

Danish DSP

COPLAND DRC205 (£1590)

Add-on room correction processors can be a daunting prospect, so Copland is aiming to make things easier with its plug-and-play solution

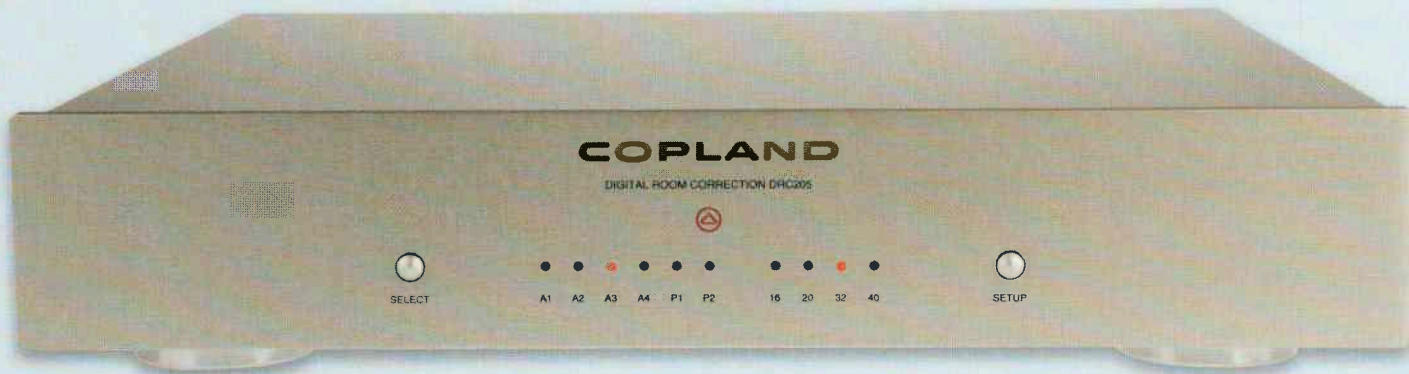
COPLAND
DIGITAL ROOM CORRECTION DRC205



- A1
- A2
- A3
- A4
- P1
- P2
- 16
- 20
- 32
- 40

SELECT

SET

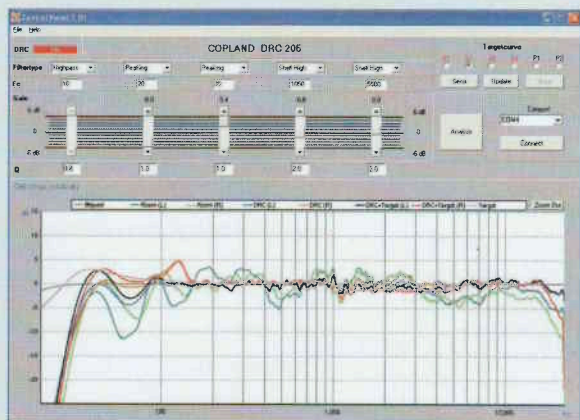


If you hadn't noticed, we are living in what will surely be remembered as audio's digital room correction (DRC) era. Although this technology was conceived as long ago as the late 1970s and there have been DRC products on the market for well over a decade now, until quite recently they were expensive, specialist items. Today an increasing number of manufacturers of domestic audio equipment are offering room correction of varying degrees of sophistication, either built into components such as amplifiers or surround sound processors, or as stand-alone processors like the £1590 Copland DRC205.

That the DRC205 should hail from Denmark is appropriate since much of the recent academic work on digital room correction – which is an issue of psychoacoustics as much as it is of computing power and filtering algorithms – has been conducted in that country. TacT Audio led the way commercially and then gave birth to Lyngdorf Audio, whose RoomPerfect DRC technology I will be assessing in a future issue. Copland uses a DRC engine designed by Danish company Dynaton (not Dynatron), which Lyngdorf was also going to employ until development delays persuaded it to create its own alternative.

NO NEED FOR PC CONNECTION

As audio retailers know only too well, products that have to be hooked up to a computer as part of the setup procedure are a turn-off for the vast majority of hi-fi consumers. So Copland has sensibly configured the DRC205 in such a way that its USB port need never be deflowered, and operationally it could hardly be simpler. The front panel controls comprise just two symmetrically disposed buttons, the left one labelled 'Select' and the right labelled 'Setup'.



