

BOUM USER MANUAL

Safety warnings and recommendations

Do not eat BOUM. Before using BOUM, make sure to read all the instructions below, and this User Manual. BOUM has some openings on its enclosure and 4 adhesive feet for cooling purpose. To ensure sufficient cooling, do not obstruct the openings and/or remove the adhesive feet. BOUM should be connected to the included AC adaptor or a power supply of the type described in this manual. Do not place things on the top of the AC adaptor which could prevent normal cooling. If your BOUM is unused for a long period of time, disconnect the AC adaptor from the outlet. BOUM, in combination with an external amplification system or headphones, may generate a high sound level, which could potentially damage your ears. Do not operate BOUM for a long period of time at a high volume level. It's safer to keep reasonable levels and start with low volume. Do not expose BOUM and its AC adaptor to rain, moisture, dust, sand or dirt. Do not pour liquids into BOUM. Never use or store BOUM near water, for example sea, swimming pool, bathtub, kitchen or bathroom sink. BOUM should be located away from high temperatures (> 35 degrees C), for example direct sunlight in a closed vehicle, radiators, heat registers, stoves or other heat sources. Only clean BOUM with a soft, dry cloth. Do not apply any liquids or alcohol. Do not apply excessive vibration forces to BOUM, do not drop it and always transport it in its original packaging or in shock absorbing material. Never climb on top of, nor place heavy objects on BOUM. Some parts of BOUM are fragile (such as the housing and some electronic components), so dropping it might damage your BOUM. Repair work resulting from dropped BOUM is not covered by the normal warranty of the product. Do not leave

small children alone with BOUM, and do not let them use BOUM unless they are capable of following all the rules for the safe operation of BOUM. Do not open (or modify in any way) BOUM or its AC adaptor. There are no user-serviceable parts inside. Refer all servicing to qualified personnel only. If you think your BOUM needs repair, you can send us an e-mail at : support@otomachines.com.

Warranty

BOUM is sold with one year full warranty. This warranty covers all malfunctions that may occur from normal use, and does not cover damage due to abuse, faulty connections or operation under other than specified conditions. Warranty is void when serial number is unreadable, when the device is repaired by unauthorized persons, opened, or tampered with in any way, or if the product was not sold to the end-user through an authorized dealer or the OTO Machines website. This warranty is limited to replacement or repair of the product. The unit can only be returned for repair after agreement from OTO Machines. Customer covers shipping costs of faulty BOUM to OTO Machines and OTO Machines covers shipping costs back to customer.

Disposal

The trash can symbol indicates that your product must be disposed of properly according to local laws and regulations.

Warning on epilepsy

A very small percentage of individuals may experience epileptic seizures or blackouts when exposed to certain light patterns or flashing lights. If you have an epileptic condition or have had seizures of any kind, consult your physician before using BOUM.

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PRESENTATION

Congratulations and thank you for purchasing BOUM !

BOUM is a full analog stereo warming unit, combining an easy-to-use compressor, a versatile distortion generator and a smooth hi cut filter. BOUM is the perfect tool when you need to add warmth, thickness, and character to your sounds, but also apply severe distortion and extreme compression treatments.

BOUM is based on an original and unique circuit, including the following stages :

INPUT GAIN : boost your signal up to +18db to adapt BOUM to various signal levels, and also improve the distortion content and the compressor sensitivity.

COMPRESSOR : with a single knob, control the 3 essential parameters of a compressor, threshold, ratio and makeup gain, without thinking about how a compressor works ! The ratio ranges from 1:1 (no compression) to inf. :1 (limiter), but also negative compression up to 1: -1 ! 6 different attack and release times are available for fine tuning.

LO CUT FILTER : attenuate the distortion content of the bass frequencies with this 6 dB/octave lo cut filter, making your distorted sound easier to mix with the original one.

DISTORTION GENERATOR : choose one of the 4 different distortion circuits :

- **BOOST** : soft clipping amplifier, perfect for subtle harmonic enhancement.
- **TUBE** : asymmetrical tube distortion emulator based on MOSFET technology. Generate mostly a second harmonic distortion.

- **FUZZ** : symmetrical hard clipping amplifier, similar to an overdriven mixer preamp.
- **SQUARE** : pure square wave generator based on a comparator. The ultimate fuzz !

HI CUT FILTER : soften the high frequencies with this smooth and musical 12 dB/octave hi cut filter.

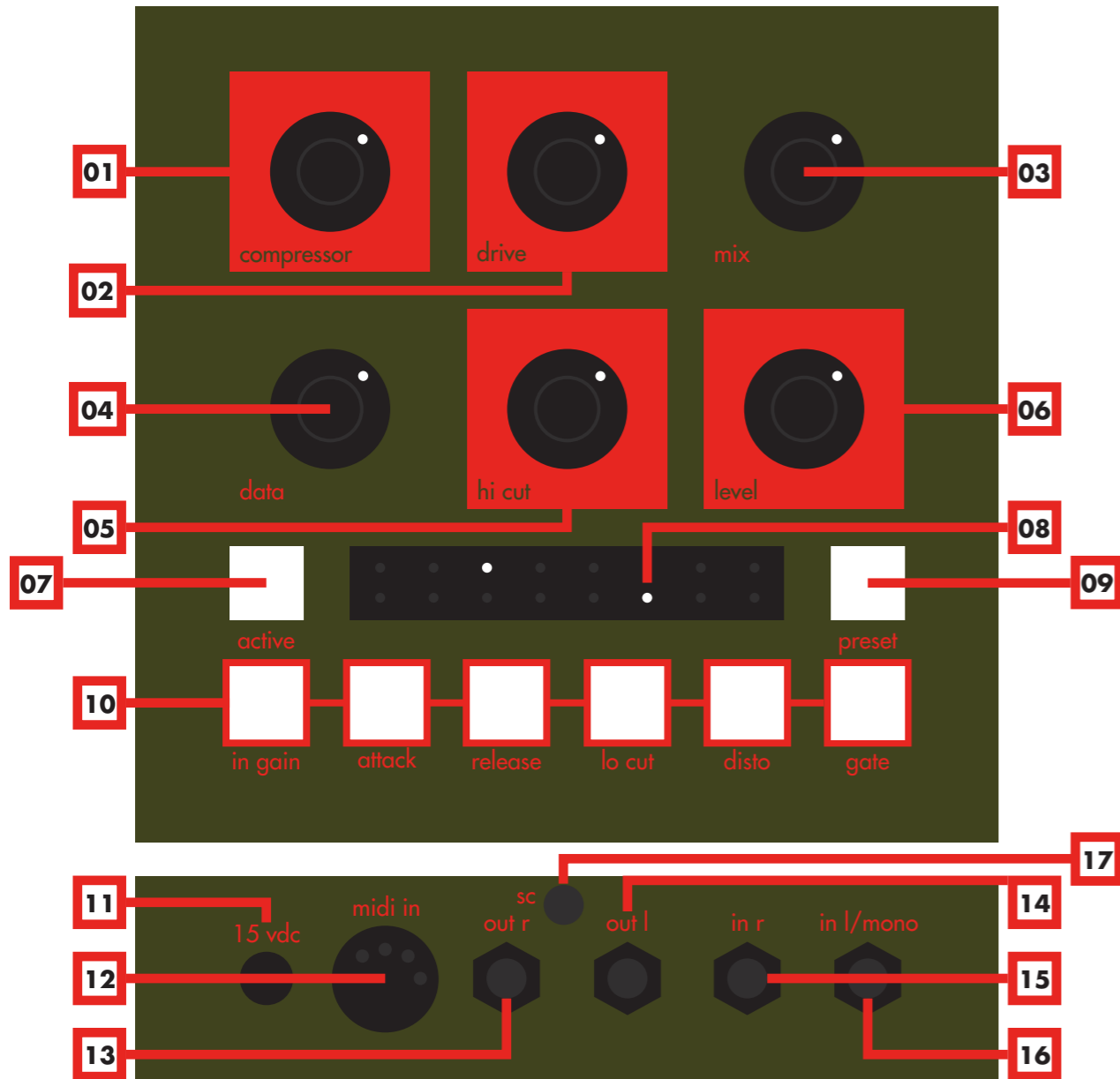
NOISE GATE : remove the noise coming from the different treatments, or use it for interesting chopping effects.

