OBLIQUENCER

THE DREAM SEQUENCER
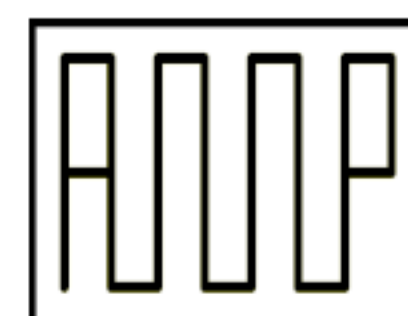
AMP

PANEL

GATE OUT MATRIX C

EXT GATE IN L

EXT GATE IN R

CV & GATE OUT L

GATE & CV OUT C

GATE & CV OUT R

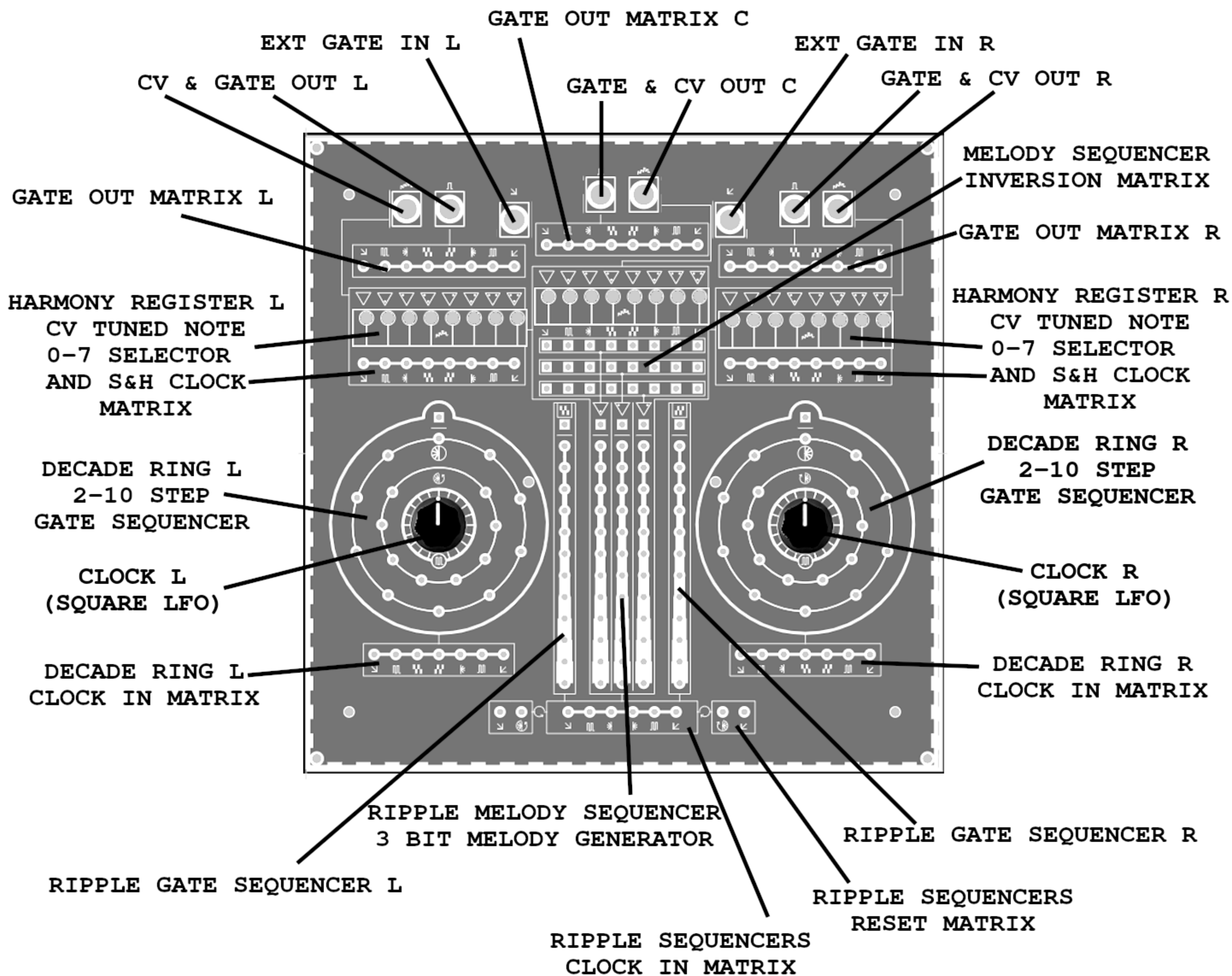GATE OUT MATRIX L

MELODY SEQUENCER
INVERSION MATRIX

GATE OUT MATRIX R

HARMONY REGISTER L
CV TUNED NOTE
0-7 SELECTOR
AND S&H CLOCK
MATRIX

HARMONY REGISTER R
CV TUNED NOTE
0-7 SELECTOR
AND S&H CLOCK
MATRIX

DECADE RING L
2-10 STEP
GATE SEQUENCER

DECADE RING R
2-10 STEP
GATE SEQUENCER

CLOCK L
(SQUARE LFO)

