MSM

OSCiX

Linear Frequency Modulation Attenuators

Coarse Frequency Control Oscillator B

FM Index Attenuator

VCO / LFO Toggle Switches

Coarse Frequency Control Oscillator A

Analog / Digital Toggle Switch

Fine Frequency Control Oscillator B

Fine Frequency Control Oscillator B

Fold Up Attenuator

Fold Down Attenuator

ANLG

A1 SIN   B1 TRI   C1 SAW   DIGI   A2 SIN   B2 SQR   C2 FOLD

FOLD

OSC
LFO

COARSE

SYNC A>B

OSC
LFO

UP   DN

FINE

SYNC B>A

FINE

COARSE

PW

FOLD CV

LIN

FM INDEX

LIN

FOLD INDEX

OSCiX

EXP

EXP

C3 F CV   D3 UP CV

A3 FI CV   E3 DN CV

D1 V/OCT   E1 LIN   H1 FM INDEX   D2 V/OCT   E2 LIN   F2 PW

F1 RST   G1 EXP   I1 CV S A>B   I2 CV S B>A   G2 EXP   H2 RST

B3 EXT SRC

/MSM

Exponential FM Attenuators

Pulse Width Modulation Attenuator

Fold CV Control

Sync VCO B with VCO A

Fold Index Control

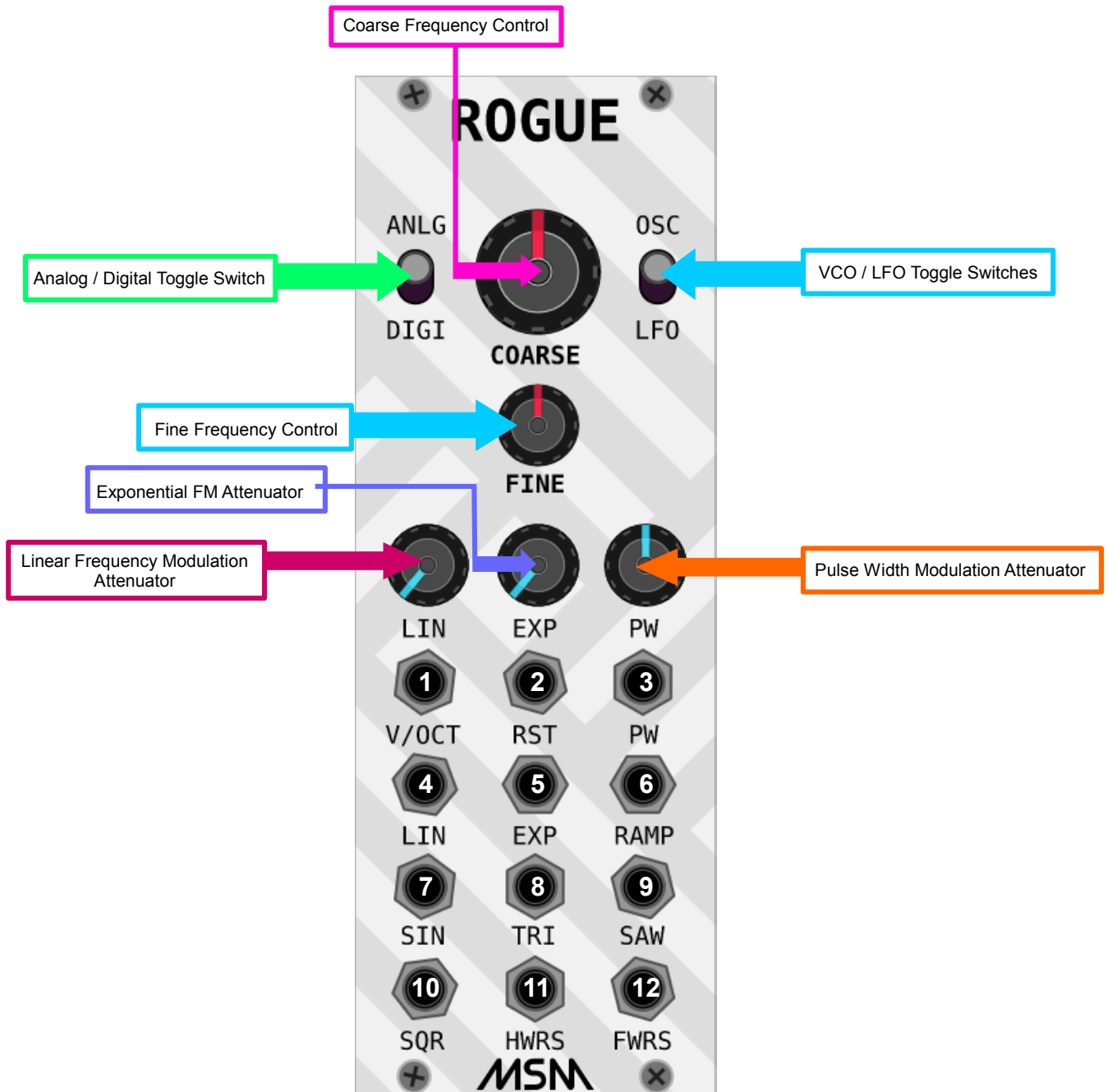Fold Attenuator

Sync VCO A with VCO B

A1: Sine Output
B1: Triangle Output
C1: Sawtooth Output
D1: 1 Volt/Octave Input
E1: Ext. Linear FM Input
F1: Reset/Sync Input
G1: Ext. Exponential FM Input
H1: FM Index Control Voltage Input
I1: Sync Control Voltage Input

A2: Sine Output
B2: Square Wave Output
C2: Fold Output
D2: 1 Volt/Octave Input
E2: Ext. Linear FM Input
F2: Pulse Width Modulation Input
G2: Ext. Exponential FM Input
H2: Reset/Sync Input
I2: Sync Control Voltage Input

