BRAINS

BRAINS

CLK

RST

RUN

DIR

T-GATE

T-CLK

MAKENOISE

v2.4

BRAINS

Make Noise warrants this product to be free of defects in materials or construction for a period of one year from the date of purchase (proof of purchase/invoice required).
Malfunction resulting from wrong power supply voltages, backwards or reversed eurorack bus board cable connection, abuse of the product or any other causes determined by Make Noise to be the fault of the user are not covered by this warranty, and normal service rates will apply.

During the warranty period, any defective products will be repaired or replaced, at the option of Make Noise, on a return-to-Make Noise basis with the customer paying the transit cost to Make Noise. Please contact technical@makenoisemusic.com for Return To Manufacturer Authorization.

Make Noise implies and accepts no responsibility for harm to person or apparatus caused through operation of this product.

Please contact technical@makenoisemusic.com with any questions, needs & comments, otherwise...
go MAKE NOISE!

http://www.makenoisemusic.com

About this Manual:
Written by Tony Rolando
Edited by Walker Farrell
Illustrated by W.Lee Coleman

Electrocution hazard!

Always turn the Eurorack case off and unplug the power cord before plugging or un-plugging any Eurorack bus board connection cable cable.
Do not touch any electrical terminals when attaching any Eurorack bus board cable.

The Make Noise BRAINS is an electronic music module requiring 10mA of +12VDC and 0 mA of -12VDC regulated voltage and a properly formatted distribution receptacle to operate. It must be properly installed into a Eurorack format modular synthesizer system case.

Go to http://www.makenoisemusic.com/systems.shtml for examples of Eurorack Systems and Cases.

To install, find 4HP in your Eurorack synthesizer case, confirm proper installation of included eurorack bus board connector cable on backside of module (see picture below), plug the bus board connector cable into the Eurorack style bus board, minding the polarity so that the RED stripe on the cable is oriented to the NEGATIVE 12 Volt line on both the module and the bus board. On the Make Noise 6U or 3U Busboard, the negative 12 Volt line is indicated by the white stripe.
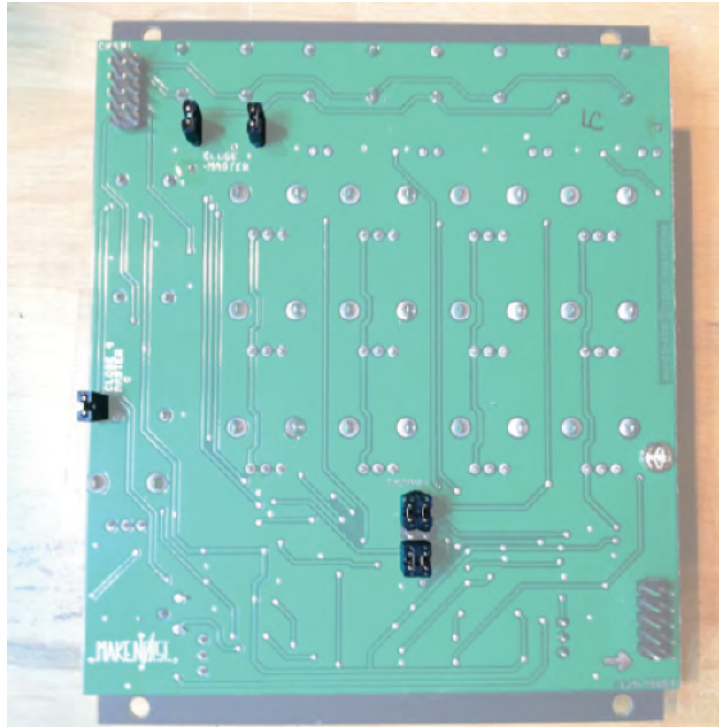

