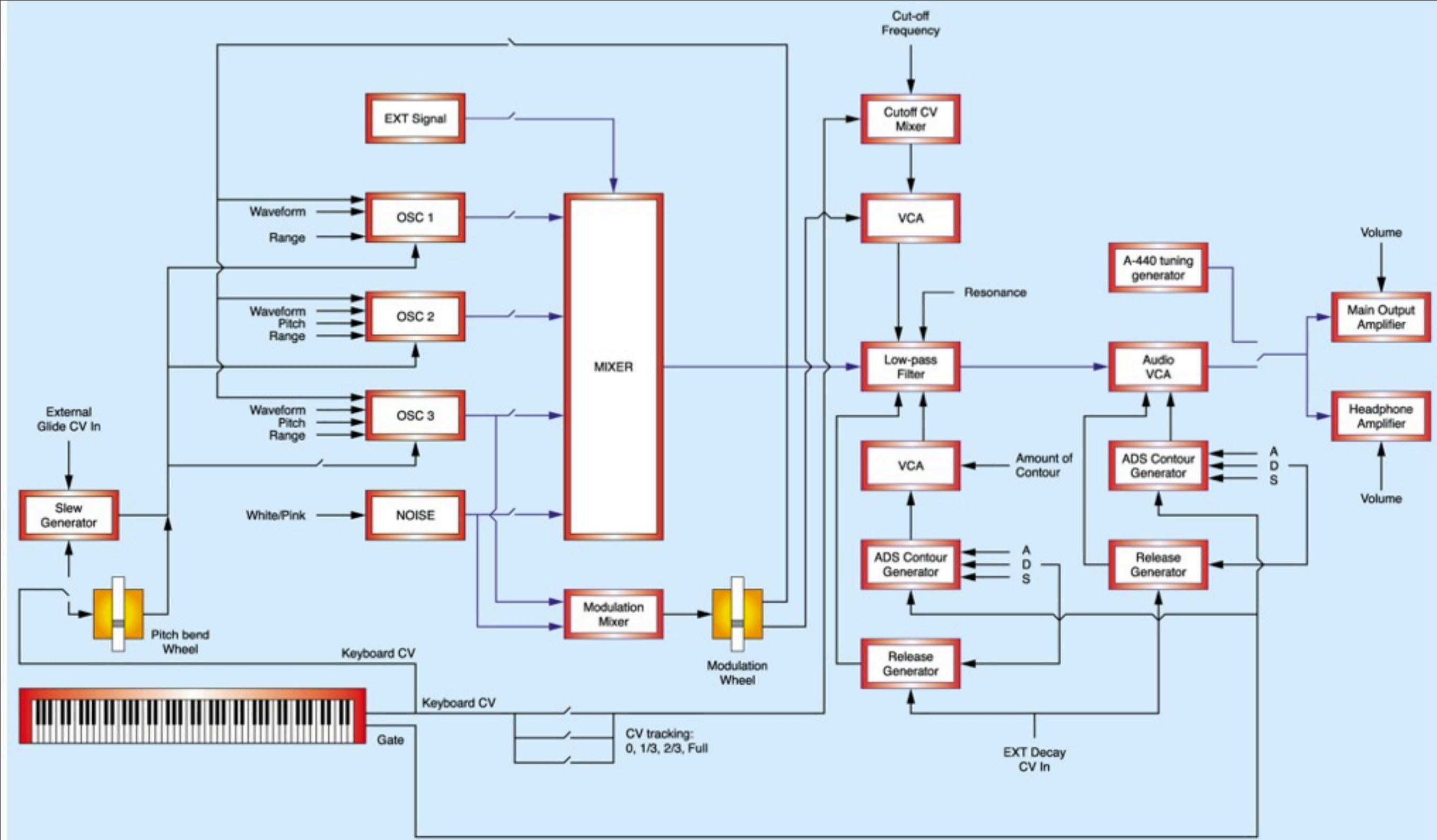


Music 172 Wk. 1

Analog synthesis

Analog synthesis

- Subtractive synthesis is the main model used in analog synthesizers.
- Easy to understand and control: Oscillator > Filter > Amplifier
- Oscillator(s) and noise generators develop a harmonically rich sound
- Filter(s) filter the oscillators' sound, acting similar to instrument resonators (guitar body, piano soundboard, drum body)
- Amplifier provides additional articulation, sharp or slow attack/release
- Envelope or contour generators control note evolution, typically filter frequency and amplifier gain



Moog Minimoog

block diagram

Oscillator bank - VCOs

- The three oscillator bank has several options which help in building of different timbres
- Waveshape selection
- Pulse width modulation changing spectral rolloff
- Multiple oscillators with independent octave control and tuning to build formants, reinforce fundamental or chorus
- Oscillator also doubles as a low frequency vibrato or tremolo source
- Frequency modulation to create inharmonic sounds

The Moog Filter - VCF

- The voicing filter is a 4 pole ladder lowpass filter with feedback
- Each stage of the ladder filter saturates slightly giving it a nice biting character
- Resonance feedback emphasizes the frequency of the filter, giving this lowpass filter bandpass characteristics
- Resonance breaks into oscillation equally over most of the frequency range
- The filter is often used to emphasize certain parts of the harmonic structure, and keyboard tracking is used to move this formant or keep it static

Emulating this in PD

- The hardest thing is the oscillator and its waveshaper
- nice trick - once you have a ramp, you can make a pulse wave
- make sure to give the right number of harmonics to your ramp wave
- oscillator sync is a little tricky in PD
- getting the filter right? easiest is to just use the moog~ or svfilt~ externals