MUSIC 105 A PRELIMINARY ENTRANCE EXAMINATION JAN. 4, 1972

INSTRUCTIONS: MAKE A GRAPHIC REPRESENTATION OF THE MAJOR SECTIONS OF SIDEWINDER (PART II) BY MORTON SUBOTNICK. GIVE THE CLOCKTIME OF THESE SECTIONS AND THE SHAPE. EXPLAIN YOUR REPRESENTATION. COMMENT ON THE SOUND OF EACH SECTION, HOW IT BEGAN AND ENDED. GIVE ANY FURTHER SIGNIFICANT DATA WHICH SUPPORTS YOUR REPRESENTATION. GIVE TOTAL CLOCKTIME OF PIECE.

YOUR NAME _____

JAN. 4, 1972

MUSIC 105 ELECTRONICS IN MUSIC

INSTRUCTOR PAULINE OLIVEROS T.A. TRAVIS CHANDLER

TEXT ELECTRONIC MUSIC, SYSTEMS AND TECHNIQUES, ALLEN STRANGE, ROB. BROWN

RECOMMENDED – NEW DIRECTIONS IN MUSIC, DAVID COPE, ROB. BROWN

GOALS OF THIS COURSE:

1) TO LEARN THE USES OF THE AVAILABLE EQUIPMENT IN THE DEPARTMENT FOR ELECTRONIC MUSIC MAKING, ESPECIALLY THE BUCHLA SYSTEM AND MOOG SYSTEM.
2) TO BECOME FAMILIAR WITH THE FIELD OF ELECTRONIC MUSIC AND THE ASSOCIATED SYSTEMS AND TERMINOLOGY.
3) TO LEARN AND DEVELOP NOTATIONS
4) TO DO ELEMENTARY TECHNICAL ANALYSIS.
5) TO WORK WITH LIVE PERFORMANCE AS WELL AS TAPED ELECTRONIC MUSIC.

ASSUMPTIONS:

1.) 4 TO 6 HOURS A WEEK BEYOND CLASS HOURS IS NECESSARY IN ORDER TO KEEP UP WITH LAB AND READING ASSIGNMENTS.
2) LAB ASSIGNMENTS WILL BE ISSUED ON TUESDAYS AND WILL BE DUE THE FOLLOWING TUESDAY. LATE ASSIGNMENTS WILL NOT BE ACCEPTED UNLESS THE CIRCUMSTANCES ARE BEYOND THE CONTROL OF THE STUDENT.
3) STUDENTS WILL BE CONSIDERATE OF OTHERS REGARDING THE USE OF THE LABS:
   a) AN ORDERLY LAB IS A HELP. CLEAN UP AFTER YOURSELF.
   b) DON'T SIGN UP FOR TIME YOU CANNOT USE, SOMEONE ELSE NEEDS IT.

REQUIREMENTS:

1) ATTENDENCE OF 5 MONDAY NOON TAPE MUSIC PROGRAMS, JAN. 10, 24, FEB. 7, 21 MAR. 6 IN THE GALLERY.
2) PAYMENT OF $1.75 FOR TAPE TO BE USED FOR ENTRANCE TEST ON THURSDAY JAN. 6. TAPE TO REMAIN PROPERTY OF STUDENT. TEST TO BE GIVEN IN THE EDITING LABS IN THE BASEMENT OF HL BUILDING

105 1st Lecture

Williams mix Dripsody

So splicing really replaced by sequencer?

WORKING METHODS

Provide yourself with Razor (Safety) splicing tape, leader and several empty reels. Anyone who steals a blank reel is a real crumb!

Each assignment shall be recorded and notated and analyzed. Examples from work will be played and discussed in class.

Scheduling – Studio Responsibility. Protecting your vested interest.

Grading – Lab assignments – Mid term – Final Class Participation

Find Xerox manual ~~to~~ supplement drawing.

Harmonic series (put calibrated generator in to aid)

Needs # Lew what are # for each item?

Editing kit

Blank reels 50¢
Splicing tape 40¢
Leader ~~$1.50~~ 60¢ for 4
Stain. steel Splicing Razor Tape Scotch only! 202
Gem
Pitch pipe or tuning fork
Green Pencil Stop watch
Xerox fee. $1.00 Kay 50¢ return
Buy manual

How much is tape? $2.50 $3.00 as opposed to $4.50 & $5.00

mini-test write the harmonic series up to the 6th harmonic given C C4 use music notation for pitch & numbers for freq. check in class

Chapin — Lab II
Brownell
Benedon
Berg — "

✓ Crouch
✓ Dorain
Esty
Forbes
✓ Kahrs

✓ Zaller
Mastro

Wolfe — "

Schwarz

Tabor

{ arreguin
Cortez
Leung
Julian

Dept. Seminar

Announce Party Reception International Center
behind bookstore. after concert

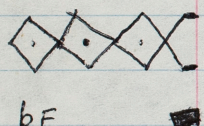
Shiro Hardie
Australian cat } are here
Dan Good

Jeff
D'Ombrain

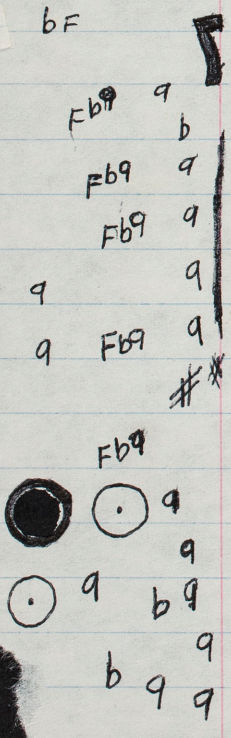
Tape Session 10 - 12 in Gallery
Mozart Feb March 2 Spurzem

Music 105
Williams Mix } your orientation to Electronic Music
Dripsody } Books for the course

Sine C 64 Mini test harmonic series
Play on piano
explain



Demonstrate mouth as Helmholtz Resonator John Glazier



Realizing intent } distinguish
Interpretation }

105 2nd Lecture (Get oscilloscope from Leo)

* 1. Sing B 60, B 120, F# 180, B 240, D# 300, F# 360
1 2 3 4 5 6

2. Sell tape → Travis Chandler see after class. Buys the next day

† 3. Demonstrate the Buchla System Format distinguish signals
Refer to Source article by Buchla. (Compare sine wave sources) Bring heath + Lafayette

Explain non-technical orientation of the course
Triton Times article,
Ask each person to reveal her interest or orientation. How much musical experience? - how much technical experience

Notation exercise Technical (review these non-such and Strange)
Musical Can you think of a way to graphically represent the sound we have been tuning? or White noise (Sidewinder)
Think of sources

Play Stimming if time permits

* Be able to tune harmonic series by mid-term (use of earphones) and notate pitch by staff notation and frequency by number from any given pitch and frequency.
That will be part of exam.

† Two people can work simultaneously now with the ear phones available

Do not Disturb Gabriel's Class

105 third Lecture Jan 20 1972

Assignments are due Tuesday and Thursday
Noon Concert again Monday

1. Sing B 120 with the series from B60 in both pitch & frequency.
Practice singing a while.
Explain that by mid-term all must be able to tune harmonic series from any given pitch in the tempered system and notate pitch with staff notation frequency with numbers.

2. Finish explaining voltage processor — call attention to Strange and Howe for further knowledge. Point out famous error.
Technical notation — explain flow chart or Signal path idea. show examples.

3. Get someone to sing B 120 then tune the series.
When series is in tune. Give test Turn all pots to half then emphasize harmonics sequentially in the following order.

3	2	5	4	6	1	
5	3	1	4	2	6	
4	3	6	5	2	1	

F#180 B120 D#300 B240 F#360 B60
D#300 F#180 B60 B240 B120 F#360
B240 F#180 F#360 D#300 B120 B60

Advise ~~a~~ a frequency - pitch chart.
Advise notice of tempered system
B60 is out of tune with tempered system
B 61.735 is correct

[Consult music Physics + Engineering Olson Dover]

Show harmonics from piano
Advise two people work together, Pick a partner and try dictation.
Record some motor drones determine pitch and predominant harmonics. (Sony 800 check out)
Ask each person to reveal orientation ie musician technician other wise?

[Put technician + musician together helps each other]

4. Stimming

Learn to count impulses per second.
What harmonics arise?

105 Fourth Lecture Jan 25, 1972

Assignments due Today + Thursday and Tuesday
Concert tonight + Water Whistle
Editing deck now in middle of Q 306

1 Play Stimming as class assembles - Point out spot where pitch changes with loudness.

Discussion of frequency and amplitude — Illustrate with generator. write discoveries on blackboard
Stranges book - correction

Bell telephone Scenic of Sound Record

2. What is your orientation to EM Choose or assign partners. Match musicians with technicians.
Who is interested and conversant with circuitry?
Ask Travis to conduct discussion section -
Come up with designs Term project

3. Pitch Pipe and Stop watch
Listen to monday Tape lab. Identify constants
musicians identify all pitches in Palestinis drone piece

4. Frequency Modulation
Harold

5. Intervals from Harmonic Series

Thursday Notation Bent Lorentzen

Intensity Range of Human Ear is greater than frequency range
Loudness is not directly proportional to intensity

these two terms are not interchangable

Frequency = A periodic quantity. Unit is the cycle per second or hz. the number of recurrant waves or cycles which pass a reference or observation point per second

Pitch = is that attribute of auditory sensation in terms of which sounds (of regular vibration) may be ordered on a scale extending from low to high, such as a musical scale.

Pitch is primarily dependent upon frequency. but also intensity + waveform duration (number of cycles needed to establish pitch?)

The average ear (whatever that is) can distinguish 1,400 discrete frequencies. In the equally tempered scale 16 to 16K hz there are only 120 discrete tones.

Pitch capability is not fully realized in Western music.

Test range using reference intensity.

The ear is most sensitive to frequency changes at high frequencies.

Persistence of duration or no. of cycles necessary to establish pitch is also frequency dependent, average about 13 milliseconds.

Pitch can vary almost a whole tone with a change in loudness.

Two tones which apparently differ in pitch may harmonize perfectly i.e. no beats if frequency is same. Try saw tooth and sine wave tuned to unison.

beats are caused by differences in frequency.

Piece #4 for Tape (4 channels) and orchestra by Pauline Oliveros

dedicated to Cal Arts composers

These Program notes are essential

Note: This Piece does not exist

MUSIC 105 LAB I JAN. 4, 1972

CHECK OUT KEYS FOR Q306 FROM IRENE SOLOMON IN THE MUSIC OFFICE. IDENTIFY YOURSELF.

MAKE A DIAGRAM OF EACH OF THE 4 BUCHLA BOXES. IDENTIFY EACH MODULE. NOTE THE FUNCTIONS OF EACH DIFFERENT KIND OF MODULE. THIS DIAGRAM SHOULD SERVE AS A GUIDE TO AVAILABLE MODULES FOR YOUR FUTURE PLANNING OF WORK OUTSIDE THE LABORATORY, AND ACQUAINT YOU WITH THIS EQUIPMENT.
COMMENT ON OR ANALYZE THIS ASSIGNMENT BRIEFLY.

DUE NEXT TUESDAY JAN. 11, 1972

P. OLIVEROS

WHAT IS YOUR TECHNICAL AND MUSICAL ORIENTATION TO ELECTRONIC MUSIC? GIVE A BRIEF RESUME OF YOUR EXPERIENCE. BE PREPARED TO READ IT TO THE CLASS.

READ CHAPTER 1 - STRANGE

MUSIC 105 JAN. 11, 1972 OLIVEROS

PROCEDURE FOR LAB ASSIGNMENTS:

1. ALL ASSIGNMENTS MUST BE RECORDED (TAPE AND WRITING)
   a) VOICE IDENTIFY ON THE TAPE EACH PART OF THE ASSIGNMENT AND GIVE YOUR NAME.
   b) PRESENT THE TAPE 1) HEAD OUT 2) EDIT ALL EXTRANEOUS MATERIAL 3) CUE UP THE FIRST SOUND WITH LEADER 4) WRITE YOUR NAME, HEADS OR TAILS, TAPE SPEED, NUMBER OF CHANNELS USED AND THE DATE ON THE LEADER.
2. SCOTCH 202 OR EQUIVALENT HIGH QUALITY TAPE ONLY IS ACCEPTABLE, BARGAIN BASEMENT TAPE IS OUT
3. A WEEKLY SIGN UP SHEET IS KEPT ON THE DOOR OF LAB Ⓠ306W. IF YOU SIGN UP AND DO NOT SHOW WITHIN 15 MINUTES YOUR TIME IS UP FOR GRABS.
4. PLEASE HELP AVOID THIEVERY. IF WE LOSE ANY EQUIPMENT, REPLACEMENT IS DIFFICULT IF NOT IMPOSSIBLE. COOPERATE BY LOCKING THE DOOR AND WINDOWS AND KEEPING THE KEYS AND COMBINATION TO YOURSELF.
5. LEAVE THE LAB AS ORDERLY AS YOU WOULD LIKE TO FIND IT
6. REEL THIEFS ARE ABSOLUTE CRUMBS.

LAB II JAN 11, 1972

Tune a Sine/saw Generator to a selected pitch from the calibrated Lafayette sine tone Generator - Eliminate all beats

Tune a harmonic series from the selected fundamental using a pitch pipe or the calibrated generator as a guide. Eventually you should be able to do this by ear. Counting the fundamental as 1 tune through the 6th harmonic. Musicians make frequency notation as well as pitch notation

Non musicians make pitch notation as well as frequency notation

Patching

Audio patches

EXT - Wave Shaper ∿ ○ output of 5561 to input 1 of mixer

" " " " " " " " 2 " " " 2 " "

" " " " " " " " 3 " " " 3 " "

" " " " " " " " 4 " " " 4 " "

" " " " " " " " 5 " " " 5 " "

" " " " " " " " 6 " " " 6 " "

All output of Mixer to input of Gate

output of Gate to patch input chan 1

output of Lafayette Generator to patch input Chan 2

Control patches

Settings

output of Control voltage processor to control input of Gate

Lab-II Music 105A Jan 14, 1970

1. Tune two generators to the same pitch.
   a. Without the aid of the voltage processor
   b. With the aid of the voltage processor
   Tune until no beats are present. Record example

2. Mix 3 or more generators together to one output. Adjust individual amplitudes for various timbres. Record 3 examples of exceptionally different timbres.

3. Frequency modulate a Sine-Sawtooth generator with a) a low frequency at low amplitude
   b) a high frequency at maximum amplitude
   c) a continuously low moving to high frequency at 3 different amplitude settings.
   Record all examples.

4. Identify each example with your voice, using the microphone through the Buchla System to the tape. Put leader at the beginning of the tape at the first sound.