A3: Control Voltage Input Fold Index
B3: External Source Input
C3: Control Voltage Input Fold Attenuator
D3: Control Voltage Input Fold Up
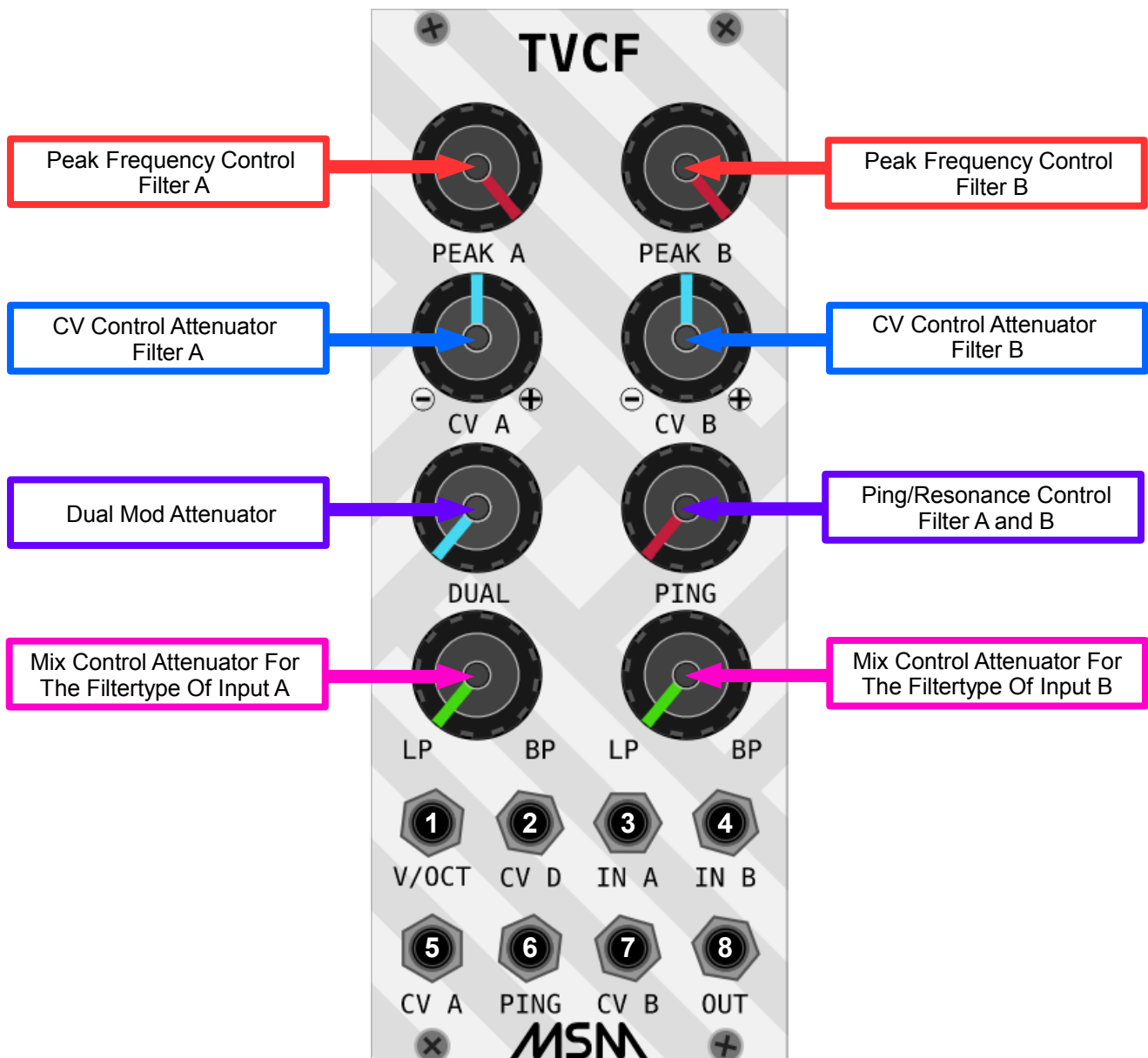**E3:** Control Voltage Input Fold Down

/MSM

Rogue

Coarse Frequency Control

ROGUE

ANLG

OSC

Analog / Digital Toggle Switch

DIGI

LFO

VCO / LFO Toggle Switches

COARSE

Fine Frequency Control

FINE

Exponential FM Attenuator

Linear Frequency Modulation Attenuator

LIN

EXP

PW

Pulse Width Modulation Attenuator

1 V/OCT

2 RST

3 PW

4 LIN

5 EXP

6 RAMP

7 SIN

8 TRI

9 SAW

10 SQR

11 HWRS

12 FWRS

MSM

1: 1V/Octave Input
2: Reset /Sync Input
3: Pulse Width Modulation Input
4: Linear FM CV Input
5: Exponential FM CV Input
6: Ramp Waveform Output
7: Sine Waveform Output
8: Triangle Waveform Output
9: Sawtooth Waveform Output
10: Square Waveform Output
11: Half Wave Rectified Sine Waveform Output
12: Full Wave Rectified Sine Waveform Output

TVCF

The **TVCF** is using the Twinpeak principle of two inverse-parallel low pass filters, which can be found in hardware modules and intruments like Blippoo Box and 5 MU modules of **Rob Hordijk**, but with different LP-filter implementations and therefor resulting sound.
The inverse parallel architecture of the **TVCF** allows for a wide array of nuances and gradations across the response spectrum. This way the filter offers distinct advantages over a low pass/high pass-series configuration. It can even use gates, triggers or one-shots on the inputs to create warm, percussive ringings and bell-like effects.