CLOCK R
(SQUARE LFO)

DECADE RING L
CLOCK IN MATRIX

DECADE RING R
CLOCK IN MATRIX

RIPPLE MELODY SEQUENCER
3 BIT MELODY GENERATOR

RIPPLE GATE SEQUENCER R

RIPPLE GATE SEQUENCER L

RIPPLE SEQUENCERS
RESET MATRIX

RIPPLE SEQUENCERS
CLOCK IN MATRIX

ZONES

OBLIQUENCER GENERAL ARCHITECHTURE: OBLIQUENCER IS A MELODIC AND RHYTHMIC "SEQUENCER" WHICH USES BASIC PATTERN BUILDING BLOCKS TO CREATE MUSICAL SEQUENCES. IT OUTPUTS THREE CHANNELS OF TUNED ANALOG CONTROL VOLTAGE AND THREE CHANNELS OF ANALOG GATE SIGNALS. UNLIKE TYPICAL SEQUENCERS, THERE IS NO MEMORY, AND THE USER DOES NOT ENTER SEQUENCES NOTE-BY-NOTE LINEARLY. INSTEAD, THE USER SETS SEQUENCE BEHAVIOR PARAMETERS AND ROUTES LOGIC ("ON"/"OFF") SIGNALS, THEREBY GENERATING PATTERNS OR EVEN WHOLE SONGS. DESPITE THIS APPARENTLY MECHANICAL METHOD, IT IS CAPABLE OF CREATING VERY "MUSICAL" SOUNDING SEQUENCES, AS WELL AS MORE UNUSUAL, ASYNCHRONOUS, AND POLY-RHYTHMIC PATTERNS. OWING TO ITS OBLIQUE METHOD OF MUSICAL CREATION, IT IS MORE OF A PATTERN *DISCOVERY* DEVICE THAN A PATTERN *COMPOSITION* DEVICE. IT MAY EVEN UNCOVER FOR THE USER, A DIRECT UNDERSTANDING OF THE MATHEMATICAL NATURE OF THE MELODIC PATTERNS HUMANS EMOTIONALLY ENJOY. IT CONSISTS OF SEVERAL GATE PATTERN GENERATING MODULES, AND THREE INTERRELATED CV PATTERN MODULES. TUNING IS ENTIRELY VARIABLE AND EACH MELODIC MODULE IS CAPABLE OF COVERING A 5+ OCTAVE MODULATION RANGE. ALL INTERNAL PATCHING AND ROUTING (OVER 150 PATCH POINTS) IS ACHIEVED VIA PIN MATRICES.

