australian hi-fi

REVIEWED

REL Serie T9
Subwoofer

Rotel RA-1520
Integrated Amplifier

Musical Fidelity CLiC
Universal Music Controller

Von Schweikert VR-35
Loudspeakers

Vitus Audio RI-100
Integrated Amplifier

MF M1 CDT
CD Transport

WHEN THINGS JUST CLiC...

Musical Fidelity's First Streaming DAC

SHOW REPORT

CES 2012: PART II

We continue our report on the world's largest show...

May/June 2012

Musical Fidelity M1 CLiC

UNIVERSAL MUSIC CONTROLLER

It's taken a while for Musical Fidelity to catch up with the fact that streaming audio is rapidly usurping the more conventional sources of recorded music. But that's not so surprising. I remember company founder Antony Michaelson telling me some years ago that when you're a relatively small company working out of the UK, you have to be careful where you allocate your resources. And it's not like Musical Fidelity has ignored the digital audio market entirely: it's been offering standalone DACs for many years, and even its V-Link digital interface was getting a little long in the tooth until its recent 192kHz upgrade. I was initially going to describe the Musical Fidelity CLiC as a 'streamer'—and indeed it is a streaming audio device—but it's actually much more than that, which is no doubt why Michaelson decided to call it a Universal Music Controller. It's also a DAC and it's also a pre-amp, so Michaelson has obviously worked very hard at making his very first 'streaming' audio product as useful as possible. The very recent addition of the M1 power amplifier to the M1 line-up means you can now assemble a complete Musical Fidelity 'M1' system comprising the CLiC, CDT CD transport, DAC, HPA headphone amp, VNL phono stage and PWR power amplifier, all of which share the same dimensions and general appearance. Although this review is primarily of the M1 CLiC, I decided to use the M1 CDT as one of the audio sources, so it will also get a fairly significant mention during the review. I also plan to do a follow-up review of the M1 PWR power amplifier in an upcoming issue of Australian Hi-Fi Magazine.

M1 CLiC

The DAC inside the CLiC is able to handle up to 24-bit/192k files depending on how the files are packaged. Linear PCM files can be up to 24/192, as can FLAC files. If we're talking about compressed file formats, you're looking at maximums of 16/32 (Ogg Vorbis), 16/48 (MP3/WMA), and 24/96 (AAC/HE-AAC).

The CLiC has built-in Wi-Fi, but this is limited to 24/96. If we count Wi-Fi as an 'input' (and it most certainly is one), the other inputs on the CLiC comprise three line-level analogue RCA inputs, three digital inputs (two RCA and one Toslink optical), USB Type-A inputs on the front and rear, an additional USB Type B on the rear panel and an Ethernet connection. Speaking of the Ethernet connection, I have to say that it sticks out like the proverbial on the rear panel, looking for all the world like an afterthought. Whereas all the other connectors are neatly and securely housed on the rear panel and mostly gold-plated, the Ethernet connection is nickel-plated and has gaps all around it. There's probably a story about how this particular connection came to be there, but I wasn't game to ask. I also didn't want to ask why one of the two wired digital inputs couldn't have been a BNC fitting, which I far prefer for connecting digital audio cables. There are two pairs of analogue outputs. One comes from the pre-amp, so you can vary its voltage, while the other has a fixed voltage output.

The CLiC's front panel is a model of modernity. The moderately large (73×57) full-colour display almost completely dominates the front panel.

Initially I wondered why the display was so large, since it only seemed to contain lines of text, but all became clear when I streamed music into the CLiC: the display also shows album artwork and other music content-related information.