-12V
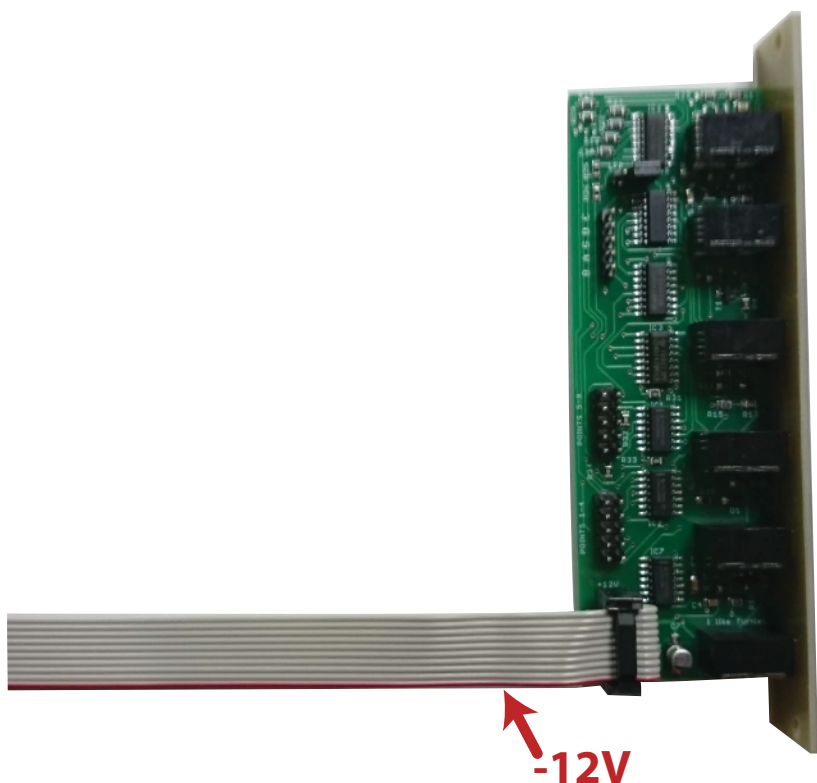
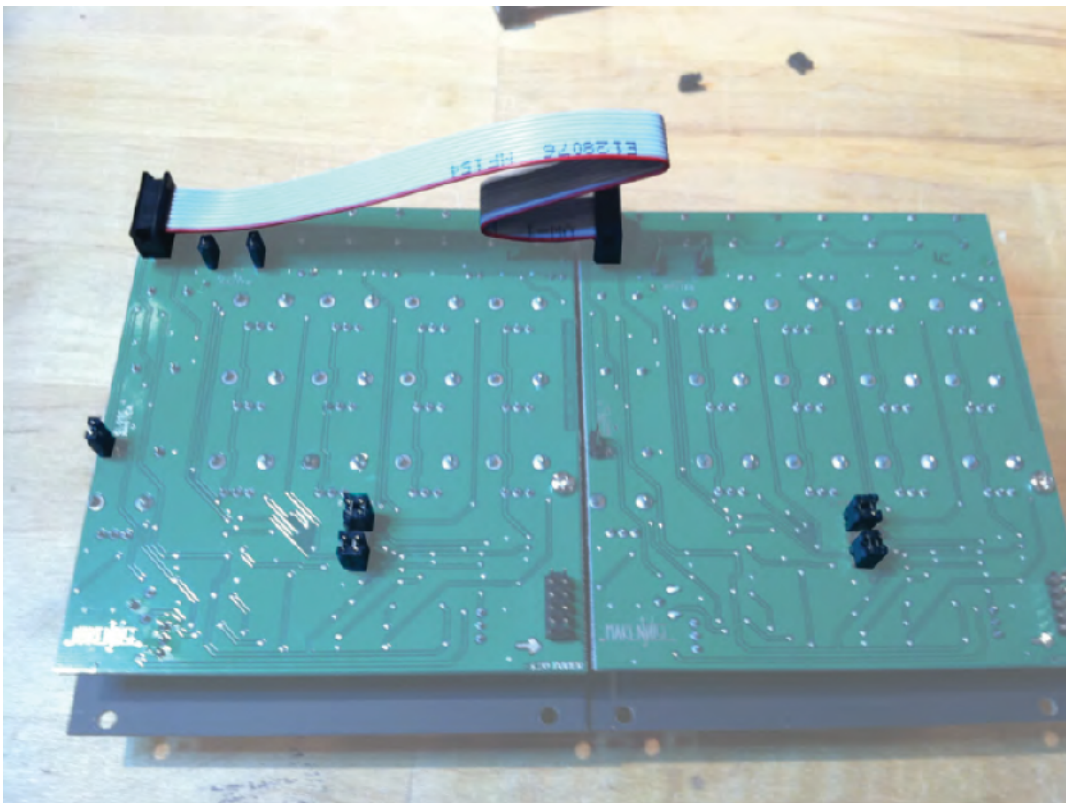**Please refer to your case manufacturers' specifications for location of the negative supply.**

(Power connections for each module not shown for clarity.)