Peak Frequency Control Filter A

Peak Frequency Control Filter B

CV Control Attenuator Filter A

CV Control Attenuator Filter B

Dual Mod Attenuator

Ping/Resonance Control Filter A and B

Mix Control Attenuator For The Filtertype Of Input A

Mix Control Attenuator For The Filtertype Of Input B

PEAK A   PEAK B
CV A   CV B
DUAL   PING
LP   BP   LP   BP

1 V/OCT **2** CV D **3** IN A **4** IN B
5 CV A **6** PING **7** CV B **8** OUT

1: 1 Volt/Octave Input
2: Control Voltage Dual Mod Input
3: Audio Input A
4: Audio Input B
5: Control Voltage Filter A Input
6: Control Voltage Ping/Resonance Input
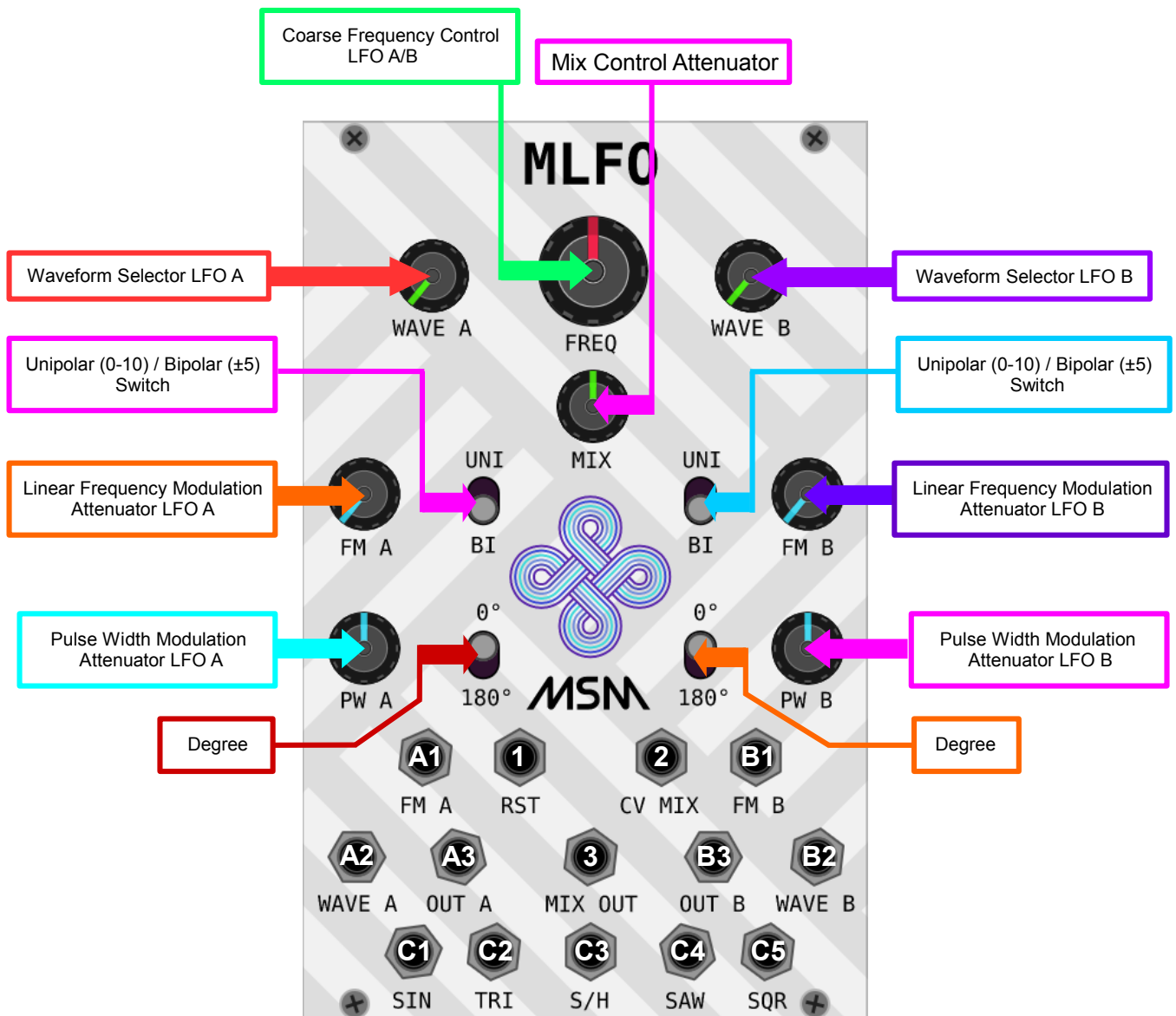**7:** Control Voltage Filter B Input
8: Main Audio Output

MLFO

MLFO is a low frequency oscillator, which produces cyclical control voltages.
Four waveforms are available: sine, triangle, sawtooth, square wave.
Additional to the four waveform outputs the MLFO also got a sample and hold output.

A1: Linear FM (A) Input
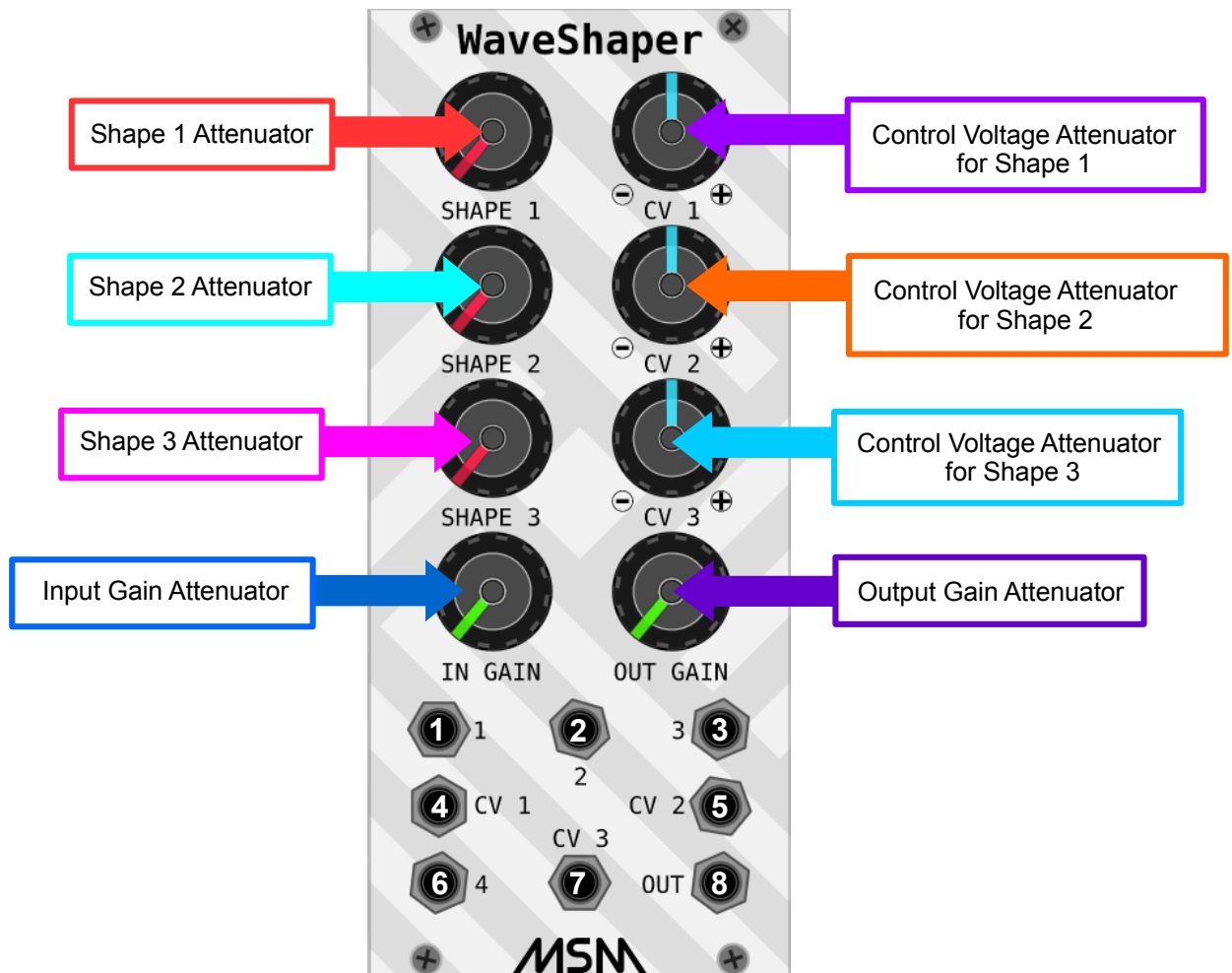**A2:** Control Voltage Waveform Selector (A)
A3: LFO A (Mix) Output