Apparently Musical Fidelity commissioned StreamUnlimited to develop this display. This well-known Austrian company would have been a very obvious choice for Michaelson, because the people behind StreamUnlimited originally worked at Philips, where they introduced the first streaming audio and video products, the first MP3 players, the first hard-disc and DVD recorders, the first HDMI products and the first Wi-Fi enabled products. Back in those days, they worked in a development centre within the Philips Audio Video Innovation Centre in Vienna. These days StreamUnlimited is nothing to do with Philips, being now wholly-owned by its employees, who number around 50. Since it's effectively an 'OEM' display, you'll find similar displays on products (including streamers and other devices) from other companies (the Onix DCD10S springs to mind). The only thing I found odd about the display is that it's so realistic that it looks like it's a touch screen (which it's not) and because there are no front panel controls, I was constantly trying to touch the screen to control the CLiC. It took me quite a few days before I got used to hunting around for wherever I'd left the remote control so I could use it... because, if you misplace the remote, you're stuck, because you can't use the CLiC without it... or at least that was true when I first started reviewing the CLiC. During the review process, Musical Fidelity released a free App which meant I could instead control the CLiC with any iDevice (iPad, iPhone etc). The iPad (HD) version of the App is pretty much a mirror of the front panel except that selecting options is easier, and as you navigate through the iPad interface the front panel updates to reflect the changes you've made. Select 'Media Server' and the front panel will display the same browsing options: album, artist, genre etc. After you've selected and started playing a track, the album art is displayed on both the iPad app and CLiC display. I managed to find play options such as shuffle, repeat, track back, track forward, but I couldn't find a way to create a playlist or queue tracks at the time this review was written. (The App may well have been upgraded to include these features by the time you read this review.) I have created a tiny URL link to the Musical Fidelity App on Apple's iTunes website here: [www.tinyurl.com/clic-app]

LISTENING SESSIONS

Because of the versatility of the CLiC/CDT pair, I was able to listen to music from CD, from hard-disc, and streamed from the Internet as well as from portable devices. The only connection I didn't use was wi-fi, because when I tried to connect via wi-fi downstairs in my home, I didn't get anything at all, which didn't surprise me, because the router is upstairs, but it was only when I moved the CLiC to my home office, which is immediately next door to the room in which the router resides, that I got a signal. It appears that I am not the first reviewer to experience this: Michael Everard of *Gramophone* said that he was told by Musical Fidelity that 'the wi-fi provision is mainly on the M1 CLiC for occasional use, and that for the best performance the company recommends a wired Ethernet connection from the network router.' I agree with this sentiment entirely, and would add that if, like me, it's impractical to run Ethernet cable in your home, you should instead use a powerline Ethernet solution, which means you can have Ethernet anywhere in your home that there's a 240V socket.

In all the situations in which I used it, I have to say that the performance of the CLiC/CDT duo was exemplary, limited only by the format of the music itself, so that if you were listening to a low-res MP3 file, you'd hear exactly what you'd expect: low-res sound!

MUSICAL FIDELITY M1 CLIC
UNIVERSAL MUSIC CONTROLLER

Brand: Musical Fidelity
Model: M1 CLiC
Category: Streamer
RRP: $1,999
Warranty: Two Years
Distributor: Audio Marketing Pty Ltd
Address: Unit 14L. 175 Lower Gibbes Street
Chatswood NSW 2067
(02) 9882 3877
(02) 9882 3944
info@audiomarketing.com.au
www.audiomarketing.com.au

- Easy to use
- Neat and part of series
- Outstanding performance

- Wi-Fi range
- Lacks BNC fitting
- Ethernet connection

LAB REPORT

Readers interested in a full technical appraisal of the performance of the Musical Fidelity M1 CLiC and M1 CDT CD Transport should continue on and read the LABORATORY REPORT published on page 56. Readers should note that the results mentioned in the report, tabulated in performance charts and/or displayed using graphs and/or photographs should be construed as applying only to the specific sample tested.

Lab Report on page 56

The CLiC's Type B USB supports only up to (and including) 24/48 so if you want higher quality, a good option would be to add a Musical Fidelity V-Link 192 to take the USB from your computer and feed it to the coaxial digital input on the CLiC. I don't have many hi-res files, but on the few that I do have, I occasionally heard dropouts (only with 24/176.4 and 24/192). This may have been the files themselves (although they've previously played without incident) or a specific compatibility issue with the CLiC. If you play such files exclusively (or with any degree of regularity) you should audition this yourself. (I'd also expect that if it is an issue, it'll be software-related, and thus easily fixable via a software update.) As it happens, it really wasn't an issue for me at all, because I play mostly 16-bit/44.1kHz files, plus a few 24-bit/96kHz and the CLiC worked perfectly for me with these file formats.

If you want higher quality via USB, a good option would be to add a Musical Fidelity V-Link 192 to take the USB from your computer and feed it to the coaxial digital input on the CLiC...

