Merging Technologies Pyramix V4

This DAW's DSD capability points to the maturation of an established line of products and knocks on the door of wider acceptance.

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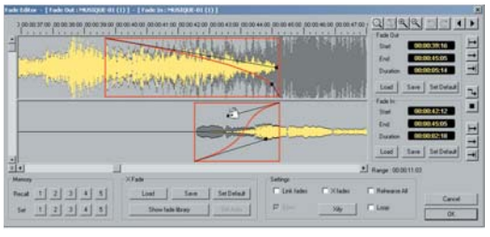
WHAT DO YOU want to do today? An appropriate question for Merging Technologies' Pyramix. Most DAWs claim to be multipurpose but all too often the result is a jack of all trades and master of none. It is now no great trick to produce a system capable of recording and replaying some tens of tracks at 44.1kHz or 48kHz and a good many at 96kHz. The real secret lies in tailoring the look and feel to fit real world tasks. This doesn't simply mean a single user interface with every imaginable option. The only sensible approach is different applications, or front-ends, for different tasks. Pyramix is already some way down this road with four distinct project types and a considerable library of templates. I hope it will go further. The repertoire is already extensive in covering broadcast, music and sound for picture.

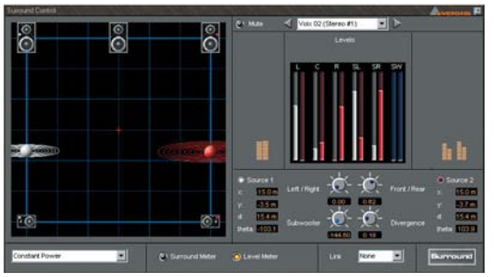


Although perhaps less well known than some DAWs, the hardware is now third generation and the software is in its fourth major version. Pyramix is easily distinguishable from the rest of the herd in a number of ways.

The paradigm is similar to others, a PC with a DSP card, or cards, that also handles I/O. However, Merging's choice of DSP provider is an unusual one. At a time when the majority of DSP chips used in workstations came from Motorola (56K and 96k series) or Analog Devices (SHARCs) Merging elected to use the Philips Trimedia VLIW 32-bit floating point device.

At the heart of the software is the Pyramix Virtual Studio (VS3) which controls all the sources passing through the system. The Trimedia chip or chips carry out all DSP processing (apart from DirectX effects). This results in very low and predictable latency. Live in to live out at 48kHz is 2.66mS with a single board and with two boards it is still only 5.33ms. A comprehensive delay compensation scheme deals with the myriad ways signals can be delayed inside a complex workstation, such as the insertion of internal and external effects.

In Pyramix the track display is part of the Composition Editor. This has all the usual features, including scrolling tracks with waveforms, and a few more,



such as non-destructive strip silence and a multimachine control panel. Composition Overview makes navigation of lengthy projects less of a chore by showing the entire project in miniature. There are also comprehensive file management and text EDL functions. Crossfades are real time with no rendering to waste time and clutter up the audio disks with thousands of fade files.

The Mixer is a fairly conventional representation of a hardware console and of special note are the clean graphics and the meter displays. Automation is likewise conventional and crucially includes all parameters of the native plug-ins. These are high quality items although, as always, a wider selection would be welcome. DirectX plug-ins are supported using the host PC processor, but only in the inputs.

Among the included native plug-ins, Strip Tools adds 3-band parametric EQ, dynamics and an expander as a single plug-in. Strip Tools are multichannel (up to 8) enabling all channels of a surround source to be linked and adjusted in one go.