B1: Linear FM (B) Input
B2: Control Voltage Waveform Selector (B)
B3: LFO B (Mix) Output

1: Reset / Sync Input
2: Control Voltage Mix Control (A/B)
3: Mix Output (A/B)

C1: Sine Output
C2: Triangle Output
C3: Sample and Hold Output
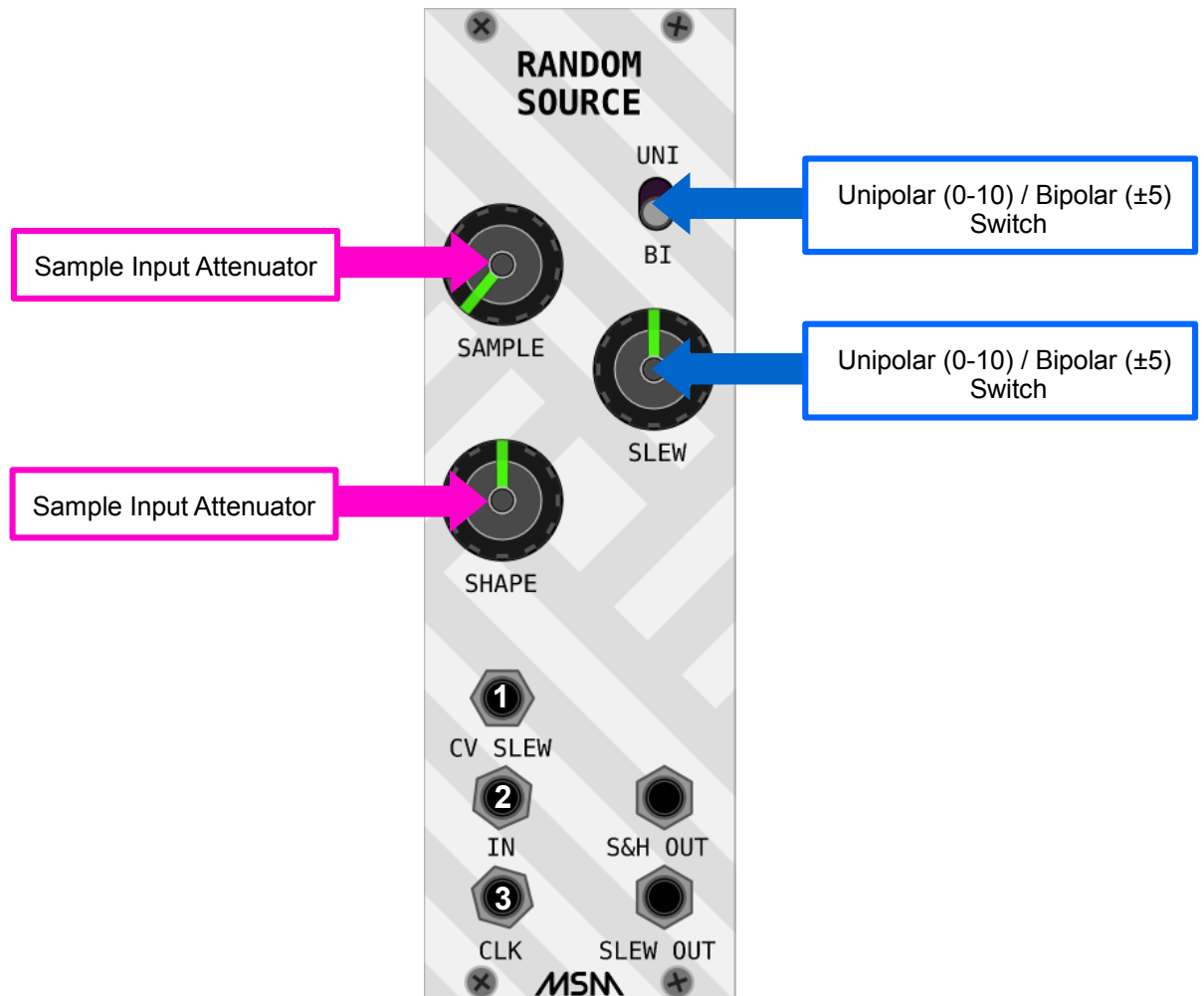**C4:** Sawtooth Output
C5: Square / Pulse Output

WAVESHAPER

WaveShaper

Shape 1 Attenuator

Shape 2 Attenuator

Shape 3 Attenuator

Input Gain Attenuator

Control Voltage Attenuator
for Shape 1

Control Voltage Attenuator
for Shape 2

Control Voltage Attenuator
for Shape 3

Output Gain Attenuator

SHAPE 1   CV 1

SHAPE 2   CV 2

SHAPE 3   CV 3

IN GAIN   OUT GAIN

1   2   3

CV 1   CV 2

CV 3

4   7   OUT

1: Audio / CV Input Shape 1
2: Audio / CV Input Shape 2
3: Audio / CV Input Shape 3
4: Control Voltage Input (Shape 1)
5: Control Voltage Input (Shape 2)
6: Audio / CV Input (All In One)
7: Control Voltage Input (Shape 3)
8: Audio / CV Output

MSM

RANDOM SOURCE

Random Source produces 'staircase' voltages. The signal present at the sample input (IN) is sampled at a rate set by the signal at the trigger input (CLK), and held at the voltage at the sample and hold output (OUT). The exact shape of the staircase depends on the sort of waveform at the sample input.
Noise and Random signals produce random patterns /
LFO produces rising or falling staircase patterns.