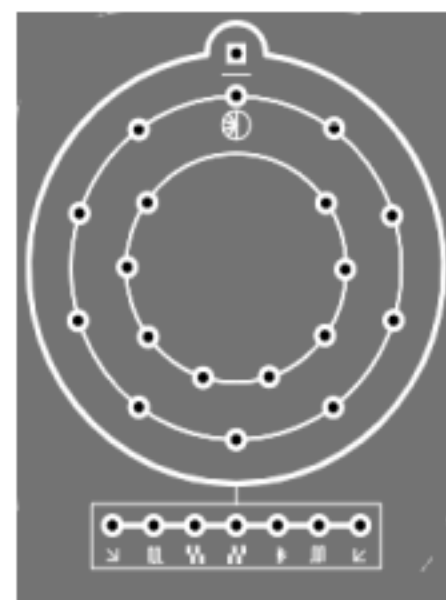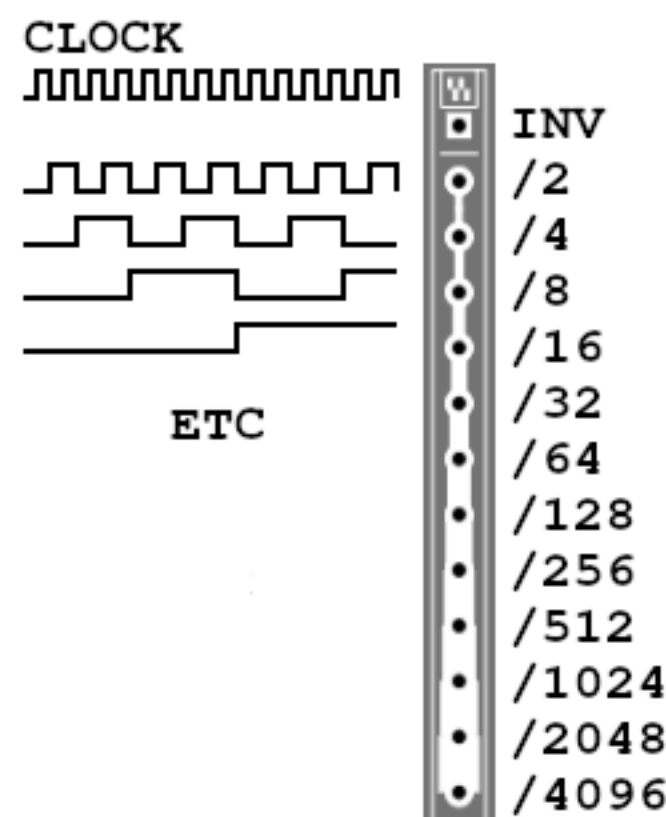| MODULE	DESCRIPTION	SYMBOL
CLOCKS (2)	LOW FREQUENCY PULSEWAVE OSCILLATOR. USED TO STEP AND TRIGGER OTHER MODULES AT USER DEFINED RATE. ILLUMINATED ICON BELOW RATE KNOB INDICATES CLOCK PULSES. DESPITE THE LOCATION IN THE CENTER OF THE DECADE RING MODULES (DESCRIBED BELOW), THE CLOCKS ARE NOT NORMALLED TO THE DECADE RING MODULES. THEY ARE SEPARATE MODULES.	
DECADE RINGS (2)	2 TO 10 STEP GATE SEQUENCER. OUTER RING SETS ACTIVE STEPS. INNER RING SETS SEQUENCE LENGTH (RESET POINT). STEPS ADVANCE CLOCKWISE STARTING FROM TOP. GATE OUTPUTS REMAIN HIGH UNTIL NEXT STEP IS CLOCKED. ADJACENT PINS IN OUTER RING WILL FORM ONE LONGER GATE. INNER RING SETS NUMBER OF STEPS IN SEQUENCE, FROM 2 to 9. ABSENCE OF ANY PINS IN INNER RING SETS SEQUENCER TO DEFAULT PATTERN LENGTH OF 10 STEPS. IF MORE THAN ONE PIN IS INSERTED IN THE INNER RING, ONLY THE EARLIEST IS RECOGNIZED. THE SOLITARY SQUARE PATCH POINT IN THE SMALL ARC AT THE TOP OF THE MODULE INVERTS THE PATTERN TO MAKE EACH "ON" STATE "OFF," AND VICE VERSA. THE CLOCK MATRIX (IN THE RECTANGLE BELOW THE CIRCLES) PATCHES CLOCK SOURCES. ILLUMINATION OF MODULE ICON INDICATES GATE OUTPUT ACTIVITY.	
RIPPLE GATE SEQUENCERS (2)	THE RIPPLE GATE SEQUENCERS SHARE A COMMON CLOCK MATRIX WITH THE RIPPLE MELODY SEQUENCER, DESCRIBED NEXT PAGE. THEY DIVIDE THE CLOCK SOURCE INTO A PARALLEL ARRAY OF EXPONENTIALLY LONGER PULSES. EACH DIVISION PATCH POINT, (INDICATED BY PROGRESSIVELY WIDER PLATING SURROUNDING THEM), MIXES-IN A DIVISION TWICE THE LENGTH ONE ABOVE IT. FOR EXAMPLE THE TOP DIVIDER PATCH IN THE DIVISION COLUMN DIVIDES THE CLOCK INPUT BY 2, MEANING FOR EVERY TWO PULSES OF THE CLOCK INPUT, ONE LONGER PULSE, SPANNING TWO INPUT CLOCK PULSES, IS OUTPUT. THE PATCH BELOW THAT DIVIDES BY 4, THE ONE BELOW THAT BY 8, 16, 32, ETC. CONTINUING IN THAT MANNER TO THE LOWEST PATCH POINT, WHICH DIVIDES BY 4096. SEE DIAGRAM, LEFT. THE PATCH POINT ABOVE THE LINE AT THE TOP OF THE MODULE (WITH SQUARE PLATING) INVERTS THE WHOLE PATTERN TO MAKE EACH "ON" STATE "OFF," AND VICE VERSA. IF NOTHING IS PATCHED IN THE SELECTIONS BELOW IT, THE INVERSION SELECTOR SIMPLY SETS THE OUTPUT TO "ON." CLOCK INPUT CAN ACCEPT SIGNALS FROM ZERO TO OVER 10KHZ. BE AWARE THAT THE LONGEST DIVISIONS CAN BE VERY LONG TIME INTERVALS, MINUTES OR MORE, DEPENDING ON THE INPUT CLOCK RATE, AND THAT IT MAY THEREFORE TAKE A LONG TIME TO WITNESS ANY ACTIVITY FROM THOSE SELECTIONS IF PATCHED. THE ILLUMINATING ICON AT THE TOP OF THE MODULE INDICATES THE ACTIVITY OF THE MODULE.	