Operation is intuitive. Whether you prefer to use virtual knobs, enter numeric data or grab a node on the graphic representation of frequency response, the controls work exactly as one would expect. For example, grabbing a node allows immediate adjustment of frequency and level while grabbing with the right hand mouse button enables control of Q. The range is impressive with +/-24dB and a maximum Q value of 100. Filter bandwidth depends on the sampling rate and up to 48kHz the range is 20Hz to 20kHz, from 48kHz to 96kHz the range is extended to 40kHz, and with rates between 96kHz and 384kHz EQ up to 80kHz is possible. Alternatively there is a simple tone control, a 4-band parametric and a 10-band graphic. Other native plug-ins supplied include delay, de-noiser, de-scratcher, dynamics, a flanger and a generator.

Transport control is very fluid, almost like a film system or high-end multitrack. Although there is no ramping up to speed or down to stop, local control is extremely positive and well up with the best of the digital multitracks. For example, you can go straight from play into reverse play with no glitch. You can also do this repeatedly. For those of us used to working this way this functionality is extremely welcome

and surprisingly rare. The scrub algorithm is excellent. Multitrack punch-in and monitor switching performance is refreshingly immediate.

For DSD operation a Pyramix DSD Recording Session directly records the 2.8224MHz bitstream in the DIFF format defined by Sony and Philips. Pyramix provides a DSD Editing Project in which DSD bitstreams are converted on the fly into 32-bit floating point 352.8kHz PCM i.e. 8 times standard 44.1kHz. This is deemed sufficient to retain the virtues of the DSD recording. At the end of the Virtual Studio Mixer, a final requantising process converts the output back to DSD.

The only real difference from normal operation is the number of simultaneous streams that can be achieved: two with a single Mykerinos card or eight with two cards. Apart from this, all the editing and mixing capabilities and native plug-ins function just as they would with 'normal' projects.

Pyramix can use AES or SDIF to input and output DSD streams. Two mappings have been defined: the Sony format, which transmits up to three channels of DSD over four AES-EBU pairs, or the P3D format, which caters for two channels of DSD over three AES-EBU pairs. I had a pair of dCS convertors for the review, connected using an AES-EBU daughter card. Once set up, the whole process of recording editing and mixing was remarkably drama free.

In short, Pyramix provides a comparatively painless route into DSD working. As a stereo or multichannel recorder it already has a lot going for it. Future developments will see the number of streams increase, which will make multichannel editing and mixing easier. For the present, 8 streams are fine for stereo projects that need crossfades or mixing. Needless to say, with the data rates involved, anyone contemplating using Pyramix for this application would be well advised to invest in serious SCSI storage, preferably RAID. That said, I just about managed to achieve eight DSD streams from a single 7200rpm ATA 100 IDE drive.

Pyramix is an interesting system, one of the few to successfully address a variety of distinctly different applications. Configurable as a multitrack recorder, a digital dubber, a sound for picture workstation, virtual studio, digitising and autoconforming station, and now a DSD recorder-editor it can equally well be used for mastering.

Merging has covered more of the ground than most of the competition with 32-bit floating point processing at sample rates up to 192kHz plus 384kHz for DSD. Unusually comprehensive I/O options for audio, sync and control include VITC and RS422. There's support of BWF, Akai DD/DR series disks with direct playback, SDII including direct playback from Mac disks, OMF1 and 2 import, and a

Hardware

The Pyramix system consists of a PC (PIII 650, 256Mb RAM or better) running Windows 2000 or NT4 SP5 or above with one or more Mykerinos cards. A mini-DIN connector carries time-code word clock and video sync connections and a 3.5mm jack provides an analogue stereo monitor output. Mykerinos is modular and accepts a range of daughter I/O cards. MADI, SDIF, AES-EBU, ADAT and TDIF are all available. 'Dual' is a new, cost-effective, option with 12 inputs and outputs. Eight AES-EBU plus two analogue mic/line ins, two line ins and four line outs.

Analogue convertor options from Merging are the DUA II and modular Sphynx.