All these analog effects are packaged in a compact format, with 36 user presets and full MIDI control. BOUM will give you a wide range of compression, distortion and filtering effects, ranging from subtle harmonic enhancement to an insane square distortion, and everything in between !

FEATURES

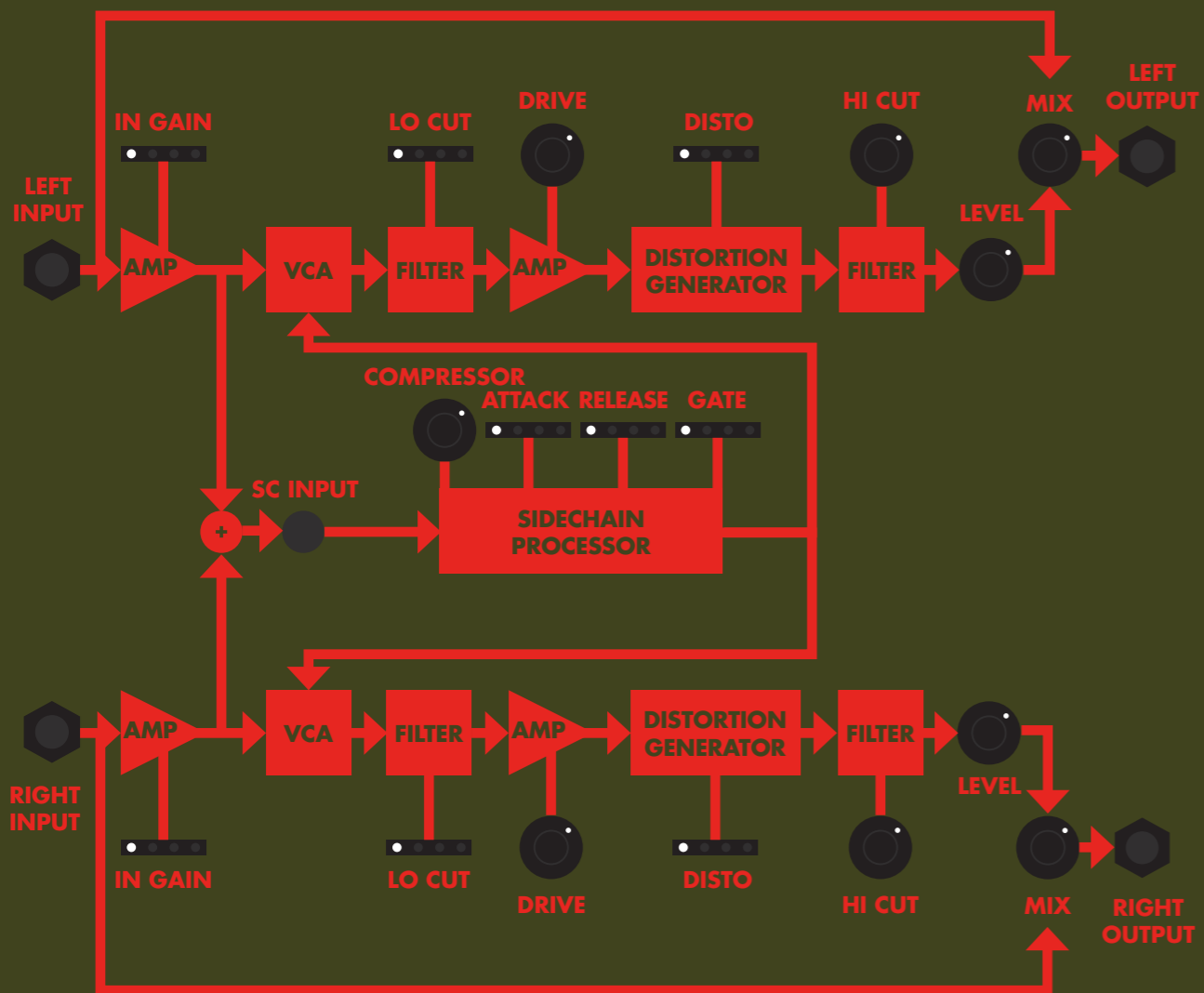
- Analog signal path and sidechain
- One knob compressor (Ratio 1:1 to 1: -1) with attack & release parameters
- 4 distortions : Boost, Tube, Fuzz and Square
- Variable Hi Cut Filter, 12 dB/oct. from 20 kHz to 20 Hz
- Gate with threshold up to 0 dB for production purposes
- Input Gain up to +18 dB
- Lo Cut Filter : Flat, 75 Hz, 150 Hz, 300 Hz
- 36 user presets
- MIDI input : BOUM responds to CCs, Pgm Change, Note
- Nice and simple user interface via 16 white LEDs
- Rugged steel enclosure
- Neutrik® jack connectors
- Power supply included