Sample Input Attenuator

Sample Input Attenuator

Unipolar (0-10) / Bipolar (±5) Switch

Unipolar (0-10) / Bipolar (±5) Switch

RANDOM SOURCE

UNI
BI
SAMPLE
SLEW
SHAPE

1 CV SLEW
2 IN
3 CLK

S&H OUT
SLEW OUT

MSM

1: Slew Control Voltage Input
2: Sample Input
3: Trigger Input
4: S&H Output
**5:** Slewed S&H Output

MSM

MULT

MULT is a utility module with three independent sections. Each section of the multiple module got two inputs, which are either added or subtracted by each other and split to six copies.
This allows audio or CV signals to be sent to several destinations at once.

Add / Subtract Switch

Audio / CV Outputs
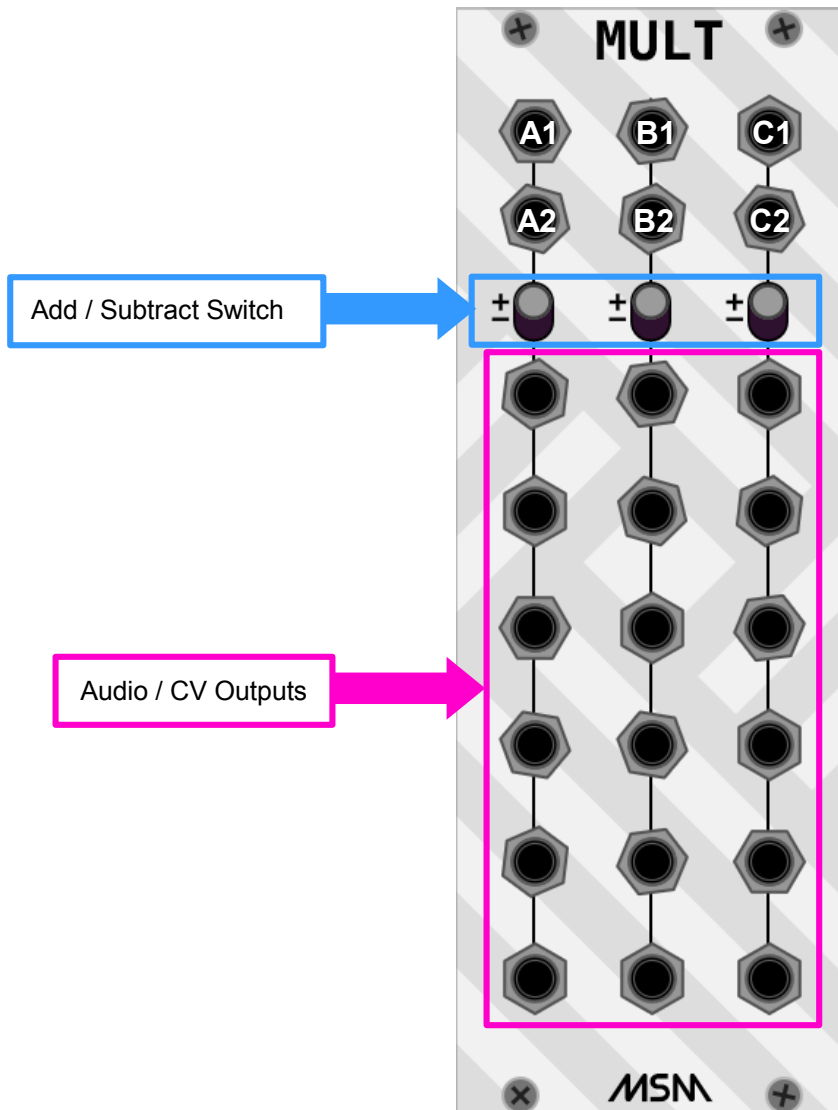
A1: Audio / CV Input
A2: Audio / CV Input
B1: Audio / CV Input
B2: Audio / CV Input
C1: Audio / CV Input
C2: Audio / CV Input