When playing CDs using the CLiC/CDT combo, I found the sound quality completely involving. The bass was delivered powerfully and effectively, with perfect timing, and the treble was exemplary. The midrange also was excellent. In a direct A–B comparison with a much higher-priced transport/DAC combo—and I'm talking a factor of ten, not just two or three—I fancied that perhaps the mids from the Musical Fidelity pair seemed very slightly veiled, but I had to do a lot of very critical listening with revealing material to come to this conclusion.

CONCLUSION

The CLiC is Musical Fidelity's first streamer, and it may not be quite perfect, but it's perfect enough, and does so many things so well that it will make a great many people very happy... and here I'm talking primarily about music lovers who want to access their music (including internet radio) from multiple digital and analogue sources with no fuss, a minimum outlay of money, plenty of flexibility and from a sensibly-sized high-quality component that delivers very high-quality sound. You don't need a degree in computer science to install it, and you certainly won't need an instruction manual to learn how to use it. Operation is completely intuitive. And that's really the CLiC in a nutshell. It looks good, sounds good, plays everything and is really *really* easy to use, particularly if you control it via your iPad.

greg borrowman

Postscript: I was also more than pleased with Musical Fidelity's CDT. If you need to play back CDs, it's the obvious match. However, if you're going the CLiC route, it makes more sense to use your computer to rip your CDs and use the CLiC to access the resulting music files from your hard disk (or NAS). ***gb***

M1 CDP CD TRANSPORT

Musical Fidelity's M1 CDT CD transport (which sells for $999) has a fairly conventional front-panel display, but frankly, its two-line and rather dull blue/grey LCD read-out looks a bit dowdy when it's up against the glorious full-colour display of the CLiC. I guess that even if it were economical to put a CLiC-type display on the CDT, it wouldn't fit, because you'd have to leave room for the slot-loading CD mechanism. Speaking of which, although the CDT's slot-loader was fast, reliable and relatively quiet it had one quirky characteristic that constantly frustrated me. It is that if you eject a disc, and then change your mind and want to play it again, you can't just push it gently back. Instead, you have to grip the CD (which is hard, because I always try not to touch the playing surface of a CD, and I'm a bit wary of touching the label side as well), and pull it out a little way to 'reset' the mechanism. It's only after you've done this that you can re-insert the disc. OK, this isn't likely to happen too often, and the reviewing process is not like 'real life' because there's a lot more inserting and removing of discs than usual, but it's a quirk I just had to mention. Another one is that if you press either the track forward or track reverse buttons too quickly too many times in rapid succession, all the transport controls are locked out (the music keeps playing!) so that then the only way I found I was able to use any of the front panel controls was to turn the power switch off, then back on again. I would venture that most people will never run across this fault in every-day use, because it requires lots of very rapid button-pressing to initiate.

Once a disc is loaded, it takes around 8 seconds to initialise and then, rather strangely, the mechanism goes to its 'STOP' mode, during which the fast-forward control is locked out. To get the CDT to enter normal play mode you have to press the Stop button, after which the fast-forward control will work as it's supposed to. As you can see from the photograph, you can operate the CDT entirely from the front panel, with the controls arrayed beneath the slot, which are (left to right) Standby/On, Pause/Play, Stop, Track Back, Track Forward, Eject. What looks to be a control at the far right is actually an infrared receiving window, to accept commands from the remote control.

Around the rear of the CDT are three digital outputs: one via a gold-plated RCA socket, one via a balanced AES three-pin socket and the other optical, via a standard Toslink connector. There are also trigger input/outputs and a standard three-pin IEC mains power socket.

LAB REPORT ON PAGE 56

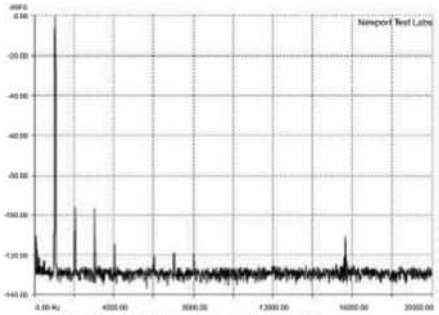
CONTINUED FROM PAGE 30

TEST RESULTS

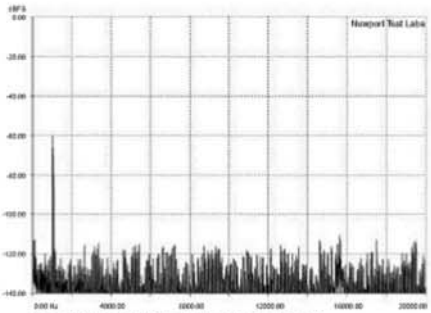
Newport Test Labs tested the Musical Fidelity CLiC using two different digital standards: 16/44.1 and 48/24. It performed brilliantly with both formats