Select toggles through six DRC options, most of which relate to the target frequency response – that is, the room response trend that the room correction tries, within certain important restraints, to achieve. Settings A1 to A3 call up pre-programmed target responses that cannot be changed by the user. A1 is flat while A2 applies a bass boost with a mild presence band depression and tailed off treble, in the manner of famous BBC monitor-derived speakers like the BC1. The A3 option imposes a uniformly down-sloped response from 40Hz upwards which seems intended to compensate for home cinema speakers that are

ABOVE: Connections could not be simpler – input/output phonos, a socket for the microphone and a USB port for PC access. LF rolloff may also be set here

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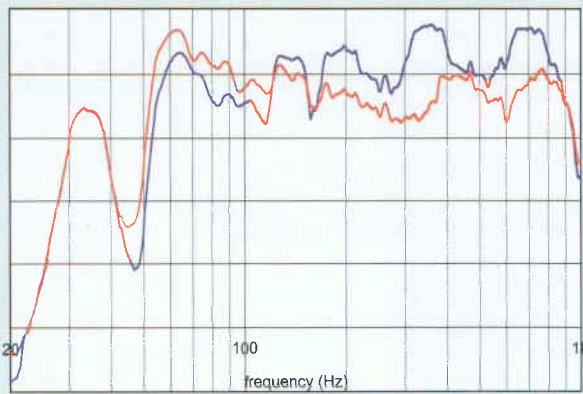
voiced for use behind a projection screen. Setting A4 is a bypass, while P1 and P2 are user-definable via the DRC205's USB link, using software supplied on CD-R.

Operating system requirements are Windows 98, ME, 2000 or XP, and firmware updates can also be delivered via the USB port. A row of six LEDs on the front panel indicates which target function is selected.

Switching between target functions, including the bypass mode, can only be achieved sequentially via the front panel control – there is no remote control capability. For many buyers, who will use the DRC205

LEFT: Connecting the DRC205 to a computer is optional but allows measured room responses to be viewed and bespoke target filters to be designed for presets P1 and P2

RIGHT: Overlaid in-room frequency responses measured from one channel before (blue trace) and after (red trace) correction in the author's listening room, using the A1 target curve. Note how the DRC205 reduces the response deviations without attempting to fill the deep dip around 46Hz (vertical divisions 5dB)



as a set-and-forget device, this will not be an omission, but in review circumstances it is a mild annoyance.

The second button on the front panel, when held down for three seconds, initiates the entirely automatic setup procedure whereby the DRC205 measures the room response and designs the filters for the various target responses. The whole process takes but a couple of minutes and only requires the user to plug in the supplied measurement microphone and place it at the listening position before starting. Copland's instructions suggest holding the microphone by hand but those with access to a mic stand will probably prefer to use that. Apart from the mic input, the rear panel houses the aforementioned USB socket, two pairs of gold-plated phono sockets for input and output, and a recessed rotary switch that adjusts the high-pass filter applied during the measurement process. The supplied user manual gives guidance on which setting to use according to loudspeaker type.

