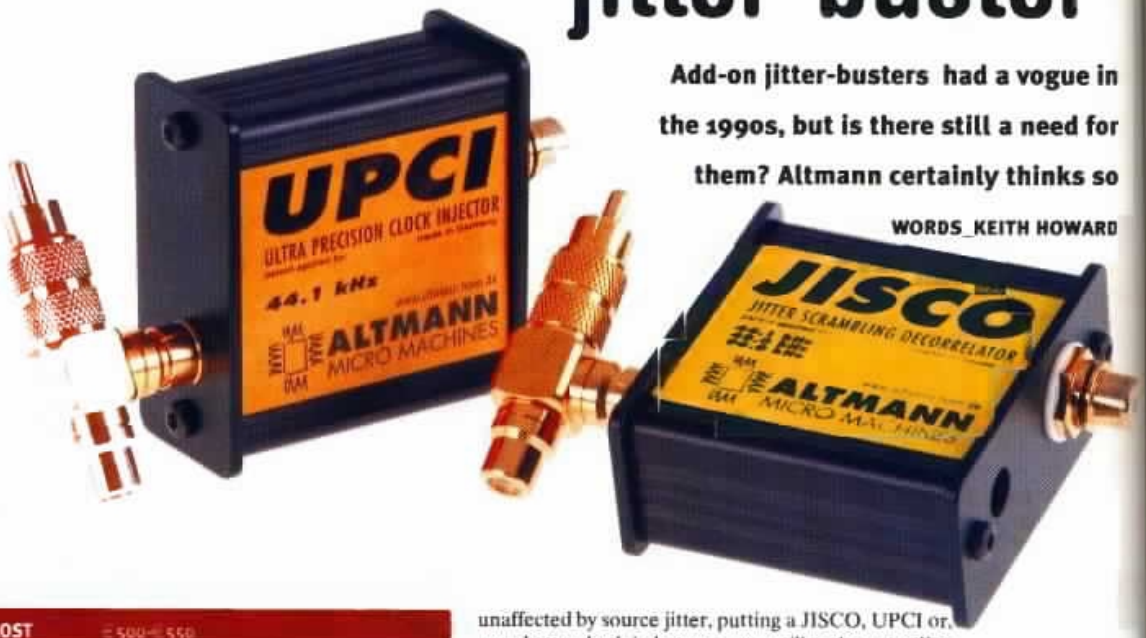
Altmann UPCI 'jitter-buster'

Add-on jitter-busters had a vogue in the 1990s, but is there still a need for them? Altmann certainly thinks so

WORDS_KEITH HOWARD



COST	£500–£550
SUPPLIER	Altmann Micro Machines
CONTACT	www.jitter.de

Last month's feature article about jitter was, in part, a preamble to this two-part review of two jitter suppression devices from Altmann Micro Machines (AMM) in Germany. Jitter busters, as they became widely known, first appeared about a decade ago and were popular for a while as a means of reducing jitter effects in two-box (transport/DAC) CD players. Today they have fallen out of fashion rather, not least because the best modern two-box CD combinations appear to have reduced jitter to imperceptible levels.

Does this mean the Altmann UPCI and JISCO are latecomers to a party that's already finished? Actually no, for two good reasons. First, many DVD players are now called upon to act as high quality audio sources, playing CD, audio DVD-Vs and DVD-A. But DVD players tend to produce copious amounts of jitter, audiophile examples excepted. Most will be used as stand-alone sources, in which case the jitter has to be tolerated, but some — notably the Pioneer players, which all support 24/96 PCM via their digital outputs — will be partnered with outboard DACs. In this context the jitter buster may still have a role.

Second, and this is the puzzling part, even when you use a low-jitter transport and a DAC that is ostensibly unaffected by source jitter, putting a JISCO, UPCI or, even better, both in between, can still make a startling difference to the sound.

It may seem odd that one company should produce two different jitter busters but there's a perfectly logical reason for this: the UPCI (ultra precision clock injector) and JISCO (jitter scrambling decorrelator) work in fundamentally different ways. The UPCI re-clocks the input by means of a narrow-bandwidth phase-locked loop 'flywheel' and so shares its *modus operandi* with most of the jitter busters seen previously. The JISCO, by contrast, has a novel operating principle I'll describe next month.

