

Product Review

Monarchy DIP Upsampler

Reviewed by Gary Galo

Monarchy DIP Upsampler. Monarchy Audio, 380 Swift Ave. #21, South San Francisco, CA 94080, 650-873-3055, FAX 650-588-0335, monarchy@earthlink.net, www.monarchyaudio.com. Price: \$299.

Monarchy Audio's DIP Upsampler is the most affordable upsampler yet (Photo 1). At \$299 factory-direct, it is priced \$100 lower than the GW Labs Digital Signal Processor I reviewed in May 2002 (p. 63). The DIP Upsampler converts incoming digital data—whether 44.1kHz, 48kHz, or 96kHz—to a user-selectable output sampling frequency of either 48kHz or 96kHz. The 48kHz output makes the DIP Upsampler compatible with nearly all of the older outboard D/A converters, and the 96kHz output takes advantage of the performance capabilities of more current DACs (see the sidebar, "Upsampling Demystified," accompanying my review of Perpetual Technologies' P-1A in April 2002, p. 52).

In addition to upsampling, this new DIP performs clock jitter suppression,

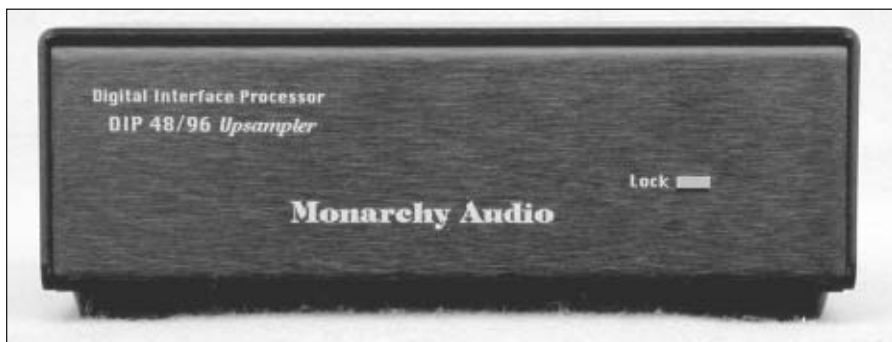


PHOTO 1: Monarchy's DIP Upsampler has no front-panel switches or controls. You can see the digital lock LED on the right.



PHOTO 2: Rear panel of the DIP Upsampler. S/PDIF and Toslink inputs are included, plus S/PDIF and AES/EBU outputs. Input switching is done mechanically, with the rear panel selector switch in the center.



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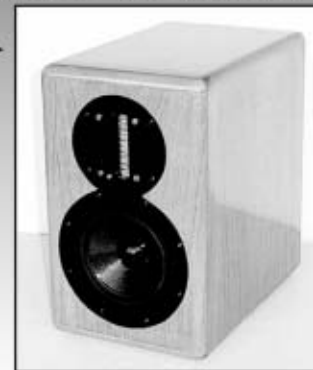
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boosting the S/PDIF digital signal, and input-to-output ground isolation. S/PDIF coax and Toslink optical inputs are included, along with S/PDIF and AES/EBU digital outputs. The S/PDIF connections are RCA jacks (*Photo 2*).

Two precision oscillators are used to generate the 48kHz and 96kHz output sampling frequencies. There may be a handful of outboard DACs still in use that will not accept 48kHz data. For such cases, Monarchy offers a high-precision oscillator for 44.1kHz to replace the 48kHz oscillator. The cost is \$10 including shipping.

Their one-page sheet of installation instructions doesn't really tell you what you are getting into, however. You must remove the PC board, and the plated-through holes will make removal of the 48kHz oscillator a challenge for novices. If you are still using a DAC that accepts only 44.1kHz inputs, it's probably time for a new DAC!

DESIGN PARTICULARS

Photo 3 shows the inside of the DIP Upsampler. Monarchy's Upsampler is similar to the GW Labs DSP in several respects:

- It uses the Cirrus Logic CS8420 Sample Rate Converter chip as a stand-alone device.
- The common-mode AC line filter is on the main PC board.
- The power transformer is a dual-bobbin type, which helps attenuate

power-line noise.