CLOCK

ETC

INV
/2
/4
/8
/16
/32
/64
/128
/256
/512
/1024
/2048
/4096

ZONES *(CONTD.)*

MODULE	DESCRIPTION	SYMBOL

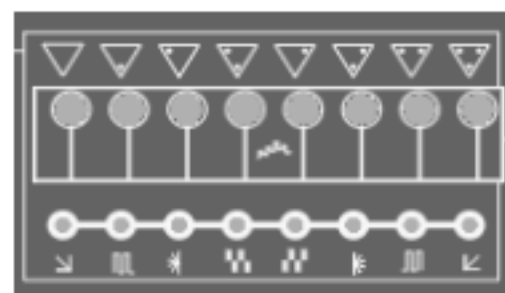**RIPPLE MELODY SEQUENCER**
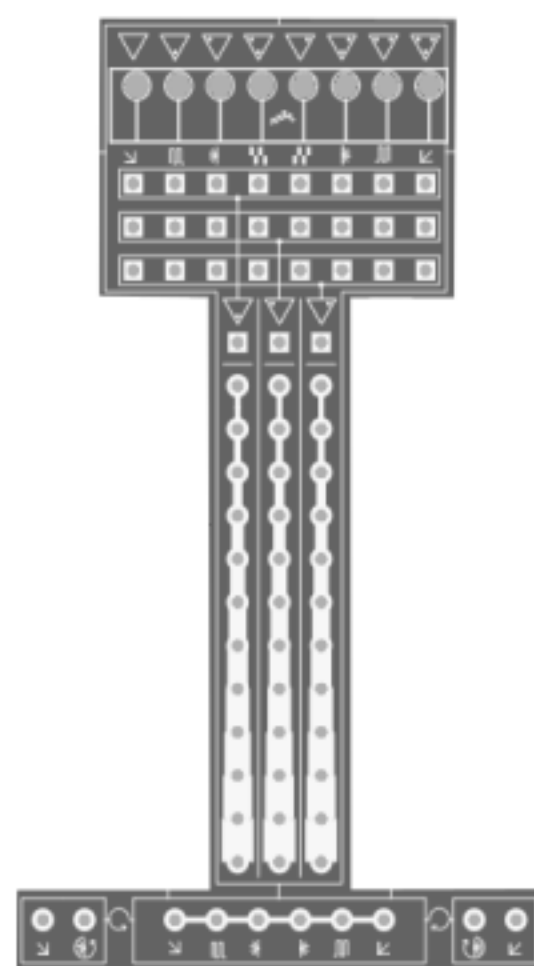
THE RIPPLE MELODY SEQUENCER, COMBINED WITH ITS INVERSION MATRIX (DESCRIBED BELOW), IS THE "MELODIC BRAIN" OF THE OBLIQUENCER. IT IS A THREE-BIT BINARY PATTERN GENERATOR THAT SELECTS FROM THE EIGHT CONTROL VOLTAGE TUNERS FOUND ABOVE IT. THE THREE COLUMNS OF RIPPLE DIVISION CENTRAL TO THE MODULE BEHAVE IN THE SAME MANNER AS DESCRIBED IN THE RIPPLE GATE SEQUENCER ABOVE, BUT ARE USED IN COMBINATION TO CREATE A SINGLE CV SEQUENCE OUTPUT. NOTE THE TRIANGULAR ICONS ABOVE EACH RIPPLE SELECTION COLUMN, WHICH ILLUMINATE TO INDICATE ACTIVITY. EACH HAS A SMALL DOT IN ONE OF ITS CORNERS. THE LOCATIONS OF THE DOTS IN THE TRIANGLES ARE SHOWN ADDED IN THE TRIANGLES ABOVE THE TUNERS, TO SHOW THE COMBINATIONS OF ACTIVE BITS THAT SELECT THE DIFFERENT TUNED CV VALUES. THE CV OUTPUT OF THIS MODULE IS FOUND AT THE CENTRAL CV OUTPUT JACK. THE PATCH POINTS TO THE LEFT AND RIGHT OF THE CLOCK INPUT MATRIX AT THE BOTTOM ARE "RESET" PATCHES FROM THE DECADE RINGS' RESET SELECTIONS, AND THE EXTERNAL INPUTS, AS INDICATED BY THE ICONS. THE RIPPLE MELODY SEQUENCER IS HELD AT ITS FIRST STEP WHILE ANY RESET INPUT IS HIGH.