Newport Test Labs tested the Musical Fidelity CLiC using two different digital standards: 16-bit/44.1kHz and 48kHz/24-bit. It performed brilliantly with both these standard digital file formats. Looking first at 16/44.1, Graph 1 shows the almost complete lack of distortion in the CLiC's output. The three low-order harmonics visible are nearly 100dB down (0.001%) and seem to be the product not of the conversion process, but of the analogue output stage, which appears to have be optimised for slightly lower levels due to the fact that the harmonics drop away so quickly at the –6dB and –10dB levels shown in Graphs 2 and 3.

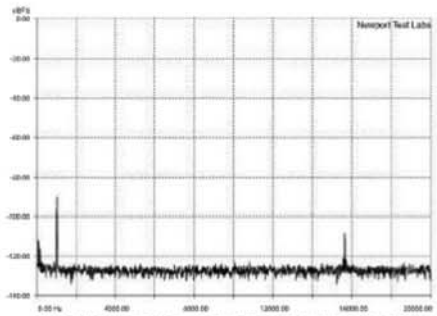
As I have noted previously, there are no commercially available CDs that will deliver a 0dB output level due to the need for headroom. This means that 'typical' distortion performance will be more like what's shown in Graph 3: a single second harmonic component at –115dB (0.0001%). Regular readers may also have recognised that the signal visible just below 16kHz is interference from a nearby piece of test equipment that uses a standard cathode ray tube for its display, so you should ignore this on all the graphs, as it's unique to *Newport Test Labs'* testing environment and would not appear in typical home use. At –20dB you can see there are no distortion components visible above the noise floor, and that the noise floor is for the most part sitting down at –130dB with very few low-frequency components visible at the extreme left of the graph.



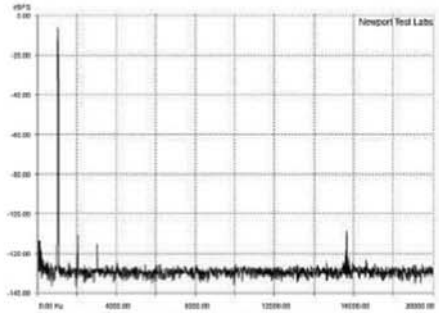
Graph 1. THD @ 1kHz @ 0dB recorded level. (Musical Fidelity M1 CliC)



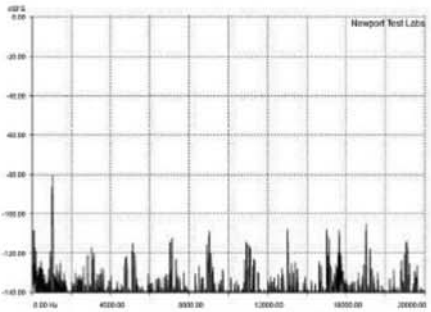
Graph 5. THD @ 1kHz @ -60dB recorded level. (Musical Fidelity M1 CliC)



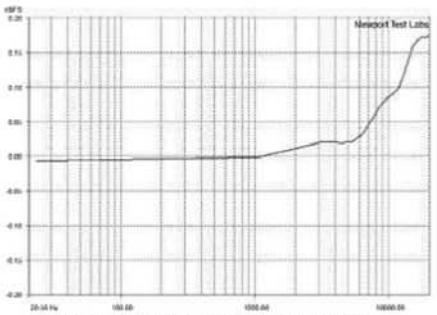
Graph 9. THD @ 1kHz @ -90.31dB recorded level. (With dither) (Musical Fidelity M1 CliC)



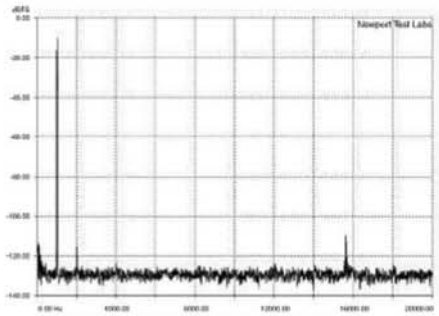
Graph 2. THD @ 1kHz @ -6dB recorded level. (Musical Fidelity M1 CliC)



