

K503 Super All-inclusive Final Exam Review Sheet

Coaches Hass and Gibson

1. Format of the exam:

- 10 brief, but complete and accurate identifications from MIDI and analog synthesis (example: Q, for which you would list the general definition and the formula (found in the web filters page))
- Three questions requesting information and diagrams (example: Describe the **four simple waveforms** provided on most analog synthesizers and the harmonic spectrum of each. Be sure to indicate the relative strength of the partials and be specific about the form with a variable phase width—so you would draw a waveform like a triangle wave, say it only had odd # partials which decrease exponentially in strength $1/p\#^2$). You would also include a longer definition of the pulse wave's spectrum as described on the Synthesis Waveform page—and you would of course list **PULSE WAVE**, and *not* **SQUARE WAVE** (which is only one type of pulse wave with a 1:2 duty cycle).
- One long essay on a complete overview of the MIDI system, with some prompts in the question

2. Topics for study: All the etext reading on MIDI and analog synthesis.

3. For the MIDI essay, know everything on pages 1-5 of my MIDI chapter EXCEPT you don't need to know specific MIDI binary codes, but you do need to know the verbal description of them. So for example, if I asked you to describe the MIDI codes for turning a note on, you would answer: status byte (note on action + MIDI channel), data byte (key #), data byte (velocity 1-127)). Know the four specific controller numbers on Page 5, know the transmission rate, that it is serial or asynchronous (one bit after another rather than 8 or 10 bits at a time in parallel). Know all terms you see, including running status and OMNI mode. Know the code classes on Page 3 and briefly what each does. Be able to diagram a typical MIDI set-up (see Page 2 of the MIDI chapter).

4. For analog synthesis:

- as the above example lists, be able to list the four basic waveforms and provide specific information about their spectra (spectrums, what partials are sounding and what is their relative strength) •
 - be able to diagram the basic patch and label the modules (VCO, VCF, VCA, EG, etc.) and each connections as signal or control or gate (S or C or G)
 - be able to diagram the four basis filter types listed in the webpages, with cutoff frequency (half-power point or -3 dB) or frequencies, know the terminology, such as cut-off point, passband, poles and zeroes, Q (or resonance) and its formula.
 - terms such as subtractive synthesis, additive synthesis, offset and attenuator*, half-power point (filters), formants (areas of resonance), tremolo (low-frequency amplitude modulation), vibrato (low-frequency frequency modulation), LFO (low-frequency oscillator), VCO, VCF, VCA, envelope generator (attack, decay, sustain, release), c.o.f. (cut-off frequency-filters), duty cycle (waveforms).

- for those who missed it, here are the simple defs for offset and attenuator
 - **offset**: sets the *initial* setting of a module, such as the initial frequency of a VCO, the initial cutoff frequency of a VCF or the initial amplitude of a VCA
 - **attenuator**: cuts down on the effect of applied control voltage, so for example, a filter won't sweep as wide a frequency range when an envelope generator is applied to it