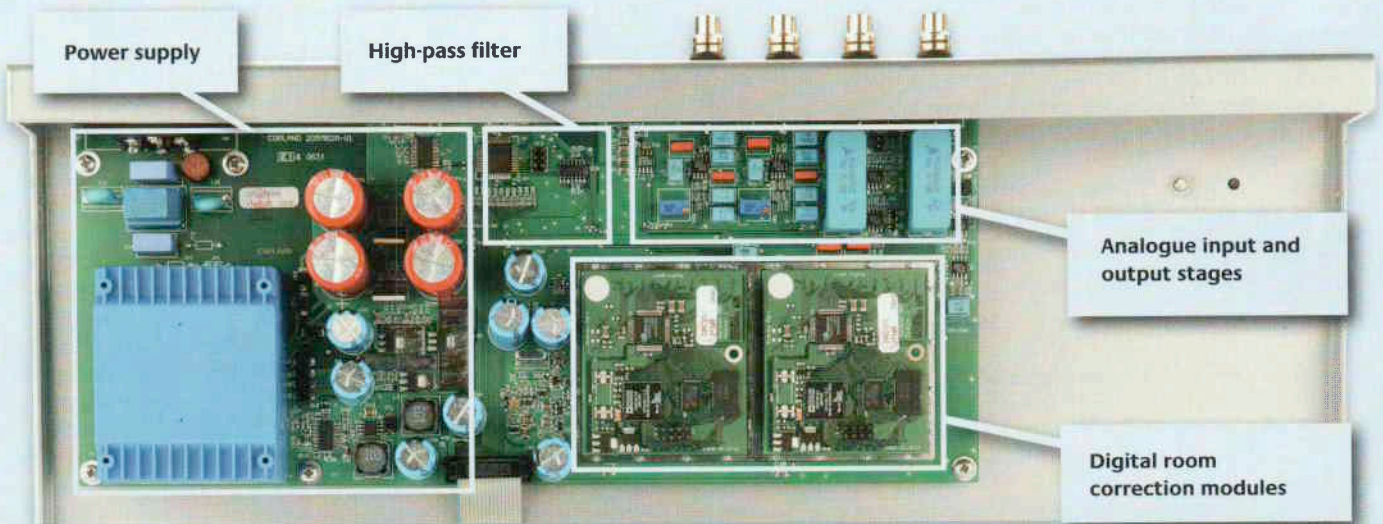
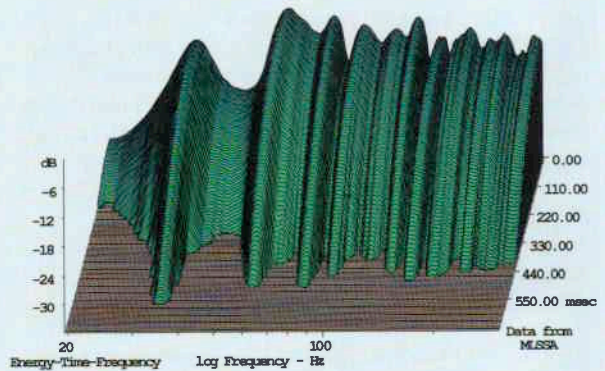
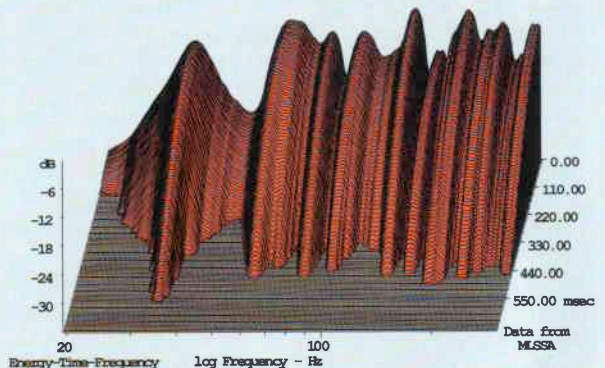
FAR RIGHT: Energy-time-frequency waterfalls corresponding to the same two in-room responses (top: uncorrected, bottom: corrected) but to a maximum frequency of 300Hz. Note how the DRC205, while flattening the response, appears to have little or no effect on the decay (Q) of each mode

A second puzzling aspect of the DRC205 is that it doesn't include at least an S/PDIF input or, better, an S/PDIF output. The Cirrus Logic CS42518 codec chip used in the Dynaton DRC module includes an S/PDIF receiver, so it would surely add very little to the cost to provide a digital input facility. The advantage of this is that it would save two unnecessary conversions – D-to-A in the source and A-to-D in the DRC205 – when used with a CD player. If a digital output were also provided then the DRC205 could also be better integrated into systems which have either digital amplifiers or digital loudspeakers, again eliminating superfluous conversions.

Last in the list of puzzlements, I can't understand why the DRC205 should have an insertion loss in bypass mode of 0.8dB (in other words, why the output level should be 0.8dB lower than the input). This is of no consequence in normal use but it does complicate the test that every enquiring audiophile will want to make: comparing the system sound with DRC205 in bypass mode to that with it removed altogether ☺

CURIOUS SIMPLICITY

All told, the DRC205 is a model of elegant simplicity, albeit with some curious aspects. The first and most far-reaching of which is that it operates at an internal sampling rate of 44.1kHz (see Lab Report), despite the ADC and DAC being specified as 88.2kHz devices. Copland tells me that this sampling rate was chosen to achieve the required filter resolution at low frequencies, where the DRC205 does most of its work. But this has ramifications in any system that includes the widest-bandwidth sources such as DVD-A and SACD which will subsequently be limited to a CD-like 20kHz bandwidth.





(and, preferably, switched off as well). I use a stepped attenuator passive pre-amp with step sizes of (mostly) 2dB, so it wasn't possible for me to compensate for this level disparity. Users with continuous volume controls will be in a better position to increase the system level accurately once the DRC205 is in-circuit. This is important, because the reduced output of the DRC205 is likely to be perceived by anyone unaware of the level change as a less dynamic and open sound.

A word about my listening room since it is of obvious relevance to the results I obtained. It has an internal volume of about 64m³, is 5.6m long into a bay window, 4.2m wide and has almost 3m high ceilings. At a glance it would appear to have a lot of acoustical treatment in the form of foam panels on all walls, but these are quite deliberately placed above seated ear level so as not to interfere with early reflections, and they offer negligible absorption at low frequencies. Of more significance in practice is the fact that the room is used solely for listening, so speaker and seating positions can be chosen for best sound rather than being circumscribed by other requirements. As this represents an inherently well-balanced system and room, it is arguably not the best candidate for DRC, although the principal acoustic problem of low-frequency room modes remains.