5. Make block diagram notations of each patch.

MUSIC 105 LAB II JAN. 11, 1972 OLIVEROS

1. TUNE SIX SINEWAVES TO THE HARMONIC SERIES. COUNT THE FUNDAMENTAL AS NUMBER 1 OF THE SERIES. IDENTIFY THE PITCH AND FREQUENCY OF EACH HARMONIC. (USE MUSICAL NOTATION FOR PITCH AND NUMBERS FOR FREQUENCY.) TRY TO ACHIEVE A SMOOTH, BLENDED OVERALL SOUND WITH ALL BEATS ELIMINATED. WHEN YOUR SERIES IS IN TUNE RECORD A ONE MINUTE SAMPLE.

PATCHING: AUDIO SIGNALS

SSG 1 ⊙ INT. OUTPUT TO 6 CH. MIXER INPUT 1
SSG 2 " " " " " " " " " " " " 2
SSG 3 " " " " " " " " " " " " 3
SSG 4 " " " " " " " " " " " " 4
SSG 5 " " " " " " " " " " " " 5
SSG 6 " " " " " " " " " " " " 6
6 CH. MIXER ALL OUTPUT TO VCG INPUT
VCG OUTPUT TO AMPLIFIER INPUT OR RECORDER INPUT (AS NEEDED)
[PATCH BOX]
MICROPHONE OUTPUT TO BUCHLA PREAMP IMPEDANCE 50K 50 150 250 ⊙
PREAMP OUTPUT TO RECORDER INPUT (AS NEEDED)

CONTROL SIGNALS

CVP ⊙ INT OUTPUT TO VCG INPUT ⊙ (AS DESIRED)
⊙
⊙

LEGEND SSG = SINESAW GENERATOR, VCG = VOLTAGE CONTROLLED GATE
CVP = CONTROL VOLTAGE PROCESSOR ⊙ = FRONT PANEL POTENTIOMETERS OR SWITCHES, INT. REFERS TO SETTING OF TOGGLE SWITCH ON SSG

2. TRANSLATE THE ABOVE NOTATION TO A BLOCK DIAGRAM USING SYMBOLS FOR EACH MODULE OR COMPONENT. DISTINGUISH BETWEEN AUDIO SIGNALS AND CONTROL VOLTAGE SIGNALS.

3. WRITE YOUR OBSERVATIONS OF THIS ASSIGNMENT.

MUS. 105 LAB II JAN. 11, 1972 OLIVEROS

SELECT A FUNDAMENTAL USING THE CALIBRATED LAFAYETTE OR HEATH KIT SINEWAVE GENERATOR. IDENTIFY PITCH AND FREQUENCY. MATCH THE SELECTED FUNDAMENTAL WITH A BUCHLA SINEWAVE GENERATOR. COUNTING THE FUNDAMENTAL AS 1, TUNE 6 min waves THE HARMONIC SERIES THROUGH THE 6TH HARMONIC. TEST EACH HARMONIC WITH THE CALIBRATED GENERATOR. TRY TO ELIMINATE ALL BEATS IN ORDER TO ACHIEVE A SMOOTH, BLENDED SOUND. PRACTICE UNISON AND OCTAVE TUNINGS TO BEGIN WITH. WHEN YOUR SERIES IS IN TUNE, FADE OUT THE FUNDAMENTAL AND LISTEN FOR THE APPARENT FUNDAMENTAL. IF YOUR SERIES IS IN TUNE THE FUNDAMENTAL WILL BE REINFORCED. NOTATE PITCH AND FREQUENCY OF THE WHOLE SERIES. RECORD AN EXAMPLE OF YOUR SERIES AS ONE SOUND THEN EACH HARMONIC SEPARATELY. IDENTIFY YOUR TAPE BY FORMAT AND BY RECORDED VOICE. TAPES SHOULD BE PRESENTED HEAD OUT AND EDITED. WITH LEADER COING THE FIRST SOUND. FORMAT ON LEADER: NAME, HEADS OR TAILS, TAPE SPEED, NO. OF CHANNELS. SCOTCH TAPE ONLY OR EQUIVALENT QUALITY RECORDING TAPE.

PATCHING: AUDIO

SSG 1 WS ↓ INT ○ OUTPUT TO 6CH. MIXER INPUT 1
SSG 2 " " " " " " " " 2
SSG 3 " " " " " " " " 3
SSG 4 " " " " " " " " 4
SSG 5 " " " " " " " " 5
SSG 6 " " " " " " " " 6

6 CH MIXER ALL OUTPUT TO GATE INPUT
GATE OUTPUT TO AMPLIFIER INPUT (PATCH BOX) CH1 OR RECORDER INPUT

MICROPHONE OUTPUT TO PREAMP (IMPEDANCE 50K)
PRE AMP OUTPUT TO RECORDER INPUT

LAB III MUSIC 105A JAN. 18 1972 OLIVEROS

1. TUNE TWO SINEWAVES TO THE SAME PITCH:

   A. WITHOUT THE AID OF THE VOLTAGE PROCESSOR.

   B. WITH THE AID OF THE VOLTAGE PROCESSOR.

   TUNE UNTIL NO BEATS ARE PRESENT. RECORD 30" EXAMPLES OF A & B.

2. TUNE 6 SINEWAVES TO THE HARMONIC SERIES. EXPERIMENT WITH THE AMPLITUDES OF EACH HARMONIC. WHAT ARE YOUR OBSERVATIONS. ILLUSTRATE BY RECORDING. (PLEASE BE BRIEF.)

3. FREQUENCY MODULATE A SINEWAVE WITH ANOTHER SINEWAVE:

   A. A LOW FREQUENCY AT LOW AMPLITUDE AND HIGH AMPLITUDE

   B. A HIGH FREQUENCY AT " " " " " " "

   C ~~A~~ CONTINUOUSLY MOVING FROM LOW TO HIGH WITH MINIMUM, MIDDLE AND MAXIMUM AMPLITUDES.

4. NOTATE THIS ASSIGNMENT.

5. ANALYZE, COMMENT OR GIVE YOUR OBSERVATIONS ON EACH PART OF THIS ASSIGNMENT.

PLEASE REMEMBER TO VOICE IDENTIFY YOUR RECORDING AND EACH EXAMPLE. ALSO OBSERVE THE TAPE FORMAT.

IF YOU HAVE TIME TRY TUNING THE NEXT 6 HARMONICS IN THE SERIES

LAB IV MUSIC 105 JAN. 25, 1992 OLIVEROS

DUE DATE TUES. FEB 1 T.A. TRAVIS CHANDLER

1. THE MONDAY NOON TAPE CONCERTS ARE ON RESERVE IN THE LIBRARY. LISTEN CAREFULLY TO STREAMBEAN BY KRISTINA MELCHER, DI MATTINA PRESTO BY RICHARD TEITELBAUM, AND DRONE BY CHARLEMAGNE PALESTINE. WITH THE AID OF A STOP WATCH AND A PITCH PIPE, IDENTIFY THE CONSTANT (OR NEARLY CONSTANT) ELEMENTS IN THESE PIECES. IDENTIFY AT LEAST ONE ELEMENT FOR EACH PIECE. WHAT CHANGES THE MOST IN EACH PIECE?

2. PATCH UP HAROLD, AND RECORD YOUR PERFORMANCE OF THIS PIECE. CONSIDER THE NOTATION VERY CAREFULLY. IS IT POSSIBLE WITH WHAT IS GIVEN TO IMAGINE THE RESULT OF A PERFORMANCE? WHAT WOULD YOU NEED TO KNOW IN ORDER TO DO THIS? WHY SHOULD THIS PIECE BE BETTER IF LONGER THAN 20 MIN.? TRANSLATE THE NOTATION OF HAROLD TO YOUR OWN NOTATION OR A BLOCK DIAGRAM SHOWING THE SIGNAL PATHS. WHAT SENSITIVITIES MUST A PERFORMER HAVE OR DEVELOP IN ORDER TO GIVE THIS PIECE THE BEST POSSIBLE PERFORMANCE? TECHNICAL? AESTHETIC? WHAT ARE YOUR OBSERVATIONS?

3. PRACTICE TUNING INTERVALS DERIVED FROM THE HARMONIC SERIES.

HAROLD: LIVE PERFORMANCE VERSION

FOR 1 PERFORMER ON BUCHLA SYNTHESIZER

PATCH AND CONTROL SETTINGS AT START

AUDIO

SSG I B — OUTPUT TO VCG I B

"INT"

VCG I B — OUTPUT TO REV A

REV A — OUTPUT TO OUT

SSG I A — OUTPUT TO SSG I B (FM INPUT)

CONTROL

TPG I — "ALL" OUTPUT TO ATG B

INT

INT

ATG B — OUTPUT TO VCG I B

INI

CONTROLS ARE GROUPED THUS:

GROUP I
ATG CONTROLS
SSG IB FM CONTROL

GROUP II
SSG I B SIN-SAW
REV CONTROL

THE PIECE STARTS WHEN THE PERFORMER BEGINS THE ADJUSTMENT OF THE CONTROLS. THE CONTROLS ARE ADJUSTED ACCORDING TO THE FOLLOWING PLAN:

EACH CONTROL IN GROUP II IS ADJUSTED 1CE PER CYCLE.

ONE CONTROL IN GROUP I IS ADJUSTED EACH CYCLE.

A CYCLE IS THE ADJUSTMENT OF 3 CONTROLS.

CONTROLS ARE ADJUSTED CLOCKWISE IN SMALL INCREMENTS.

HAROLD (CONTINUED)

WHEN A CONTROL IN GROUP II HAS REACHED ITS MAXIMUM CLOCKWISE POSITION, A CONTROL FROM GROUP I IS ADJUSTED IN ITS PLACE. THIS NEED NOT BE THE SAME CONTROL EACH CYCLE.

WHEN THE SOUND BECOMES CONTINUOUS, STOP ADJUSTING THE CONTROLS ON ATG. AFTER THIS HAS OCCURED, AND WHEN ALL CONTROLS IN GROUP II AND THE SSG 1B FM CONTROL ARE IN MAXIMUM CLOCKWISE POSITION, UNPLUG THE INPUT TO REV A AND WAIT FOR SOUND TO DIE DOWN. THIS ENDS THE PIECE!

HAROLD SHOULD LAST AT LEAST 10 MIN., BUT CAN LAST AS LONG AS THE PERFORMER WISHES, AND IS BEST IF LONGER THAN 20 MIN.

VARIATION ON HAROLD: FOR MULTIPLE CHANNELS

USE A TAPE RECORDER OR SEVERAL TAPE RECORDERS SO YOU HAVE 1 TAPE TRACK FOR EACH CHANNEL NEEDED. NUMBER THEM FROM 1 TO N WHERE N IS THE NUMBER OF CHANNELS NEEDED. PLUG THE PLAYBACK OUTPUTS FROM TRACK I INTO THE REC INPUT OF TRACK I+1 FOR $1 \leq I \leq N-1$. PLUG "HAROLD" OUTPUT INTO TRACK 1 RECORD. MONITOR PLAYBACK OF ALL TRACKS. TAPE SHOULD TRAVEL AT 7½ IPS

YAPKOWITZ

(Travis, get 1 copy of Buchla users guide from office for Buchla lab. Write do not remove under penalty of eternal death or cover.)

Music 105 2/1/72

1. Write down a question which you would like discussed next class meeting.

2. Have you been able to learn the operation of the Buchla system from the manual? If not why have you not spoken up in class?

3. Make a brief comparative statement concerning the overall sound of Morton Subotnick's The Wild Bull and Charles Dodge's Earth's Magnetic Field.

4. Keep practice tuning the harmonic series. Mid term will include that plus written pitch and frequency notation from any given pitch-frequency.

5. Since the noon concert tapes did not arrive in the library until Friday evening, I will extend the due date till next Tuesday for that part of the assignment.

MUSIC 105 LAB V OLIVEROS 2/1/72

T.A. TRAVIS CHANDLER

1. FROM THE USERS GUIDE TO THE BUCHLA MODULAR ELECTRONIC MUSIC SYSTEM, PATCH UP FIGURES 1A, 1B, 1C, 1D. WHAT ARE YOUR OBSERVATIONS CONCERNING EACH PATCH? (DO NOT RECORD EXAMPLES UNLESS YOU WANT TO BRIEFLY ILLUSTRATE A POINT.)

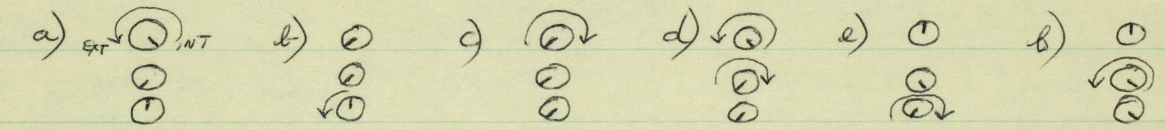
2. TUNE THE MOD. 112 KEYBOARD TO AN EQUAL TEMPERED MAJOR SCALE. RECORD THIS EXAMPLE AND NOTATE YOUR PATCH.

LAB VI MUSIC 105 2/15/72 OLIVEROS

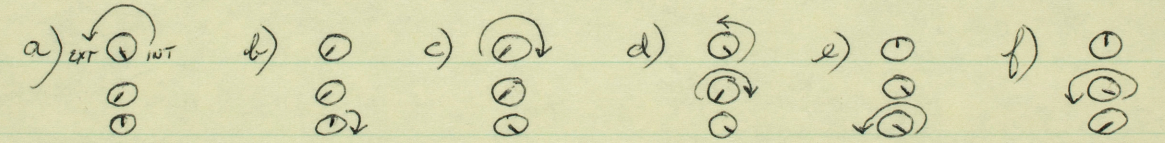
T.A. TRAVIS CHANDLER

1. CONTROL THE FREQUENCY OF AN OSCILLATOR WITH THE SEQUENTIAL VOLTAGE SOURCE. TUNE THE SEQUENCER TO AN EQUAL TEMPERED SCALE. USE 8 INCREMENTS. TRIGGER THE SEQUENCER WITH A MODERATE TEMPO FROM THE PULSE GENERATOR. (RECORD THE SCALE & GIVE PITCH NOTATION USING A STAFF.)

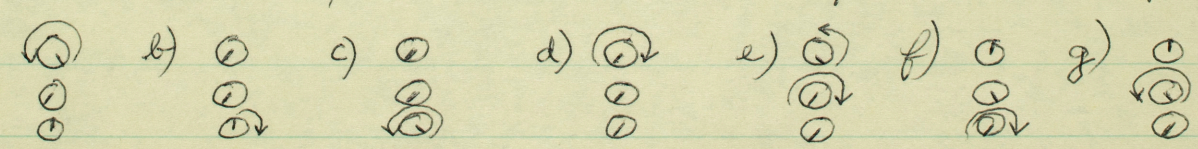
2. AFTER TUNING THE SEQUENCER TAKE THE OUTPUT TO THE LEFT INPUT OF THE VOLTAGE PROCESSOR. TRY THE FOLLOWING SETTINGS AND NOTATE THE RESULTS ON THE STAFF. INVENT WAYS TO SHOW DEVIATIONS FROM EQUAL TEMPERAMENT. TAPE EACH EXAMPLE (ONE PASS ONLY)



3. TAKE THE OUTPUT OF THE SEQUENCER TO CHANNEL B OF THE CVP (THE RIGHT HAND INPUT. (INVERTING) TRY THE FOLLOWING SETTINGS AND NOTATE THE RESULTS ON THE STAFF. TAPE EACH EXAMPLE (ONE PASS ONLY)



4. TAKE THE OUTPUT OF THE SEQUENCER TO CHANNEL A OF THE CVP. (LEFT INPUT) TAKE THE OUTPUT OF THE RANDOM VOLTAGE SOURCE TO THE RIGHT INPUT. TRY THE FOLLOWING. NOTATE YOUR RECORDED EXAMPLES.