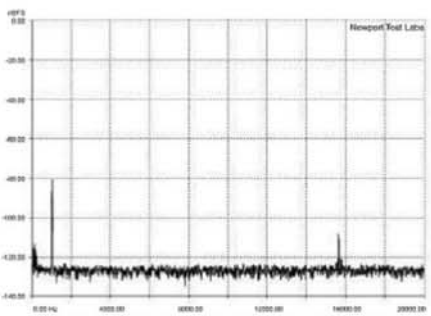
Graph 6. THD @ 1kHz @ -60.59dB recorded level. (No dither) (Musical Fidelity M1 CliC)



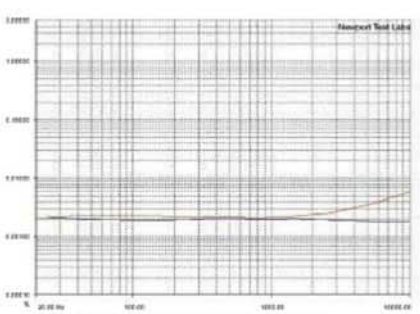
Graph 10. Frequency Response at @ 0dB recorded level. (Musical Fidelity M1 CliC)



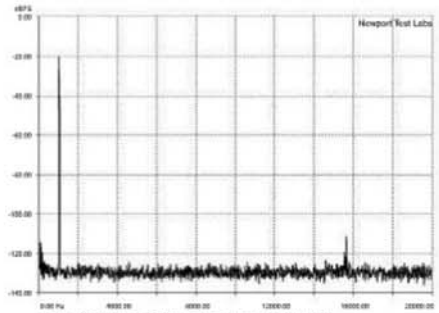
Graph 3. THD @ 1kHz @ -10dB recorded level. (Musical Fidelity M1 CliC)



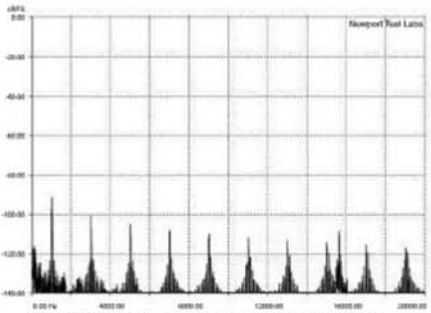
Graph 7. THD @ 1kHz @ -80.75dB recorded level. (With dither) (Musical Fidelity M1 CliC)



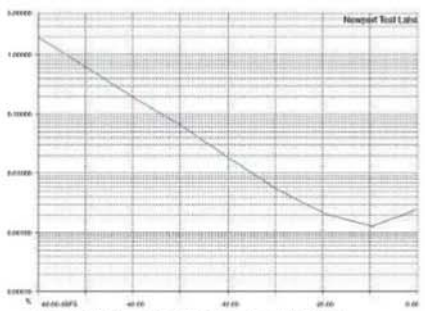
Graph 11. THD vs Frequency. Left channel (red trace) vs right (blue trace. Digital input. 24-bit/48kHz. (Musical Fidelity M1 CliC)



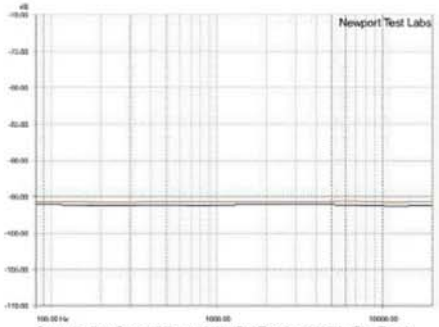
Graph 4. THD @ 1kHz @ -20dB recorded level. (Musical Fidelity M1 CliC)



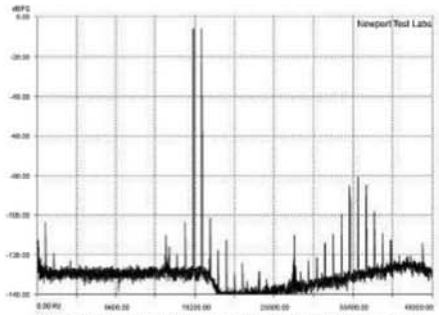
Graph 8. THD @ 1kHz @ -91.24dB recorded level. (No dither) (Musical Fidelity M1 CliC)