The UPCI operates at a fixed sampling rate (44.1, 48, 96 and 192kHz versions are available — the 44.1kHz version was tested), which — contrary to what I've just said — makes it less than practical to use with a multi-rate signal source like a DVD player. Measuring just 65 x 55 x 24mm, it is remarkably compact and intended to be plugged directly into a digital input, thereby obviating the need for an additional digital cable. To this end all variants are fitted with a body-mounted gold-plated RCA phono plug and supplied with a gold-plated T-connector to make the connection arrangement more flexible. A phono input socket is fitted as standard, also gold-plated, but either TosLink or ST optical connectors can be specified. Output voltage is switchable between 0.5 and 5V peak-to-peak, to suit S/PDIF or AES inputs. Power supply is 12V DC via a wall-wart, which Altmann says can beneficially be replaced by a 12V

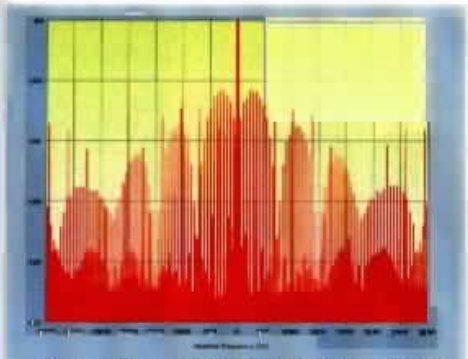


Figure 1. Jitter spectrum (J-Test), DV-939A/X-24K

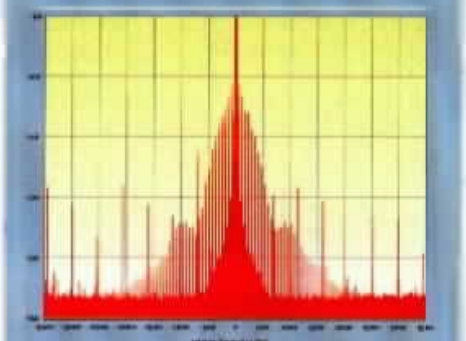


Figure 2: as Figure 1, but with UPCI added

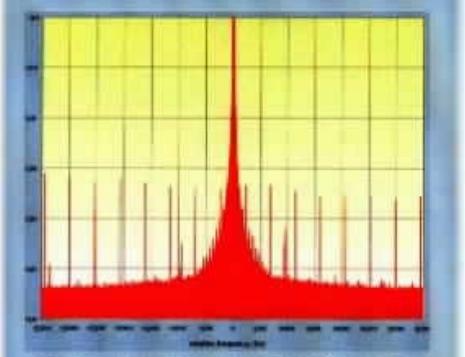


Figure 3. Jitter spectrum (J-Test), DV-939A/P-3A

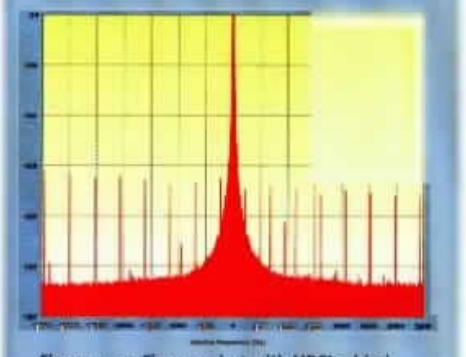


Figure 4: as Figure 3, but with UPCI added

battery. Asking price is €500 with phono or TosLink input, or €550 if fitted with the ST option.

Let me tell you how I expected this review to pan out. With a high-jitter source (a role played here by a Pioneer DV-939A) and a DAC prone to the effects of source jitter (Musical Fidelity X-24K), I anticipated the UPCI would have a beneficial effect. Whereas if the source were replaced by a low-jitter alternative (Meridian 508.24) or the DAC by one largely insensitive to input jitter (Perpetual Technologies P-3A), the beneficial effects would evaporate.

Measurement mostly confirmed these expectations. Figure 1 shows the jitter spectrum at the output of the X-24K fed a 16-bit J-test signal from the DV-939A — it's a mass of jitter components, mostly from the '939. Figure 2 shows the effect of adding the UPCI: although the '939's jitter isn't eliminated it is certainly significantly suppressed. Figures 3 and 4 show the very different result when the P-3A is used in place of the X-24K, without and with UPCI respectively (note the different vertical scale here). In this case the DAC's inherent jitter suppression is so good that the UPCI can make only a small improvement. And if the '939 is replaced by the Meridian 508.24, no improvement whatsoever can be seen.

On this basis the UPCI should have little sonic benefit when used between the DV-939A and P-3A, and none whatsoever between the 508.24 and X-24K or (even better) the 508.24 and P-3A. But that's not how things turned out — in fact the listening came as a shock.