FRONT PANEL & REAR PANEL



- 01 - COMPRESSOR.** Sets 3 parameters of the compressor with 1 knob (cf p. 7)
- 02 - DRIVE.** 0 to 55 dB (depending on the disto type)
- 03 - MIX.** Mix between the dry and wet sound
- 04 - DATA.** Sets the selected parameter (cf p. 9)
- 05 - HI CUT.** 12 dB/octave non resonant Hi Cut Filter (from 20 kHz to 20 Hz)
- 06 - LEVEL.** Sets the level of the whole audio path for the wet signal
- 07 - ACTIVE.** Turns the effect on or off (when it's off, Boum is bypassed)
- 08 - LEDS.** Display the parameters, presets, midi settings and other info
- 09 - PRESET.** Save and Recall presets
- 10 - FUNCTION KEYS.** Enable access to the parameters (cf p. 10 to 15)

- 11 - POWER SUPPLY INPUT.** 15 Volts DC 0.5 Amps, center positive
- 12 - MIDI IN.** Midi input
- 13 - OUT R.** Right output. Unbalanced 1/4" jack
- 14 - OUT L.** Left output. Unbalanced 1/4" jack
- 15 - IN R.** Right input. Unbalanced 1/4" jack
- 16 - IN L/MONO.** Left or mono input. Unbalanced 1/4" jack
- 17 - SIDECHAIN INPUT.** 1/8" mono jack



COMPRESSOR POT

The COMPRESSOR pot sets the 3 essential parameters of a compressor : Threshold, Ratio, and Makeup.

Threshold is the point at which the compressor begins to react. A signal below this threshold won't be affected by the compression process, and a signal above the threshold will be compressed. Threshold of the BOUM compressor varies between -30 and -15 dB, depending on the position of the COMPRESSOR pot.

Ratio determines the intensity of the compression effect, and is expressed by the relation in dB between the input and the output signals. For instance a ratio of 10:1 means that a 10 dB increase above the threshold at the input will lead to a progression of only 1 dB at the output. Therefore the dynamic range of the input signal is attenuated at the compressor output.

A 1:1 ratio is equivalent to no compression.

A ∞:1 ratio is called a limiter because the output level stays constant when the input signal rises above the threshold.

1:-1 is a kind of over compression since a progression of 1 dB at the input above the threshold will lead to an attenuation of 1 dB at the output. The more the input signal rises above the threshold, the more the output signal is lowered. This kind of ratio can create dynamic reversal effects.

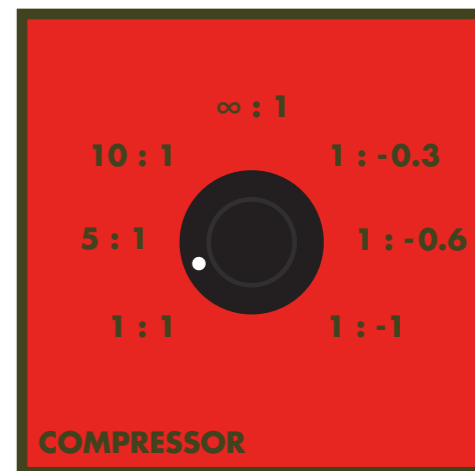
Makeup is the output amplifier gain and compensates for the level loss generated by the compressor action. With BOUM, you don't have to know how to set these 3 parameters, you just have to turn the COMPRESSOR pot for more or less compression !

Here is a layout of the ratios :

PROTECT YOUR EARS !

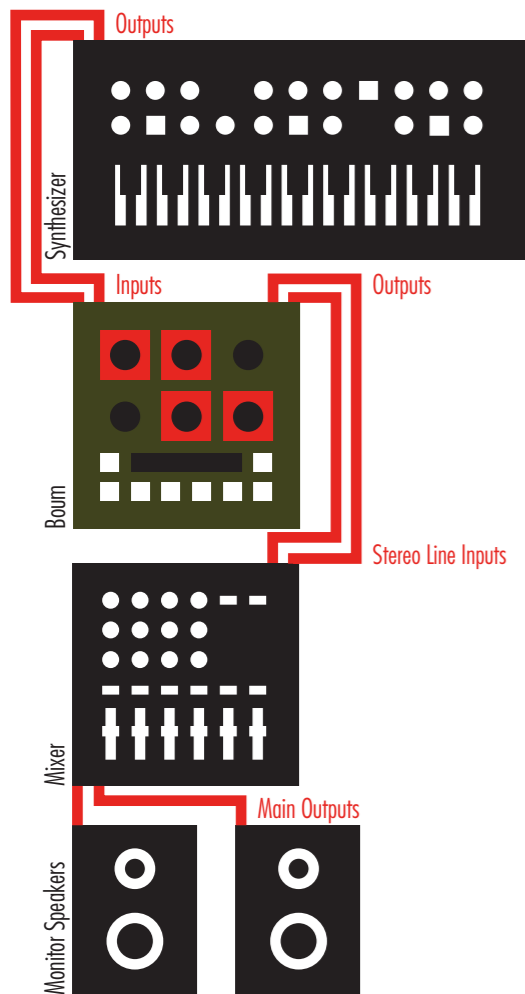
BOUM, in combination with an external amplification system or headphones, may generate a high sound level, which could potentially damage your ears.

Do not operate BOUM for a long period of time at a high volume level. It's safer to keep reasonable level and start with low volume.

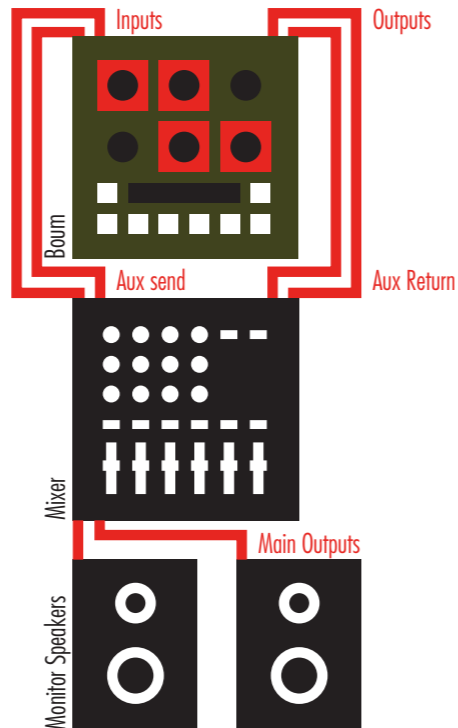


SETUP EXAMPLES

1. Instrument



2. Auxiliary



NOTE : turn the MIX pot to its maximum position (clockwise)

PARAMETERS

BOUM has 6 function keys :

