb performance – we weren't expecting otherwise. The champagne gold machine unfurled exquisite sound images from each format and with each musical style, dappling the opalescent sound hues and delicately fading reverb tails of "Play of the Waves" from Claude Debussy's "La Mer" like an impressionist painting. Floating



▲ Among other things, we operated the DC-37 in a complete Accuphase chain including the Super-Pre C-3800 (M.).

almost weightlessly, yet at the same time accurately laid out and contoured, the lucid orchestral piece was projected into the listening room.

How sensitively the D/A converter works also became obvious in the way it delineated the various resolutions contained on our first Hörtest Edition. In the minor formats below the ultimate 24/192 the musicians were closer together, with less air around them and less tonal shade; move up to higher resolutions and the problems were neatly resolved.

Shortly afterwards CC Coletti's "Rock And Roll" of Edition Vol. III, featuring tracks from top label Chesky Records, made it very clear that the DAC – for all its champagne style and flawlessly lacquered wood side-pieces – can also party hard.

One could itemize dozens of examples of the DC-37's class, but instead we'd like to mention another two striking attributes: it lies on the line followed by Accuphase for quite some time of blending an explicit resolution capacity with a never cozy, yet all the more authentic tonality. We greatly appreciate this trend.

Also top with CD format

When crosschecking with German high-class converters from Acoustic Arts or MBL, the advantage was merely the sovereign style in which the Japanese renders complex structures or copes with loud voices – other contenders similar in price and ambition can do that just as well. No, the CD-37's major strength is in its very sharply contoured separation of sonic events, creating an impressive spaciousness. This is well audible on Carolin No's crystal-clear "Still Waters Run Deep" from the new Hörtest CD Vol. VIII, or James Taylor's elderly "Here We Are" (this time in the 2.8 Megahertz DSD64 format).

However, in order to experience the clear benefits of the DC-37, you need neither no high-bit PCM nor double-rate DSD – rather it will allow the discerning listener to rediscover an entire CD collection. At the same time it fits seamlessly into the premium league of Accuphase's product range, both soundwise and technically, and can even act as an upgrade for some of the company's players. When combined with one of those popular home network bridge solutions, the multitalented DC-37 could even turn into a streamer.

Matthias Böde

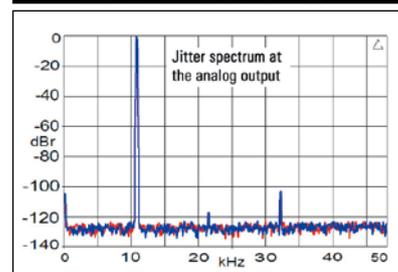
ACCUPHASE DC-37



About € 8,500*
 Dimensions: 47 x 12 x 44 cm (WxHxD)
 Warranty: 3 years
 Phone: +81 45 901 2771
 Contact: www.accuphase.com

The uncompromising, complex technology concept of the DC-37 has its equivalent in a superb soundscape. A future-proof D/A converter for the highest demands in exquisite quality.

MEASUREMENT RESULTS



Step and impulse response function		OK
Symmetrically		
Signal-to-noise ratio Digital Zero		121 dB
Signal-to-quantization-noise ratio (24 bits)		120 dB
Signal-to-quantization-noise ratio (16 bits)		96.7 dB
Distortion factor		
-60dBFS -9dBFS/400Hz		0.07 0.0004 %
Converter linearity up to -90 dB		<0.1 dB
Output resistance (Cinch/XLR)		47/50 Ohm
Output voltage 0 dB (XLR)		2.5 V
Power input		
Off Standby Idling 0 - 9 W		

LABORATORY COMMENTS: "This is not a Hi-Fi, but a measuring instrument," was the enthusiastic reaction of the laboratory staff from Accuphase-DAC. Apart from the unrecognized emphasis of older CDs, this one captivated with peak values, exploring the theoretical advantages of high-bit technology in its signal-to-noise ratios. Excellent are also the low output impedance and extremely low distortion values.



FEATURES

Digital inputs: 2x coaxial, 2 x optical, USB (B) and HS link for appropriately equipped Accuphase drives and players
Analog outputs: one each balanced (XLR) and unbalanced (RCA), **Accessories:** Power cable, LAN cable, User manual

STEREO-TEST

SOUND QUALITY	100%
PRICE/PERFORMANCE	
★ ★ ★ ★ ☆	
EXCELLENT	

*All prices listed are German retail prices incl. VAT valid at the time of evaluation.