5. RECORD A FOUND DRONE I.E. REFRIGERATOR, CAR MOTOR ETC. IDENTIFY ALL OF THE PARTIALS. (PITCH AND FREQUENCY)

LAB VII MUSIC 105 2/22/72 OLIVEROS

1. TAKE A 1 MINUTE SEGMENT FROM YOUR RECORDED FOUND DRONE (SEE LAB VI #5.) AND SUBSECT IT TO THE FOLLOWING MODIFICATIONS:

a) REINFORCE SOME SELECTED PARTIALS (AT LEAST 3) BY MIXING WITH WAVEFORMS OF THE SAME PITCH. TRY TO MAKE A SIGNIFICANT CHANGE IN THE QUALITY OF THE DRONE.

b) AMPLITUDE MODULATE THE DRONE USING THE PULSE GENERATOR DIRECTLY TO THE GATE. WHAT ARE THE MOST EFFECTIVE SETTINGS OF TEMPO AND PERCENTAGE OF PERIOD? (PULSE WIDTH)

c) FREQUENCY MODULATE A SINEWAVE WITH THE DRONE. WHAT RANGE (FREQUENCY) IS MOST EFFECTIVE?

d) RING MODULATE THE DRONE WITH THE FOLLOWING:

1.) SINE WAVE AT 5-7 hz., MID RANGE, 15k-20khz

2) SQUARE WAVE LOW, MID, AND HIGH RANGE

3) SAW TOOTH LOW, MID, AND HIGH RANGE.

4) WHITE NOISE - FLAT, FILTERED (4 RANGES FROM BP FILTER)

e) FILTER THE DRONE USING THE SHARP CUT OFF FILTER:

1) BAND PASS - WHAT ARE THE MOST EFFECTIVE SETTINGS?

2) HI PASS - " " " " " " " "

3) LO PASS - " " " " " " " "

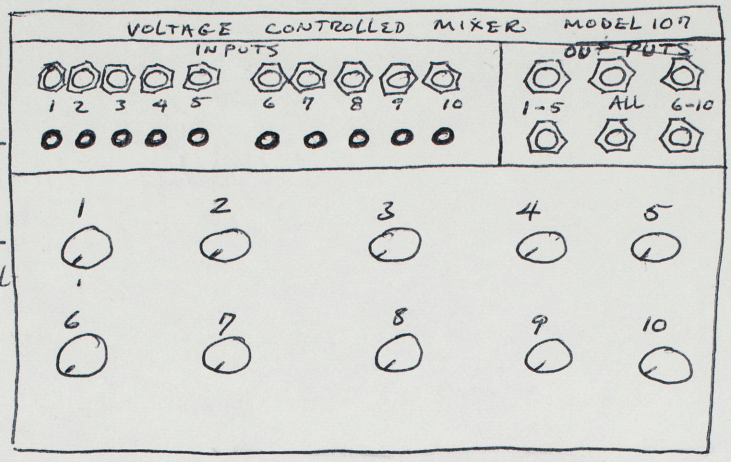
4) BAND PASS WITH REGENERATION = TAKE DRONE INTO MIXER, FEED OUTPUT OF MIXER TO FILTER. FEED OUTPUT OF FILTER TO MIXER INPUT 2. THIS WILL BE REGENERATION

CONTROL. FEED 2ND FILTER OUTPUT TO GATE OR SYSTEM OUT.

2. HOW WAS THE DRONE MATERIAL EFFECTED BY THE ABOVE MODIFICATIONS? AS REGARDS PITCH, VOLUME, QUALITY AND RHYTHM?

3. TRY THE SAME MODIFICATIONS USING A HARMONIC SERIES.

4. DEVELOP AND ORIGINAL PATCH. NOTATE AND ANALYZE THE PATCH. BE PREPARED TO DEMONSTATE IT IN CLASS.

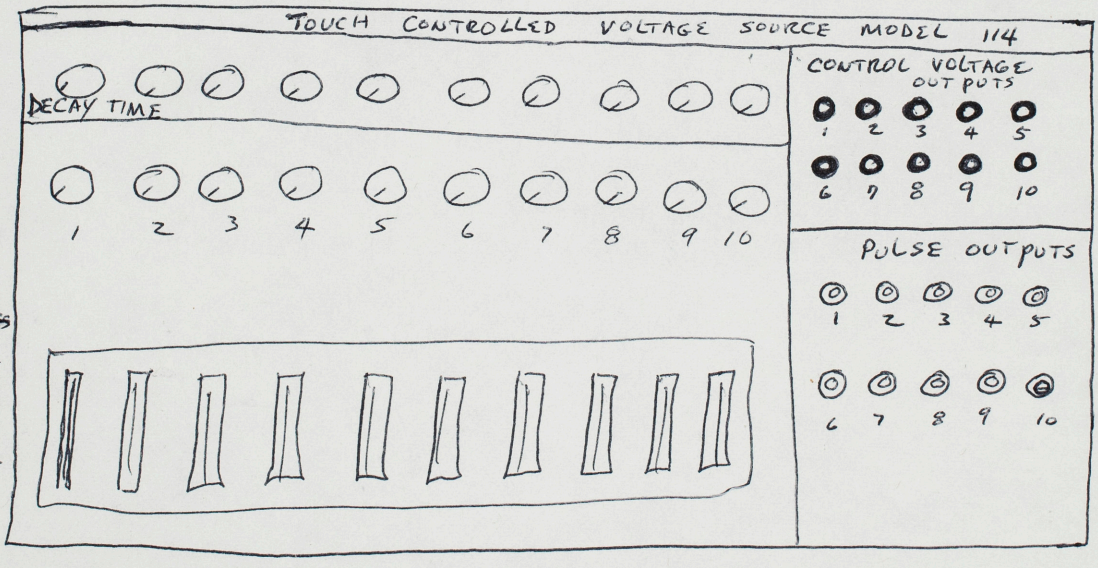


ACCEPTS ANY AUDIO OUT PUTS.

ACCEPTS ANY CONTROL VOLTAGE OR TIMING PULSE.

CONTROLS LEVEL OF EACH INPUT INDIVIDUALLY.

THIS KEY BOARD IS DESIGNED FOR USE WITH THE VOLTAGE CONTROLLED MIXER. KEYS OPERATE INDEPENDANTLY AND SIMULTANEOUSLY.



CA. 1 SECOND DECAY TIME

VARIABLE VOLTAGE AVAILABLE CONTINUOSLY. WHEN INTRODUCED, ~~[illegible]~~ TOUCH SENSITIVITY. BEGINS AT LEVEL OF VOLTAGE SETTING.

FOR KEYED TRIGGERING ROW 2 POTENTIOMETERS MUST BE AT ZERO. OPEN POTENTIOMETERS CAUSE CONTINUOUS DC VOLTAGE AT CORRESPONDING OUTPUT.

TOUCH SENSITIVE KEYS. VOLTAGE INCREASES AS PRESSURE INCREASES WHEN ROW 2 POTENTIOMETERS AT ZERO. RANGE CAN BE LIMITED UPWARD BY POTENTIOMETER SETTING.

SAN DIEGO: DEPARTMENT OF MUSIC
LA JOLLA, CALIFORNIA

COURSE 105 MEMO

1) the price for tapes until Feb. 1st is: scotch 201 = $2.36 a reel includes tax.
scotch 202 = $2.40 a reel includes tax.
blank reel = .45 a reel
splicing tape = .65
leader tape = 1.65 for 7" reel worth + 5% tax.
not affected

2) 48 reels of scotch tape must be ordered in order to get the $2.36 discount for scotch 201. we are still lacking 9 reels of scotch 201. to order

3) to pay for scotch 201: please write checks to LEWIS PRINCE with accurate price.

4) to pay for scotch 202: please write checks to REGENTS OF UNIVERSITY OF CALIFORNIA. this is also true for blank reels, and other accessories.

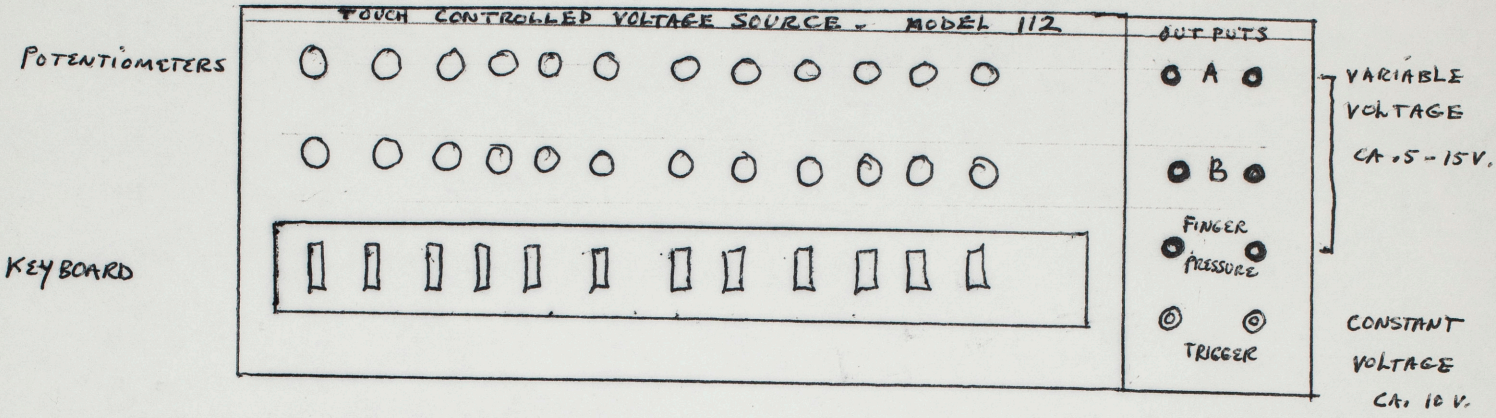
5) those of you who are NOT RETURNING KEYS FOR QUONSET 306 are REALLY SCREWING IT UP FOR those who come after you. i.e. 4:00 p.m. monday jan. 19th John Palmer could not check out any keys for his lab. ALL KEYS CHECKED OUT that should have been returned. !!!!

6) check out splicing kit at the office. includes, blank reels, splicing tape, splicing block.

7) a 7" reel of paper leader tape will be left in quonset 306 and the cost to you will be each student = 11¢.

B. WONG t.a.

UNIVERSITY OF CALIFORNIA—(Letterhead for Interdepartmental use)



PARALLELED OUTPUTS A AND B HAVE 12 CORRESPONDING POTENTIOMETERS FOR SETTING THE VOLTAGE OF EACH INCREMENT OF THE KEYBOARD. THESE VOLTAGES CAN BE SENT TO ANY VOLTAGE CONTROLLED MODULE IN THE SYSTEM.

THE FINGER PRESSURE OUTPUTS VARY ACCORDINGLY.

TRIGGER OUTPUTS CAN OPEN THE GATE, TRIGGER THE ATTACK GENERATOR, RANDOM VOLTAGE GENERATOR AND ETC.

THE KEYS WILL ACTIVATE SUCCESSIVELY BUT NOT SIMULTANEOUSLY.

Rules for use of Buchla Boxes

1. Boxes may be checked out from the Electronics Lab @ 315 one at a time for use in @ 314 editing stations at specified times.

2. Box is charged to <u>one</u> person only unless there is an authorized collaboration. Please <u>do not</u> invite your friends.

3. Patch cord sets go with the box and must <u>all</u> be returned to @ 315. Pull patch cords from jacks <u>by the plug</u> to prolong life of patch cords.

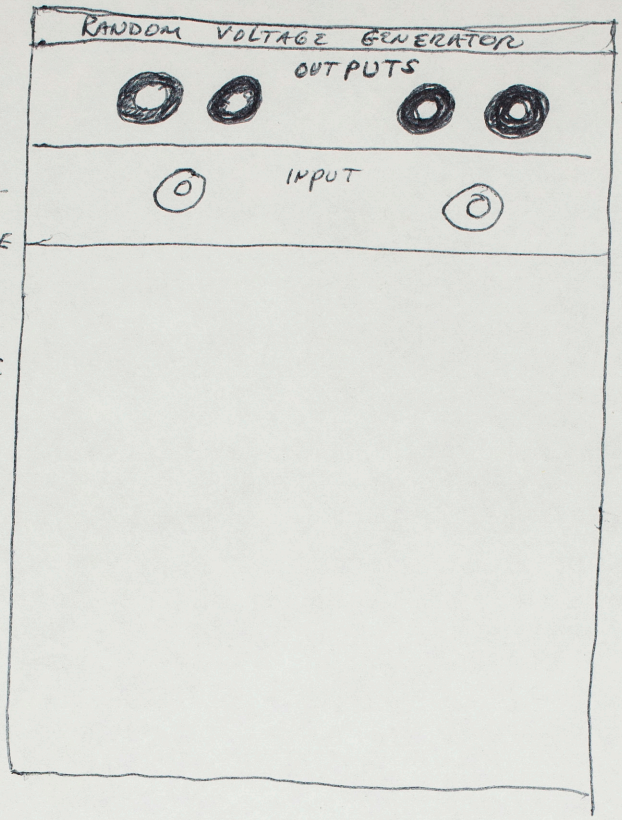
4. All equipment should be handled gently to keep maintenance at minimum.

5. Please report any malfunctioning to Jim Campbell or Pauline Oliveros. <u>Do not</u> attempt maintenance on your own.

6. Do not leave box or patch cord set in editing station. Return all equipment to @ 315.

PRODUCES RANDOM VOLTAGES WHEN TRIGGERED BY PULSE GENERATOR OR OTHER TRIGGER SOURCE.

