FPGA-CAPELLA: A REAL TIME AUDIO FX UNIT

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WHAT IS FPGA-CAPELLA?

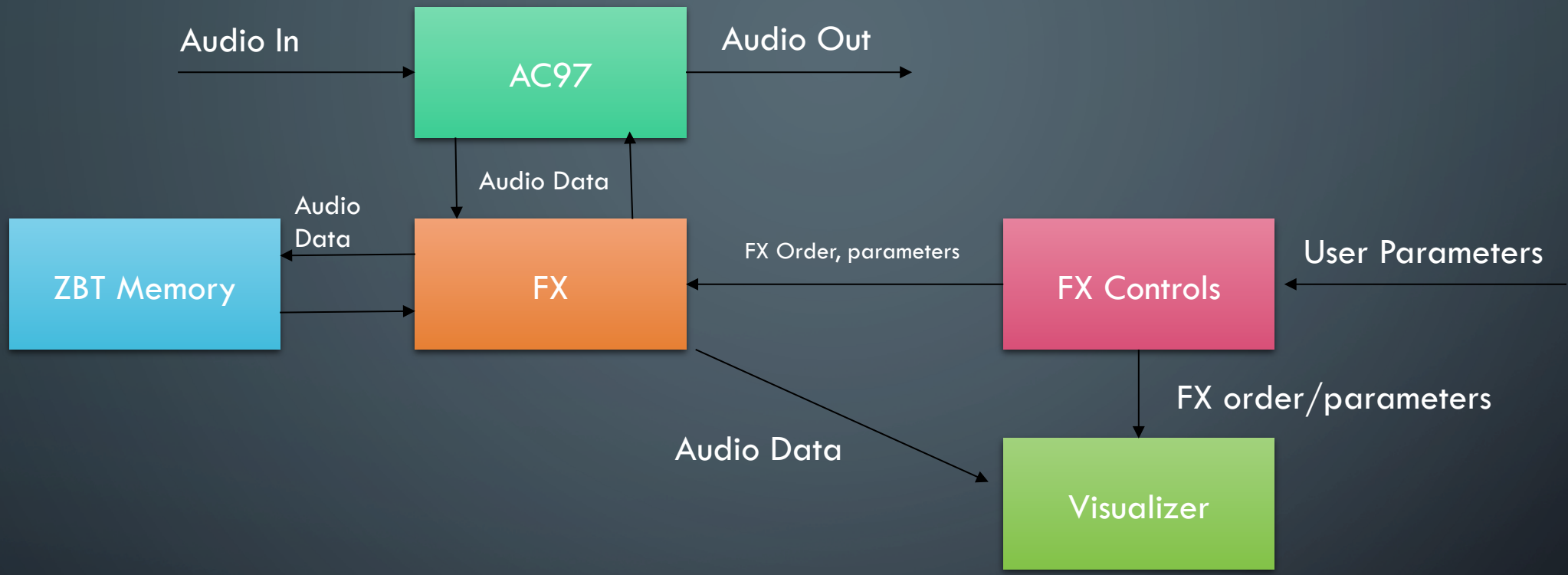
- FPGA-capella is an audio FX unit
- Allows users to apply interesting audio FX to their sound
- Offers flexibility
- Gives musicians an interesting visual interface

DRY SIGNAL: BORING!

WET SIGNAL: INTERESTING!

FPGA-CAPELLA REPLACES STANDARD FX!

- Typically, outboard FX are bulky and expensive
- Often, each FX unit can only do one job, such as filtering or distortion
- FPGA-capella is capable of producing multiple FX
- Users can choose up to 3 FX, decide order, and input parameters for each effect!