PROGRAMMED POWER

About a year ago newcomer Exogal made a brilliant start with its debut converter, the Comet. New software and an optional power supply are designed to make it even better.



Unfortunately, still as puny as the original: the remote control, meanwhile replaced by a more convenient model.

In the digital age, first-class sound has a whole lot to do with mathematics, as was been proven by Wadia more than 20 years ago: if the Americans didn't totally unshackle the established Hi-Fi world with by writing in-house algorithms for sound enhancement, they certainly gave it good shake.

Those influential heroes of yesteryear – Jan Larsen, Larry Jacoby, Jeff Haagens-tad and lead developer Jim Kinne – have now been trying for two years to create some more waves, following the same 'in house' technical approach, but with pricing clearly directed at a larger clientele. That's in spite of doing things 'the expensive way', with complete production in the United States.

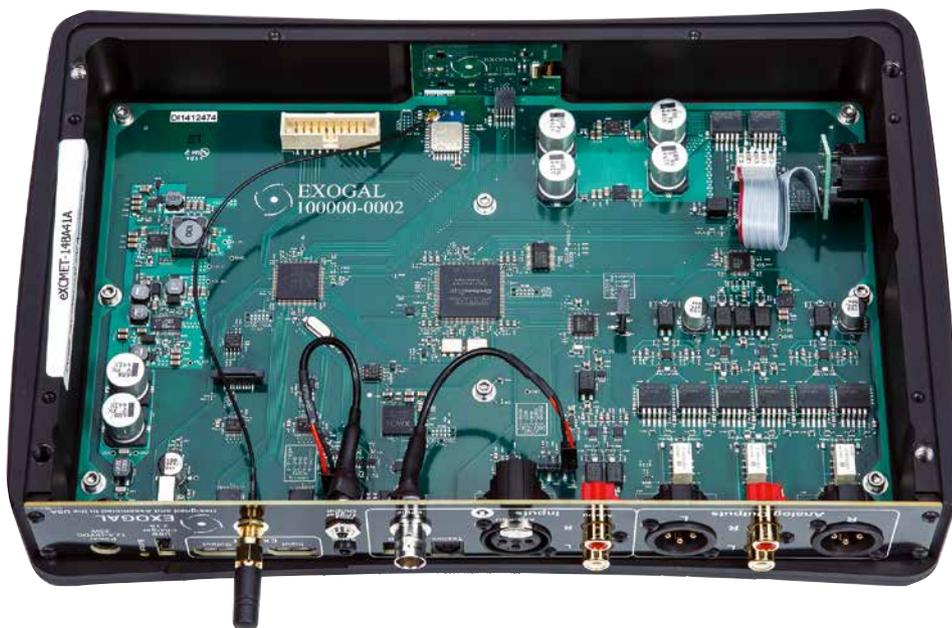
What they delivered, in their original Exogal Comet D/A converter, was a sound competitive far beyond its price range, and a product capable of satisfying the measurement laboratory while still producing consistently excellent results.

At first glance, nothing has changed since then, neither inside nor out, but the software has been updated: that's an advantage of the largely open concept, and should also contribute to above-average

value retention, as the devices can at least partly benefit from new ideas in the development department.

Three years on, the Exogal team also offers a factory update in order to upgrade the converter to the last series status

– setting an excellent example. However, though we'd like more changes, both the puny remote control and the non-skid-resistant feet linger on, the display is also still waiting for an upgrade, and the controls cannot yet be really called intuitive.



▲ Symmetrical design, high-quality output level and a lot of programming work – Exogal Comet Plus

On the plus side, the very accurate volume control operates without loss of resolution, the extensive connectivity options include a top-quality headphone amplifier, and the double output socket pairs in cinch and XLR remain. These can even be operated in parallel, allowing the use of Exogal as a spartan, yet flexible, preamp.

Amplifier-like PSU

The improvements aren't all hidden: Exogal has replaced the previous AC adapter with a separate 'black box' supply with a capacitor bank totaling 85,000 µFarad – more than in most amplifiers. The aim was to increase the spatial imaging, to make the bass sound a little darker and more unshakable and to further minimize interference from other devices.

The idea was to merge a sound as natural as possible with slightly more realism than the Comet could manage with the old supply, while retaining the format flexibility – the Comet Plus still handles everything in terms of data up to DSD.

Absolutely of course

We used the "Plus" both as an amplifier for high-quality headphones and as a preamplifier, with equal success – and not only taking the price into account.

