"CD-4 was cutting-edge LP technology. It can now be processed in software"

Martin Pipe

Back in June 2015, we examined the intriguing 'Stereo Sauce' program for Macs. A flexible set of audio-processing tools, it's the brainchild of Pspatial Audio – otherwise known as Richard Brice (an ex-BBC man and one-time contributor to Hi-Fi World) and software engineer Alastair MacMaster.

Features include RIAA decoding from 'flat' (not RIAA-equalised) needle-drops, stereo-image enhancement, noise-reduction, removing needle-scratches from shellac 78s, cancelling tracking distortion and surround-sound upmixing. Load the audio files that need attention, select the desired processing with pull-down menus and the program crunches through the queue. Its output is one or more processed files, with filenames derived from the original(s). Easy!

Over the past four years, this veritable toolkit (https://bit.ly/2Z9PVXV) has evolved to include even more functionality - and to reflect this growing sophistication, its name has changed to 'Stereo Lab'. Four versions, trading price against flexibility, are available. The most expensive Audiophile sells for just £70. One of the features exclusive to this version (and its cheaper present-day equivalent) is effective software-decoding of SQ and QS 'matrix' quadraphonic material – an interest of mine.

Much music was released in these mutually-incompatible formats during the 1970s. In the UK, EMI issued 'single-inventory' classical-music SQ LPs until the end of that decade. You'll frequently encounter them at record fairs, and even charity shops - look for the 'SQ' logo, and the words 'stereo/quadraphonic' on the back of the sleeve. Stereo Lab outputs a 5.1 WAV file that you can lossily-compress to FLAC understandable to modern AVRs. Those – like myself – partnering vintage quad gear with a 5.1 disc player can convert the output into DTS-CDs or even DVD-As.

Chancing upon the Pspatial website, I discovered that it now supports the 'discrete' CD-4 format (also labelled 'Quadradisc'). In the early 1970s, CD-4 was cutting-edge analogue technology. This can now be processed in software. Quite an achievement and Stereo Lab's authoring team deserve credit for the work. Brice told me that working out ANRS was "the most complicated part".

Your turntable ('crystal-locked direct-drives' are recommended by Pspatial) must have a cartridge with 50kHz upper response and Shibata-style 'line-contact' stylus. My Technics SL1200 MkIII and Audio-Technica AT-440MLb fitted the bill. You will also need a 'flat' preamp with 50dB or so of gain, feeding a capture device (I used a Tascam portable unit) capable of recording at 24-bit resolution with 96kHz sampling rate. The latter is necessary to capture the ultrasonic CD-4 information. Anything else will be rejected by Stereo Lab's two CD-4 decoding modes - a 'straight' emulation of the 'classic' JVC 4DD-5 decoder, and a 'high quality' setting that uses "the power of Ambisonics" to facilitate decoded CD-4 playback on home-cinema systems with ITU-R BS775 5.1 speaker layout. Both offer declicking.

Using a simple preamp knocked together for the job (Pspatial's hardware associate Phaedrus Audio can supply ready-built hardware), I captured some CD-4 LPs – early MFSL effort Sound In Motion, and Arlo Guthrie's Last of the Brooklyn Cowboys – and ran them through Stereo Lab in JVC mode with default settings.

Using Audacity I then extracted the four 'active' channels from the 5.1 WAV file in 44.1kHz/16-bit form and turned them into a DTS CD. Heard through a Pioneer universal disc player and QX-949 receiver feeding a quartet of Wharfedale Diamonds, the results were very encouraging. What I heard is as good as, if not better, than vintage hardware decoders - which rely on obsolete and now-unobtainable chips.

During the process of reviewing Stereo Lab I came across some recordings of 1970s BBC broadcasts encoded in the Matrix-H quad format. Support for this is now part of the Stereo Lab Audiophile repertoire...

There are plans to add even more features! One is correction for the cyclic wow caused by records with an off-centre hole (shades of Nakamichi's legendary TX-1000 'computing' turntable). Aware that Brice cracked the problem of emulating CD-4's ANRS (JVC's attempt at Dolby) in DSP, I expressed a desire that he might support other noise-reduction systems, thereby making the software as useful for tape users as it is for record fans. Tape EQ curves are planned I was told – but wouldn't it be great to see accurate software implementations of dbx, Super-D, adres, MXR and High-Com...as well as the various Dolbys. How many of us have tapes encoded with noise-reduction systems like these, but can't remember what fate met the hardware? I have Dolby A master tapes that I'd like to play properly, in the absence of 'physical' decoders. How about it, guys? Stereo Lab is certainly a powerful and fascinating piece of software, worth checking out.