As anticipated, with the UPCI in circuit between the DV-939A and the X-24K there was an obvious improvement in clarity, dynamics and imaging – a blanket had been removed from the sound. But expectations were confounded when I substituted the 508.24 for the DV-939A and, in contradiction of the measurements, the

Are the Altmann UPCI and JISCO just latecomers to a party that's already finished? Actually, no...

same sonic differences were apparent. I had expected the 508 to eliminate or at least diminish the audible effects but that wasn't the case at all. The UPCI still imparted greater stability and solidity to the sound and reduced digital 'edge'.

Next I adopted a belt and braces approach — low-jitter source (508) connected to a DAC which the measurements suggest is largely insensitive to incoming jitter (P-3A). Surely this combination would render the UPCI ineffectual? Again no: the UPCI still had a clearly audible effect on the sound, along the lines already described.

Although I wish some way could be found to make the UPCI a multi-rate device without sacrifice to its performance, I can recommend it without reservation. It measures well, which is always reassuring, and brings obvious benefits to sound quality even with partnering equipment you might expect to be immune from its influence. The JISCO story, as we'll see next month, is more complicated — but all the more fascinating.

Altmann JISCO 'jitter-buster'

Part two of the micro machines investigation

WORDS_KEITH HOWARD

PRICE	€500–550
SUPPLIER	Altmann Micro Machines
CONTACT	www.jitter.de

Whereas the UPCI [*HFN* Sept '03] rates as a conventional jitter reduction device, the second jitter buster from German manufacturer Altmann Micro Machines is more unusual. As its name suggests, the JISCO (jitter scrambling decorrelator) goes about its task rather differently.

The design philosophy underlying the JISCO is simple enough. Digital receiver chips usually perform some measure of jitter suppression along the lines of the UPCI, only they don't become effective until much higher jitter frequencies. On the Altmann website the popular Crystal CS8414 is used as an example, which the data sheet shows only begins to provide progressive jitter attenuation above 10kHz or so. To prevent lower jitter frequencies passing unsuppressed, the JISCO modulates the jitter to much higher (MHz) frequencies, where the attenuation provided by the receiver chip is high. That, at least, is the claim.

Whereas the UPCI operates at a fixed sampling rate, which makes it inconvenient to use with a multi-rate signal source like a DVD player, the JISCO has the practical advantage of working at any sampling rate from 32 to 96kHz, and beyond.

Other features of the two units are identical: output voltage is switchable between 0.5 and 5V peak-to-peak; the JISCO, measuring just 65 x 55 x 24mm, plugs directly into a digital input; and a phono input socket is fitted as standard but can optionally be replaced with either TosLink or ST optical connectors.

SOUND QUALITY

I tested the effect of the JISCO, like the UPCI, between a high-jitter digital source (Pioneer DV-939A DVD player) and two outboard DACs — an old Musical Fidelity X-24K, which is susceptible to input jitter, and a Perpetual Technologies P-3A, which is largely unaffected by it. The JISCO and UPCI were also tested in series: the UPCI connected to the DAC input and the JISCO connected to the UPCI's input.

Results are shown in the accompanying spectra [right]. Note that all these measurements, and those last month, were taken from the DAC's output via the analogue input of a Lynx L22 soundcard, recording at 24-bit resolution and 44.1kHz sampling rate. Spectral analysis is by 32,768-point FFT in each case, averaged over approximately 30 seconds, under which conditions the inherent noise floor of the L22 (input shorted) is around –146dBFS. The test signal was a 16-bit J-test waveform, as described in August's jitter feature, present on both channels. All the tests were made with the UPCI and JISCO powered, for convenience, from a 12V lead-acid battery; comparison measurements made with the mains supplies showed no significant differences.

Taking the DV-939A/X-24K sequence first, the jitter sidebands for the two when directly connected