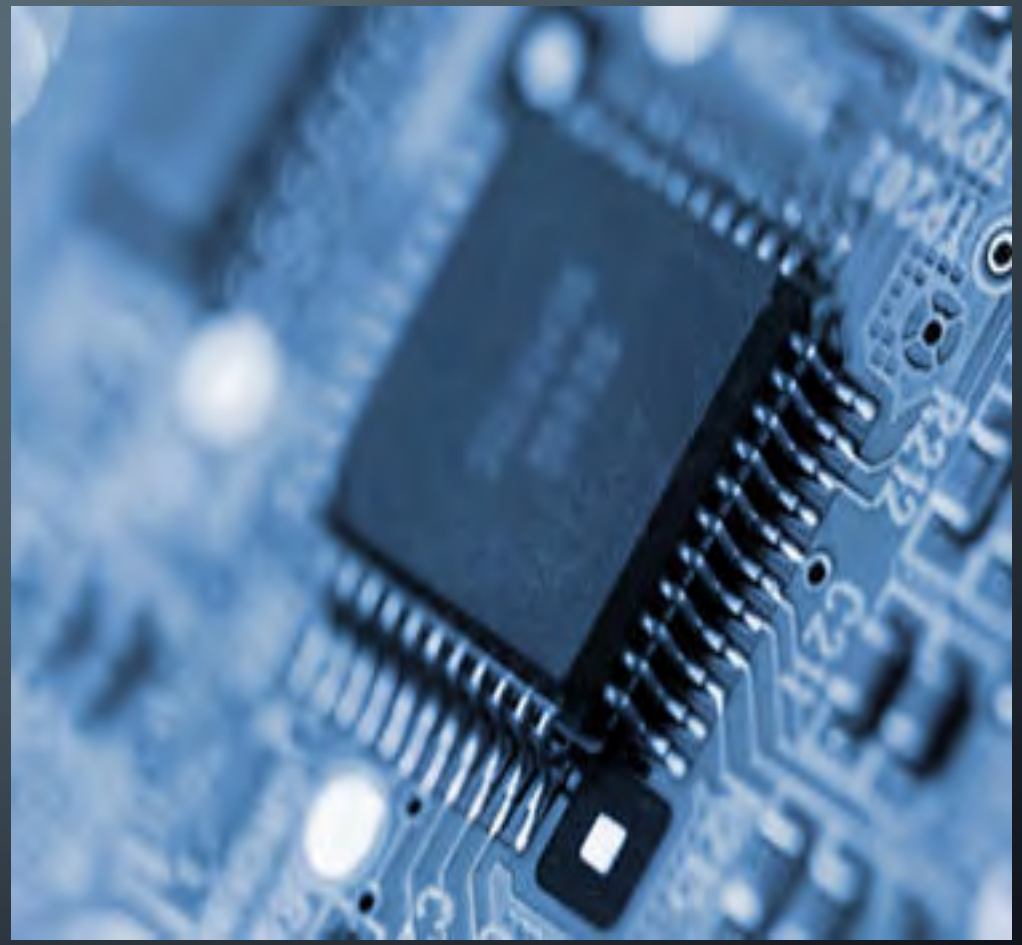

Audio In
AC97
Audio Out
Audio Data
Audio Data
ZBT Memory
FX
FX Order, parameters
FX Controls
User Parameters
FX order/parameters
Audio Data
Visualizer

FX MODULE

- Delay
- Echo
- Equalization
- Distortion
- Looping
- Panning/stereo width

MEMORY

- What type of memory?
- How many bits are we storing?
- Memory Allocation Function



FX CONTROLLER MODULE

- 3 different controllers corresponding to each FX
- Once the FX for each controller is chosen, controller allows for user-controlled parameters
- Order the FX are chosen in determines the order of the FX chain
- This configuration allows for maximum flexibility!

VISUALIZER

- Analog level meter that swings with the audio level amplitude
- FFT frequency bin amplitude visualizer
- Highest frequency component indicator
- Peak amplitude indicator

TIMELINE

Week	To do
11/1/15	• Plan each module • Test bit depth of AC97 • Implement basic effects
11/8/15	• Test basic effects • Implement a basic visualizer • Continue implementing FX
11/15/15	• Implement Controls module • Finish Testing basic effects • Implement mouse module to ease user face interaction • Implement more advanced visuals
11/29/15	• Finish testing and debugging • Implement a more appealing user interface