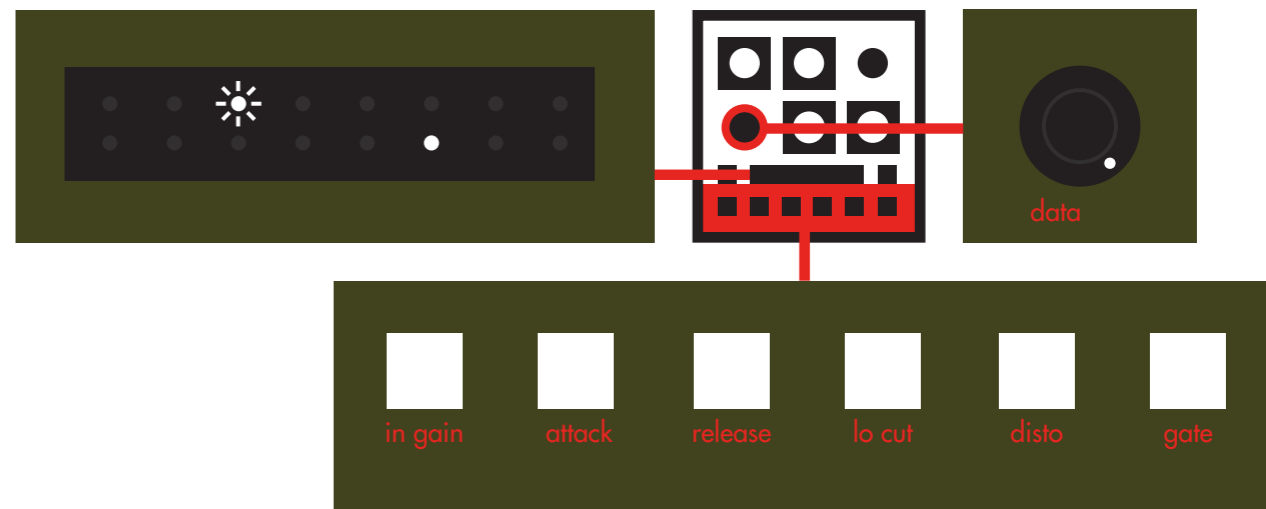
In Gain, Attack, Release, Lo Cut, Disto and Gate.
Each function key gives you access to a parameter.

You can modify this parameter with the DATA pot.

To exit parameter selection press the function key again.

Function Key Overview

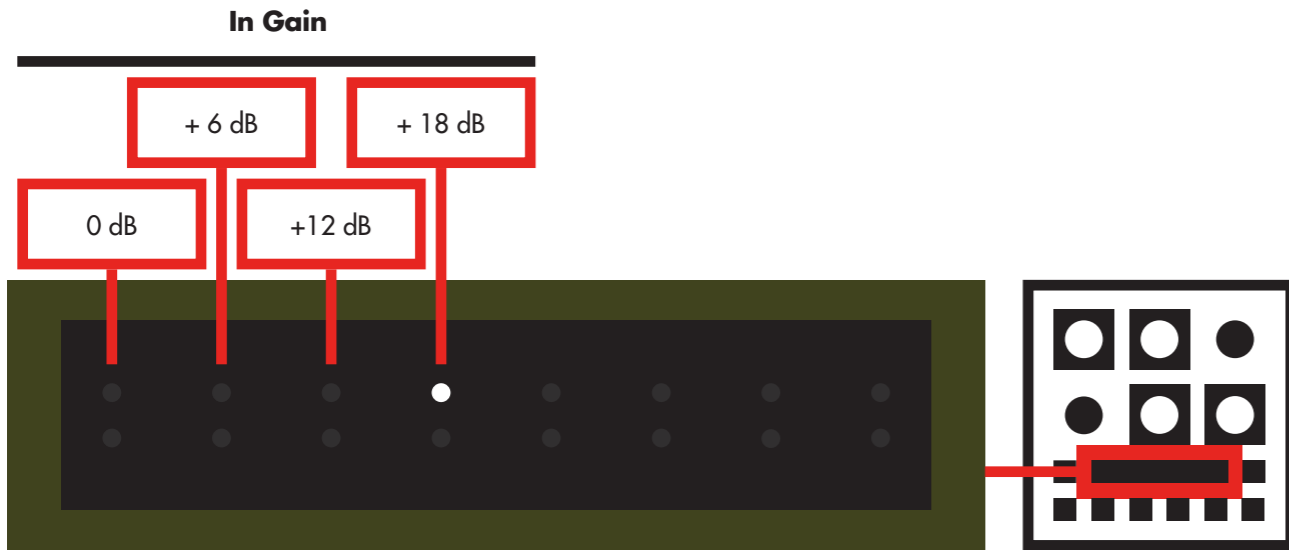
1. In Gain : sets the gain of the input buffer. It is the first stage of the circuit.
2. Attack : sets the attack time of the compressor.
3. Release : sets the release time of the compressor.
4. Lo Cut : a 6 dB/octave lo cut filter, located after the compressor and before the distortion generator.
5. Disto : selects one of the 4 distortion circuits.
6. Gate : a noise gate that can also be used for chopping effects.



in gain attack release lo cut disto gate

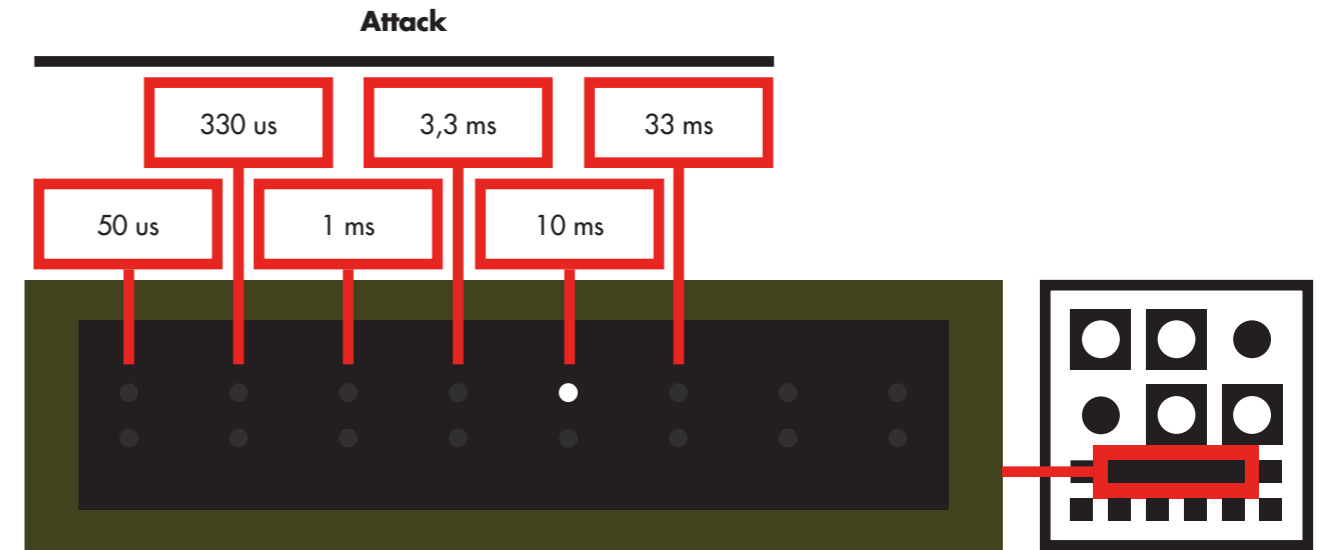
IN GAIN

This is the first stage of the circuit. Raising the input gain also raises the compressor sensitivity.



