

# 21M.380 MUSIC AND TECHNOLOGY SOUND DESIGN

## LECTURE N<sup>o</sup>25 MUSIC SYNTHESIZERS

MONDAY, MAY 9, 2016

### 1 Subject evaluation

### 2 Review QZ2

### 3 Synthesizer history

- Pipe organ
- Thaddeus Cahill's *Thelharmonium* or *Dynamophone* (1897)
- Lev Termen's *Theremin* (1928)
- Friedrich Trautwein's *Trautonium* (1929)
- Oskar Sala - *Mixtur-Trautonium* (1950s; Hitchcock's *Birds*)
- Hugh Le Caine's *Electronic Sackbut* (1948)
- RCA Mark II synthesizer (1957)
- Buchla 100 series (1963)
- Wendy/Walter Carlos' *Switched-On Bach* (1968)
- Joe Paradiso's (MIT Media Lab) modular synth (1974–88)

### 4 Modular synthesizer theory

- Voltage-controlled oscillators (VCO)
- Voltage-controlled amplifier (VCA)
- Low-frequency oscillator (LFO): vibrato, tremolo
- Voltage-controlled filters (VCF)
- Envelope generator (ADSR)
- Sequencer

## **5 Resynthesizing Eurythmics' *Sweet Dreams***

### **5.1 Sequencer**

- Which MIDI pitches?
- How many voices?
- How many steps?
- Which tempo?

### **5.2 Oscillator**

- Which instruments?
- Which waveforms?

### **5.3 Envelope generator**

- How long are attack and decay periods?

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