

# CEDAR SERIES 2 DC-1 AND CR-1

**CEDAR's Series 2 badge marks a significant improvement in performance**

**E**arlier this year, CEDAR's stand-alone processors (derived from the company's computer-based audio-restoration system) saw an addition to the range. The established *CR-1 DeCrackler* and *DC-1 DeClicker* (see reviews in *Studio Sound*, October 1993 and February 1994 respectively) were joined by the *AZ-1 Azimuth Corrector*, whose purpose is to re-align time differences between left and right channels of a stereo signal such as those produced by incorrect replay-head azimuth on an analogue tape machine. This is not intended as a comprehensive review of the *AZ-1* (see Issue 2 of *MDR*) but since CEDAR's latest offerings incorporate ideas and changes introduced in the *AZ-1* a brief recap is in order.

The *AZ-1* uses the same processing engine as the other units, but its software looks for the best fit of any signals common to both channels and applies compensatory delay to bring those common points back into line. The compensation is checked and adjusted 44 times per second in order to allow for continual changes in the amount of error, a common phenomenon with misaligned tape paths, and can be manually overridden in the unlikely event that other factors—deliberate delay effects for instance—make it difficult for the system to detect the required alignment.

CEDAR set out very deliberately to make these units as cosmetically similar as possible—the front panels of the *DC-1* and the *CR-1* are effectively identical apart from the delicate shade of grey. The differences only become apparent when the units are switched on, when the large LCD panel shows the different available parameters and the roles of the five main function keys.

The *AZ-1* continues this tradition, using a particularly interesting display on its screen to announce its function. This takes the form of a graphic representation of the stereo soundfield based on Lissajous figures, with the refinement that the amplitude of the display is logarithmic rather than the linear trace an oscilloscope would give, producing a tighter, clearer picture of the signal's spatial distribution. Phase discrepancies between the two channels show as a lateral elongation of the basically circular pattern. The

audible effects of misaligned azimuth should be familiar enough—loss of focus, poorly defined localisation, central images losing their presence and a general muddiness.

Switching the correction process in shows its result immediately on the display, which generally appears as a vertical elongation of the pattern with central bunching of the dots making up the picture. This corresponds to the audible effect, which is the removal of the ambiguities in the stereo image, a greater presence and clarity, a better-defined bass and an overall tightening and stabilising of the whole picture. The system works remarkably effectively, and should be a godsend to, for instance, mastering houses presented with copies made with misaligned machines—once an azimuth error has been copied it cannot be corrected by the normal method of realigning the playback machine's heads and would not be salvageable without the *AZ-1*.

Despite the *AZ-1*'s evident similarity to the other CEDAR models, the sharp-eyed will notice a small visible difference: the rack ears are no longer simply the ends of the front panel but are detachable. This change means that the unit looks neater when sitting on a table top, but has more far-reaching implications—it is the only outward sign that the entire physical platform for the processor has been re-engineered.

The front-panel construction has been redesigned to effectively screen the internal boards from interference from the display or the data on the controls, and to form part of a Faraday cage surrounding the entire processing circuitry. CEDAR point out that new regulations are going to force manufacturers to think more carefully about keeping interference safely locked inside their products, and this was a factor in the redesign; they also point out that the new regulations incorporate basic sound-design practice which can significantly improve a circuit's noise performance. CEDAR claim a dynamic range of 103dB for the *AZ-1* as a result.

CEDAR are justifiably proud of the construction of the new chassis and the boards within it, which have a striking appearance of

uncompromising quality. The next stage has been to put the original processors into this chassis, and this, together with further modifications, has led to the introduction of the *DC-1* and *CR-1* Series 2.

The other main change is the addition of dedicated processing for the I-O; formerly this tied up about 10% of the DSP chip's time, so separating it out in this way frees that time for further refinements of the processing algorithms. The resulting improvement is audible; while there were never any really significant side-effects of the processing the new versions sound even cleaner and make it even easier to achieve the desired result. This is helped further by increased resolution of the parameter controls, such as the *DeCrackler*'s THRESHOLD control which now operates in 0.1dB increments. Again, setting up the units before was very easy—it was harder to produce a bad result than a good one—but now the absolute optimum seems easier to find, with a much wider band between the extremes at which the processing starts to become apparent.

It is good to see that CEDAR are not resting on their laurels, despite the continuing success of their very specialised products. The Series 2 processors show worthwhile improvements in audio performance and processing power, and all for the same price as the original versions. ■

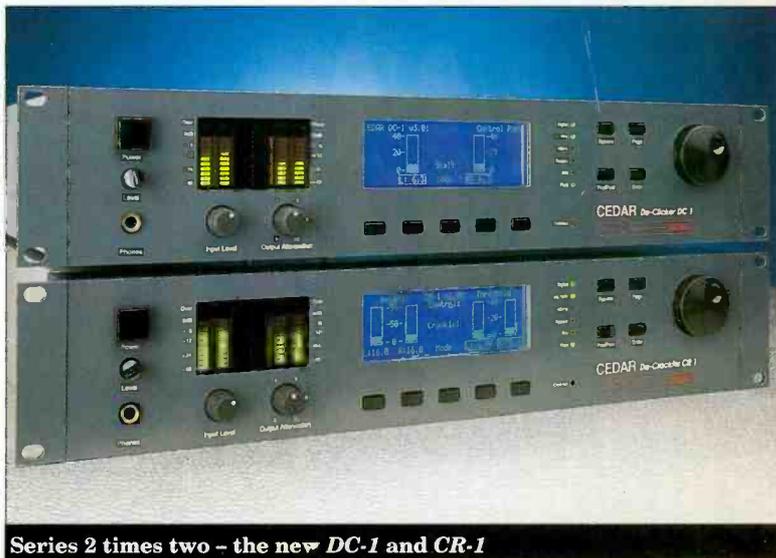
Dave Foister

**CEDAR Audio, 5 Glisson Road, Cambridge**

**CB1 2HA, UK. Tel: +44 1223 464117.**

**UK: HHB Communications Ltd., 73-75 Scrubbs Lane, London NW10 6QU. Tel: +44 181 960 2144. Fax: +44 181 960 1160.**

**USA: Independent Audio, 295 Forest Avenue, Suite 121, Portland, Maine 04101-2000. Tel: +1 207 773 2424. Fax: +1 207 773 2422.**



Series 2 times two – the new *DC-1* and *CR-1*