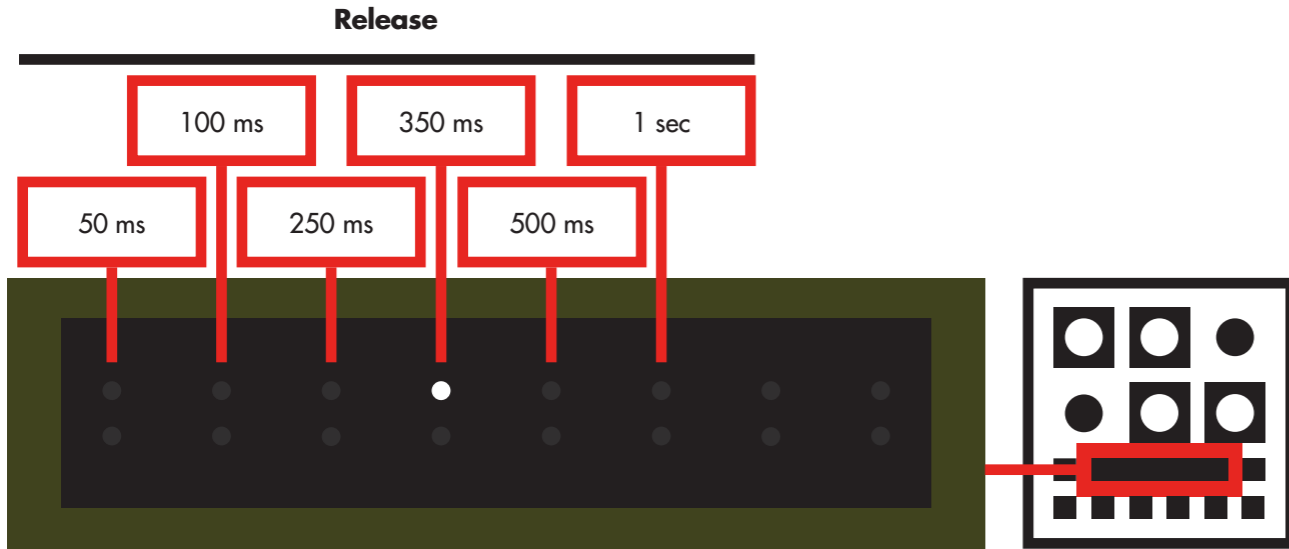
ATTACK

Sets the attack time of the compressor.



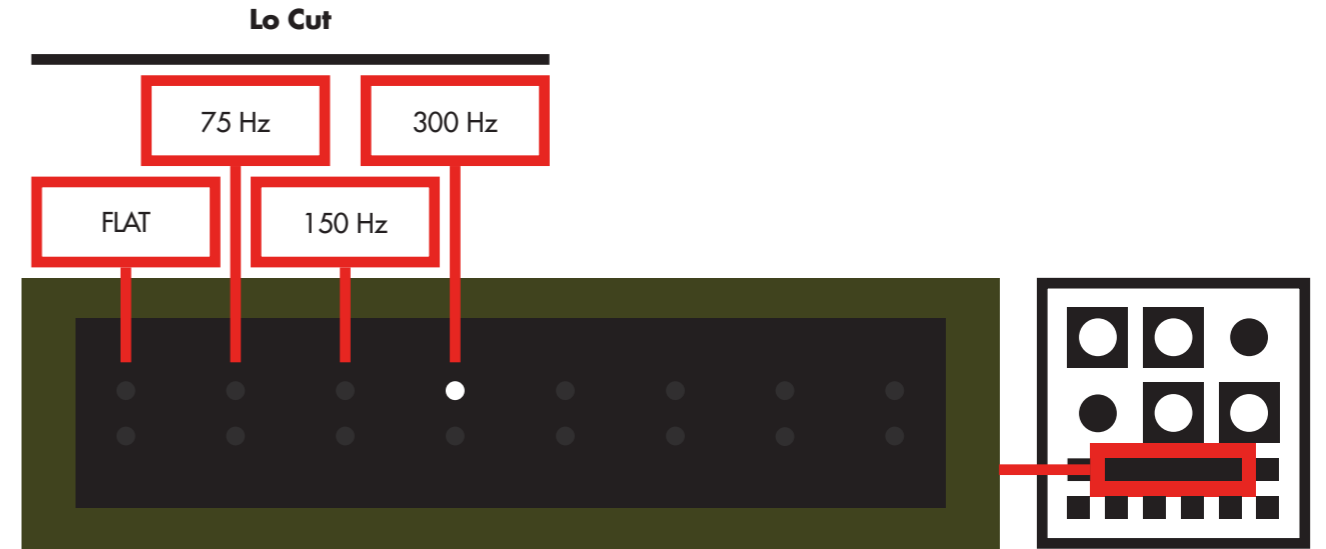
RELEASE

Sets the release time of the compressor.



LO CUT

This 6 dB/octave Lo Cut filter is located before the distortion. It can help make your distorted sound easier to mix with the original one.



