

Musical Fidelity V90-DAC

One of the least expensive amongst Musical Fidelity's five current DACs, this component is the latest in its miniature *V-series* products, designated the *V90s*. The range currently consists of just two models: this DAC, aptly christened the *V90-DAC*, and a *V90-LPS* phono stage.

I liked the original *V-DAC (HIFICRITIC Vol3 No2)* and admired its ability to compete with much more costly alternatives and convincingly trounce most of its peers at that time. Since then, although the size and shape of the £199 *V90-DAC* is very similar to its predecessors, it has had a facelift. It is now a miniature version of a full sized separate component, with a proper front panel complete with switches and indicators, while the back panel accommodates the inputs and outputs. The power supply unit is still a switch-mode plug-top type, which helps keep the overall size of the unit to a minimum (and may facilitate future upgrading).

Internally the printed circuit board appears to be a revamp of the previous *V-DAC* models. It has virtually the same format and shares many parts; while surface-mount technology dominates, the occasional through-hole component is evident. In fact the basic tenet of the design is unchanged, but with one major difference: the Burr Brown 24-bit digital to analogue chip has been replaced by the more recent *PCM1795*, which is Burr Brown's current 32-bit high performance device incorporating Texas Instrument's advanced segment architecture with current output. This is claimed both to provide excellent dynamics and have excellent tolerance to clock jitter.

The current output gives the audio designer more control over the analogue design, and consequently the sound produced. A two-channel sample rate converter combined with a digital audio interface receiver captures the input signal and reformats the data to a high bit-rate to feed the DAC. It supports input and output data with sampling frequencies up to 216kHz, but only supports data with word lengths up to 24 bits, and in the *V90-DAC* is set to up-sample at 192kHz. This device is also claimed to have excellent jitter attenuation characteristics. The USB interface is provided by the much used Texas Instruments *TAS1020B* streaming controller which works well enough and performs up to 24-bit/96kHz, but TI now recommends using a more recent design for all new projects. Overall build quality is up to the usual high standards set by Musical Fidelity products made in Taiwan.

The case is not made from the usual two U-shaped bent metal halves; instead the top and sides here are formed from a one-piece silver satin



aluminium extrusion. The front panel has a stylish chamfer to the top and bottom sections and is held in place with flush chrome-plated Allen bolts, while the chassis and back panel are coated steel. Front panel controls are limited to an on/off toggle switch with an adjacent blue LED indicator while another matching toggle switch has an adjacent digital signal lock indicator. The back panel connections include RCA/phono audio outputs, alongside USB plus one co-axial and two standard Toslink optical S/PDIF digital inputs.

Lab Results

A quick check of the most important parameters reveals state of the art linearity with barely any error right down to -120dB. Distortion at 1kHz is better than -100dB and the jitter spectrogram shows a very low level of spurious artefacts. The frequency response is flat through the midband but starts to fall very slowly from about 5kHz, reaching an insignificant -0.25dB at 20kHz. The bass end shows signs of output reduction by 10Hz, presumably created by capacitor coupling at the audio output. The response was measured into a 100kohm load, so lower impedance inputs will show a greater fall.

Sound Quality

Right from the first few notes I knew that I was going to like this DAC, as it readily defined the music in the space between the loudspeakers. For less than £200 it's something of a steal, and like its predecessor is capable of embarrassing many far more expensive products. Even *via* the USB interface, the music was just more lifelike and interesting than almost any DAC I've had through my hands. Indeed, no matter what quality recording it was fed, it just made the music more interesting and involving.

I don't often get grabbed by the products I'm reviewing, and although I'd much liked its predecessor, this was primarily because it was very good value. This newcomer seems able to compete

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Manufacturer	Musical Fidelity
Model	V90-DAC
Type	Digital-to-analogue converter DAC TI/Burr Brown PCM1795 chip
Resolution	32 bits
Digital inputs	1x 24-bit/192kHz coaxial 2x 24-bit/96kHz Toslink optical 1x 24-bit/96kHz USB type B
Digital outputs	none
Output voltage	RCA 2.25V
Total Harmonic Distortion	RCA <0.004%
Frequency response	20Hz - 20kHz (+0/-0.1dB)
Signal to noise ratio	>117dB
Crosstalk	RCA <-104dB
Dimensions	(W x H x D) 170 x 47 x 102mm
Power Supply	12V 500mA DC plug-top
Colour	Black, Silver
Price	£199

irrespective of price, and actually usurps many of the current batch of reference products.