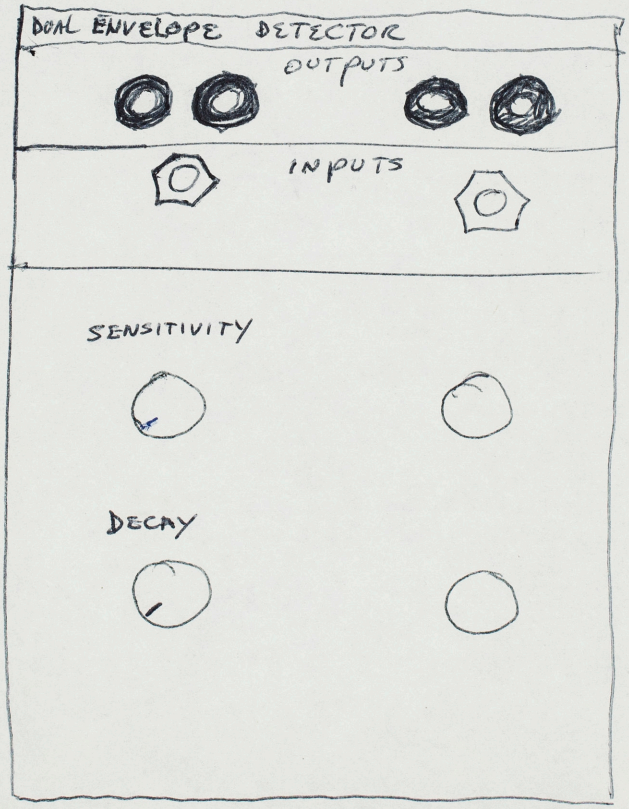
RANGE OF RANDOM VOLTAGE GENERATOR MAY BE COMPRESSED BY SENDING OUTPUT THROUGH VOLTAGE PROCESSOR (156)



RANGE .5 TO 15 VOLTS

— TO D.C. INPUTS

CONVERTS AUDIO (AC) SIGNALS TO CONTROL VOLTAGES. (DC)



— ORDINARILY TO GATE.

ANY AUDIO SOURCE ESPECIALLY MICROPHONE PREAMP.

LOWERS THRESHOLD AND EXAGGERATES THE ENVELOPE

FADES VOLTAGE OUT SLOWLY ACCORDING TO SETTING.

THE SYSTEM

The Modular Electronic Music system that was developed at the Tape Music Center is composed of functional *modules*, each designed to generate a particular class of signals or perform a specific type of signal processing. Each module is 7 inches high and 4¼ inches (or an integral multiple thereof) wide. Up to 15 modules sharing a single power supply may be assembled in a single cabinet, and form a *super-module*.

The system employs three varieties of signals, each with a distinctly different function:

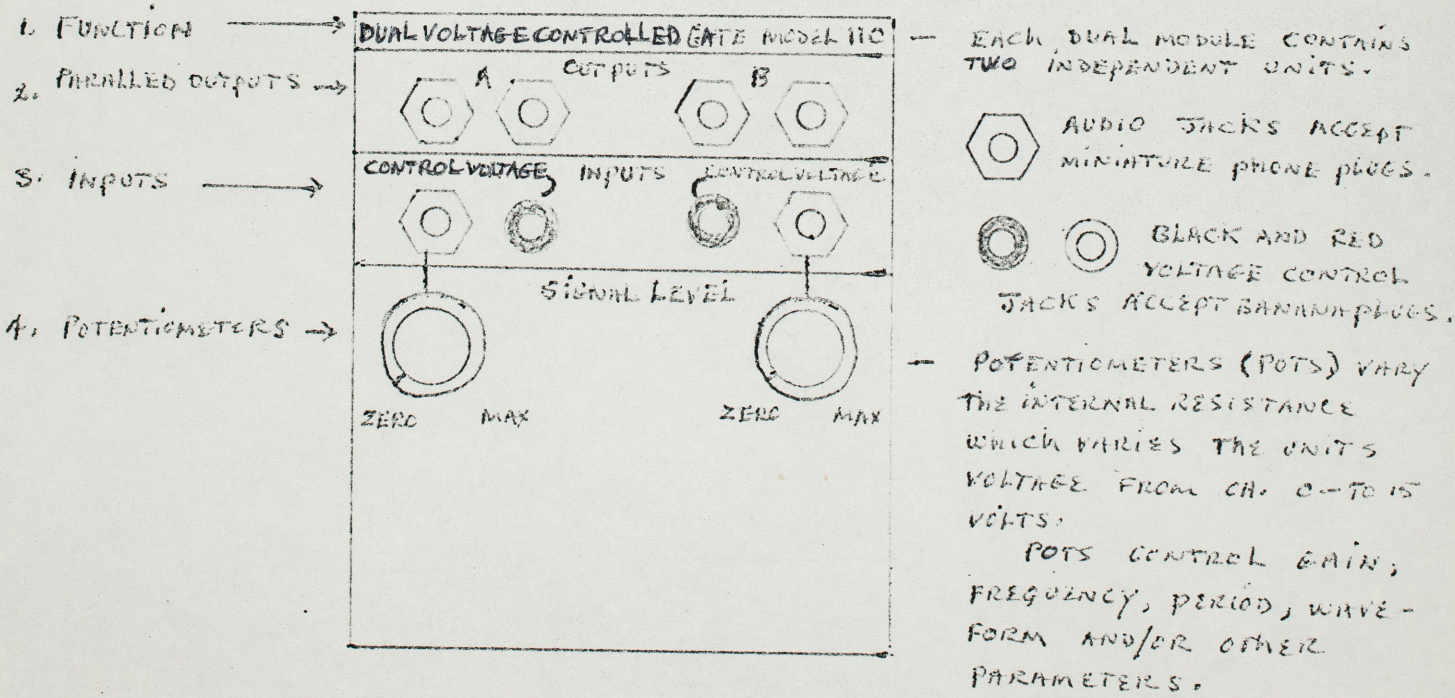
Audio signals, the raw material of electronic music, are formed by various sorts of generators (sine, square, sawtooth, harmonic) or are produced externally (tape loop, radio, microphone). In constructing a piece, they may be filtered, gated, mixed, modulated, or otherwise processed. The patch cords carrying audio signals within the system are grey, shielded cables terminated with miniature phone plugs. A standard level of Odb (ref. 600Ω) is employed for audio signals within the system.

Control voltages, used to determine frequencies, envelope characteristics, amplitudes and other parameters, are generated by keyboards, programmable voltage sources, and format generators. Black banana plug patch cords are used to interconnect control voltages. The standard control voltage range is from .5 to 15 volts.

Timing pulses are originated by keyboards, programmable sequencers, and pulse generators. They are used to trigger notes, open gates, or initiate chains of musical events. Timing pulses are about 10 volts in amplitude and are interconnected with red banana plug patch cords.

The rules for interconnection are straight-forward. Any number of inputs may be connected to a single output. Timing pulse outputs may be paralleled and connected to one input. The system output may be derived from any module; output is of sufficient magnitude to drive line inputs on tape recorders or sensitive inputs on power amplifiers.

PANEL FORMAT



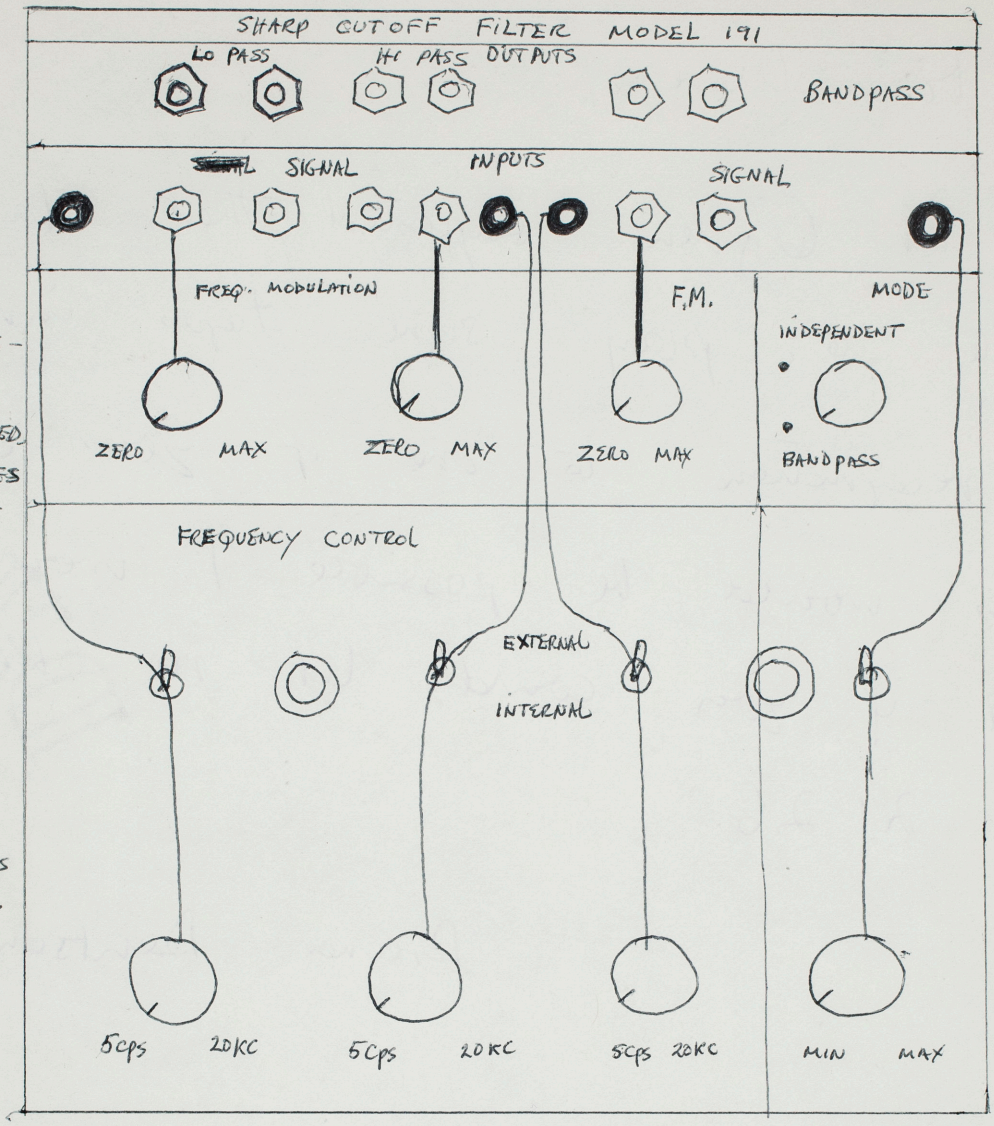
LO PASS AND HI PASS FILTERS CAN BE USED SIMULTANEOUSLY WHEN 2 POSITION SWITCH IS SET AT INDEPENDENT.

THE FILTERED SIGNAL CAN BE FREQUENCY MODULATED F.M. POT INCREASES AMPLITUDE OF MODULATOR.

TOGGLE SWITCHES OPEN CIRCUITS FOR EXTERNAL VOLTAGE CONTROL.

PILOT LIGHT SHOWS WHICH UNIT IS OPERATIVE.

FREQUENCY CONTROL IS FOR TUNING THE RESONANCE OF THE FILTER CIRCUIT. BAND WIDTH IS DETERMINED BY THE TYPE FILTER I.E. HI OR LO.



BANDPASS FILTER IS OPERATIVE WHEN 2 POSITION SWITCH IS SET AT BANDPASS.

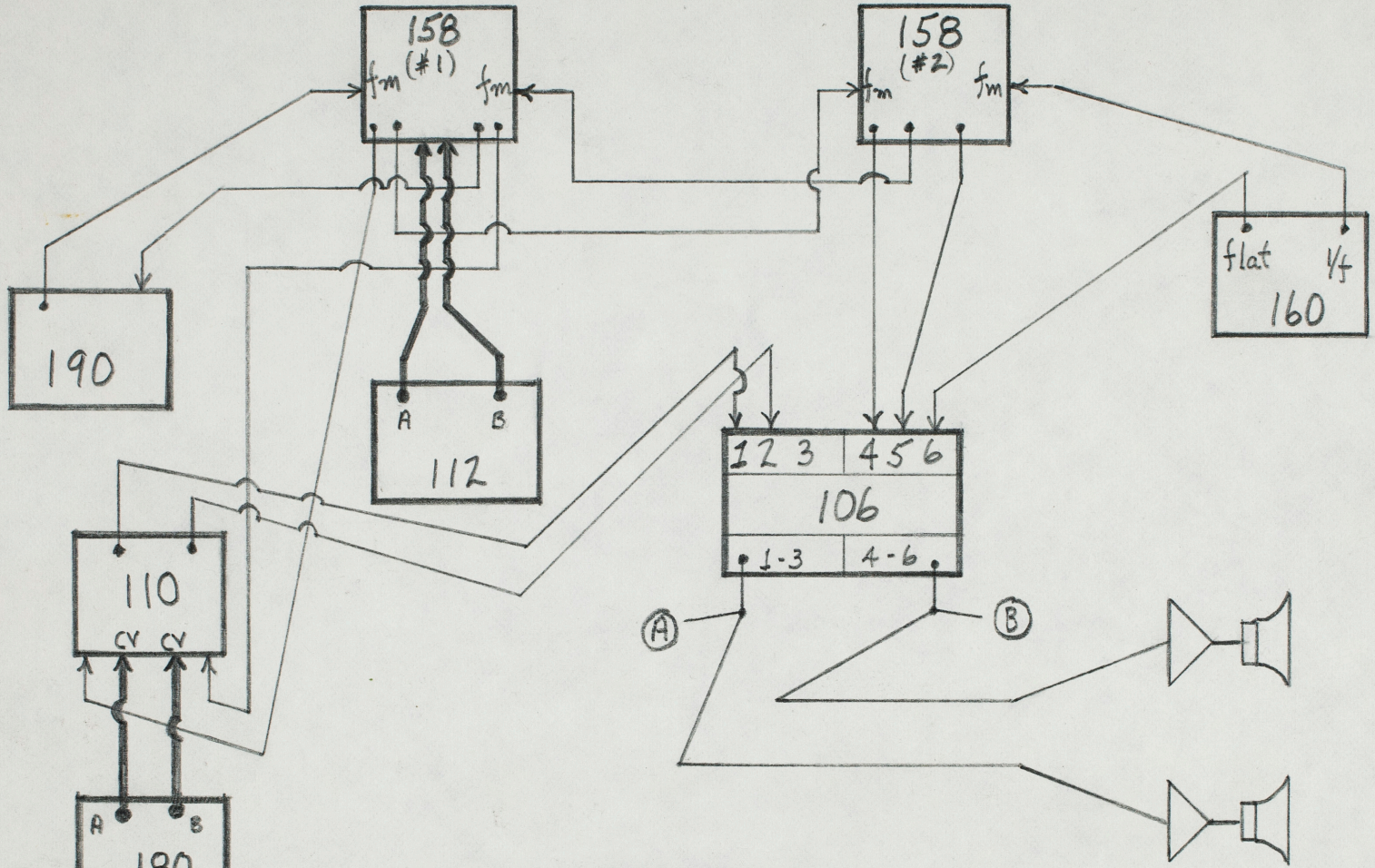
BAND WIDTH OF BANDPASS FILTER IS DETERMINED BY THE MIN-MAX POTENTIOMETER. RESONANCE IS DETERMINED BY BALANCING THE FREQUENCY CONTROL AND BAND WIDTH CONTROL.