DISTO

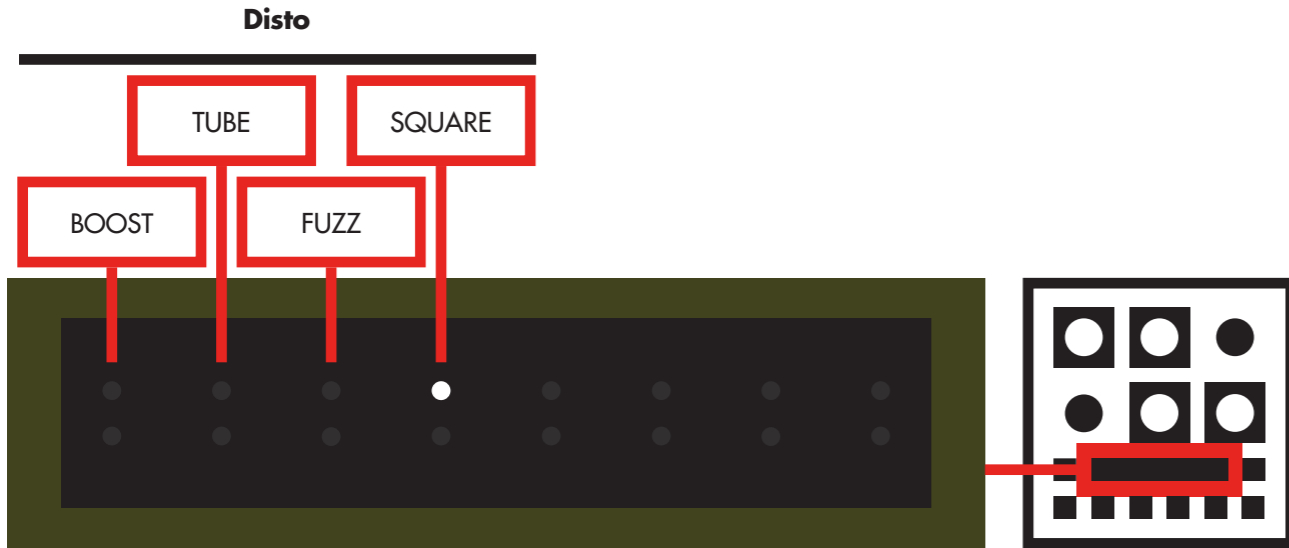
Selects one of the 4 different distortion circuits.

Boost : Soft clipping amplifier.

Tube : Emulates the sound of an asymmetrical tube amp distortion.

Fuzz : Symmetrical hard clipping amplifier.

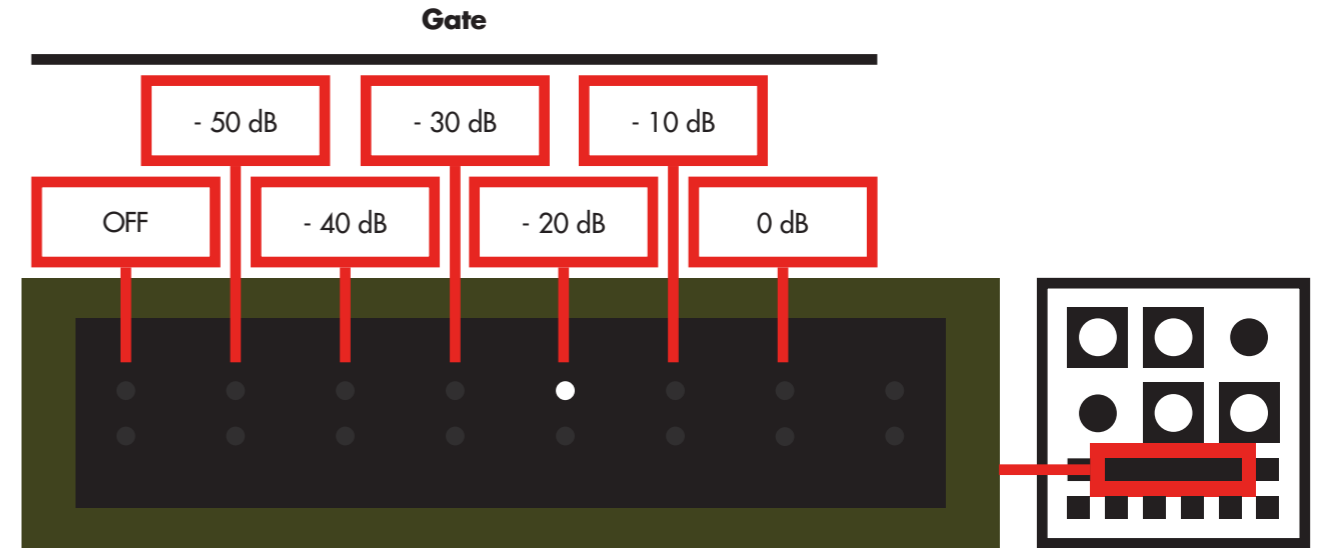
Square : Pure square wave distortion, based on a comparator circuit.



GATE

Activates a noise gate with several thresholds. Thresholds above -40 dB let you create a chopping effect.

IMPORTANT NOTE ABOUT SIDECHAIN : When a signal is connected to the sidechain (SC) input and the Gate parameter is not set to « OFF », the SC input becomes a gate trigger input. This means that when a signal is present at the SC input, the gate is opened (the wet sound of BOUM is on). With no signal at the SC input, the gate is closed (the wet sound of BOUM is muted). If you want the sidechain input to control the compressor the normal way, set the Gate parameter to « OFF ». The Compressor pot will control the intensity of SC signal used for the compression.



DISPLAY MODE

When no parameter is selected, you can choose what the screen will display.

To change the DISPLAY mode, press and hold the ATTACK function key for at least 2 seconds. The ATTACK function key and one of the following LEDs will flash to indicate the current Display mode :

- Led 1.** Off mode. The screen will display nothing.
- Led 2.** Vu meter / Gain reduction mode. The 8 LEDs of the upper line act as a signal input VU-meter. The 8 LEDs of the lower line display the gain reduction of the compressor (cf p. 23).
- Led 3.** Preset mode. The 16 LEDs show the current preset and bank number (cf p. 17).

You can change the Display mode with the DATA pot.

To exit the Display mode settings, wait for 10 seconds or press the ATTACK function key.

LOCAL MODE (MIX)

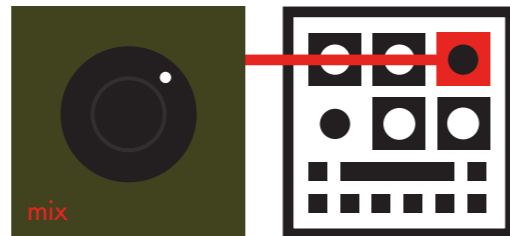
Each Preset contains its own Mix value. Sometimes it can be useful to load a preset while keeping the current Mix settings.

To change the Local mode, press and hold the RELEASE function key for at least 2 seconds. The RELEASE function key and one of the following LEDs will flash to indicate the current Local mode :

- Led 1.** Preset mode. The Mix value is loaded.
- Led 2.** Local mode. The Mix value from the loaded preset is ignored and the current Mix value is used.

You can change the Local mode with the DATA pot.

To exit the Local mode settings, wait for 10 seconds or press the RELEASE function key.