- The two secondary windings on the power transformer feed a pair of Shindengen LN2SP low-noise rectifier bridges.
- Raw DC supplies are L/C-filtered.
- Regulation consists of four 7805-type three-terminal regulators, including one dedicated to the critical PLL sup-

ply pin on the CS8420.

- Ferrite beads are used for additional attenuation of high-frequency supply noise.
- Monarchy's "pull-up" resistor technique is used on the Toslink optical receiver.
- Monarchy uses the same high-quality PC-mount RCA jacks as GW Labs.

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There are also a few differences between these products:

- Monarchy uses a pulse transformer only on the outputs. GW Labs transformer-couples the inputs and outputs.
- There are no additional ICs—beyond the CS8420—in the DIP Upsampler. The GW Labs DSP has four other chips, which are unnecessary in the DIP Upsampler, since Monarchy does the input switching with a mechanical switch on the rear panel, and the output sampling rate is set with a jumper on the PC board. There are no front-panel switches on the Monarchy.

Monarchy claims signal boosting by a factor of ten. As with the GW Labs DSP, I found the signal boost to be a factor of six, with the DIP Upsampler producing a 3V peak-to-peak output regardless of the S/PDIF input level.

Monarchy makes one claim for the DIP Upsampler that is a bit misleading. They state that the Upsampler “Down samples 96kHz (DVD Audio) for use with all *conventional* DACs (so all DVD,

or 24/96 discs can be played on them.” The DIP Upsampler is *not* compatible with DVD Audio, however, at least not the DVD Audio standard using Meridian Lossless Compression, and supporting sampling rates up to 192kHz. The DIP Upsampler is compatible with all DVDs using PCM audio with sampling rates as high as 96kHz.

THE SOUND

The DIP Upsampler performs very well, especially considering its bargain price. When connected to my Parts Connection DAC 3.0, the DIP Upsampler offered clear improvements in performance over the DAC 3.0 used as a stand-alone device. It offers a good taste of the benefits of upsampling: improved spatial characteristics, including a wider and deeper soundstage, more precise localization, smoother treble, and greater inner detail.

In my review of Monarchy’s DIP 24/96 (Sept. 2001, p. 66), I noted that it was the first outboard processor that actually improved the performance of my DAC 3.0. The DIP Upsampler is even better, and the performance im-

provement it offers over the DIP 24/96 is easily greater than the \$50 price difference between the two products.

I spent a great deal of time comparing the DIP Upsampler to the GW Labs DSP, and found the GW Labs to be the superior performer. It offers a more spacious sonic picture, with more precise localization. The treble is smoother and sweeter, especially evident on cymbals and massed violins. The DSP is also more articulate and less muddy, with greater sense of air in the treble.

Monarchy notes that the jitter attenuation characteristics of the DIP Upsampler complement those of the DIP 24/96 jitter suppressor (reviewed in Sept. 2001), and recommends using the two in tandem—DIP 24/96 followed by the DIP Upsampler—for best performance. I still had the DIP 24/96 on hand, so I tried this scheme and found that, overall, the improvement was readily audible. Compared to the DIP Upsampler used alone, the two in tandem produced a warmer sound, particularly in the midrange and lower midrange. This was most evident on massed strings. Spatial characteristics also improved.

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I did note one side-effect of this combo: high-frequency transients are smeared a bit. This is especially evident on cymbal crashes, which lose a bit of their crispness. The GW Labs still gives the tandem arrangement a run for its money, and at a cost of about \$150 less.

Here's how I rate the performance of the upsamplers I have evaluated thus far:

1. Parts Connection D2D-1 (my reference upsampler, easily the best I've heard, but unfortunately discontinued)
2. GW Labs DSP
3. Monarchy DIP Upsampler
4. Perpetual Technologies P-1A

The superiority of the GW Labs DSP over the Monarchy may appear mysterious, since the working portions of both products appear—superficially, at least—to be identical. Jon Paul, Vice President and founder of Scientific Conversion, manufacturer of some of the best pulse transformers for digital audio, gave an AES paper that made a strong case for transformer-coupling of all digital audio interfaces. You can download the paper from their website at: <http://www.scientificconversion.com/>.

