

14 April, 2010-

Multi-Voice Audio Mixer

Project Progress & Status:

This week we finalized the architecture target and got started with coding. Last week's report outlines the architecture already. The only new information and planning is that in order to easily be able to change the fpga configuration to more voices or a different route through the soft cores, a static file will list all configuration data to be interpreted at compile time for implementing the correct fpga structure. This is being called the route table. An entry in the route table includes the voice number, memory address, and the order of soft-cores progressed through. The soft-core path itself is hardcoded within the fpga meaning the only operational muxing needed during run-time is from the memory block to the soft-core.

Code has begun on the mixer and the above. We have also started to familiarize with the awb work environment and compiling the project within it. The next steps are to complete the mixer and test it, and fully understand the new sim environment to multiply the package (i.e. how to build multiple cores) and interface to memory.

Planned Exploration:

The minimal result for this project was what was outlined in last weeks document. This consisted of the module reading all voices starting and ending simultaneously and no dynamic controls passed.

The next thing to work on adding is allowing a voice to start or end early without out causing trouble at the mixer stage. This can be done by identifying a voice is not playing and send a nop through a voice path so the mixer knows all voices are complete.

The next additional feature is live control passing. This means changing, say the gain scalar on a voice in the mixer half way through playback. Right now, these controls are all to be set at startup in the described file. Implementing this feature requires adding a new control interface on the mixer and core modules and determining how to use the simulation environment to accomplish this.

The third planned exploration is to evaluate implementing a stereo path way. This will require determining how to tie two voices together and adjusting pan scalars in the mixer.