Nevertheless, our main interest was what the software update delivered and what can further be gained with the new power supply.

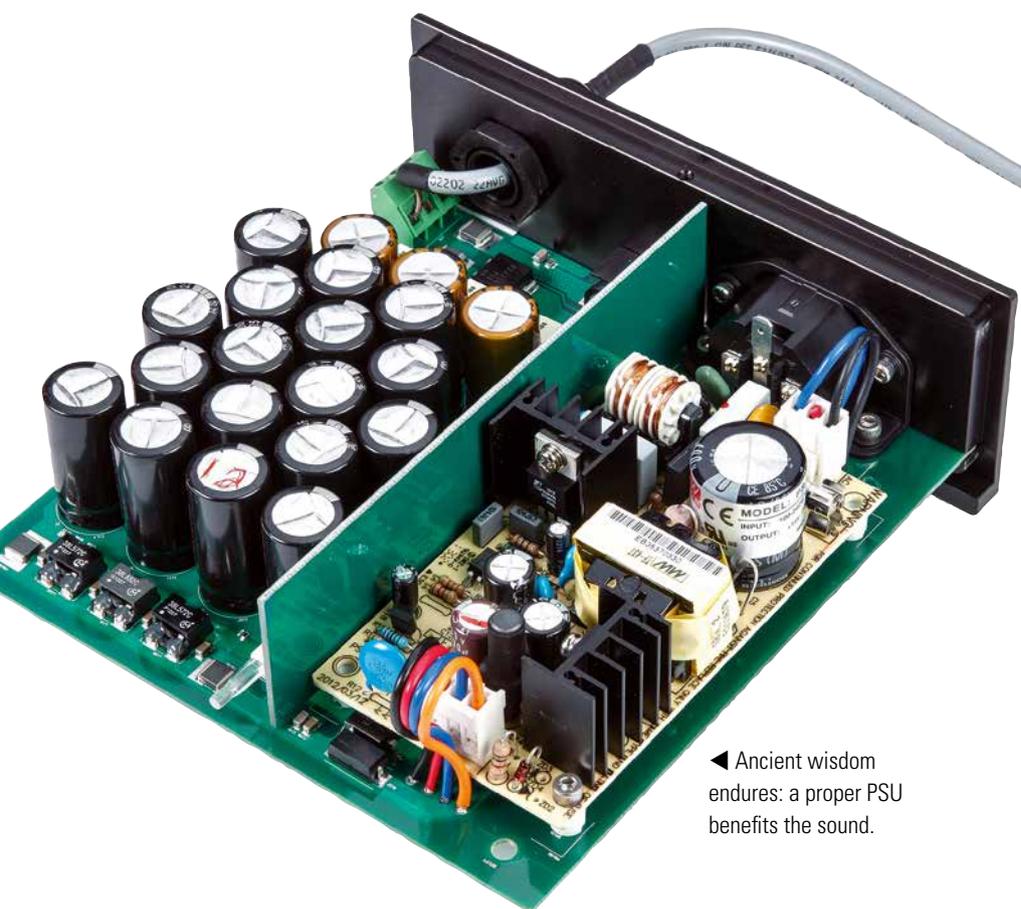
The point is this: those who expect a great spectacle, with tonal changes and a gain in the frequency extension, will be disappointed – the original Comet is already too good for that.

Instead, what is happening here is clearly directed at the "sentient" listener: the gears of the music seem to better interlock in the sound of a band or an orchestra, Red Norvo's "Saturday Night" becoming a gripping, blending performance, not unlike in Garbarek, Gismonti and Haden. The soundstage image is clearly wider with the auxiliary power supply, and a touch deeper, but everything is also outlined more sharply.

In addition, the increased ease of the sound represents a major advance, audible in any choir or strongly modulated voice. Across the frequency range, there's not much room for improvement.

So it's a case of a bit more sound courtesy of the new algorithms, with the rest coming from the power supply. The result: pure sonic joy!

Michael Lang



◀ Ancient wisdom endures: a proper PSU benefits the sound.

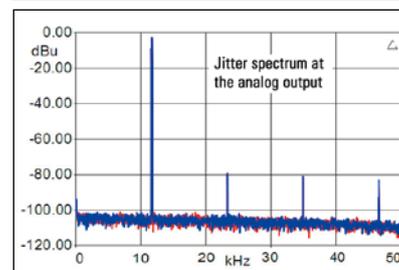
EXO GAL COMET PLUS



About € 3,000*
 Dimensions: 30 x 6 x 24 cm (WxHxD)
 Warranty: 2 years
 Contact: Exogal
 Phone: +1 651/9640698
 www.exogal.com

The second suit fits like a glove. What the older gentlemen in the United States have created at a moderate price fits the time in terms of price and sound and is well worth recommending.