Dear Miss Olivieros,

Dr. Ogden suggested that I might be able to play some tapes involving tone recognition to one of your classes. If this would be possible I would be grateful if you could let me know at Ext. 2126.

Diana Deutsch.

Wednesday -
12:00 At Johnson Voice pieces



BUCHLA, FRIAND (+ follie)

A BUCHLA PATCH
FOR ONE OR TWO PERFORMERS

USING

1- 106 Six Channel Mixer
1- 110 Dual Voltage-Controled Gate
1- 112 Touch-Controlled Voltage Source
1- 140 Timing Pulse Generator
2- 158 Dual Sine-Saw Generator
1- 160 White Noise Generator
1- 180 Dual Attack Generator
1- 190 Dual Reverberator
1- Stereo Power Amp
2- or more loudspeakers

Dwight Cannon —
9-5-70

LOUDSPEAKER

A loudspeaker is a device for converting variations of electric energy into corresponding variations of acoustic energy, i.e., sound. Its task is therefore similar to that of a telephone receiver (cf. page 112), except that the sound produced is much louder. In fact, the early loudspeakers were designed like large telephone receivers (Fig. 1): mounted in front of the poles of a permanent magnet whose field is strengthened and weakened by the speaker current passing through coils is a metal diaphragm which vibrates to the rhythm of the field strength variations and transmits these vibrations to the air as sound waves. To improve the effect, a conical horn is fitted in front of the diaphragm. Because of the restraint of the diaphragm at its edges, where it is gripped in its mounting, the fidelity of the reproduction is adversely affected, however. The further development of the loudspeaker therefore had to aim at achieving, as far as possible, unrestrained vibration of the diaphragm. The first loudspeakers in which this principle was applied were constructed as shown in Fig. 2: the "diaphragm" is a resiliently mounted paper cone which is set in motion by the armature which is energised by the speaker current which here, too, can vibrate freely in the field of a permanent magnet.

A further advance is represented by the dynamic loudspeakers (also known as moving-coil loudspeakers). In such speakers the "armature" which vibrates in the magnetic field consists of a coil attached to the conical diaphragm. In the electrodynamic speaker (Fig. 3) the moving coil oscillates inside an electromagnet which is energised with direct current, while in the permanent-magnet moving-coil speaker (Fig. 4) the coil oscillates in an annular cavity of a specially-shaped permanent magnet.

All the loudspeakers described above use the electrodynamic principle for the conversion of electrical oscillations into mechanical vibrations which in turn produce sound waves in the air. Crystal loudspeakers (Fig. 5) and electrostatic loudspeakers (Fig. 6) are based on different principles. The crystal loudspeaker utilises the piezoelectric effect, i.e., the phenomenon that certain crystals (quartz, Seignette salt) develop an electric charge or potential difference when subjected to mechanical pressure and conversely undergo changes in thickness (and thus produce mechanical forces) when they are electrically charged by the application of a potential difference. Thus, when an alternating voltage is applied, the crystal undergoes periodic variations in thickness, i.e., thickness oscillations, which are transmitted to the loudspeaker diaphragm (Fig. 5). The electrostatic loudspeaker makes use of the electrostatic attractive and repulsive forces to which a diaphragm is subjected in the electric field of a condenser when the voltage applied to the latter is made to vary. The condenser plates are perforated, so that the sound waves can emerge through them. The two last-mentioned types of loudspeaker are more particularly suitable for the reproduction of high frequencies. In high-fidelity ("hi-fi") systems these speakers are used in combination with electrodynamic speakers to obtain sound-reproduction with a very high degree of accuracy (cf. page 314 *et seq.*).

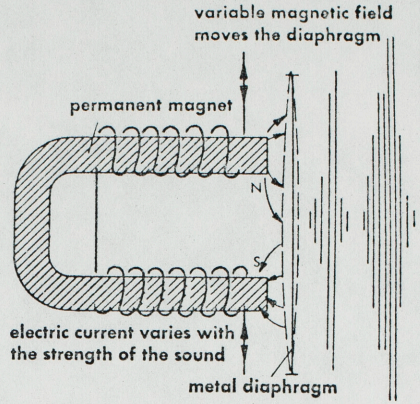


Fig. 1 PRINCIPLE OF LOUDSPEAKER

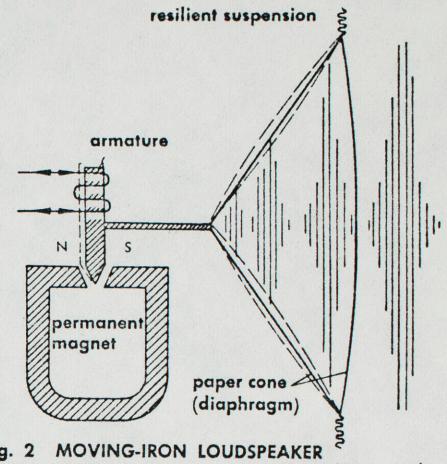


Fig. 2 MOVING-IRON LOUDSPEAKER

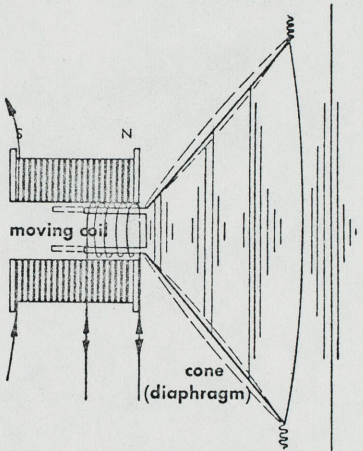


Fig. 3 DYNAMIC LOUDSPEAKER

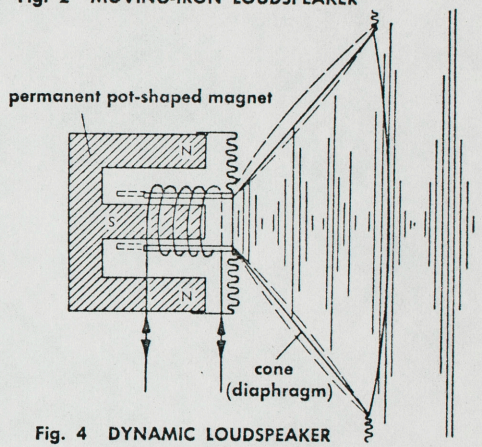


Fig. 4 DYNAMIC LOUDSPEAKER

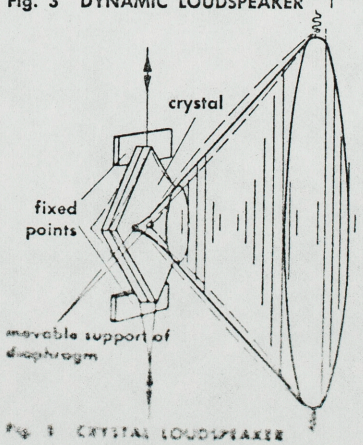


Fig. 5 CRYSTAL LOUDSPEAKER

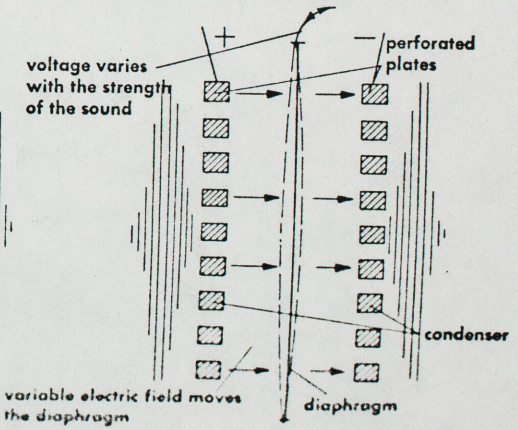
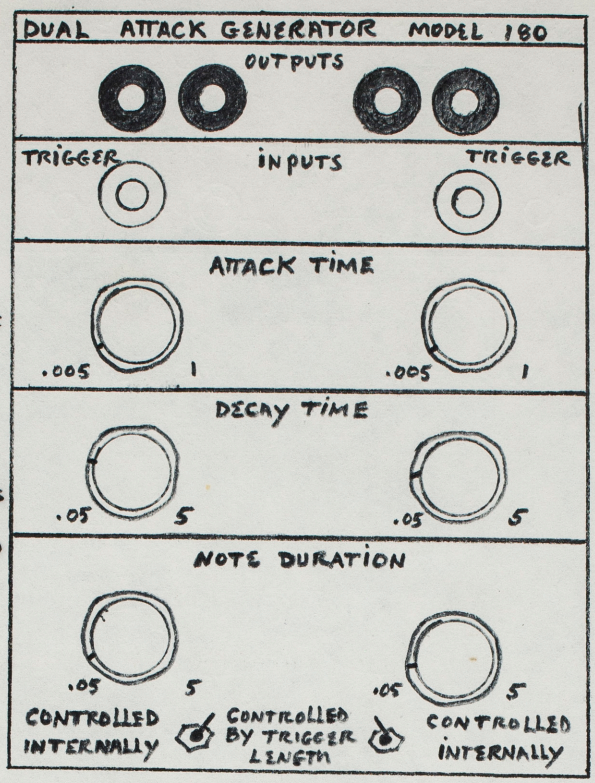


Fig. 6 ELECTROSTATIC LOUDSPEAKER



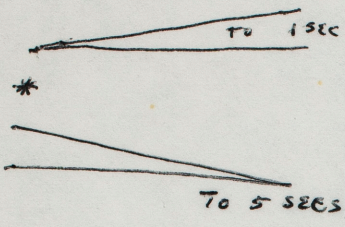
→ USUALLY TO GATE

→ FROM TRIGGER VOLTAGE SOURCE IE PULSE GENERATOR, KEYBOARD, SEQUENCER OR ANY 10 VOLT SOURCE.

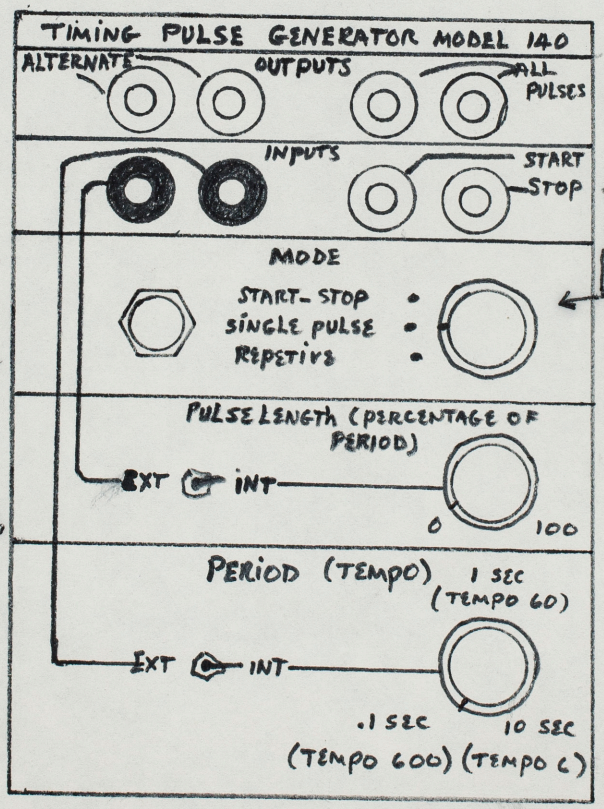
— CONTINUOUSLY VARIABLE MANUALLY

" " " "

DURATIONS CAN BE CONTROLLED BY ANY TRIGGER SOURCE, AS INDICATED ABOVE WHEN TOGGLE SWITCH IS SET TO TRIGGER LENGTH CONTROL. OTHERWISE DURATION IS CONTINUOUSLY VARIABLE MANUALLY.



* THESE CAN BE REVERSED BY USING THE INVERTING INPUT OF THE VOLTAGE PROCESSOR.



ALTERNATE PULSES DIVIDES REPETITION RATE BY 2 AND PRESENTS ALTERNATE PULSES AT EACH OUTPUT.

MOMENTARY CONTACT SWITCH: OPERATED MANUALLY IN SINGLE PULSE MODE. USUALLY FOR TUNING SEQUENCER OR SETTING OTHER PARAMETERS

TOGGLE SWITCH: PULSE LENGTH CAN BE CONTROLLED FROM EXTERNAL VOLTAGE SOURCE IE KEYBOARD, SEQUENCER OR RANDOM VOLTAGE GENERATOR.

PERIOD CAN BE CONTROLLED BY ANY EXTERNAL VOLTAGE SOURCE.

TO OTHER RED TRIGGER INPUTS I.E. ATTACK GENERATOR, SEQUENCER OR GATE (GATE CONTROL VOLTAGE INPUT IS BLACK)

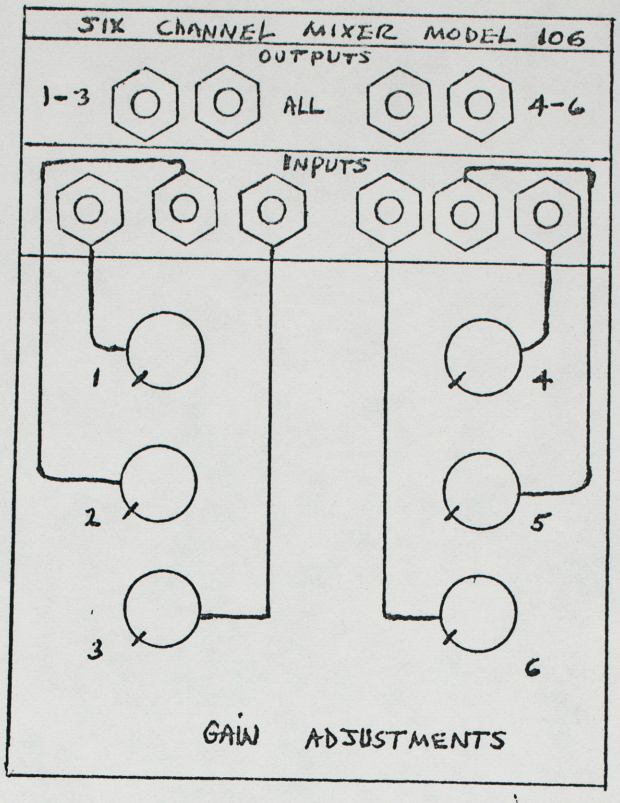
IN START-STOP MODE, START AND STOP INPUTS MAY BE TRIGGERED FROM ANY EXTERNAL SOURCE, I.E. KEYBOARD OR SEQUENCER.

REPETITIVE MODE: PULSE REPEATS CONTINUOUSLY ACCORDING TO SETTINGS OF PULSE LENGTH AND PERIOD POTENTIOMETERS.

ALTERNATE PULSE OUTPUT DIVIDES PERIOD IN HALF.

