

MUSIC 105A ELECTRONICS IN MUSIC fall 1974

TEXTBOOK READINGS: Julian, Joseph. Compositional Procedures in Electronic Music.

Strange, Allen. Electronic Music: Systems, Techniques, and Controls.

ASSIGNED LISTENING: Reserve list of recordings in Main Library.

LAB WORK: 2 hours per week to be arranged.

Sept. 24: Basic techniques of the Sound Studio

Oct. 1: Parameters of Sound in Terms of AC Voltage
Basic Waveshapes and Their Characteristics

8: Amplitude Modulation. Frequency Modulation

15: Control- Voltage Sources. Gating

22: Equalization and Filtering. Mixing

29: Midterm projects due

Nov. 5: Location Modulation. Reverberation, Echo, and Feedback

11: Tape Recording. Miscellaneous Equipment.

18: Live Electronic Music. Real-Time Networks

25: Compositional Procedures in Electronic Music
Final projects due.

ADDITIONAL READINGS (periodicals)

Perspectives of New Music

Journal of Music Theory

Eimert, H. and K. Stockhausen, ed. Die Reihe: A Periodical devoted to Developments in Contemporary Music.

Synthesis

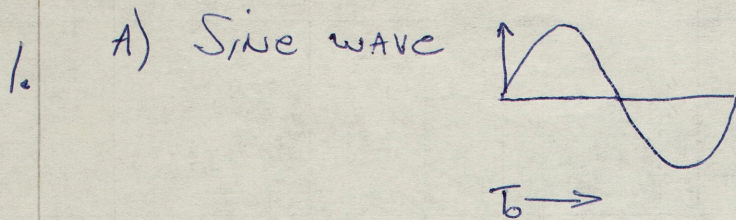
Source Magazine

Nu Mus West

INSTRUCTOR: Joseph Julian

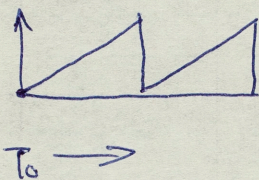
MUSIC 105A FINAL EXAM - FALL '74
Dr. Joseph Julian - instructor

1. List basic waveshapes and their characteristics.
2. Describe the technique of modulation and the application of this concept to frequency, amplitude, location, phase, and ring modulation.
3. Patch diagram a network of modules illustrating control-voltage sources, gating, equalization and filtering.
4. Patch diagram a tape delay system with a single sound source and mixing.
5. Write a critique of Electronic Music: Systems, Technique and Controls by Allen Strange.



Composed of fundamental frequency —
Has a "soft" sound throughout the
audio spectrum —

B) Sawtooth wave

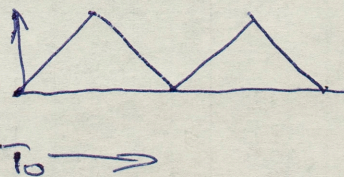


Composed of fundamental frequency and
the harmonic content ~~is~~, with
respect to amplitude, is inversely proportional
to the number of harmonics. ODD ones

i.e. fund. 1
1st Harm. $\frac{1}{2}$
~~2nd~~
3rd $\frac{1}{3}$

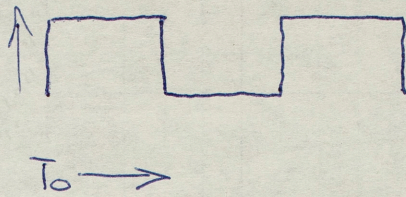
Has a harsher, more
brilliant sound
especially highs —

C) TRIANGLE wave



Somewhat the same sound as a
sawtooth, but a little smoother or pleasant —

D) ~~Pulse type~~
 SQUARE WAVE:



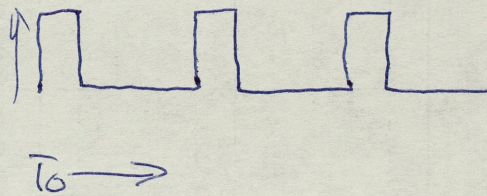
Composed of fundamental and all harmonics, amplitudes inversely proportional to the number

i.e.