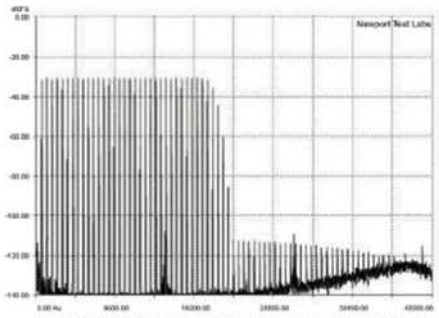
Graph 12. THD vs Level. Digital input. 24-bit/48kHz. (Musical Fidelity M1 CliC)



Graph 13: Jitter Susceptibility at 250Hz (Red Trace) and 997Hz (Blue Trace) Digital input. 24-bit/48kHz. [Musical Fidelity M1 CLiC.



Graph 14. CCIF Distortion (Twin-Tone Intermodulation) @ 1kHz @ 0dB using 19kHz and 20kHz test signals in 1:1 ratio. [Musical Fidelity M1 CliC]



Graph 15. Impulse Train. (One maximum amplitude positive sample every 70 samples (630 pulses per second). [Musical Fidelity M1 CliC]

Musical Fidelity M1 CLiC (44.1kHz/16-bit Standard)

Analogue Section	Result	Units/Comment
Output Voltage	2.0169 / 1.9864	volts (Left Ch/ Right Ch)
Frequency Response	See Graph	dB (20Hz – 20kHz)
Channel Separation	86 / 107 / 107	dB at 16Hz / 1kHz / 20kHz
THD+N	0.006%	@ 1kHz @ 0dBFS
Channel Balance	0.13dB	@ 1kHz @ 0dBFS
Channel Phase	0.04 / 0.00 / 0.00	degrees at 16Hz / 1kHz / 20kHz
Group Delay	-7.64 / +5.58	degrees (1–20kHz / 20–1kHz)
Signal-to-Noise Ratio (No Pre-emph)	80 / 92	dB (unweighted/weighted)
De-Emphasis Error	N/A	at 1kHz / 4kHz / 16kHz
Linearity Error @ -60.00dB / -70.00dB	0.02 / 0.04	dB (Test Signal Not Dithered)
Linearity Error @ -80.59dB / -85.24dB	0.03 / 0.02	dB (Test Signal Not Dithered)
Linearity Error @ -89.46dB / -91.24dB	0.05 / 0.09	dB (Test Signal Not Dithered)
Linearity Error @ -80.70dB / -90.31dB	0.02 / 0.15	dB (Test Signal Dithered)
Power Consumption	0.31 / 7.17	watts (Standby / On)
Mains Voltage During Testing	243 – 248 volts	(Minimum – Maximum)
Digital Section	**Result**	**Units/Comment**
Digital Carrier Amplitude	108mV	Audioband
Digital Carrier Amplitude	1.4V / 1.93V	Differential / Common Mode
Audioband Jitter	1.9 / 0.01	nS (p-p) / UI (p-p)
Data Jitter	1.9 / 0.01	nS (p-p) / UI (p-p)
Deviation	-9.8	ppm
Frame Rate	44099.569	
Eye-Narrowing (Zero Cross)	1.5 / 0.007	nS (p-p) / UI (p-p)
Eye-Narrowing (200mV)	7.0 / 0.04	nS (p-p) / UI (p-p)
Absolute Phase	Normal	Normal / Inverted
Bit Activity at Digital O/P	16	Where Fitted

Musical Fidelity CLiC (AES-17 Standard using 48kHz/24-Bit)

