By Erik Zobler

GRIMM AUDIO CC1

High-Stability Word Clock Generator and Distributor

Clocking is important in any audio setup, and for those taking the extra step toward uncompromising system operation, high-quality audiophile clocking is even more important. For this reason, it's no surprise that Grace Design, a company that sets the quality bar high, has brought Grimm Audio's products to the U.S.

Based in the Netherlands, Grimm Audio makes an array of products including loudness software, speakers, cables, a replacement power supply for tube microphones, an A/D converter and a word clock generator/distributor. The Grimm CC1 clock, reviewed here, appears to be a straightforward and simple device at first glance. But don't let its wood-paneled front plate lull you into believing that this is a bare-bones box—it is a pro-level device through and through.

INSIDE AND OUTSIDE

The Grimm CC1 is a word clock sync generator and distributor built into one piece. To select its base operating frequency, you can choose its internal "discrete design" crystal oscillator (at 44.1 kHz or 48 kHz), or you can select a BNC or AES connector as an external slave input. The CC1's Slave input uses a very slow, but very accurate, Phase Locked Loop (PLL) circuit that can take up to 20 seconds to "lock." The CC1's oscillator exhibits performance specs that are so low (which means good) that they had to design special test gear to measure it: a 60dB low-noise and low-distortion wideband amplifier and a Very Low Frequency nano-voltmeter that allow them to make highly accurate low-level measurements.

The CC1 has 16 BNC outputs in two groups. The first group has 12 BNC connectors while the second group has four. Each group has its own 1x, 2x or 4x multiplier of the base clock rate, selected on the front panel. There is also an AES output for a total of 17 outputs. This AES output can also be used to "re-clock" (i.e., de-jitter) a signal at the AES input (including audio and sub-code data) that is fed to a device that has no word clock input.

Because there is no standard for word sync inputs, Grimm designed the CC1 for multiple applications. Connection possibilities include serial, parallel, high-impedance termination or no termination at all. The back of the CC1 has four sets of DIP switches that allow you to configure each BNC connector to either 75 ohm or 30 ohm (low impedance). In addition, two of the BNC connectors in each output group have phase reverse DIP switches.

A useful feature for installations where settings might be accidentally changed is the "Key Lock" mode. This mode deactivates the front panel buttons, preventing unwanted changes to the CC1's settings.

A few under-the-hood design attributes worth mentioning include dramatically reduced power supply noise, temperature compensation for their extremely low-jitter oscillator, and a low-

PRODUCT *SUMMARY*

COMPANY: Grimm Audio
PRODUCT: CC1
WEBSITE: gracedesign.com
PRICE: $2,995 MSRP
PROS: Noticeable improvement in sound when connected to most equipment. Highly accurate clock output, even when the CC1 is slaving to and external reference. Seventeen configurable outputs.
CONS: Expensive. Video input (frowned upon by Grimm) is possible, but requires add-on dongle.

impedance reference plane that minimizes any potential ground loops (which can cause jitter).

LISTENING TESTS

George Duke's studio in Hollywood was a perfect place to do a test. His system uses multiple Avid and Euphonix interfaces with 48 analog channels. All of the interfaces (a total of 10) are externally clocked to an Apogee Big Ben clock. It was not possible to do a quick A/B comparison with a setup like this, so I printed a mix I was working on to an external recorder, then replaced the Big Ben with the Grimm and ran the exact same mix again to the recorder. I then burned a CD and listened to the two versions back to back, going back and forth between the two until I could easily identify the two versions. When listening, I did not know which version I was listening to, so that I wouldn't be influenced by what I may have "wanted" to hear.

My initial response was that I preferred the Big Ben. It seemed crisper and somehow more alive. But as I kept listening, I noticed that some of the high frequencies seemed a bit "hairy" or "edgy." It was almost as if the high end was a bit "excited," reminding me of an Aphex Aural Exciter signal processor. At the same time the bass sounded a bit more round or tubby—even mushy. The Grimm version, on the other hand, did not exhibit these attributes, and the first thing I noticed was that the bass sounded more defined, less puffy and more accurate. I also had the same feelings about the highs. They sounded more natural, and again, more defined. Essentially, the whole mix seemed more solid. I did not notice what many people often say about clock improvements–that it sounded more airy. In fact, in comparison to the Apogee, it sounded a tiny bit darker, due to the excitement I mentioned earlier. When I closed my eyes and told myself to forget about all the perceived sonic differences and just pick the clock that "felt" better, I chose the Grimm. It was accurate, natural and solid. I know it's cliché, but it just sounded more musical.