MAY BE OPERATED AS 2 THREE CHANNEL MIXERS ARE 1 SIX CHANNEL MIXER.

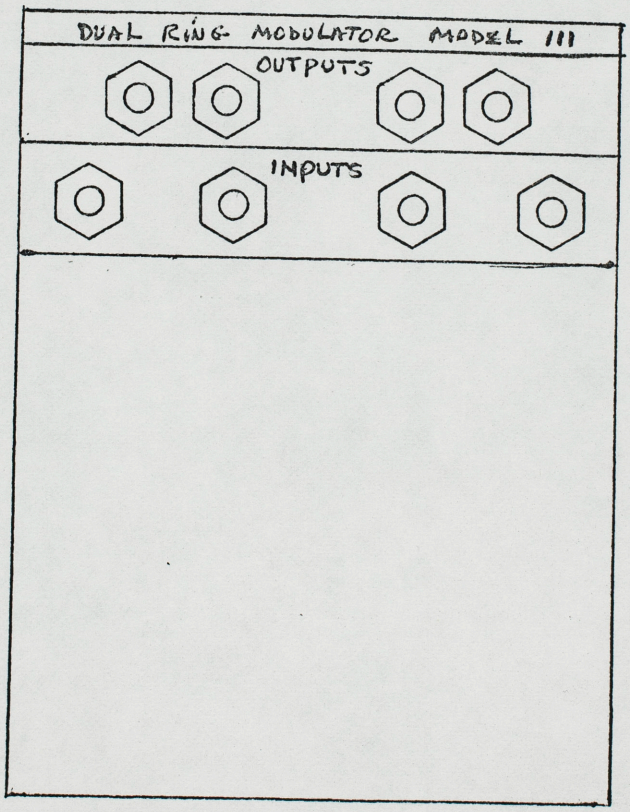
OUTPUT 180° OUT OF PHASE WITH INPUT.



TO GATE OR ANY AUDIO INPUT.

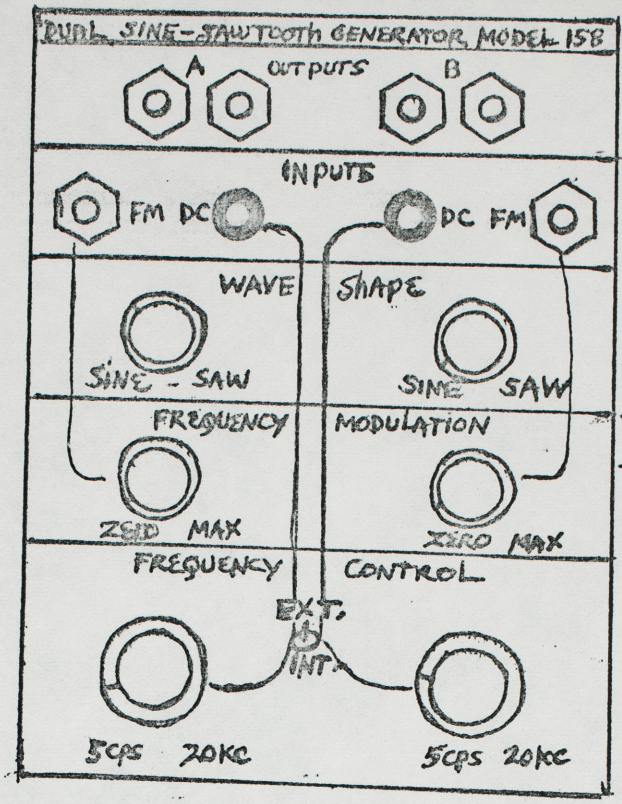
INPUT MAY BE DERIVED FROM ANY AUDIO OUTPUT.

POTS CONTROL GAIN OF EACH INPUT SEPARATELY



RING MODULATOR REQUIRES 2 SEPARATE AUDIO SIGNALS THE FUNDAMENTALS ARE SUPPRESSED AND THE SUMS AND DIFFERENCES (COMBINATION TONES) ARE AMPLIFIED.

USE OF THE SIX CHANNEL MIXER OR GATE IS RECOMMENDED FOR GAIN BALANCING BETWEEN THE TWO AUDIO SIGNALS.



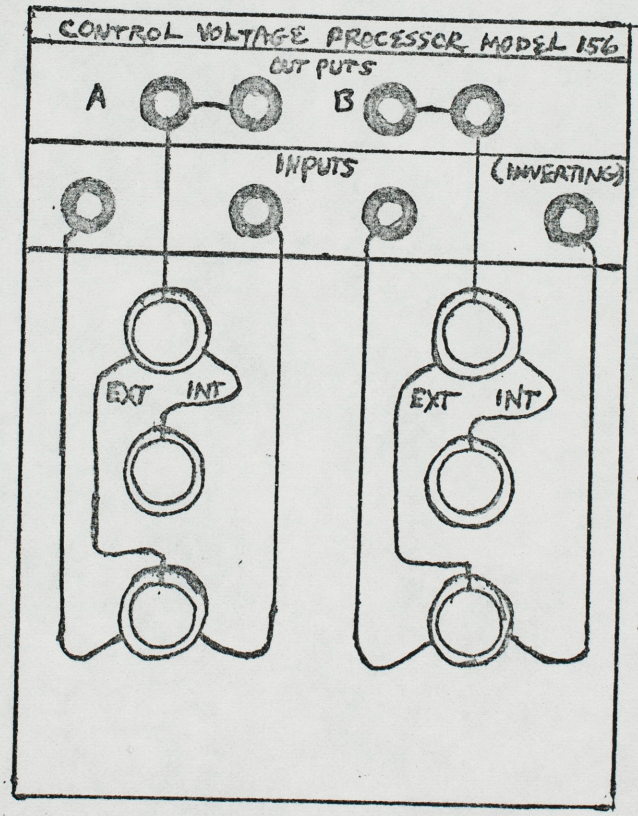
TO GATE OR OTHER AUDIO PROCESSING MODULES OR DIRECTLY TO AMPLIFIER.

FM INPUT: FROM ANOTHER AUDIO SOURCE I.E. OPPOSITE SIDE OF DUAL GENERATOR, WHITE NOISE, OUTPUT OF MIXER OR OTHER PROCESSORS.

DC INPUT: WHEN TOGGLE SWITCH IS SET TO EXT., FREQUENCY IS CONTROLLED BY VOLTAGE SOURCES SUCH AS SEQUENCER OR KEY BOARD. THE ASSOCIATED FM POTENTIOMETER CONTROLS THE AMPLITUDE OF THE MODULATING SIGNAL.

WAVE SHAPE POTS ADD HARMONICS CONTINUOUSLY FROM CA. 2% TO 60% (SINE TO SAWTOOTH)

TOGGLE SWITCH MUST BE SET ON EXT. INORDER TO CONTROL FREQUENCY FROM AN EXTERNAL VOLTAGE SOURCE.



TO DC INPUTS OF GENERATORS OR GATE.

FROM VOLTAGE SOURCES.

- MIXES INTERNAL VOLTAGE WITH EXTERNAL VOLTAGES ALGEBRAICLY IN ASSOCIATION WITH LOWER TWO POTS.
- INTERNAL VOLTAGE POT CA 0-15 VOLTS. WILL HOLD GATE OPEN AT CONSTANT LEVEL WHEN UPPER POT IS AT INT. SETTING.
- CONTROLS AMOUNT OF EXTERNAL VOLTAGES, APPROXIMATELY 50/50 AT 12 O'CLOCK SETTING.

THE SYSTEM

The Modular Electronic Music system that was developed at the Tape Music Center is composed of functional *modules*, each designed to generate a particular class of signals or perform a specific type of signal processing. Each module is 7 inches high and 4¼ inches (or an integral multiple thereof) wide. Up to 15 modules sharing a single power supply may be assembled in a single cabinet, and form a *super-module*.

The system employs three varieties of signals, each with a distinctly different function:

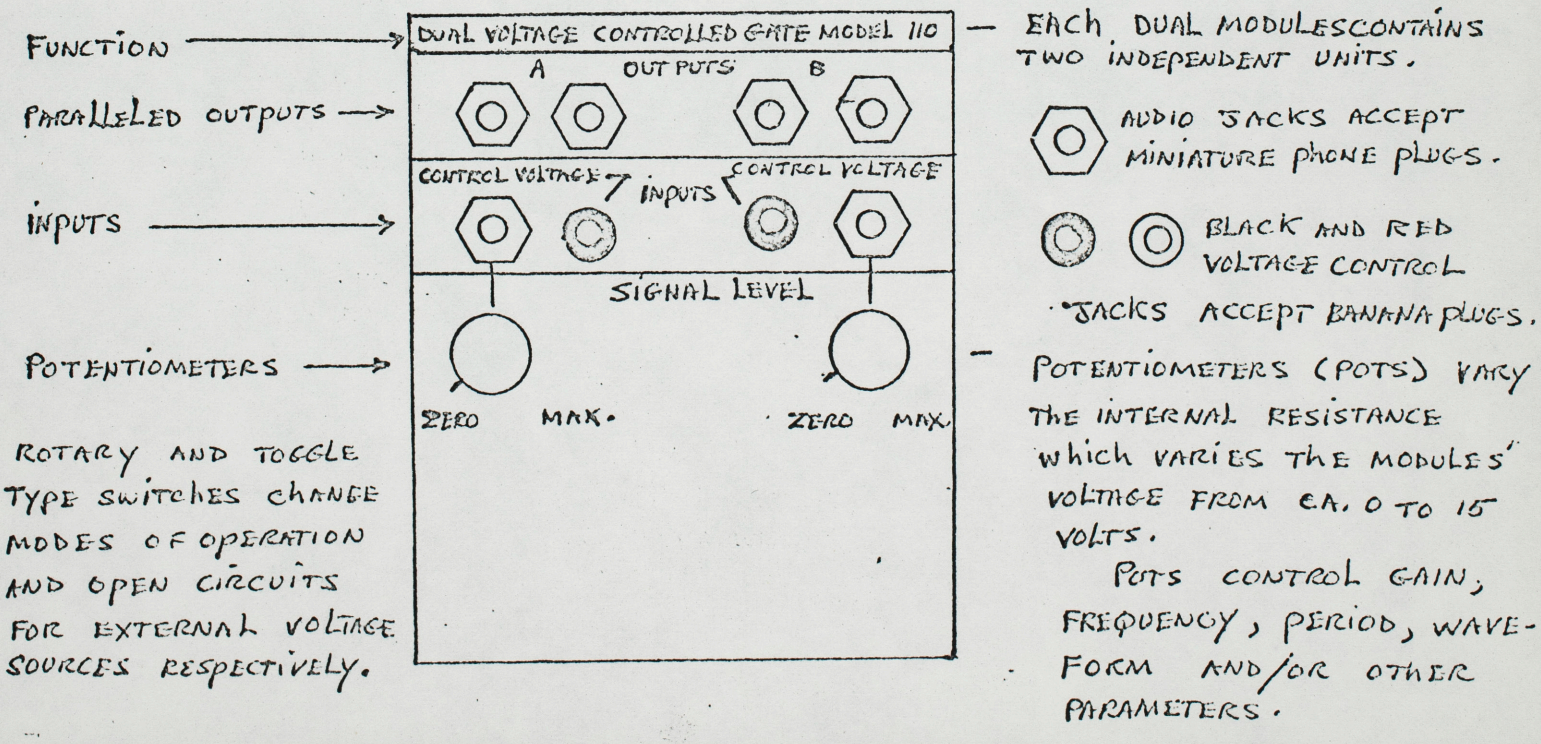
Audio signals, the raw material of electronic music, are formed by various sorts of generators (sine, square, sawtooth, harmonic) or are produced externally (tape loop, radio, microphone). In constructing a piece, they may be filtered, gated, mixed, modulated, or otherwise processed. The patch cords carrying audio signals within the system are grey, shielded cables terminated with miniature phone plugs. A standard level of Odb (ref. 600Ω) is employed for audio signals within the system.

Control voltages, used to determine frequencies, envelope characteristics, amplitudes and other parameters, are generated by keyboards, programmable voltage sources, and format generators. Black banana plug patch cords are used to interconnect control voltages. The standard control voltage range is from .5 to 15 volts.

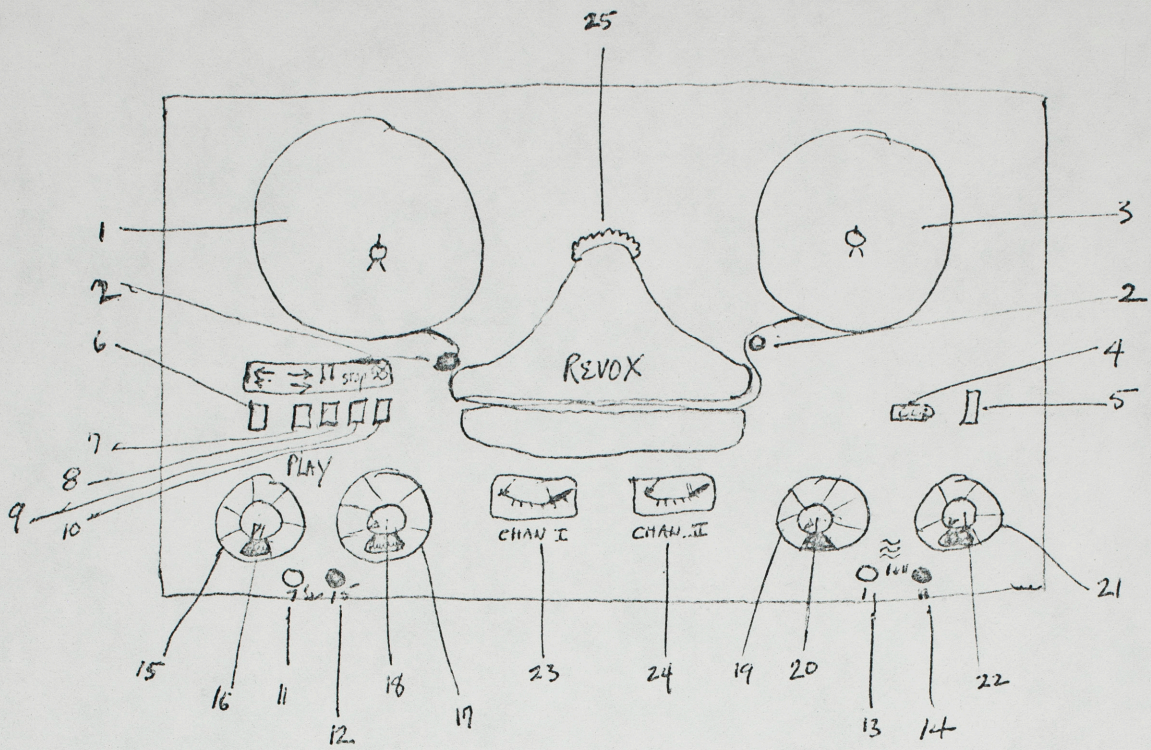
Timing pulses are originated by keyboards, programmable sequencers, and pulse generators. They are used to trigger notes, open gates, or initiate chains of musical events. Timing pulses are about 10 volts in amplitude and are interconnected with red banana plug patch cords.