CRAZYMULT
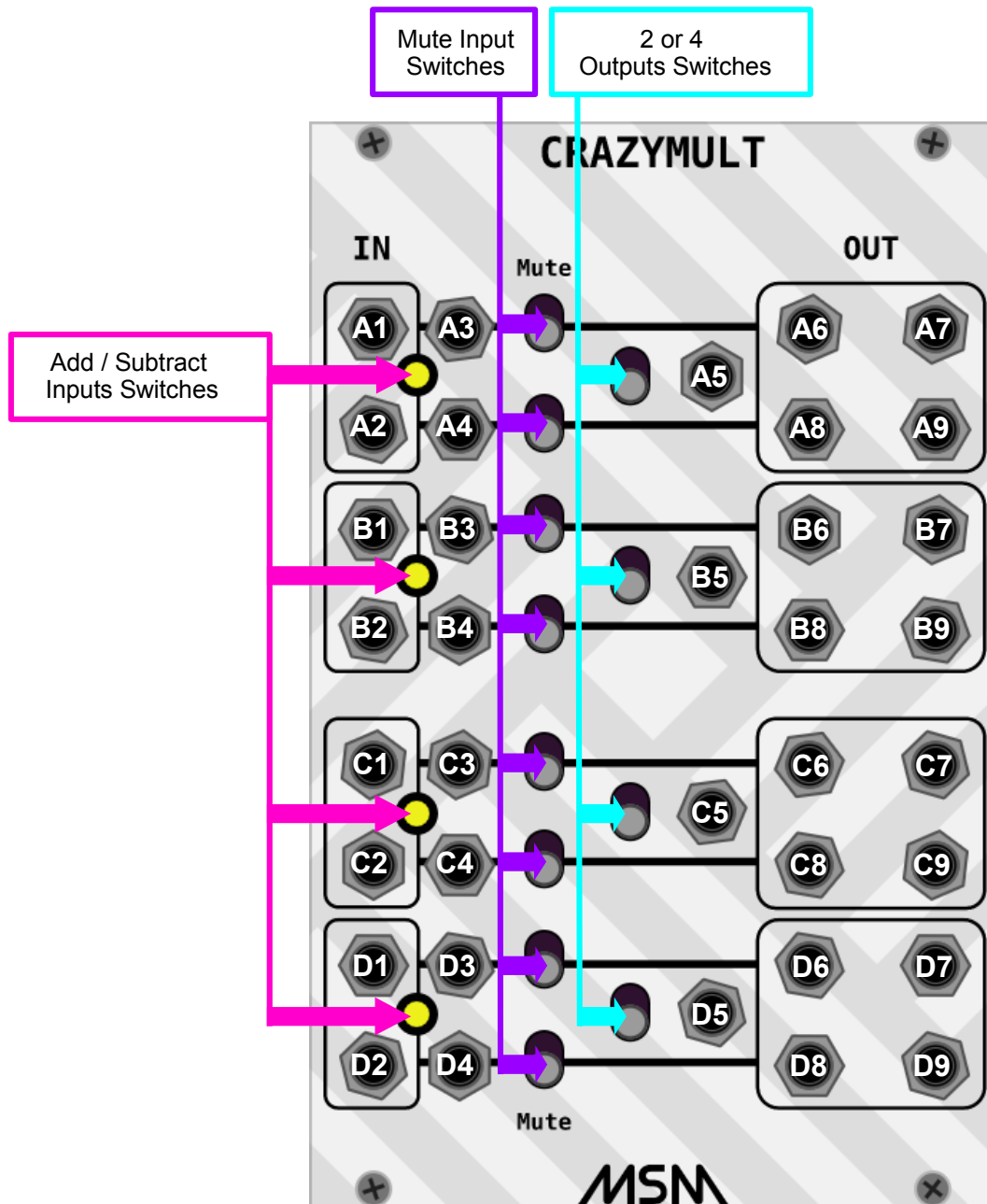
A1: Audio / CV Input
A2: Audio / CV Input
A3: Control Voltage Input Mute A1
A4: Control Voltage Input Mute A1
A5: Control Voltage Input 2 or 4 Switch
A6: Audio / CV Output 1
A7: Audio / CV Output 2
A8: Audio / CV Output 3
A9: Audio / CV Output 4

B1: Audio / CV Input
B2: Audio / CV Input
B3: Control Voltage Input Mute B1
B4: Control Voltage Input Mute B1
B5: Control Voltage Input 2 or 4 Switch
B6: Audio / CV Output 1
B7: Audio / CV Output 2
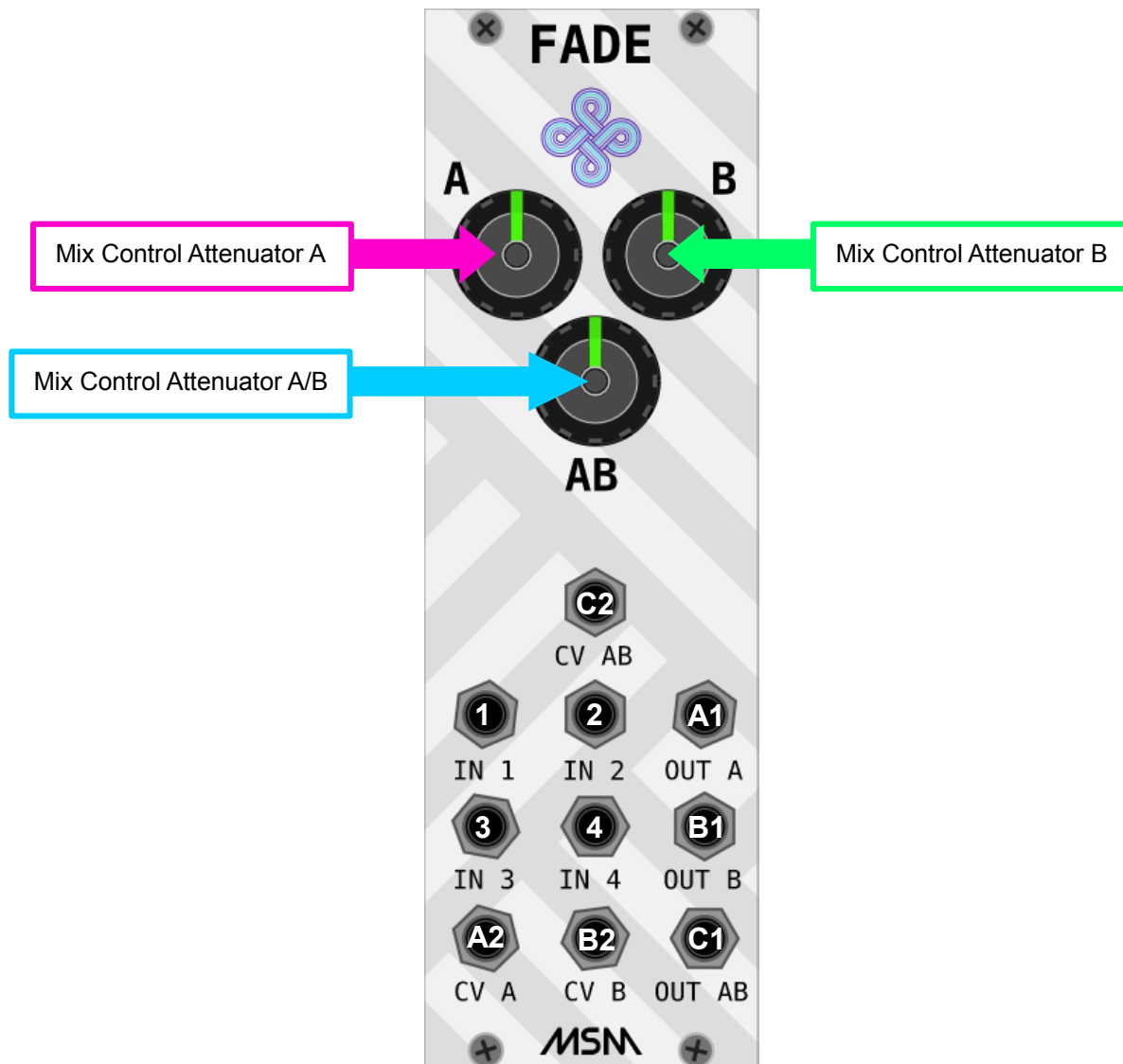**B8:** Audio / CV Output 3
B9: Audio / CV Output 4