AND MELODY SEQUENCER INVERSION MATRIX

ABOVE THE RIPPLE PATCH COLUMNS IS THE INVERSION MATRIX, WITH ALL PATCH POINTS SURROUNDED BY PLATED SQUARES. THIS MODULE IS USED TO PATCH VARIOUS SIGNALS FROM THE OTHER MODULES (INDICATED IN COLUMNS BY THE ICONS ALONG THE TOP OF THE MATRIX) TO THE THREE MELODIC BIT INPUTS. SMALL VERTICAL LINES VISUALLY CONNECT EACH MATRIX ROW TO INDICATE THE ROW'S MELODIC BIT COLUMN PATCH DESTINATION BELOW. IF NOTHING IS PATCHED WITHIN THE MELODIC BIT RIPPLE COLUMNS, THE SOURCES PATCHED INTO THE INVERSION MATRIX SIMPLY TURN THE NOTE SELECTOR BITS "ON" (*INVERTING*, IN FACT, FROM OFF TO ON) WHENEVER ACTIVE. IF PATTERNS ARE PRESENT FROM THE MELODY RIPPLE SEQUENCER, THE MELODY BIT PATTERNS WILL BE INVERTED (ON WHERE OFF, OFF WHERE ON) WHENEVER ANY MODULE PATCHED ON THE MATRIX IS SENDING A POSITIVE STATE TO THAT BIT'S INVERSION INPUT. SOURCES ON EACH MATRIX ROW ARE MIXED TOGETHER TO THE DESTINATION. THE ACTIVITY OF THIS MODULE IS INDICATED IN THE ILLUMINATED TRIANGULAR BIT ICONS ABOVE EACH MELODY RIPPLE COLUMN.

HARMONY REGISTERS (2)

THE PURPOSE OF THE HARMONY REGISTERS IS TO PROVIDE CORRESPONDING, BUT NOT NECESSARILY IDENTICAL, CV OUTPUTS TO ACCOMPANY THE CENTRAL MELODY SEQUENCER. THE INTENDED FUNCTION IS THAT EACH TUNER IN THE HARMONY REGISTER MODULES IS TUNED TO A NOTE HARMONICALLY RELATED TO THE CORRESPONDING TUNER IN THE CENTRAL MELODY SEQUENCER (FOR EXAMPLE, UP A 3RD, UP A 5TH, UP AN OCTAVE, ETC). THE HARMONY REGISTERS ARE ESSENTIALLY 3 BIT SAMPLE AND HOLD CV OUTPUT MODULES. UPON DETECTING A POSITIVE PULSE EDGE FROM ITS CLOCK MATRIX, THE HARMONY REGISTER READS THE ACTIVE THREE BIT STATE IN THE CENTRAL MELODIC SEQUENCER, AND HOLDS THAT STATE UNTIL A SUBSEQUENT POSITIVE EDGE TRIGGERS THE SAMPLING OF A NEW STATE. OBSERVE THAT THIS DIFFERS FROM AN ANALOG SAMPLE AND HOLD IN THAT IT IS THE BINARY TUNER *NUMBER* THAT IS SAMPLED AND HELD AND NOT THE ACTUAL VOLTAGE FROM THE CENTRAL BANK OF TUNERS. IN THIS WAY, INDEPENDENT VOLTAGES CAN BE SET ON THE HARMONY REGISTER TO CREATE AUTOMATICALLY TRACKING HARMONIES AND COUNTERPOINT, BUT WITH INDEPENDENT PHRASING. THE CV OUTPUT JACK FOR EACH HARMONY REGISTER IS LOCATED AT THE TOP OF THE PANEL, ABOVE THE GATE OUTPUT MATRICES.