Digital Section	Result	Units/Comment
Out of Band Spurious Components	-122.025dB	
Suppression of Imaging Components	-120.889dB	(Worst Case)
Level Dependent Logarithmic Gain	-18.441dB	
Intermodulation Distortion (1)	-95.931dB	18kHz/20kHz 1:1 Ratio
Intermodulation Distortion (2)	-86.584dB	41Hz/7993Hz 4:1 Ratio
Low Level Noise Modulation	+2.984dB	Worst Case
Idle Channel Noise	-124.528dB	CCIR-RMS weighting
Signal-to-Noise Ratio	-124.953dB	CCIR-RMS weighting
Power Line Products	-128.009dB	50Hz
Non-Linear Interchannel Crosstalk (a)	-115.730dB	3kHz (2nd-order ref 17kHz/20kHz)
Non-Linear Interchannel Crosstalk (b)	-137.304dB	6kHz (3rd-order ref 17kHz/20kHz)
Non-Linear Interchannel Crosstalk (c)	-114.816dB	10.040kHz (2nd re 40Hz/10kHz)
Non-Linear Interchannel Crosstalk (d)	-139.287dB	10.080kHz (3rd re 40Hz/10kHz)
Absolute Phase	Non-Inverting	Normal/Inverted

Performance at –60dB was excellent, as you can see from Graph 5, where the noise floor is down around –140dB, and though the 'grass' you can see that's caused by the converter rises above the noise floor, it's all more than 120dB down and therefore would be completely inaudible. Also, this 'grass' is caused by the –60dB test signal being undithered, which would not happen when playing music CDs, which are dithered. The differences between a dithered and undithered signal are shown in Graphs 6 thru 9, which essentially show distortion at around –80dB and –90dB. In both cases, the Musical Fidelity M1 CLiC delivers a spot-on signal at the correct level, with no distortion components visible and a noise floor at around –130dB. This is superb performance… and remember we're still testing using a standard CD-format signal, as you'd get if you played back CDs (using a transport connected to the CLiC) or playing back files ripped from a CD.

The frequency response of the CLiC was extraordinarily flat, though at first glance you wouldn't imagine so from looking at Graph 10, on which the trace shows the response graphically. The clue here is to look at the vertical scale and you can see that although the response meanders upwards above 1kHz, it's actually only +0.17dB at 20kHz, which puts the normalised response at 20Hz to 20kHz ±0.09dB. When testing frequency response, *Newport Test Labs* noted that Musical Fidelity has not implemented the de-emphasis circuitry in the decoder, so if you play CDs that are more than 25 years old you may hear differences in the high-frequency response between them and more modern CDs, depending on how they've been recorded. Channel separation was superb at high frequencies, as you can see from the tabulated

The frequency response of the CLiC was extraordinarily flat, though at first glance you wouldn't imagine so from looking at Graph 10!

figures, where the CLiC returned figures of 107dB above 1kHz. Separation diminished a little at lower frequencies, but the result of 86dB is still very, very good.

Graph 11 plots the M1 CLiC's total harmonic distortion against frequency, but this time using 24/48 test signals. Performance is not only excellent—down close to 0.001% but remarkably uniform between the channels, with the accuracy of the left channel falling only above 2kHz. This would, again, be completely inaudible, as the level of the left channel is just 0.015% and the second harmonic component would be up at 20kHz—beyond the level of audibility for almost all listeners. Graph 12 shows distortion vs output level, and you can see the effect noted earlier, where output stage distortion comes in at around –10dB.

I found the technical performance of Musical Fidelity's M1 CLiC with 16-bit/44.1kHz and 24-bit/48kHz bitstreams to be outstandingly good

Overall THD+N was exceptionally low, at 0.006% as you can see from the tabulated results. Linearity error was minuscule, as you can see, with a particularly good result of just 0.02dB error at –80.70dB. The 'worst-case' error was just 0.15dB at –90.31dB. Channel balance was just slightly out, at 0.13dB, but only in absolute terms as this error would be completely swamped by components further down the chain, especially loudspeakers.

Channel phase was almost perfect, and even the 0.04° error is within measurement limits, while group delay was typical of most D-A converters. Jitter was particularly low, at just 1.9nS (p–p), while eye-narrowing at zero cross was also excellent. Intermodulation distortion was very low, but not quite as low as I might have expected considering the superb performance in all other areas, particularly using a 48/24 signal, where the CLiC returned figures of –95.931dB and –86-584dB. CCIF-IMD is shown graphically in Graph 14, though this time with a 16/44.1 test signal. You can see there's some regenerated 1kHz signal, but it's more than 100dB down, and some high-frequency sidebands around the two test signals at 19kHz and 20kHz. There are some sampling artefacts up around 40kHz. Overall, I found the technical performance of Musical Fidelity's M1 CLiC with 16-bit/44.1kHz and 24-bit/48kHz bitstreams to be outstandingly good.

Steve Holding