One of the key points in the paper is the superior rejection of common-mode signals and EMI suppression with transformer coupling, and a corresponding reduction of jitter. I believe

the inclusion of an input coupling transformer in the GW Labs DSP may account for its superior performance.

The Monarchy DIP Upsampler is a fine product, nonetheless, and the clear choice for audiophiles on a budget. At \$299, it continues the “best-buy” tradition of the Monarchy DIP products.

Manufacturer response:

As usual, Gary's reviews and comments are accurate and fair.

It's true that the Upsampler's performance can be further enhanced by using a wide band coupling transformer at its input, but this would add extra cost and is actually available from us as an add-on adapter for \$49. This is a small [RCA female—transformer—RCA male] plug that inserts into the Upsampler's input as an add-on device.

For best results, just as Gary observed, the Upsampler should be used in tandem with our DIP 24/96 which boosts the signal to feed the Upsampler, in the following configuration:

CD/DVD player—DIP 2496—DIP Upsampler—D/A converter—preamp, and so on.

The DIP 2496's output is transformer coupled. So there is no need to install another transformer at the input of the Upsampler.

However, if the Upsampler is used without the DIP 2496, and if there is no transformer at the output of the CD/DVD trans-

port, our add-on adapter is recommended.

It seems that in order to save costs the new crop of DVD/CD players do not use transformer coupling at its digital audio out any more. A good example is Denon's older model, 3520, which had two separate coupling transformers at its digital outputs. Only a capacitor was found in the newer Denon models.

There is another major difference between the GW Labs and the DIP Upsampler that Gary did not elaborate on: The GW Labs retains the original Red Book standard frequency of 44.1kHz. The DIP Upsampler “upsamples” this frequency to 48kHz (hence the name). On DACs that generate their own 44.1kHz reference clock instead of recovering the clock from the data stream, the DIP Upsampler obviously will not be as compatible as the GW Labs, due to a discrepancy in clock frequencies. A user should base his purchase decision on whether he wants a little “upsampling” (from the DIP Upsampler), or whether he wants a precision clock to replace the re-covered clock (as provided by the GW Labs' DSP). Either way he can expect a significant sonic improvement. ❖

*C.C.Poon
Monarchy Audio*

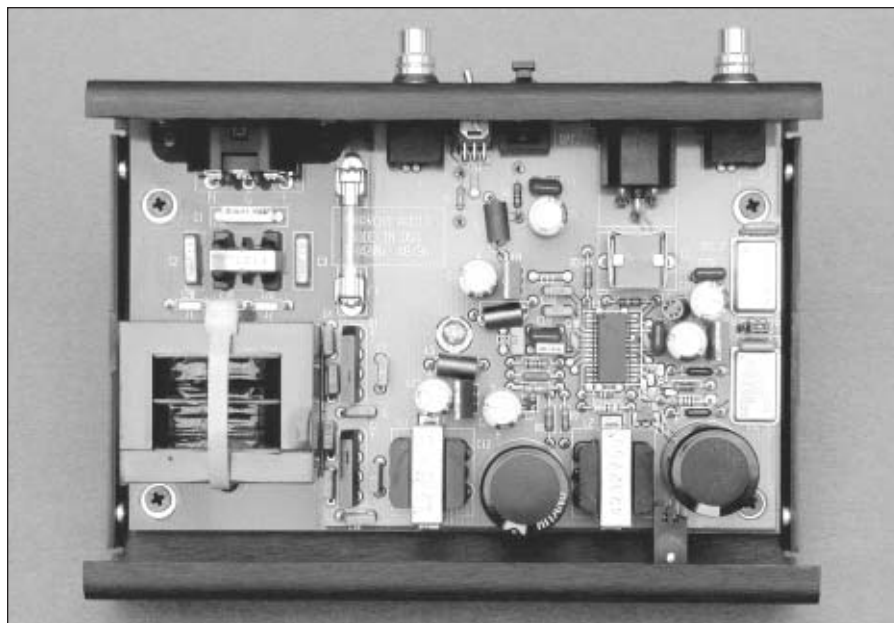


PHOTO 3: Inside the DIP Upsampler. You can see the industry-standard CS8420 Sample Rate Converter chip in its surface-mount package on the right. Four three-terminal supply regulators are included.

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