Single Pressure Points with no BRAINS attached: Note all the "Close 4 Master" locations are closed, as well as the Expand headers.

Two Pressure Points, chained: Note that the "Close 4 Master" headers are closed on the first unit (will be on the right when installed in the case). For three or four Pressure Points, use 4-header CHAIN cable and leave "Close 4 Master" headers open on all units but the master (rightmost when installed/leftmost from behind). Also, note the jumpers on the EXPAND headers.
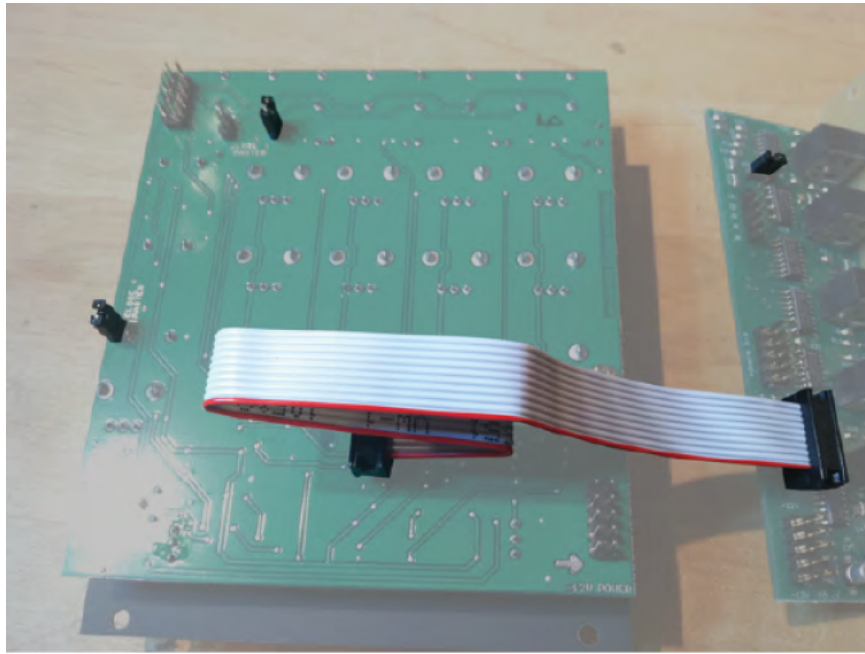
BRAINS with a single Pressure Points: Note the single open "Close 4 Master" header, the BRAINS cable connected from "Points 1-4" header to EXPAND header, and the jumper on BRAINS set to "1PP."
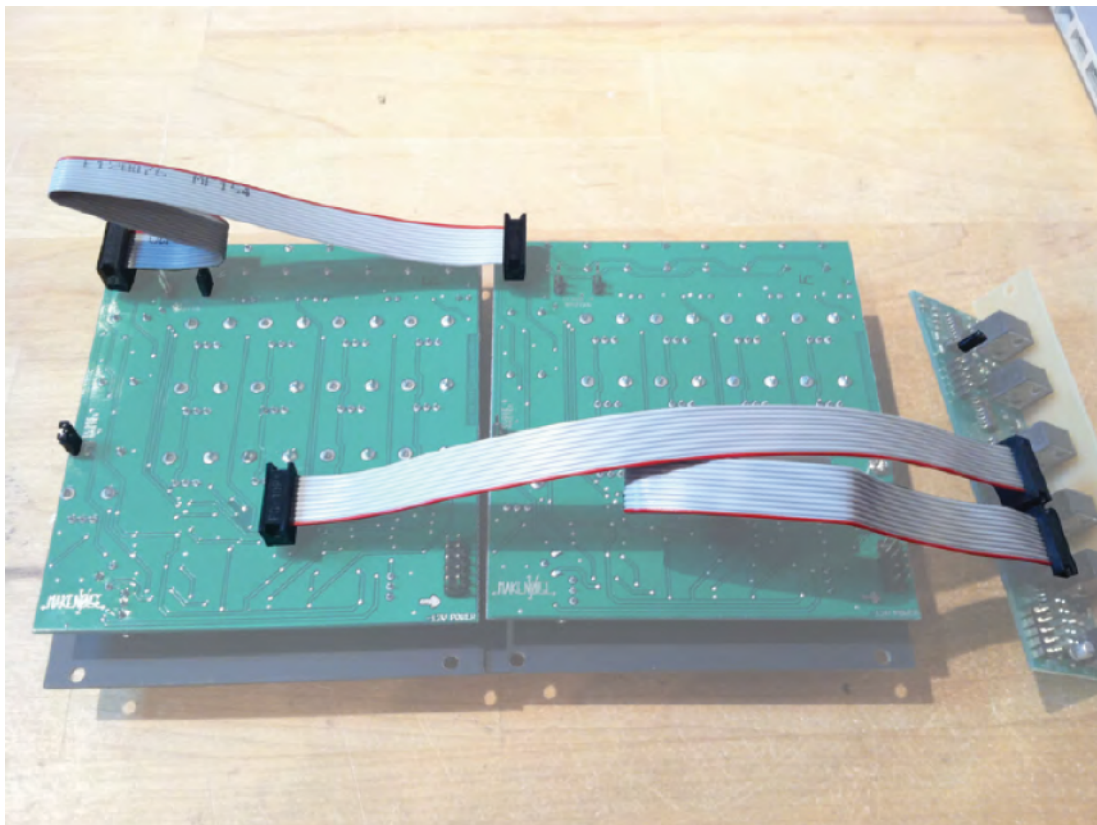
BRAINS with two Pressure Points:
Two is the maximum number of Pressure Points that can be attached to a single BRAINS. Note: the connections of "Points 1-4" and "Points 5-8" to EXPAND headers the single open location on the "Master" Pressure Points' "Close 4 Master" headers; all three "Close 4 Master" locations open on the non-master Pressure Points, and the Jumper on BRAINS set to "2PP."
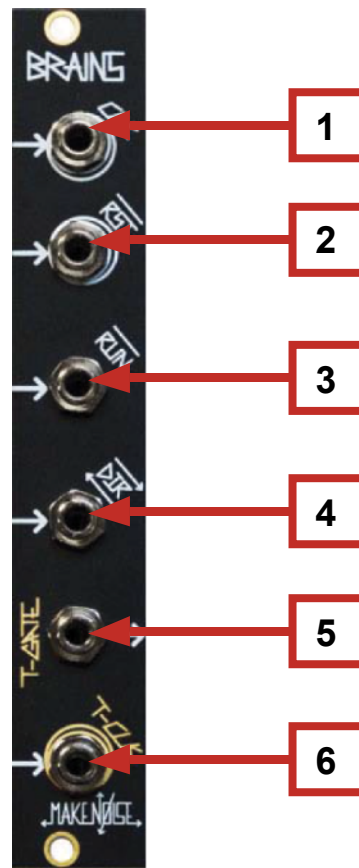
1. CLOCK IN: selects next stage or number to be counted on rising edge of clocke, pulse, or trigger, of at least 1V.
Patch here to sequence