The rules for interconnection are straight-forward. Any number of inputs may be connected to a single output. Timing pulse outputs may be paralleled and connected to one input. The system output may be derived from any module; output is of sufficient magnitude to drive line inputs on tape recorders or sensitive inputs on power amplifiers.

PANEL FORMAT



2. DO NOT PIN THE VU METERS, PLEASE KEEP RECORD POTS LOW UNTIL SIGNAL LEVEL IS DETERMINED.



1 Supply reel
2 Tape guide pin
3 Take-up reel
4 Position indicator (3 digit counter)
5 Counter re-set
6 Push button: Fast rewind
7 Push button: Fast forward
8 Push button: Play
9 Push button: Stop
10 Push button: Recording
11 Black button depressed: Tape speed 3 3/4 ips
12 Red button depressed: Tape speed 7 ½ ips
Both buttons in mid-position: Capstan motor switched off
13 Black button depressed: Recording on Channel I (lefthand channel, upper tape section)
14 Red button depressed: Recording on Channel II (righthand channel, lower tape section)
15 Power switch OFF - ON (this switch is mounted on bass control)
16 Tone control: Bass will increase if turned clockwise
17 Channel selection switch for internal monitor amplifier and for high impedance outputs 43 and 44
18 Monitor amplifier volume control
19 Input source selection switch I (on stereo: for lefthand channel)
R Tuner D Aux. input M Microphone
20 Input level control (recording) for channel I
21 Input source selection switch II (on stereo: for righthand channel)
22 Input level control (recording) for channel II
23 VU - Meter channel I
24 VU - Meter channel II
25 Tape tension switch

Rules for use of Buchla Boxes

1. Boxes may be checked out from the Electronics Lab @ 315 one at a time for use in @ 314 editing stations at specified times.

2. Box is charged to <u>one</u> person only unless there is an authorized collaboration. Please <u>do not</u> invite your friends.

3. Patch cord sets go with the box and must <u>all</u> be returned to @ 315. Pull patch cords from jacks <u>by the plug</u> to prolong life of patch cords.

4. All equipment should be handled gently to keep maintenance at minimum.

5. Please report any malfunctioning to Jim Campbell or Pauline Oliveros. <u>Do not</u> attempt maintenance on your own.

6. Do not leave box or patch cord set in editing station. Return all equipment to @ 315.

KATHY ESTY
MUSIC 105A
PROF: PAULINE OLIVEROS
TA: TRAVIS CHANDLER

FINAL TAPE COMPOSITION

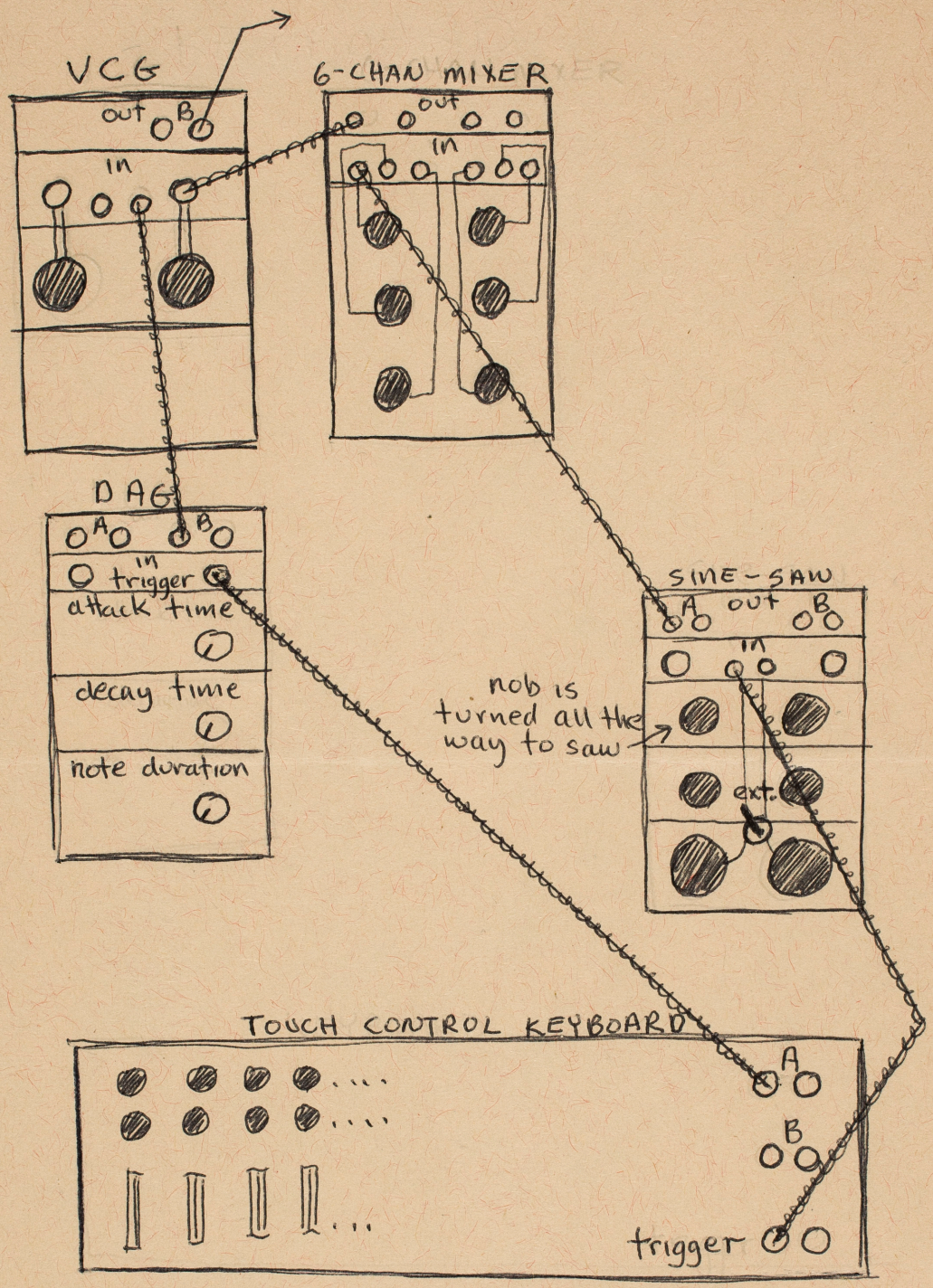
"Dawn of Man" time:

I had no trouble at all with my piece as far as what sounds I wanted to produce. The idea for "Dawn of Man" came to me one day while I was in our "sound-proof" (I'm kidding, of course) Buchla room. I was practicing tuning different harmonic series when I was continuously interrupted by a lawn mower outside the window. Not only was the lawn mower blasting at an incredible pitch, but our radio station, KSDT, decided that they wanted all of Third College to hear ther program, so they turned their amplifiers outside, (which were, naturally, diffusing into the Buchla room) It was then that I decided to simulate one of my "normal" working conditions.

There is one small problem, however, with the mechanics of the piece. Although the actual patches are very simple, the actual performing is the difficult part. I achieved my lawn mower sound ~~by~~ by my "Patch I: KEYBOARD" set-up. The difficulty is in how steady the performer's hand is. The entire lawn mower sounds are produced by raising my finger up and down (at very, very, very small distances) to achieve the motor effect, <u>without</u> ever taching the key itself. Once the performer's finger touches the key, a static interference is created, and the piece is ruined.

The second sound series is merely ~~an~~ a regular keyboard patch with the |out A| → going to a |sine-saw|. The irregularity comes from first setting the wave shape nob to "saw" and then bringing it back to "sine".

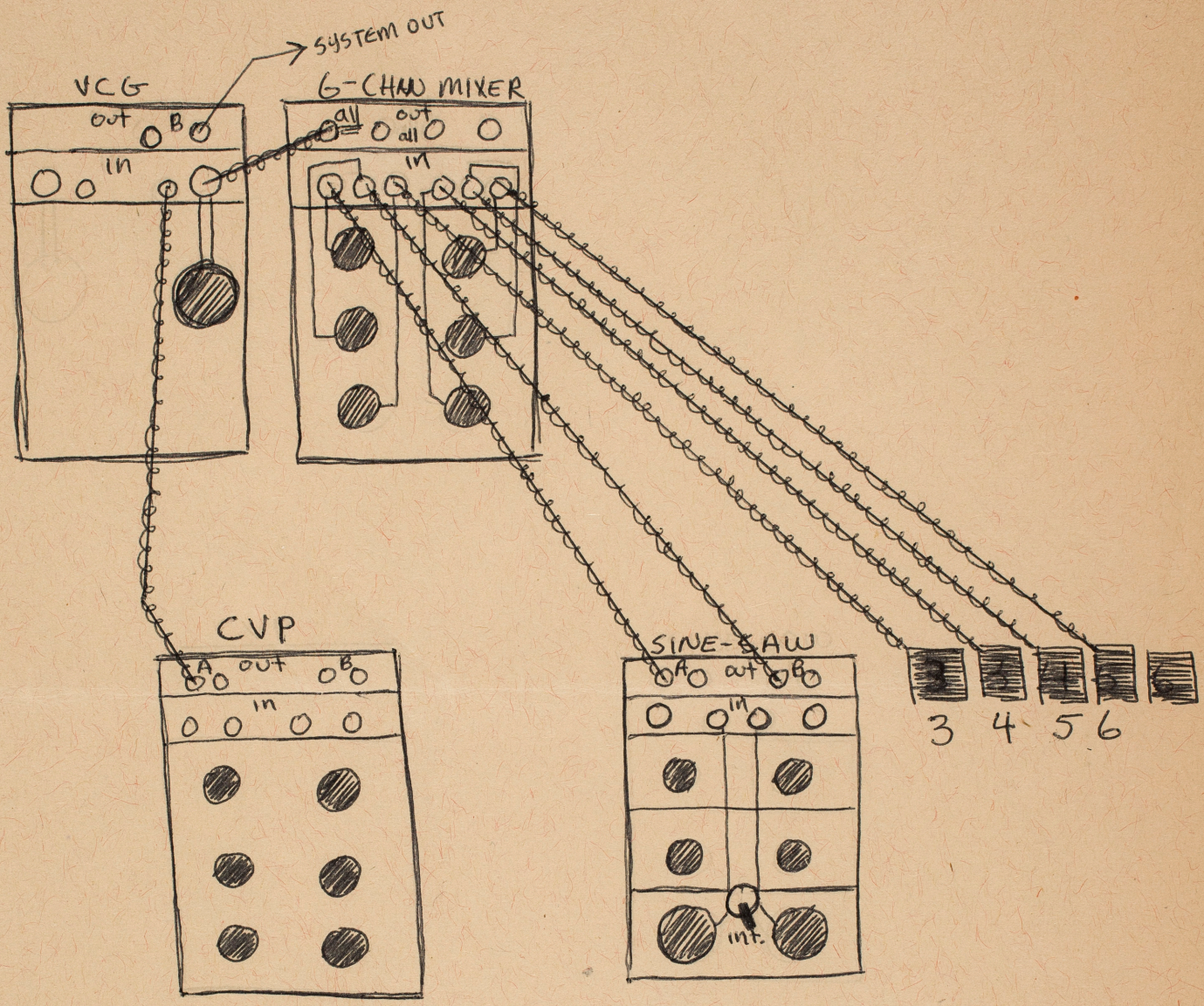
PATCH I : KEYBOARD



There is a constant tapping sound in this system. To increase the speed of this tapping, place finger very delicately on top of key. By bringing your finger closer to key, the tapping will become faster and the pitch will increase. All this is done without actually touching the key itself.

KEY: VCG = voltage control gate
DAG = dual attack generater
sine-saw = sine-sawtooth generator

PATCH II: HARMONIC SERIES (6)

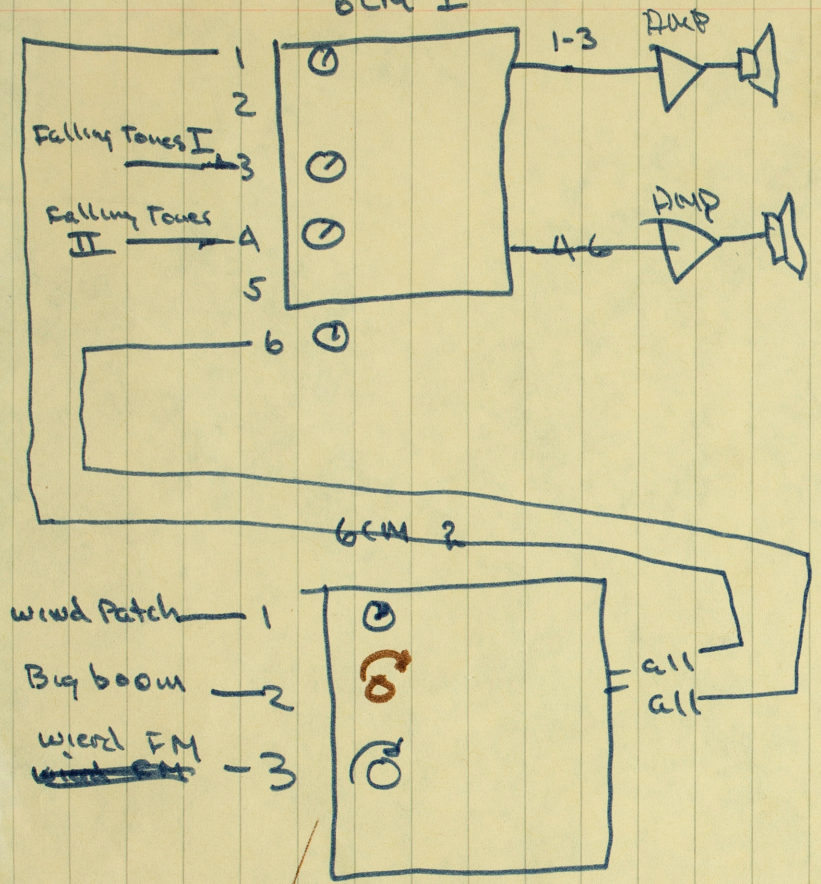


Tune a harmonic series to the 6th partial.