MEASUREMENT RESULTS



Maximum frequency deviation	less than	0.1 dB
Step and impulse response function	Symmetrically	OK
Signal-to-noise ratio	Digital Zero	103 dB
Signal-to-quantization-noise ratio (24 bits)		103 dB
Signal-to-quantization-noise ratio (16 bits)		97 dB
Distortion factor -60dBFS -9dBFS/400 Hz	0.5 0.004 %	
Converter linearity	up to -90 dB	0.1 dB
Output resistance (Cinch/XLR)		9/20 Ohm
Output voltage 0 dB (Cinch/XLR)		2.7 V
Power input		
Off Standby Idling		0 4.5 9 W

LABORATORY COMMENTS: The measurement laboratory reveals effortless performance under pressure.

Mains phase on test device The quality of the components is high; the output level can hardly be improved on.

FEATURES

Inputs: coaxial, optical, BNC, AES/EBU, USB; adjustable headphone output; pre-amplifier function with analog input, BNC connector; DSD-capable; display, controllable via Android and iPhone; updatable, external power supply
Outputs: 1 x balanced (XLR) and cinch, can be operated in parallel
Accessories: Power cable, remote control, User manual

STEREO - TEST

SOUND QUALITY	93%
PRICE/PERFORMANCE	
★ ★ ★ ★ ☆	
EXCELLENT	

*All prices listed are German retail prices incl. VAT valid at the time of evaluation.

A SUPERB PURIST

There is not much to the new digital NAD C 510 preamplifier. But what the manufacturer has packed into the converter makes it even more convincing.



Other NAD components can also be operated with the sophisticated system transmitter. ▶

The NAD C 510, as is made clear from its place in the company's numbering system, is a preamplifier, not a D/A converter. However, this dark gray box is far from being an imposter in our test group, being fully digital and accordingly uncompromising when it comes to connectivity. Six ports, including USB and asynchronous AES/EBU, accept signals of up to 24 bits and 192 kHz, though you'll look in vain for any analog inputs on this preamp.

So is this a thoroughbred D/A converter? To be honest, it is becoming increasingly difficult to distinguish D/A converters from preamplifiers: as already established with the Accuphase and Exogal, such devices increasingly have the ability to control their output voltage, enabling them to be connected directly to a power amplifier, or even active loudspeakers.

In this world, NAD is doing everything in its power to ensure highest possible precision in its level control: the 510 uses 35-bit architecture, meaning that the volume control can operate across its full range without loss of sound quality through bit reduction. In fact, the

company points out, "even 24-bit files are not truncated until well below the threshold of audibility."

The NAD's true qualities as a preamplifier are noticeable in the details, which only become apparent when you have used the device for a few days as a preamplifier. For example, the volume can be adjusted smoothly via a controller on the front panel, whereas many DACs require laborious repeated presses on up/down buttons, while the current output level is easily read on the display, even from several yards away.

Alongside the level readout, the selected input, sampling rate and the incoming signal are displayed – it could hardly be

any clearer. Finally, the large remote control also has an easily accessible mute button in addition to the input selection and volume controls.

With features such as these, the C 510 feels supremely suited to use with a power amplifier – like the powerful C 275 BEE – or active speakers such as the sensationally dynamic Genelec 8351, and proves itself to be a brilliant, unfussy and superbly easy-to-use digital preamplifier.

Much of that is down to simplicity: NAD has deliberately avoided



▲ A far too rare sight on Hi-Fi DACs: NAD's C 510 even converts HDMI audio signals (frame).

superfluities such as tone controls, switchable filters, upsamplers and the like, while other typical preamplifier features such as tape monitor, record-outs, etc. are also nowhere to be found. Yes, such facilities can be a matter of taste, and some might say they couldn't live with a preamp lacking tone controls, for example: however, we like the way the NAD is so wonderfully simple and intuitive. What's more, the sound is so musical, clear and dynamic that such sonic adjustments really aren't required.