GATE OUTPUT MATRICES (3)

SETS SOURCES TO BE SENT TO GATE OUTPUT JACK.

MODULE	DESCRIPTION	SYMBOL

EXTERNAL INPUTS (2)

GATE (SQUARE WAVE/"ON/OFF") INPUTS. THEY CAN BE ROUTED VIA THE VARIOUS MATRICES TO ALLOW EXTERNAL CLOCKING AND CONTROL OF ALL MODULES. INPUTS ACCEPT ANY DC GATE, TRIGGER, SQUARE OSCILLATOR/LFO, LOGIC, ETC. WITH 0V BEING "OFF" AND +3.5V TO +12V BEING "ON." ACCEPTS FREQUENCIES FROM ZERO TO 10,000+HZ.

CLOCK INPUT MATRICES

NA

A COMPONENT PRESENT IN MOST OF THE MODULES. ALL FOLLOW THE SAME FUNCTION. MODULE SIGNAL SOURCES ARE REPRESENTED BY SYMBOL ICONS BELOW PATCH POINTS. THE GENERAL MODE OF OPERATION IS TO MIX THE OUTPUTS OF ANY PATCHED MODULES INTO A SINGLE CLOCK SIGNAL FOR THE GIVEN MODULE. NOTE THAT OVERLAPPING POSITIVE STATES FROM ALL MODULES MIXED WILL OUTPUT LONGER POSITIVE SIGNALS, RATHER THAN INTRODUCING ADDITIONAL INDIVIDUAL CLOCK "TICKS." FOR EXAMPLE, A LONG GATE SIGNAL FROM ONE MODULE MIXED WITH A RAPIDLY OSCILLATING ONE FROM ANOTHER WILL SIMPLY OUTPUT A LONG POSITIVE SIGNAL, AS THE "OFF" STATES DO NOT "BRING DOWN" THE "ON" ONE.

TUNER BANKS/CV OUTPUTS

A COMPONENT IN THREE OF THE MODULES. ONLY ONE TUNER PER MODULE IS ACTIVE AT A TIME, AND IS INDICATED BY A LIGHT ABOVE IT. THE SUGGESTED USE OF THE TUNERS IS TO FIRST PRESET THEM BY CONNECTING A VCO (OR OTHER INTENDED MODULATION DESTINATION) TO THE MODULE'S CV OUTPUT AND MANUALLY ACTIVATE EACH TUNER VIA PATCHING, TUNING THE CV OUTPUT OF EACH AS YOU GO (PROCEDURE SHOWN ON A FOLLOWING PAGE), UNTIL YOU HAVE A SERIES OF DESIRED POTENTIAL NOTES, SUCH AS A MODE OR SCALE. THE SEQUENCER AND HARMONY REGISTER MODULES, WHEN PRESENTED WITH PATTERNS AT THEIR INPUTS, THEN SWITCH BETWEEN THE DIFFERENT TUNED CV VALUES, THEREFORE GENERATING PATTERNS OF NOTES. THE CV OUTPUTS CAN OF COURSE ALSO BE USED TO MODULATE ANY OTHER VOLTAGE CONTROLLED ASPECT OF A MODULAR SYNTHESIZER PATCH. EXPERIMENTATION IS ENCOURAGED. INDICATOR LIGHTS ABOVE EACH TUNER SHOW WHICH TUNER IS ACTIVE. NOTE THAT THE TUNERS ARE MULTI-TURN AND DO NOT HAVE A "STOPPING" POINT. THEY WILL CONTINUE TURNING AT THEIR HIGHEST AND LOWEST CLOCKWISE AND COUNTERCLOCKWISE SETTINGS. IF YOU HEAR A QUIET PHYSICAL "CLICK" FROM THE TUNER WHEN TURNING, YOU HAVE REACHED THE END OF ITS RANGE. IT IS NOT RECOMMENDED TO EXCESSIVELY TURN THEM BEYOND THE LIMITS OF THEIR RANGES. VOLTAGE OUTPUT RANGE IS APPROXIMATELY 0 TO +6V