Multiplex

An HDTDM (High Definition Time Domain Multiplex) bus connects multiple cards. This is 128 'slots' wide, 64 route signals into the Virtual Studio mixer and 64 route mixer outputs to the physical I/O and the internal send and return busses. The disposition of these is up to the user or automatic routing can be used. Distribution of DSP power is split between plug-ins in the input strips, the mixer itself and plug-ins on the output strips. The user can choose between Privilege Input Effects and Privilege Output Effects for each DSP board. This and the routing are set up using the VS3 control panel application.

whole project can be sample rate converted in one operation. Video support for AVIs is built in and VITC can be read and generated and timecode may be burnt-in to a composite signal.

The result? A very serious DAW and a plausible alternative in situations that would usually demand a dedicated hardware box, such as classical music recordings on location.

It is in the nature of these things that there will always be room for improvement and a wish list. One penalty of success is the number of users who become convinced that the product would be perfect if only their pet function could be included. Pyramix is comprehensively customisable so many of these desires can be accommodated by keyboard shortcuts or macros. However, I do think a couple of areas could be improved. The display and handling of multichannel material needs work, a greater choice of native plug-ins would be desirable but, for me, the real omission is a dedicated hardware editing controller.

Pyramix already has excellent functionality but getting at it can be frustrating. Various generic controllers are supported but they are something of a compromise. With everyone else jumping on the hardware controller bandwagon I would not be surprised to see something from Merging. Meanwhile, there is the Sony DMX-R100 interface to look forward to. This combines MADI and control functions. Pyramix seems to be a natural fit with the DMX and, done well, the Sony should be an excellent Pyramix controller for mixing. Then all that's needed is an edit controller.

Pyramix is not the easiest workstation to learn. To get the best out of it requires considerable commitment on the part of the user. Systems that are easy to learn are too often shallow and ultimately unrewarding but after some initial frustration I now respect and like Pyramix. It is reliable, productive and most importantly, sounds great. Unfortunately, this cannot be taken for granted with all DAWs.

Many of the changes in version 4 clearly demonstrate that Merging Technologies have been listening to their users. However, DAWs were never invented simply by asking a focus group what it wanted and a spark of original genius is essential to the genesis of a truly innovative product. On the evidence of the review system there is more than a hint of real innovation about Pyramix. □

PROS Sounds good; integrates well with complex systems; wide range of interface options; addictive

CONS Needs more native plug-in support from third party manufacturers; needs a hardware editing controller; fairly steep learning curve

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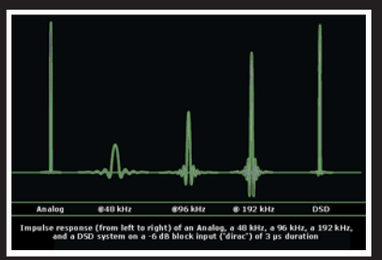
DSD and SACD



Impulse response (from left to right) of an Analog, a 48 kHz, a 96 kHz, a 192 kHz, and a DSD system on a -6 dB block input ('dirac') of 3 µs duration

Originally developed for archiving purposes, Direct Stream Digital employs high data rates to improve on conventional PCM methods. DSD uses a sampling rate of 2.8224MHz with one bit conversion. The resulting pulse chain looks like the analogue signal and, at the simplest, D-A conversion can be achieved with an analogue low pass filter. If the DSD pulse train is printed out as vertical bars and placed alongside the conventional two-dimensional depiction of a sine wave then this becomes obvious.

The data rate is around four times that of 44.1kHz PCM and the one bit sampling process introduces a lot of self-noise. Fifth order noise shaping is used to shift this out of audible range. Analogue filtering is minimised and no decimation is needed in the digital to analogue conversion. SACD is capable of 120dB dynamic range with a 100kHz frequency response.

SACD uses lossless packing to contain the massive amount of data. Form factor is the same as CD and DVD but requires an appropriate player to retrieve the DSD information. The format uses two layers, one of which is conventional 'Red Book' CD for backwards compatibility. Stereo and surround formats of up to 8 channels are supported. The SACD specification is known as 'Scarlet Book'.