1 ST	1
2 ND	$\frac{1}{2}$
3 RD	$\frac{1}{3}$
4 TH	$\frac{1}{4}$
5 TH	$\frac{1}{5}$

Has a harsh, buzzy sound -

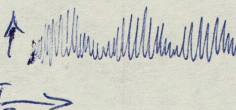
E) Pulse type



Derived from the square wave, only the percentage of pulse is varied - used for timing purposes - Has somewhat of a clicking sound -

2. Modulation: The changing of one medium with respect to another —

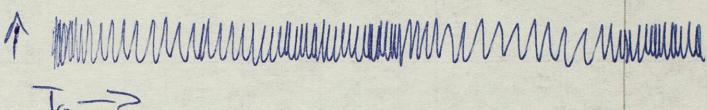
Amplitude:

i.e. — a 1 KHz sine wave is modulated by a 5 Hz sine wave and a tremolo effect is heard — 


Frequency:

i.e. — a 2 KHz sine wave is modulated by a 500 Hz sine wave to produce 2.5 KHz & 1.5 KHz sidebands —

Location:

i.e. — using a low frequency sine wave to gate two amplifiers between two speaker locations — causing the location of sound to waver — a program source is moved between two separate locations — 

Phase:

i.e. altering the phase of one signal when modulating another, will cause a cancellation or addition of portions of the cycle, and cause a fluctuation in amplitude — APPROXIMATION 

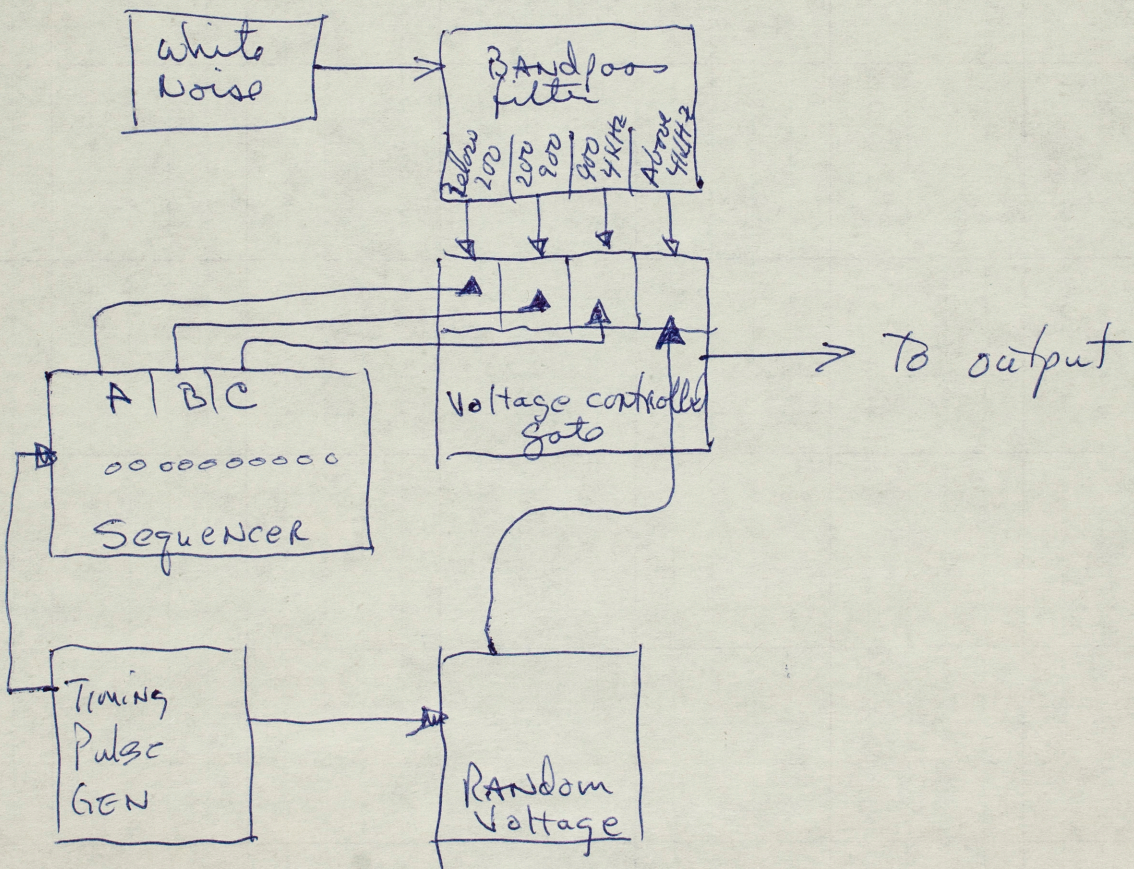
ring modulation:

i.e. - modulating two signal sources together and subtracting the fundamentals -

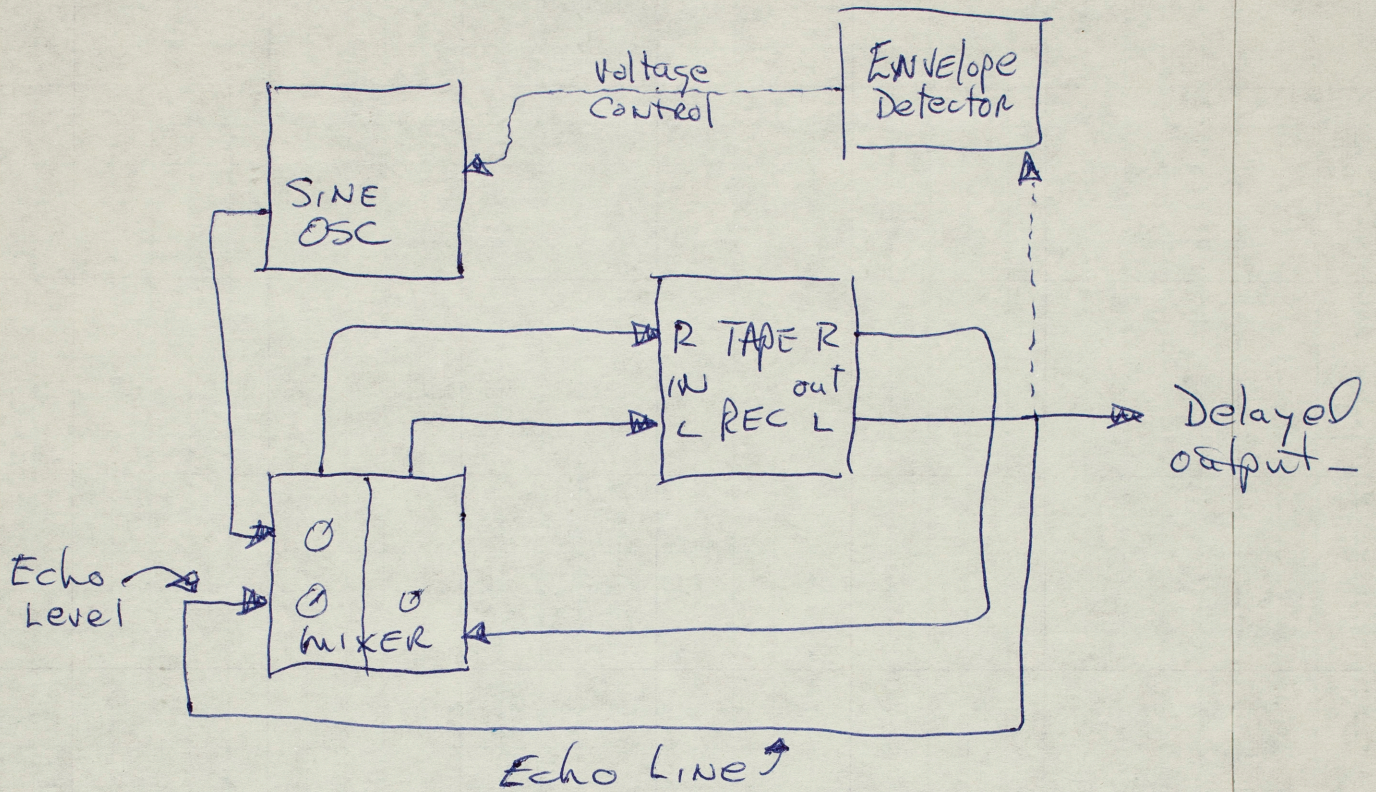
$$2\text{ KHz} + 500\text{ Hz}$$

resultant 1.5 KHz and 2.5 KHz

3.



40



5.

Strange has a fairly well organized approach - more information on compatibility with other systems would be helpful - instead of reference to Buchla or Moog Only - there are many other synthesizers -

More uses of wave shapes as central sources i.e. - triggering pulses, timing pulses -

Use of more standardized notation in respect to flow-charts -