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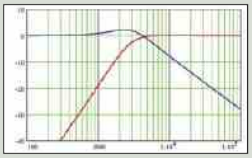

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Do you need an External Clock? The answer is probably yes, but maybe not. It depends on your gear and your system. Even Grimm admits that in some situations, depending on the gear being used, there may not be any appreciable improvement to the sound. I have found this to be the case when working with live digital consoles. For example, externally clocking a DiGiCo or a Studer/Soundcraft console doesn't seem to improve the sound, but when I externally clock a Yamaha desk, the difference is literally jaw dropping.

Because this test was only a comparison of the two clocks' effect on the D/A converters, I performed a different test to isolate the sound of the A/D converters. At my studio I have a stock Avid 192 HD converter and a Black Lion Audio/Requisite Audio Engineering FM192. I also have an Apogee Big Ben clock modified by The Mastering Lab, so with the Grimm CC1 I could audition four different clocks.

The best way to compare audio equipment is to use the exact same source every time you make a switch. Obviously this isn't possible with a live player, so I selected a song with all live players that I had previously recorded to Pro Tools at 96 kHz, and mixed to a DSD recorder operating at 5.6 MHz. In other words, I used a very high-resolution source with which I was intimately familiar. I recorded directly into the stock Avid (Digidesign) 192 audio interface operating at 96k, and I recorded the same material with the four different word clock settings. The first setting was Pro Tools, set to its internal clock. For the other three settings, Pro Tools was set to External Clock, but with different sources: Grimm CC1, Apogee Big Ben, and the word clock output from the Black Lion Audio/Requisite Audio Engineering FM192.

With Pro Tools set back to its internal clock, I lined up all the tracks and with the help of my assistant, did some blind listening tests. I had her play a section of the song, each time playing back one of the differently clocked recordings. Then we selected a different section of the song and she randomized the order of playback. After each set of playbacks, we noted which one I preferred. Four out of six times I chose the Grimm. My criteria was to pick the playback that I liked best, that sounded the cleanest and the closest to how I remembered the original recording.

This type of listening is extremely difficult. The differences, especially after being played back through my DAW (passing through the Pro Tools audio engine once again), were very subtle. It was very easy to go into a type of information overload to the point where I had to take a break to give my ears a rest. Yet I was definitely hearing differences between the clocks. Of course a "slam dunk" would have been if I had picked the Grimm all six times, but I think it was statistically significant that while listening blind, I chose the CC1 four times and the BLA/RAE and Apogee clock once each. Once again, the word "solid" or "defined" seemed to be the best way to describe how I perceived the effect of the CC1.

As another test with these recordings, I listened for the effects these different clocks had on the playback. Using the stock Avid 192, I would play a selection, stop, change clock sources, wait a bit for the PLLs to settle, and then listen. I preferred the CC1 to the other three choices, although I must admit, I did not do blind tests. Finally, I repeated this test using the FM192. I didn't know what to expect with this test because I love the sound of my FM192 set to its internal clock. This test was almost a toss-up. They both sounded good, but again I felt the CC1 gave a slight improvement.

In addition to the 16 BNC outputs, the CC1 has an AES input and output. It can be used to re-clock (and de-jitter) the source at the AES input. This is a very useful feature of the CC1, especially when used to drive a DAC that has no word clock input. I use a DEQX HDP-3 as my monitor controller. It is a digital EQ and Crossover with multiple DACs driving each component of my speaker system. Normally I just run an AES output from one of my 192s into the DEQX. When I inserted the CC1's AES into that monitor chain, I noticed that the sound was smoother and more "silky."

IS IT GRIMM TIME?

The CC1 is a brilliantly designed piece of equipment. Every piece of gear that I plugged into it sounded better and more natural. The word I keep coming back to describe its effect is "solid." It is one of those pieces of gear that has a price tag that can scare you, but when you hear it, you have to have it. ■

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