The bass is firm and articulate, with very good definition, able to read changes of pitch with ease. It will also translate complex bass patterns with surprising dexterity. The midrange has plenty of detail along with fine tonality, and both voices and instruments sound more realistic than they have any right to at this price. Indeed, the sound of the *V90-DAC* is more reminiscent of products costing at least ten times the price. The treble also has great clarity and composure, with loads of information – cymbals have that magic shimmer factor and sense of realism. It does CD quality material really well and sounds brilliant when driven from a good transport.

When fed with high resolution 24-bit 88kHz and 96kHz material from a server, it easily shows the advantages that high sampling rates and extra bits have over the old Red Book CD formula. Using good transfers, the midrange is still more convincing in detail and textures, and an already excellent soundstage grows in size and depth. Focus becomes sharper and in one's mindscape, images become almost palpable.

This DAC also works fine with 24-bit/192kHz material, creating unbelievable realism for a product of this price. Occasionally it can sound really lifelike, belying the fact that it's the hi-fi playing. I kept thinking that it couldn't be this good, and that somehow I had been fooled, so I tried it in many systems and different situations, with all types of music and spoken voice. But I couldn't break it. So I must conclude that the effect is real, and that Musical Fidelity has designed and made an exceptional product, in spite of its lowly pretensions.

I can accept that this inexpensive DAC is unlikely to find its way into a top class hi-fi system, and that it will not exhibit quite the same talents in one more commensurate with its price. However, using a relatively cheap system with good quality £400 loudspeakers and an old Creek integrated amplifier, it shone through, and the high quality the *V90-DAC* produces remained easy to hear. When put into a top rated audiophile system it doesn't sound out of place in the slightest: it just gets on with the job of creating believable high end quality.

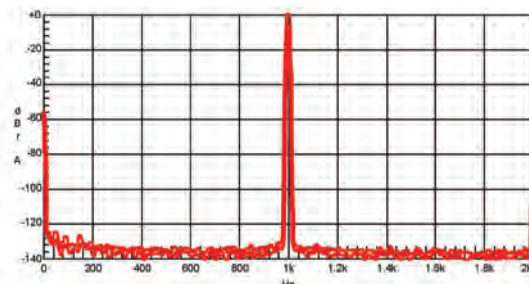
Even more astounding from my point of view was that the *V90-DAC* again performed admirably when put into my super critical system of Supravox *215-2000EXC* field-coil drivers with a low noise, direct current power supply, driven by an amplifier specially made to provide exceptional dynamics and timing. I was immediately happy with the sound it produced, and although one or two alternative DACs can do certain things a little better, as an all-rounder this Musical Fidelity DAC is quite amazing. It is capable of

very good rhythm and timing, no matter what device is used to provide the data. I tried it successively with a top quality CD drive, a standard computer using optical, USB and co-axial outputs, an Astell & Kern *AK100* high resolution portable player, a *Windows 7* laptop and finally a Naim *NDS* as an S/PDIF source, and it never failed to impress.

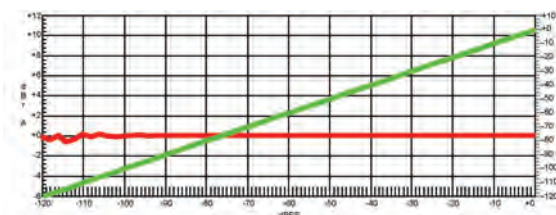
Conclusions

The performance of Musical Fidelity's *V90-DAC* came as a total surprise. A couple of exceptional value for money products, the Cambridge Audio *DACMagic 100* and the Metrum *Octave*, have cropped up recently, but neither quite measure up to the *V90-DAC* in the performance per pound stakes. Not only does it sound exceptional, achieving an astonishingly high score of 150, but it manages to measure like the best too. This exceptional product is wholeheartedly recommended.

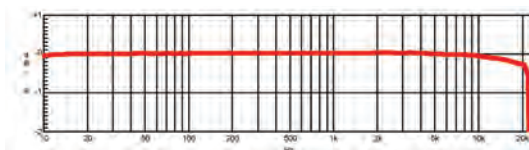
Musical Fidelity V90 Digital jitter 1kHz-10dB, 0-2Hz span, 140dB resolution



Musical Fidelity V90 Input/Output Linearity (green) (0dB to -120dB), error (dB) (red)



Musical Fidelity V90 Frequency Response



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