2. RESET IN: jumps to last touched stage on rising edge of clock, gate, pulse or trigger, of at least 1V.

3. RUN IN: Gate or logic HI (of at least 1V) will tell BRAINS to count, and thus RUN Gate or Logic LO (below 1V) will Stop BRAINS.

4. DIRection IN: Gate or logic HI (of at least 1V) tells BRAINS to count ForWarD Gate or Logic LO (below 1V) tells BRAINS to count BackWarD.

5. Touch-GATE OUT: Generates Gate HI, 10V when connected Pressure Points is touched.

6. Touch-CLocK secondary clock activated when Pressure Points is touched.

BRAINS is a clocked sequential binary event machine, intended to be connected to tactile controllers such as the Pressure Points.

Once connected, Pressure Points provides data input to BRAINS in the form of touch-selectable Reset stage and Hold stage. Pressure Points also provides the tuned voltages and Pulses per stage. BRAINS, when connected to either 1 or 2 Pressure Points, will drive the stage selection in a sequential fashion, at a rate determined by the incoming clock at CLocK IN, thus forming a 4-Step or 8-Step 3-channel analog sequencer. Binary control over Direction of the stage selection, RUN/ Stop and ReSeT are provided.

Touch-GATE OUT
The only output on BRAINS, producing a Gate HIGH signal whenever the connected Pressure Points is touched.

Touch-CLocK IN
Serves a dual purpose. Used without a Master Clock applied to the CLocK IN, Events initiated by touching Pressure points will be Quantized to the timing signal applied to Touch-CLocK IN. When used along with the CLocK IN, a secondary sequence will be initiated whenever Pressure Points is touched, where the length and timing is determined by the relationship of the Touch-CLocK to the Master CLocK. Even divisions of the Master CLocK will produce tame variations of the main sequence. Non-Synchronized clocks will produce ???