PEAK PRACTICE

I listened to the DRC205 using both CD source material and hi-res programme from DVD-A and SACD. I also compared the system sound with the DRC205 in bypass mode against the sound with it removed from circuit, bearing in mind the aforementioned level difference. I also measured its effect on the in-room response using MLSSA, with the results shown in the

accompanying graphs. As those measurements confirm, the DRC205 flattens the response by suppressing the worst peaks while leaving large dips – which would consume amplifier power to correct – well alone.

As might be expected, though, the DRC205 proves to be not completely transparent, particularly on high sampling rate source material where it removes a slice of the air and precision that distinguishes such recordings from CD. Comparing the DRC205 in bypass mode to the A1 or A2 corrections,

I preferred the corrected mode every time – usually the A1 setting but sometimes A2 – for its more uniform and tuneful bass, and its more stable stereo image. It just sounded more controlled, more self-consistent. But particularly on hi-res source material, and also CD, I preferred the sound with the DRC205 out of the system entirely because that restored the freshness and vitality.

If you cherish wide bandwidth source material from DVD-A and SACD, you are unlikely to want to commit it to any processor running at 44.1kHz. Likewise, if you have a high-resolution CD system and use it in a room that doesn't have major acoustic anomalies, you may well lose more in the two additional conversions and extra cabling than you gain from the room correction. The DRC205 is no panacea, then. But in the right system and room circumstances I can well imagine it offering a worthwhile and value-for-money improvement.

The essential message is clear: this is not a product you should buy on the basis of a dealer demonstration, or as a result of hearing it, say, at a friend's house. You have to assess the Copland DRC205 in the context of your own system and your own listening room before making a purchasing decision. ☺

FOR:
Simple to use;
PC connection
optional

AGAINST: Runs at
44.1kHz;
no digital I/O

Hifi news
Verdict

COPLAND DRC205
(£1590)

With its analogue input and output, the DRC205 is compatible with a wide range of signal sources but its lack of digital input and output means that in many system contexts it will incur one or more additional and unnecessary A/D and/or D/A conversions. This counts against it in hi-res systems, as does the 44.1kHz internal sampling rate. Where the DRC205 is likely to be most successful is in systems without DVD-A or SACD sources and where there are a significant room acoustics problems. In these circumstances the unit's ability to flatten frequency response, particularly in the room's modal region (typically below about 200Hz), promises improved overall sound quality.

Lab report

Arguably the most impressive feature of the DRC205 is that its 'technical transparency' remains consistent whether used in bypass or corrected modes. Either way, distortion stays below 0.005% from 20Hz-10kHz, only rising to 0.02% at 20kHz where its harmonics are not audible anyway. The response is ruler flat to 20kHz but falls very steeply thereafter confirming that, somewhere along the input/output chain, the sample rate is reduced to CD's 44.1kHz. The >92dB rejection of stopband (digital) images ensures that ultrasonic noise and spurious is very low indeed. Do watch out for the ~0.8dB insertion loss of the DRC205, however, which might skew a less-than-stringent listening test. Otherwise, with correction engaged, the basic gain, S/N and distortion performance remains unchanged. Only the correction applied to its frequency response betrays evidence of DSP at work... (see before and after plots at www.milleraudioresearch.com/avtech)

Hi-fi News lab specifications

Frequency Response (20Hz-20kHz)	+0.2dB to -0.1dB
Gain (Input-to-Output Loss)	-0.8dB
Input Sensitivity (for 0dBV)	1100mV
Stopband Rejection	>92dB
Stereo Separation (20Hz-20kHz)	>85dB
A-wtd Noise Ratio (re. 0dBV)	89dB
Distortion (20Hz-20kHz)	0.0003-0.02%

Review system breakdown

SOURCE: Townshend TA565 universal player
CABLES: Townshend DCT and Chord Company Chameleon Silver Plus interconnects, Townshend Isolda speaker cable
AMPS: DACT stepped attenuator passive pre-amp, 4× Exposure XVIII Mono power amplifiers
SPEAKERS: B&W 805S

Contact Numbers

UK DISTRIBUTOR: Absolute Sounds
TEL: 020 8971 3909 **WEB:** www.absolutesounds.com

We listened to

ALVAREZ QUARTET
Schubert: The Trout
Tacet DVD 106 (DVD-A)

MISCHA MAISKY AND DARIA HOVORA
Schubert: Songs Without Words

Deutsche Grammophon 449

DAVE BRUBECK QUARTET
Time Out
Columbia/Legacy CS 65122 (SACD)

