

by Alan Silverman

Weiss Engineering ADC2 Analog-to-Digital Converter

Daniel Weiss doesn't disappoint with this high-powered A/D converter

Weiss Engineering's latest edition of their venerable ADC hews to the company's purist philosophy. The unit is quite nearly a digital straight wire with gain. The converter supports single and dual-wire outputs at sample rates up to 192 kHz. Included are a pair of mic preamps and a digital compressor/limiter derived from the company's highly regarded DS1 dynamics processor, enabling the ADC2 to function as a complete front end. AES digital inputs, the dynamics processor and POW-R dithering allow the unit to be used for simple mastering applications as well.

FEATURES

The ADC2's mic and line inputs share a common amplifier, consisting of Analog

Devices AD797 low-noise op amps, in a minimalist topology of only four op amps per channel. Analog input level is passively con-



trolled by a switched array of vacuum-sealed gold contact relays permitting sensitivity settings from -54 dB to 0 dB in 1 dB steps. Channels can be controlled individually or ganged for stereo operation. The minimal number of gain stages and the passive level control insure very low coloration of the input signal before conversion. Input to the ADC2 stays fully balanced right up to the converter chips, which are AKM 5.6 MHz delta-sigma types. Two converters per channel are used in a correlation technique that improves signal-to-noise by 3 dB over a single-converter design. A digital level control, ranging from -100 dB to +18 dB, is available post-conversion for further gain adjustments. Steps of 0.2 dB are implemented for fine control and changes are click-free and zipperless.

A 40-bit floating point DSP module provides the engine for digital gain, precision metering (with peak-hold) and the compressor/limiter. The latter is a two-stage dynamics processor consisting of a variable-threshold 2:1 compressor and a 1000:1 peak limiter with a fixed threshold at 0 dB full-scale. To push the limiter, set the digital gain control above 0 dB.

As in the Weiss DS1 compressor, release times are adaptively varied from fast to slow depending on a look-ahead analysis of the input. These values are user adjustable on the DS1, but are fixed at 30ms and 400ms, respectively, in the ADC2. The same time constants are applied in the limiter section. Attack time is fixed at 0.315ms and there is overall system delay of 1ms. Dynamics processing can be set for linked-stereo or dual-mono operation.

Rounding out the feature set are sync-source selection, low-cut filters and 48V phantom power for the mic inputs, analog/digital input selection, and POW-R dither (with auto-black) for 16-bit output. A rear panel DIP switch sets the wire mode and the sync termination mode. Simultaneous AES and S/PDIF outputs are on the rear panel and a FireWire port is planned.

IN USE

The ADC2 was first sent out on a live stereo session for a Manhattan-based audiophile record label. The unit was configured for 192 kHz sampling in single-wire mode and connected to a location Sequoia system through a LynxStudio AES16 sound card. The unit received the same feed as the label's own reference converter. Back at my mastering room, I put up the files for comparison. The ADC2 recording sounded excellent except for a very subtle artifact in the highs. It came to light that there was a low-level clock noise in the ADC2 files. Oscillator tests revealed that the clock noise only occurred when running the ADC2 at 192 kHz in single-wire mode. At all other speeds and modes the signal was clean. I notified Daniel Weiss and a short time later he wrote that they verified the problem and corrected it by shaving a few instructions from the unit's firmware. An EPROM was sent that put the issue fully to rest.

The next set of tests involved comparisons of the analog playback of an audiophile SACD played through a Meitner professional DSD DAC against various A/D-D/A converter

FAST FACTS

APPLICATIONS

Studio, location, post production

KEY FEATURES

Two-channel; 24-bit; up to 192 kHz sample rate; digital limiter; POW-R dithering; single/dual-wire

PRICE

\$6,500

CONTACT

Weiss Engineering | ☎ -41-44-586-58-84

↳ www.weiss.ch

loops. A particularly useful SACD for this purpose is Mark O'Connor's *Hot Swing*, featuring Jane Monheit and Wynton Marsalis, because of its great vocal and instrumental sounds tracked directly to DSD. Using a Meitner Switchman II and a set of Y-cables, level-matched comparisons could be made between the source and up to three A/D-D/A chains. Although it's not a single variable test, it realistically reflects workflow and gives a sense of the colorations, or lack of same, characteristic of each designer's work. One of the benefits of writing for *PAR* is the opportunity to put a great variety of high-end gear through its paces. In the test were Weiss, Lavry Gold, LavryBlue, Digital Audio Denmark AX24, Mytek 8x192 and UA2192 – all excellent converters. The Weiss chain sounded virtually neutral with only a very slight op-amp signature. While some converter sets seemed to subtly color the low/mid/high frequency balance of the source, the Weiss was quite faithful to the input. I would place it in the top two for accuracy.

The ADC2 was then sent to Avatar Studios, here in Manhattan, for a series of mix sessions with Grammy winning jazz

engineer Jim Anderson. The mixes later came to Arf! for mastering. First up was a new album of highly energetic modern jazz by keyboard virtuoso D.D. Jackson. Mixing was done on an SSL analog desk fed by Pro Tools|HD and captured to a second system by the ADC2 at 24/96. The mixes sounded like ideal analog in that there was no sense of grain or harshness. This impression was confirmed by the artist, himself an audiophile. The mixes took mastering EQ easily.

The second project was a Flamenco set featuring a highly respected Spanish female vocalist, Martirio, backed by piano, guitar, trumpet, clarinet, bass, drums and percussion. The apparent transparency of this set was stunning. Jim later told me that Avatar's house engineers were extremely impressed with the converter and the studio's owners eventually purchased an ADC2.

When the unit returned home, I set up an informal mic preamp test with an artist named Anja, a young woman possessed of one of the most powerful and beautiful voices I've heard in all my years of studio and mastering work. A vintage M49 mic was split to an Amek 9098, a Telefunken V72 restored

by Oliver Archut of TAB-Funkenwerk, and the ADC2's mic inputs. Anja sang loud enough and high enough to make any mic preamp quiver, not to mention the engineer. The 9098 seemed to fold under the harmonic intensity, the V72 coasted with richness and air, and the ADC2 performed gracefully under the pressure. The mic preamp in the ADC2 captured Anja's sound cleanly and smoothly with little color added.

| SUMMARY

The ADC2 is a sophisticated, audiophile-quality converter with a musical soul. Transparency and pristine sound are its hallmarks. The onboard digital compressor/limiter, unlinked independent channel operation, mic preamps, digital inputs, and POW-R dithering enhance versatility. Weiss Engineering has an uncanny knack of building equipment that is both sonically neutral, yet imparts a sense of refinement and elegance. The ADC2 carries on in that tradition. As with all things Weiss, it's hard to go wrong.

Alan Silverman has recently remastered The Kinks' complete RCA and Arista catalogs for hybrid SACD and was an album-of-the-year nominee at the 2004 Latin Grammy Awards for mastering Lagrimas Negras by Bebo Valdes and Diego El Cigala.