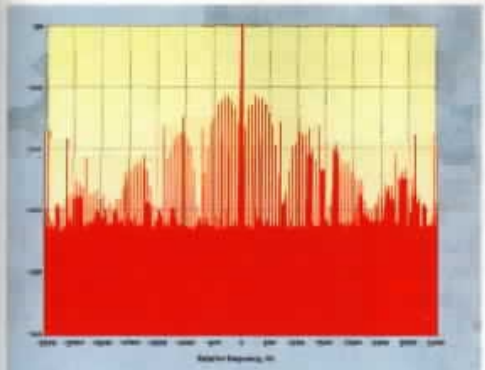


Figure 1. DV-939A/JISCO/X-24K

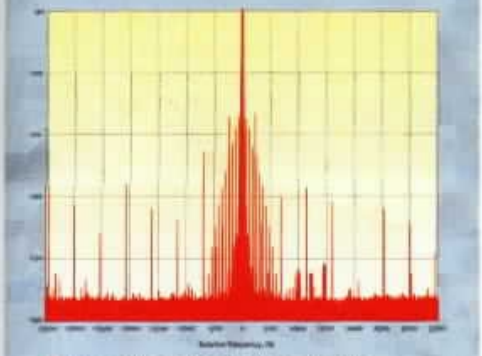


Figure 2: DV-939A/JISCO/UPCI/X-24K

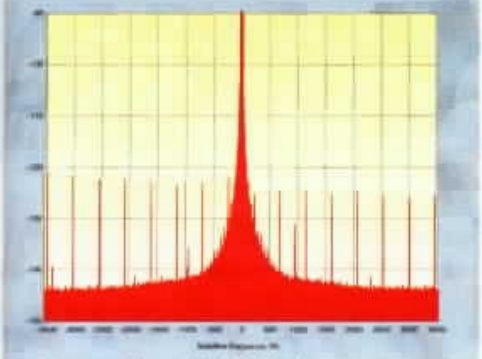


Figure 3: DV-939A/JISCO/P-3A

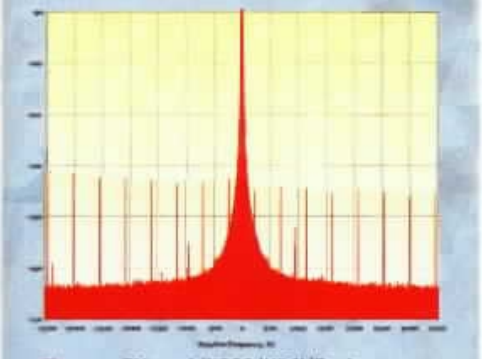


Figure 4: DV-939A/JISCO/UPCI/P-3A

are all too obvious [Figure 1 last month]. Putting the JISCO in circuit [Figure 1 here] does nothing to remove these but does raise the noise floor significantly — presumably due to an increased level of decorrelated jitter — and adds further closely-spaced spectral lines around some of the X-24K's data-related sidebands. Inserting the JISCO and UPCI in series [Figure 2] gives a much better result, with greater suppression of the DV-939's jitter signature than achieved by the UPCI alone.

Substituting the P-3A for the X-24K brings a very different outcome because of the P-3A's insensitivity to source jitter. In this case adding the JICO has negligible effect [Figure 3] although adding the JISCO-UPCI combination [Figure 4] does remove the last vestiges of jitter sidebands from the skirts of the central peak.

From these results I expected the JISCO to have little sonic benefit — a derogatory effect, more likely — when used between the DV-939A and X-24K, and none when inserted between the DV-939A and P-3A. For the JISCO-UPCI combination things looked rosier with the X-24K, although with the P-3A in circuit I again expected little.

But, just as with the UPCI, these expectations were overturned by the listening. Used between the DV-939A and the X-24K, the JISCO's effect was in some ways similar to the UPCI's only the presentation was now less relaxed, with a hint of hardness. In comparison the UPCI sounded a little softer but more natural. The best result came with the JISCO inserted ahead of the UPCI: the sharper leading edges of the JISCO were now combined with the UPCI's sense of warmth and imperturbable stability, giving an overall sound quality to match a top one-box or two-box CD player.

Expectations were further confounded when I substituted the P-3A for the X-24K and, in contradiction of the measurements, the same sonic differences were apparent. The JISCO scored for vividness but suffered some hardness, while the JISCO-UPCI combination melded the best sonic features of each.

Even when I partnered the P-3A with a Meridian 508.24 — a very low-jitter source — the JISCO or JISCO-UPCI still had a clear effect on the sound. With both connected, the end result was an astonishing overall improvement. My notes say: 'Richer and yet more detailed. More "rooted" dynamically and spatially. Intimate, characterful.' Another step closer to the master? Absolutely — and not so much a step as a stride.

CONCLUSION

Although the JISCO has received enthusiastic notices from some users, I can only recommend it with caution if used alone. The way it measures is disconcerting and, for all that it improves the sound's clarity and 'bite', it adds an edge that can prove wearing. This might be a system-specific effect, so that in other contexts the benefits more clearly dominate, but that in itself disbars the JISCO from a blanket recommendation.

Where I can endorse it wholeheartedly is used ahead of the UPCI, a combination that can bring magical benefits even to top-flight digital sources and DACs. Has Charles Altmann discovered in jitter decorrelation the jitter equivalent of dithering? That's how I think of it, and the effect is extraordinary.