KEY: VCG = voltage control gate
CVP = control voltage processor
sine-saw = sine-sawtooth generator

Mike Schwartz

TAPE PIECE PATCH



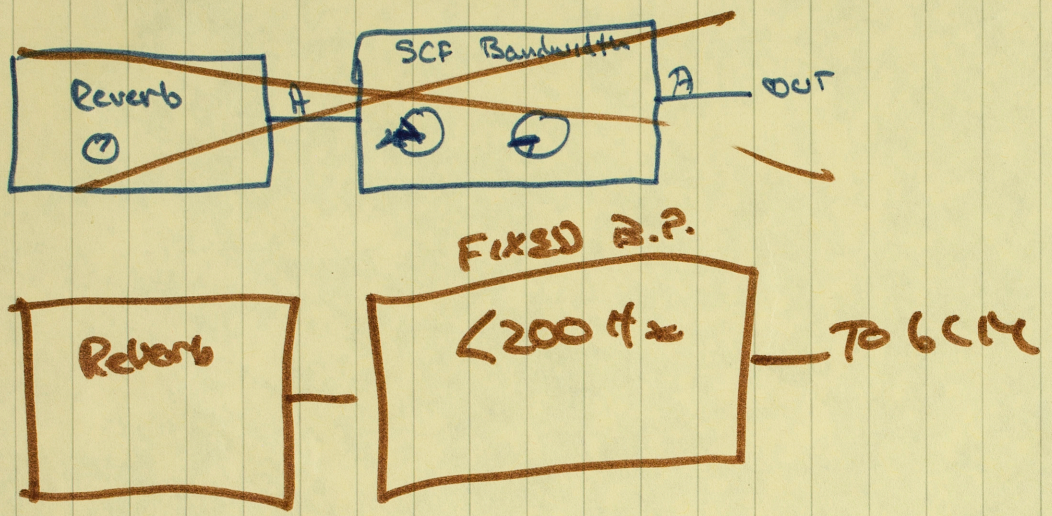
Time ≈ ~~3:00~~ 3:30

Instructions:

1) Set off Big boom Then switch to Lo Pass on SCF (careful to remove output from SWG on wind patch before setting off big boom)
2) gradually fade in "wind sound" using control either on 6cm or 16 reg us.
3) gradually bring in "wierd FM"
4) start "falling Tones" alternating between channels. (one particularly interesting sound is accomplished by starting a high sound in left channel and following in stretto by a lower one in right channel. If done correctly, a sort of continuous sound will result, but changing space-position radically.)
5) fade out "wierd FM" but not quite all the way.
6) Try to play ~~continuous~~ steady sounds on the falling tones. This is accomplished by waiting until the sound has fallen to its lowest level and keeping keyboard continuously triggered.
7) lick fingers and stick keyboard (ie: no decay)
8) fade out "Falling Tones"
9) Fade out "wind sound" and rest of "wierd FM"
10) Turn off switch before leaving room.

N.B. This piece is ~~practically~~ real-time. Because of the either/or nature of the SCF, the Big Boom must be spliced to the ~~end~~ beginning of the piece. If a real-time performance is desired, you can use the fixed Bandpass filter instead of the SCF for the "Big Boom"

Big Boom.

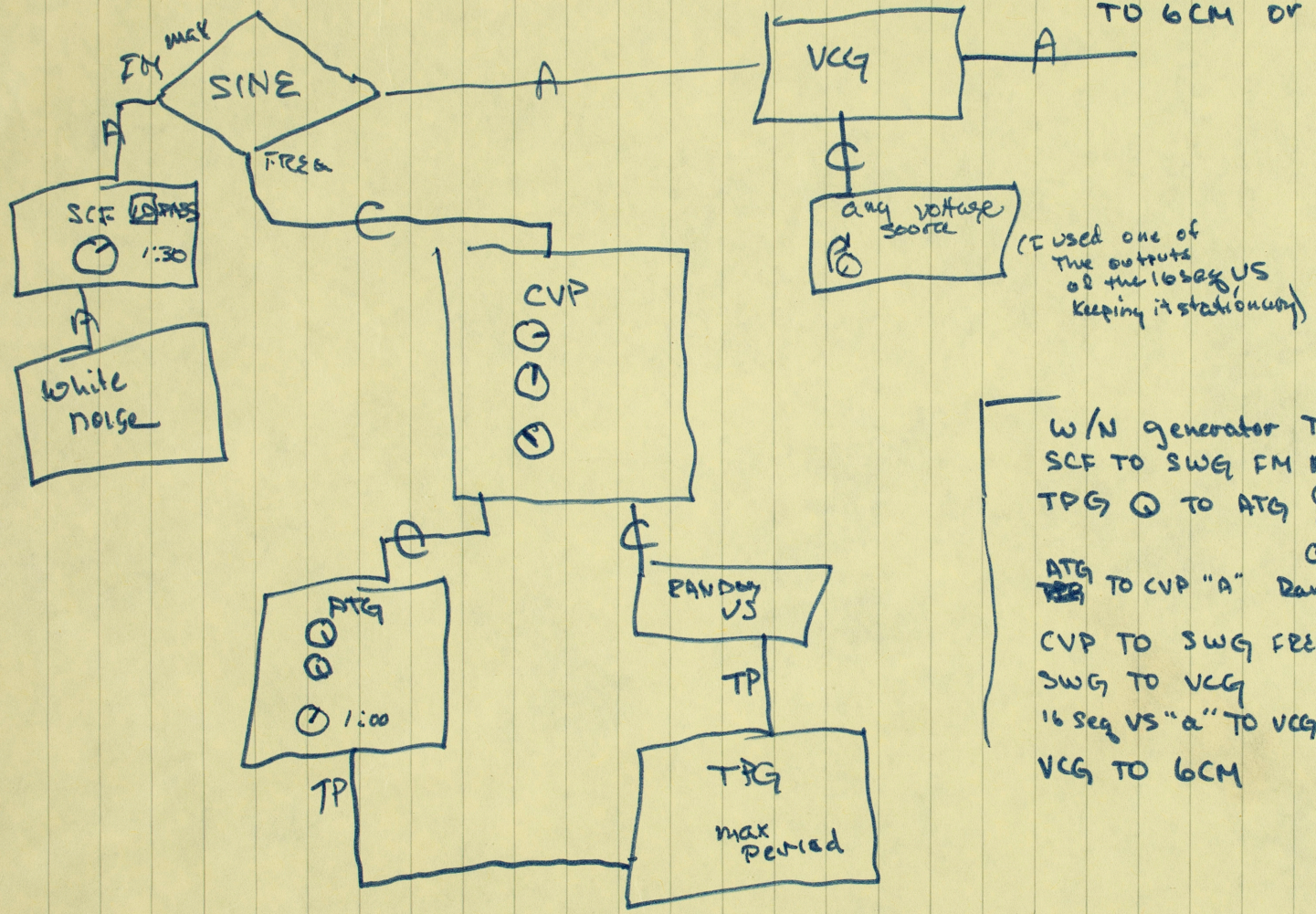


Reverb ① ~~TO SCF~~ FIXED "Bandpass" <200 Hz

~~SCF~~ ~~④~~ ~~⑤~~ ~~TO 6COM~~ Fixed B.P. to 6CM

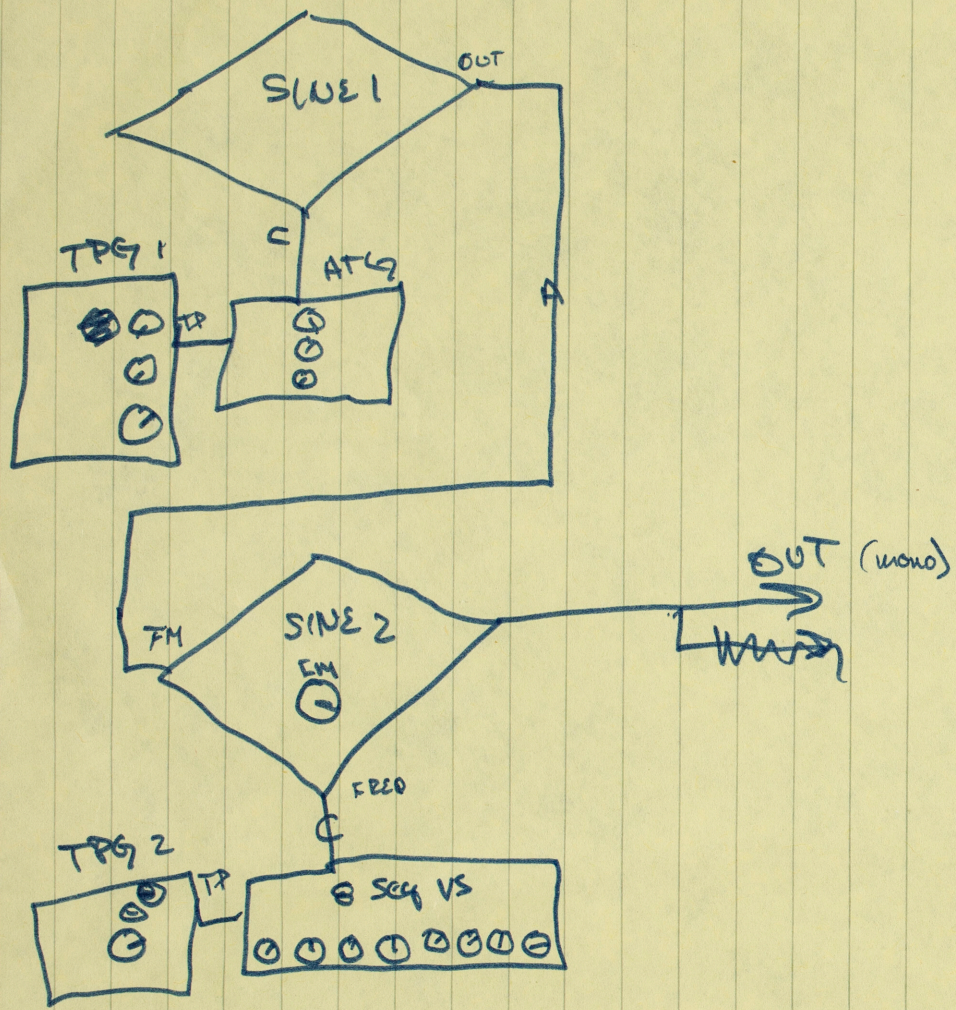
INSTRUCTIONS: rock the supersuede back and forth, thus upsetting the reverb unit. carefully not to drop the system on the floor else the "Big Boom" will emit from LOU and not the SCF.

Wind Patch



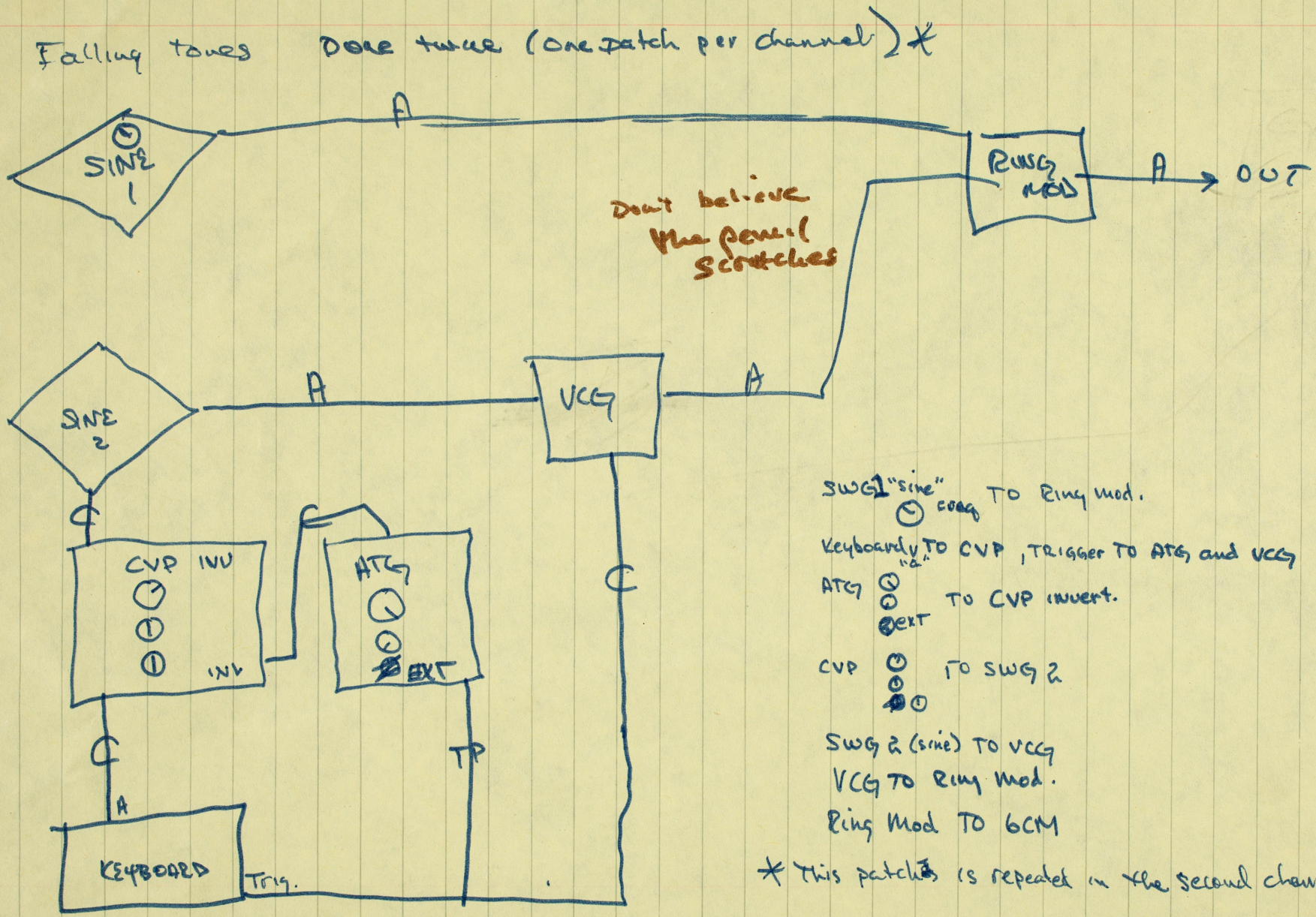
W/N generator TO SCF LOW PASS
SCF TO SWG FM IN
TPG TO ATG and Random V.S.
ATG TO CVP "A" Random VS TO CVP "B" (Non-inverting)
CVP TO SWG FREQ CONTROL
SWG TO VCG
16 seq VS "a" TO VCG — seq VS is stationary
VCG TO 6CM

WIZRD FM



"sine" "sine"
SWG1 TO SWG2 FM input
TPG 1 TO ATG
ATG TO SWG1 Freq. control.
TPG 2 TO 8 seq VS
8 seq VS "a" TO SWG2 Freq. Control
SWG2 TO 6CM.

Falling tones Done twice (one patch per channel) *



SWG 1 "sine" TO Ring mod.

Keyboard "A" TO CVP, TRIGGER TO ATG and VCG

ATG TO CVP invert.

CVP TO SWG 2

SWG 2 (sine) TO VCG

VCG TO Ring Mod.

Ring Mod TO 6CM

* This patch is repeated in the second channel.