PRESETS

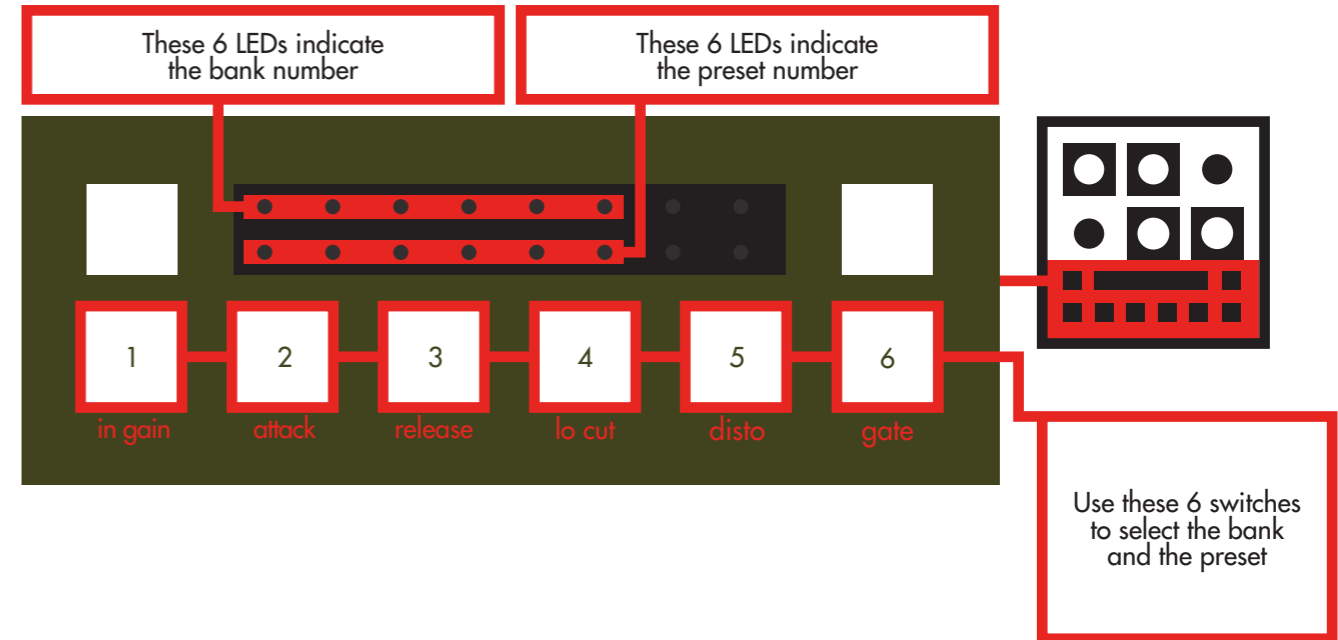
BOUM has 36 presets; 6 banks of 6 presets each. The upper line of LEDs (1 to 6) indicates the bank. The lower line of LEDs (9 to 14) indicates the preset.

Recall a preset
Press the PRESET switch. The PRESET switch lights up and one of the upper line LEDs blinks. Press one of the 6 switches (from IN GAIN to GATE) to select a bank. Then one of the lower line LEDs blinks. Press one of the 6 switches (from IN GAIN to GATE) to select a preset. Your preset is loaded.

Save a preset

Press the PRESET switch for 2 seconds. The PRESET switch flashes to indicate you are in Save mode. One of the upper line LEDs blinks. Press one of the 6 switches (from IN GAIN to GATE) to select a bank. Then one of the lower line LEDs blinks. Press one of the 6 switches (from IN GAIN to GATE) to select a preset.

All the parameters and pot positions are now saved in the selected preset.



EXIT WITHOUT LOADING OR SAVING A PRESET

If you press the PRESET switch before selecting the bank or the preset, the preset won't be loaded or saved. You can also wait 10 seconds.

POTENTIOMETERS POSITION

Once you recall a preset, the physical position of a pot may not be the same as in the preset. To prevent a sudden jump of volume when you turn a pot, the preset value will reach the pot value with a smooth fade.

Table 1 : Factory Presets list

1.1 Fatter, Higher, Stronger	1.2 Give it a triode	1.3 Buzz Tone	1.4 Tube comp	1.5 Drum Reverse	1.6 Be square
2.1 Ural exciter	2.2 Broken Radio	2.3 Transient Expression	2.4 I'm Crispy	2.5 Scissors	2.6 Boum Box

FACTORY PRESETS

The first 2 banks are filled with 12 factory presets. These 12 factory presets are listed on table 1.

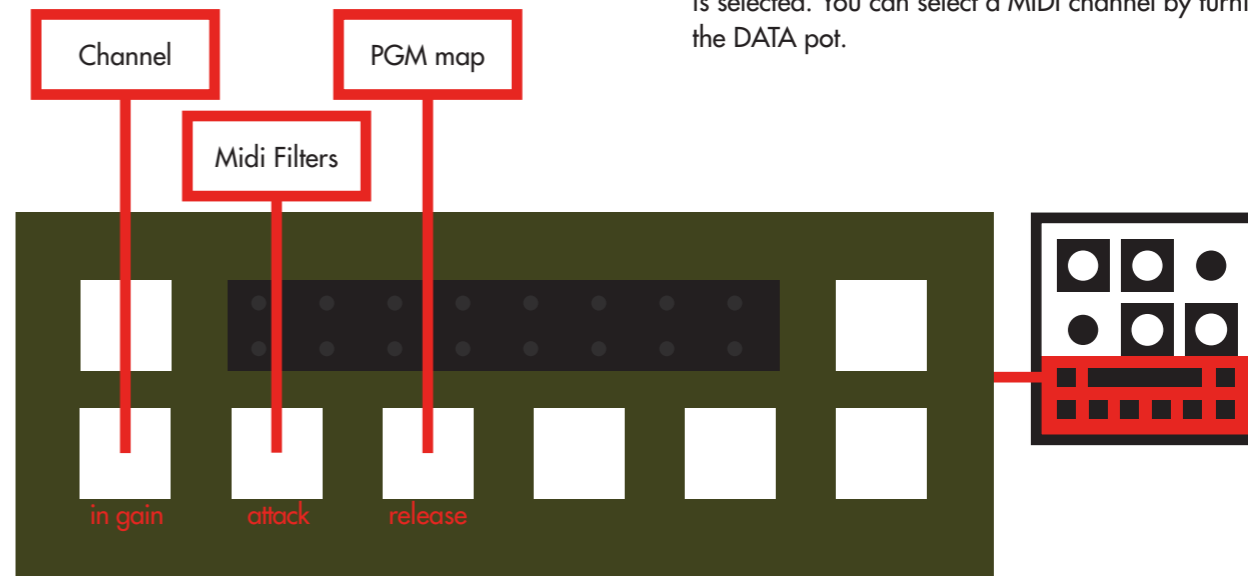
MEMORY PROTECT

You can prevent overwriting your presets with the Memory Protect function. Press PRESET and GATE switches and hold them for at least 2 seconds. The PRESET and GATE switches, and one of the following LEDs will flash to indicate the current Memory Protect mode :

- Led 1.** OFF. The memory is not protected.
- Led 2.** ON. The memory is protected and you cannot save presets. If you attempt to save a preset, LEDs 1 to 6 and 9 to 14 will flash briefly to indicate that memory is protected.