C1: Audio / CV Input
C2: Audio / CV Input
C3: Control Voltage Input Mute C1
C4: Control Voltage Input Mute C1
C5: Control Voltage Input 2 or 4 Switch
C6: Audio / CV Output 1
C7: Audio / CV Output 2
C8: Audio / CV Output 3
C9: Audio / CV Output 4

D1: Audio / CV Input
D2: Audio / CV Input
D3: Control Voltage Input Mute D1
D4: Control Voltage Input Mute D1
D5: Control Voltage Input 2 or 4 Switch
D6: Audio / CV Output 1
D7: Audio / CV Output 2
D8: Audio / CV Output 3
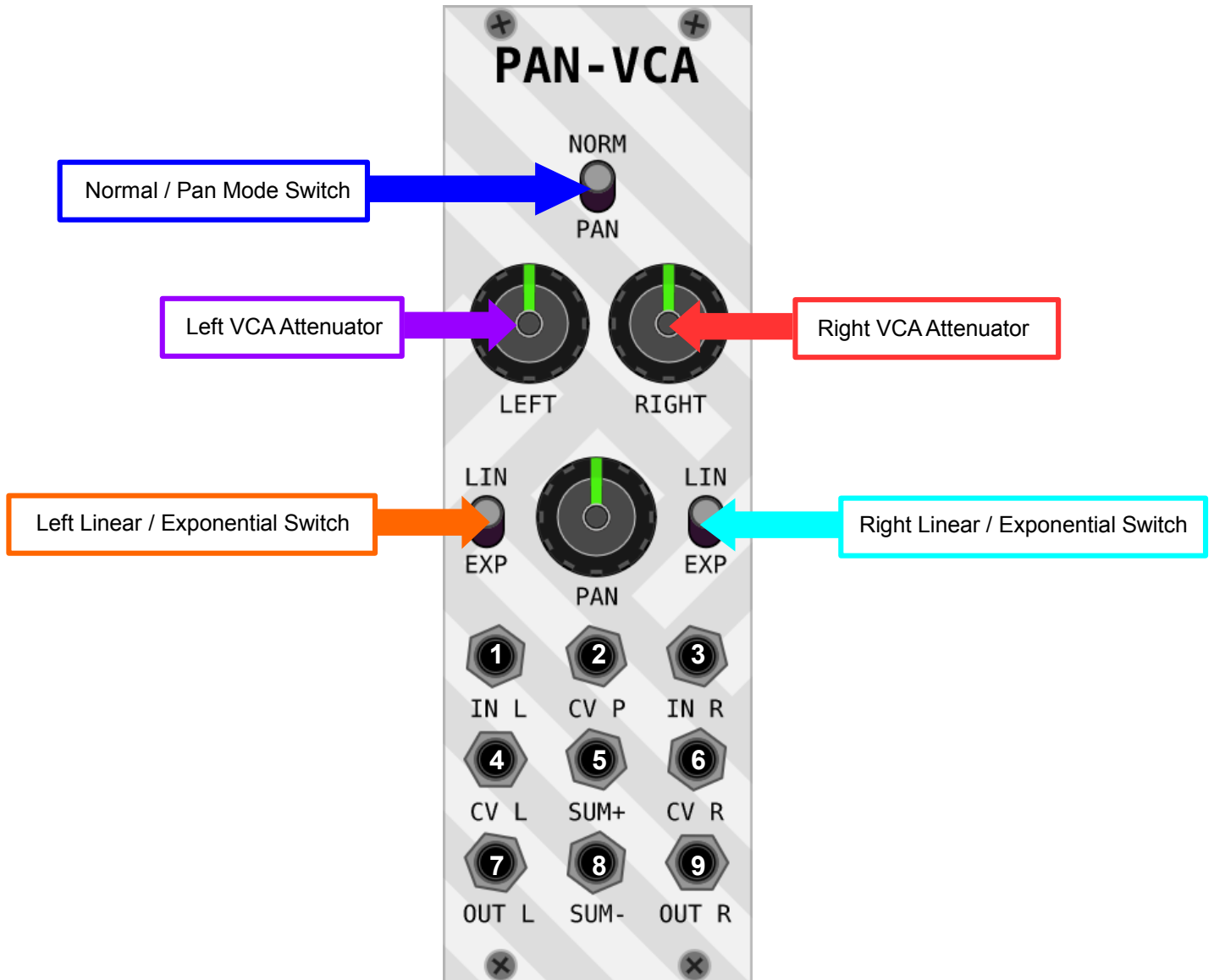**D9:** Audio / CV Output 4

FADE

Mix Control Attenuator A

Mix Control Attenuator B

Mix Control Attenuator A/B

1: Audio / CV Input 1
2: Audio / CV Input 2
3: Audio / CV Input 3
4: Audio / CV Input 4