Of course, the 510 also does an excellent job as a line-level DAC to be used with a conventional preamplifier or integrated amp, although things are made slightly tricky by the fact that the level control cannot be switched off. When using it in this way, you should regularly check whether it is at exactly zero decibels – fortunately the NAD remembers the last level setting when it is switched off – and never higher, because the preamplifier produces measurement and audible clippings at positive dB values. At zero dB and below, its test results, especially the signal-to-noise ratio and distortion figures, are excellent.

Those superb values (see concluding column) aren't that surprising: technically, the C 510 is based on proven variables. As with other components of the C class, here NAD also makes use of components developed for its flagship "Masters" family, and one could go so far as to describe this preamp/DAC as a C 390DD (about €2,600*) without that model's

integrated Class D amplifiers – and the C 390DD is itself a direct offshoot of the outstanding M 2.

Another notable feature of the C 510 is its two HDMI inputs, all too rare a find on DACs even in the era of Playstation and Co. If that provision awakens the movie buff in you, rein??? in your excitement: the C 510 only accepts two-channel PCM signals via HDMI. However, almost all HDMI sources can be set to downconvert to stereo PCM: our PS 4, Denon's BDT3313UD and even the Apple TV worked on the first attempt. An HDMI output is also provided, and this loops video through to the TV in impeccable quality.

The typical NAD joy of music filled our listening room: try as you might, this DAC inevitably forces you to keep the beat with feet and head. Need we say more? The treble is pleasantly crisp and transparent, the bass has volume and is solid, dry and fast – in comparison, Pro-ject's outstanding Pre-Box Digital sounds downright tired. The NAD is especially adept at capturing a live atmosphere, such as on Nils Lofgren's "Keith Don't Go", in a confident and appealing manner. With its stimulating character, the C 510 even comes dangerously close to the ASUS Essence III, although the latter still brings a touch more presence to the midband in direct comparison.

Nevertheless, for us there is only one conclusion: NAD's digital preamplifier is an almost perfect Hi-Fi seducer.

Carsten Barnbeck

KEYWORD

Bit reduction:
For low-resolution digital data (at 16 bits) at low listening levels only a few bits are used for signal imaging, which can result in audible losses.



▲ The image shows the complete signal processing of the C 510. The actual D/A converters are housed on the left side (arrows). Arrows missing The digital level is controlled in the prominent signal processor above it (frame).

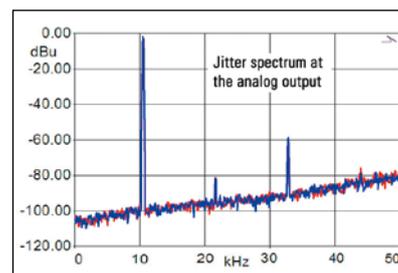
NAD C 510



About € 1,300*
Dimensions: 43.5 x 10 x 31 cm (WxHxD)
Warranty: 2 years, contact: NAD
Phone: +1 905/8316555
Contact: www.nadelectronics.com

Six high-bit inputs, level control and a lot of joy – all that is needed to produce a fully convincing digital preamplifier.

MEASUREMENT RESULTS



Maximum frequency deviation	less than <0.1 dB
Step and impulse response function	
Symmetrically	OK
Signal-to-noise ratio Digital Zero	114.1 dB
Signal-to-quantization-noise ratio (24 bits)	114.1 dB
Signal-to-quantization-noise ratio (16 bits)	88.2 dB
Distortion factor	
-60dBFS -9dBFS / 400 Hz	0.05 0.0008 %
Converter linearity up to -90 dB	<0.1 dB
Output resistance (Cinch/XLR)	140/187 Ohm
Output voltage 0 dB (XLR)	4.2 V
Power input	
Off Standby Idling 0 <2 13 W	

LABORATORY COMMENTS: As is quite typical for NAD, the C 510 excels with excellent measured values: in particular, the frequency response and distortion could hardly be better, and its appetite for power is manageable. One can, however, force the DAC to poorer measured values: you must adjusting the level into the "positive" dB range significantly distorts the input signal. The simple consequence is that "0 dB" is the highest usable volume value.



FEATURES

Inputs: coaxial, optical, AES/EBU, USB and 2 x HDMI (only PCM stereo)
Outputs: 1 x balanced (XLR) and unbalanced cinch, HDMI monitor output
Accessories: User manual, power cable, remote control

STEREO - TEST

SOUND QUALITY **85%**

PRICE/PERFORMANCE

★★★★☆
EXCELLENT

*All prices listed are German retail prices incl. VAT valid at the time of evaluation.