Single Shot:
Patch any one of the 3 tuned voltage outputs to RUN IN. Set all pots in the corresponding row to full CW. Sequence should play through all stages. Now set the pot at the stage where you want the sequence to stop, Full CCW. BRAINS counts to this stage and stops. Touching any stage other than the stage where the sequence is stopped, will run the sequence until the stop stage is reached.

Knight Rider
KIT Style sequencing: with sequence running, patch the Gate OUT from Stage 8 to the Trigger IN of MATHS CH. 4. Take EOC OUT from MATHS, patch to BRAINS DIRection IN. Set MATHS CH. 4 Rise to NOON, FALL to Full CW and Response to LINear. Patch Gate OUT from Stage 1 to MATHS CH. 4 BOTH Control IN. Sequence should travel back and forth like KIT car from Knight Rider.

Voltage Controlled Pendulum:
With sequence running, patch the Gate OUT from Stage 8 (or 4, or ?) to the Trigger IN of MATHS CH. 4. Take EOC OUT from MATHS, patch to BRAINS DIRection IN. Set MATHS CH. 4 Rise to NOON, FALL to 3 o' CLock and Response to LINear. Sequence will probably be traveling BWD at this point, but it really depends upon the rate of the incoming clock at BRAIN CLK IN. By setting or modulating the FALL parameter of CH. 4, you will have control over the direction of the sequence and how long sequence travels in that direction.

Touch Controlled Pattern Length:
With sequence running, patch the Gate OUT from Stage 8, to BRAINS Reset IN. Touch the plate of the stage that will be the start of the sequence. Sequence will now run to stage 8, and return to last touched stage, effectively giving you touch control of sequence length.

Touch Controlled JUMP:
With a sequence running, patch the Gate OUT from any of the middle Stages of Pressure Points (3, 4, 5, 6), to BRAINS ReSeT IN. Touch the plate of the stage AFTER the one with Gate applied to Reset IN. Watch sequencer jump over stage. Stack multiple stages to Reset for longer jumps or multi-jumps.

Roland m 185 Style HOLDs:

With sequence running patch same clock to Envelope Generator (MATHS CH. 1), patch resulting envelope to LPG (QMMG CH. 1). Apply VCO being driven by the sequencer to LPG. Mult same clock signal to Doepfer A-160 Clock Divider or RCD (Gates option set to ON). Using /8, /16, /32 will result in differenthold patterns where, using /16 for example, sequencer runs to stage 4 and holds, runs to stage 8 and holds. If available, a trigger sequencer clocked by a division of the master clock could be used to program the HOLDs instead of the clock divider.

Buchla 250e Style Movement:

Patch MATHS CH. 1 EOR to Clock IN, BRAINS. Set MATHS to Cycle, Rise panel control to NOON, Fall will set upper limit of clock rate. Sequence should be running. Patch the bottommost row of Tuned Voltages from Pressure Points, to MATHS CH. 1 Fall Control IN. Set all potentiometers in corresponding row to Full CCW. Sequence is now running at the upper limit (fastest) tempo/ rate. This Row of pots is like the INNER row of pots on the 250e, each setting their corresponding stage's length. As you set any stage's pot furtherCW, the length of that stage will increase. The other two rows of pots in the PP/ BRAINS system are used like the OUTER row of pots on the 250e, and at their outputs you will find the Arbitrary Function quantized to the Master CLocK.

UEG, MARF, ARF like:

Begin with the Buchla 250e Style Movement patch. Now patch the output of the middle row of Tuned Voltages to MATHS CH. 4 Signal IN. Set Rise and Fall panel controls to NOON. Set Response to LINear. Signal OUT on MATHS CH. 4 will be your CV output, patch it to VCO, VCA, VCF, you know the game! Mult the bottommost row of Tuned Voltages from Pressure Points (the same row controlling stage length), to MATHS CH. 3 IN. Set CH. 3 Scale/ Inversion to Full CCW. Apply output of CH. 3 to MATHS CH. 4 BOTH Control IN. Sequence will run at a rate determined by the bottomrow. The control signal generated by the sequence will be "interpolated" according to the length of the stage as set by the bottom most row of PP/ BRAINS. Combine this patch with Single Shot patch to achieve a touch triggered multi-stage envelope.