AMP LINK OUPTPUT (BACK PANEL)
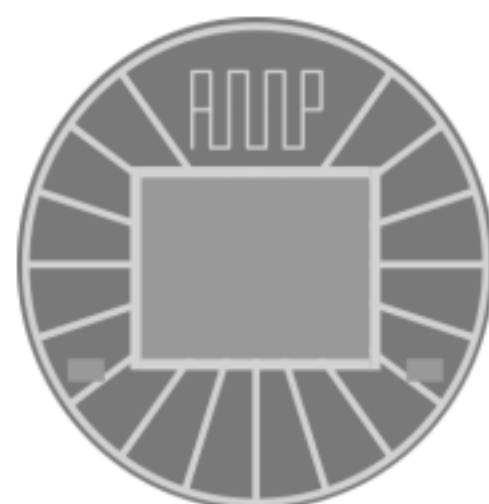
CONNECTS OBLIQUENCER TO AMP'S "WAVE EXPANDER" AND "EXPANDOOR" EXPANSION MODULES, AS WELL AS OTHER POSSIBLE FUTURE EXPANSION MODULES. THE CONNECTIONS INCLUDED ARE AS FOLLOWS... "+12V:" POWERS THE EXPANSION MODULE. "CLK": RIPPLE SEQUENCERS CLOCK INPUT MATRIX OUTPUT. "BS"(BASS): LEFT SIDE GATE OUTPUT. "LH"(LEFT HAND): CENTER GATE OUTPUT. "RH" (RIGHT HAND): RIGHT SIDE GATE OUTPUT. "1,2,4" OUTPUT GATES FROM THE MELODY RIPPLE SEQUENCER BIT COLUMNS (SELECTS CV TUNER ON EXPANSION MODULE). ONLY CONNECT **SHIELDED** CAT 5 OR CAT 6 CABLES. THE CORRECT CABLES WILL HAVE METAL END CONNECTORS. INCORRECT CABLE MAY CAUSE DAMAGE.

+12V	RH	BS	2
CLK	LH	4	1

SHIELDED RJ45 GND
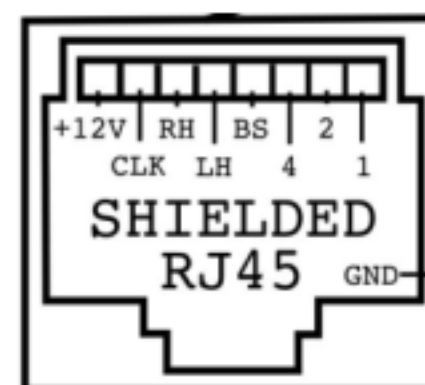
OBLIQUENCER SPECIFICATIONS:
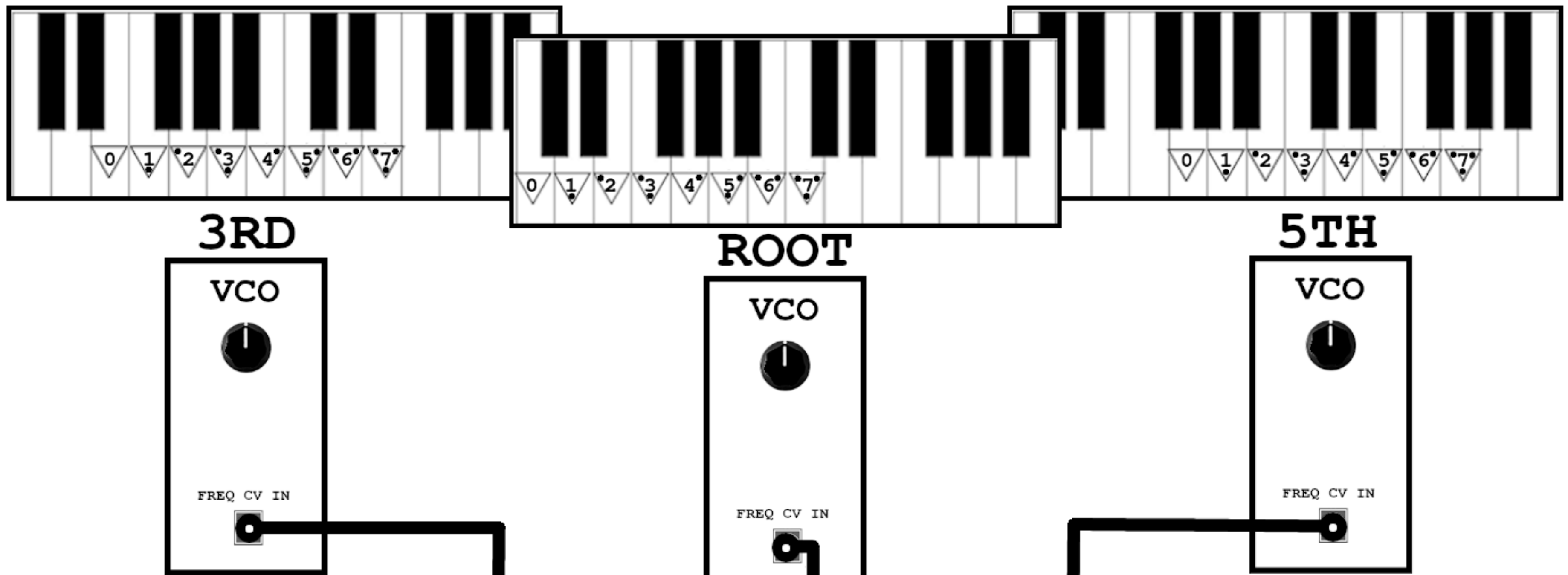DIMENSIONS: 10" X 10" X 2.5"
DC INPUT 15V DC 1A 2.1MM CENTER POSITIVE
GATE/CLOCK INPUTS: 3.5MM, 3.5 TO 12V PEAK 0 - 10,000HZ POSITIVE EDGE TRIGGERED
GATE OUTPUTS: 3.5MM 10.5V DC PEAK UNIPOLAR
CV OUTPUTS: 3.5MM 0 - 5V CONTINUOUS, UNIPOLAR