A1: Audio / CV Output A
A2: Control Voltage Input A
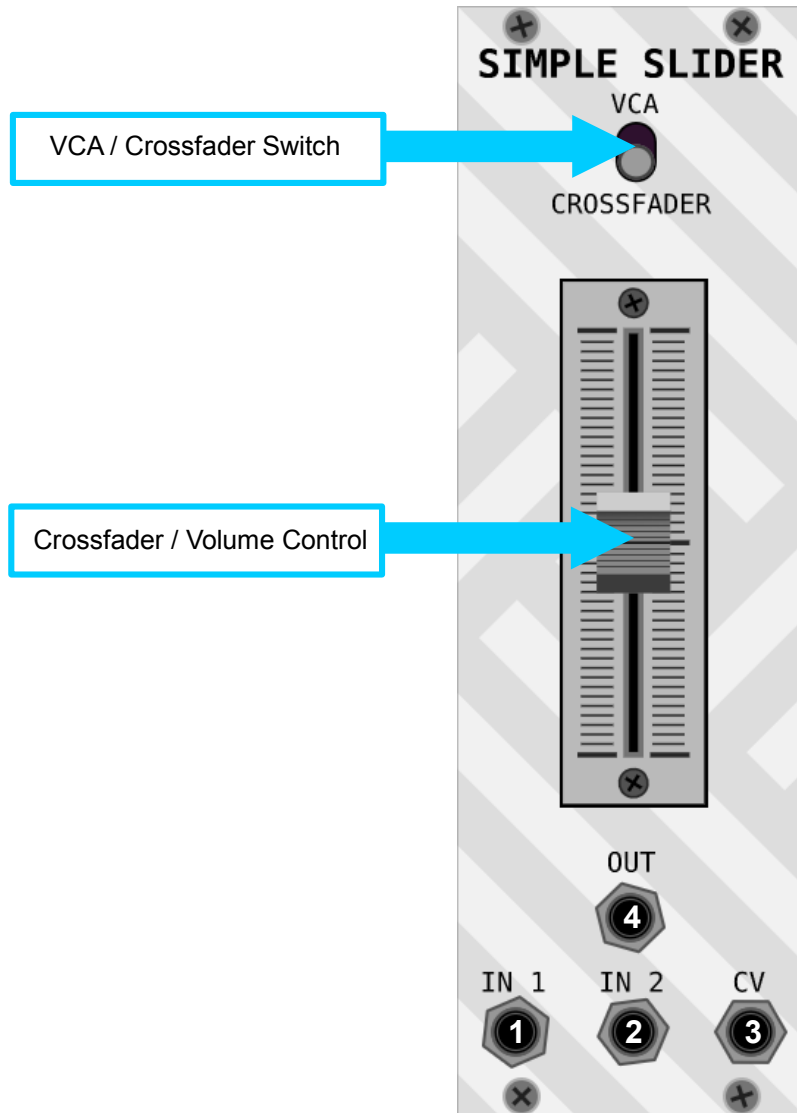
B1: Audio / CV Output B
B1: Control Voltage Input B

C1: Audio / CV Output C
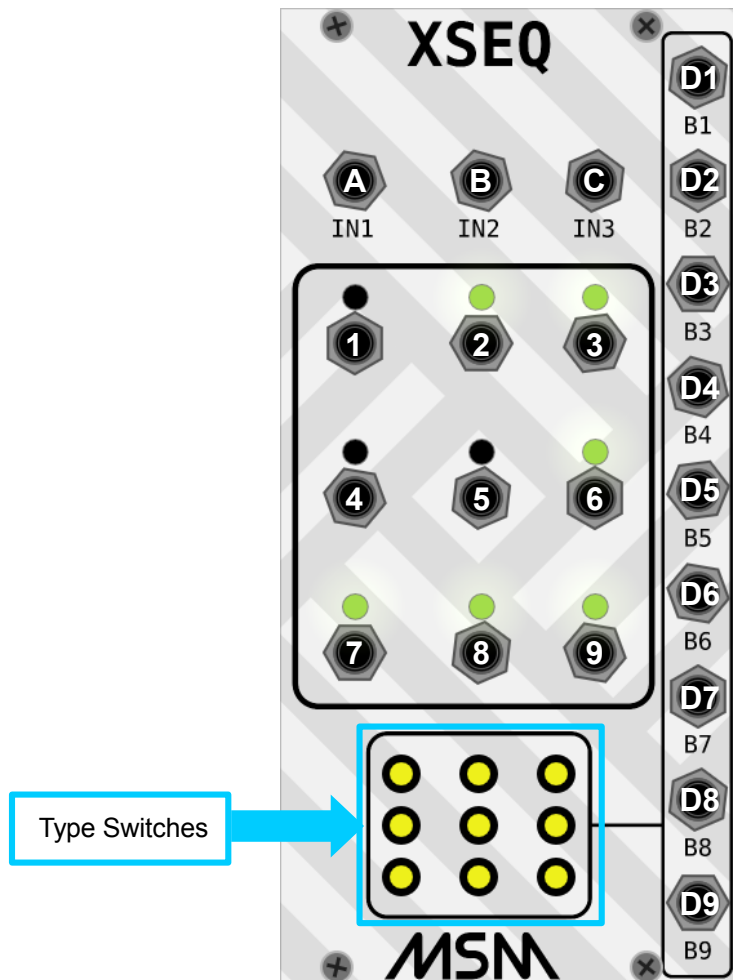**C1:** Control Voltage Input C

PAN-VCA

PAN-VCA

NORM
PAN

Normal / Pan Mode Switch

LEFT   RIGHT

Left VCA Attenuator

Right VCA Attenuator

LIN   LIN
EXP   EXP

Left Linear / Exponential Switch

Right Linear / Exponential Switch

PAN

| 1 | 2 | 3 |
| IN L | CV P | IN R |

| 4 | 5 | 6 |
| CV L | SUM+ | CV R |

| 7 | 8 | 9 |
| OUT L | SUM- | OUT R |

1: Input Left
2: Control Voltage Input Pan
3: Input Right
4: Control Voltage Input Left
5: Sum Output
6: Control Voltage Input Right
7: Output Left
8: Inverted Sum Output
9: Output Right

SIMPLE SLIDER

VCA / Crossfader Switch

Crossfader / Volume Control

SIMPLE SLIDER

VCA

CROSSFADER

OUT

4

IN 1

1

IN 2

2

CV

3

1: Audio / CV Input 1
2: Audio / CV Input 2
3: Control Voltage Input
4: Audio / CV Output

MSM

XSEQ

Type Switches

A: LFO / Clock Input 1	**1:** Gate Output 1	**D1:** Control Voltage Input 1
B: LFO / Clock Input 2	**2:** Gate Output 2	**D2:** Control Voltage Input 2
C: LFO / Clock Input 3	**3:** Gate Output 3	**D3:** Control Voltage Input 3
	4: Gate Output 4	**D4:** Control Voltage Input 4
	5: Gate Output 5	**D5:** Control Voltage Input 5
	6: Gate Output 6	**D6:** Control Voltage Input 6
	7: Gate Output 7	**D7:** Control Voltage Input 7
	8: Gate Output 8	**D8:** Control Voltage Input 8
	9: Gate Output 9	**D9:** Control Voltage Input 9

MSM