TUNE

THIS IS HOW OBLIQUENCER IS TUNED IN TESTING (C MAJOR SCALE). IT RESULTS IN AUTOMATIC HARMONIES IN THE KEY OF C (THE WHITE KEYS ON A PIANO). THIS IS ONLY ONE EXAMPLE OF INFINITE POSSIBILITIES.

1. CONNECT EACH CV OUTPUT TO THE FREQUENCY CV INPUT OF A DEDICATED VCO.

2. PATCH OBLIQUENCER AS SHOWN IN DIAGRAM TO STEP THROUGH THE TUNERS 0-7 SEQUENTIALLY. THE LEFT CLOCK RATE SETS THE SEQUENCE SPEED. NOTE IT IS ALTERNATAVELY POSSIBLE TO MANUALLY SET AND HOLD THE TUNERS BY INSTEAD PATCHING THE "INVERT" SELECTION COMBINATIONS ON THE MELODIC BIT COLUMNS IN ORDER, AS SHOWN ON THE TUNER ICONS.

3. START BY TUNING THE CENTER CV SECTION. MUTE OTHER VCOS. USE A REFERENCE PITCH SUCH AS A KEYBOARD TO MATCH EACH TUNER TO A NOTE IN THE SCALE, STARTING AT THE ROOT NOTE "C," TUNING EACH TUNER SEQUENTIALLY UP THE SCALE AND ENDING ON "C" AN OCTAVE HIGHER.

4. MUTE THE MIDDLE VCO AND MOVE ON TO THE LEFT HAND CV SECTION AND VCO. REPEAT THE SAME PROCESS, BUT THIS TIME, TUNE THE FIRST TUNER TO THE 3RD NOTE IN THE SCALE ("E"). TUNE ALL FOLLOWING TUNERS TO THE REST OF THE SCALE IN ASCENDING ORDER, ENDING ON THE "E" AN OCTAVE HIGHER.

5. REPEAT FOR THE RIGHT HAND SIDE, BUT THIS TIME STARTING ON THE 5TH ("G") AND ENDING ON "G" AN OCTAVE HIGHER.

NOW WHENEVER THE THREE CV SECTIONS ARE ON THE SAME TUNER SELECTION, THEY WILL TOGETHER VOICE A CHORD FROM THE KEY OF C MAJOR. WHEN EACH CV SECTION IS GIVEN A DIFFERENT MELODIC PHRASING VIA SETTING DIFFERENT SOURCES IN THEIR S&H CLOCK MATRICES, THEY WILL CREATE COUNTERPOINT AND HARMONIES. SETTING EACH VCO TO A DIFFERENT OCTAVE PROVIDES PLEASING RESULTS.

ANY SCALE OR TONE ROW CAN BE SET ON THE TUNERS.

3RD

ROOT

5TH

VCO

VCO

VCO

FREQ CV IN

FREQ CV IN

FREQ CV IN

MEMORY

TITLE:_____

NOTES:
_____
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MARK TUNED NOTES ABOVE

MARK TUNED NOTES ABOVE

MARK TUNED NOTES ABOVE

CLK RATE

CLK RATE

DARKEN PATCH POINTS TO INDICATE PIN PATCHES