You can now change the memory protect mode with the DATA pot.

To exit the Memory Protect setting, wait for 10 seconds or press the PRESET or the GATE switch.



MIDI

The MIDI settings menu gives you access to the following functions :

- MIDI Channel selection
- MIDI Filters
- Program Change map

To access the MIDI menu, press the ACTIVE switch while pressing the PRESET switch.

The IN GAIN, ATTACK and RELEASE switches flash. Press any of these switches to access the corresponding sub-menu.

1. CHANNEL

One of the 16 LEDs will flash and display which channel is selected. You can select a MIDI channel by turning the DATA pot.

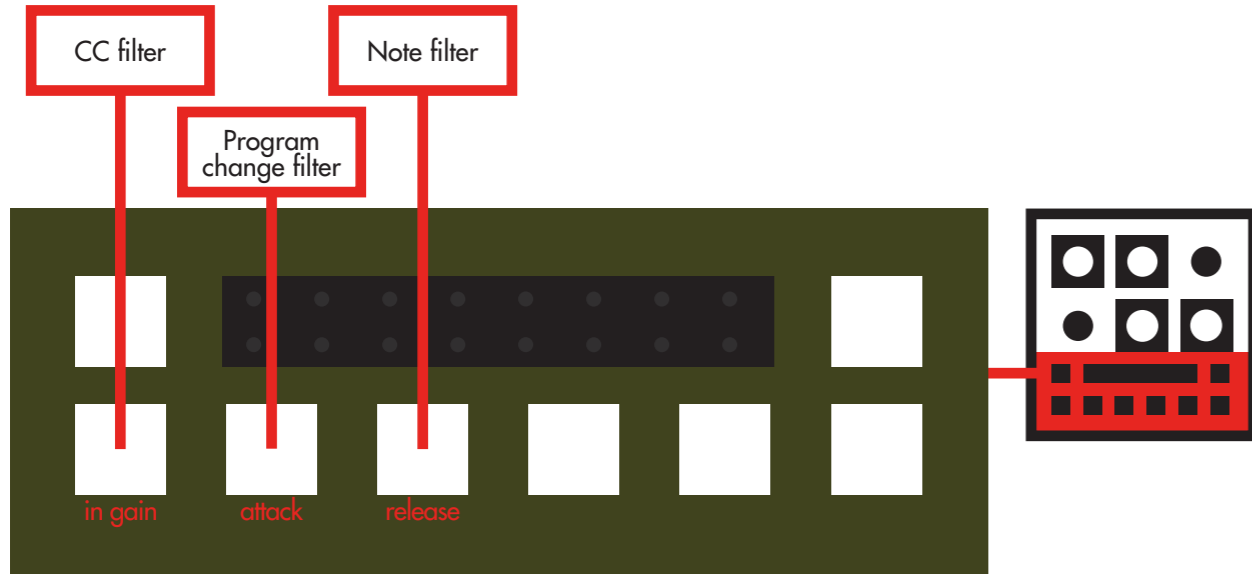
2. MIDI FILTERS

One of the IN GAIN, ATTACK or RELEASE switch is lit (the filter is off, BOUM will accept the corresponding MIDI message) or flashing (the filter is on, BOUM will ignore the corresponding MIDI message).

The 3 MIDI FILTERS are :

1. Continuous Controllers (IN GAIN switch)
2. Program Change (ATTACK switch)
3. Note (RELEASE switch). cf. p. 21

To activate or deactivate a filter, press the corresponding switch.



3. PGM CHANGE MAP

BOUM has 36 presets and MIDI Program Change messages have 128 values. You can associate any BOUM preset to any Program Change message number.

When the PGM Change Map sub-menu is selected, send a Program Change message from your computer, sequencer or any MIDI device. As soon as BOUM receives a Program Change message, it will give you access to a preset selection menu (same as "Recall a preset" cf p. 17).

Reset Program Change map

If you press DISTO and GATE switches simultaneously while you are in the PGM CHANGE MAP sub-menu, the Program Change map will be reset (cf Table 2).

To exit the MIDI menu, press the ACTIVE or the PRESET switch.

Table 2 : Default Program Change list

Preset	PGM Chge Nr	Preset	PGM Chge Nr	Preset	PGM Chge Nr
1.1	1 - 37 - 73 - 109	3.1	13 - 49 - 85 - 121	5.1	25 - 61 - 97
1.2	2 - 38 - 74 - 110	3.2	14 - 50 - 86 - 122	5.2	26 - 62 - 98
1.3	3 - 39 - 75 - 111	3.3	15 - 51 - 87 - 123	5.3	27 - 63 - 99
1.4	4 - 40 - 76 - 112	3.4	16 - 52 - 88 - 124	5.4	28 - 64 - 100
1.5	5 - 41 - 77 - 113	3.5	17 - 53 - 89 - 125	5.5	29 - 65 - 101
1.6	6 - 42 - 78 - 114	3.6	18 - 54 - 90 - 126	5.6	30 - 66 - 102
2.1	7 - 43 - 79 - 115	4.1	19 - 55 - 91 - 127	6.1	31 - 67 - 103
2.2	8 - 44 - 80 - 116	4.2	20 - 56 - 92 - 128	6.2	32 - 68 - 104
2.3	9 - 45 - 81 - 117	4.3	21 - 57 - 93	6.3	33 - 69 - 105
2.4	10 - 46 - 82 - 118	4.4	22 - 58 - 94	6.4	34 - 70 - 106
2.5	11 - 47 - 83 - 119	4.5	23 - 59 - 95	6.5	35 - 71 - 107
2.6	12 - 48 - 84 - 120	4.6	24 - 60 - 96	6.6	36 - 72 - 108

MIDI CONTROL OF THE SIDCHAIN

You can control the compressor sidechain by MIDI in 2 different ways :

1. Continuous Controller nr 24 : CC value 000 corresponds to no compression, CC value 127 corresponds to the maximum compression.

2. Midi Note : the velocity value of any played note will

control the compression. Velocity value 000 corresponds to no compression, velocity value 127 corresponds to the maximum compression.

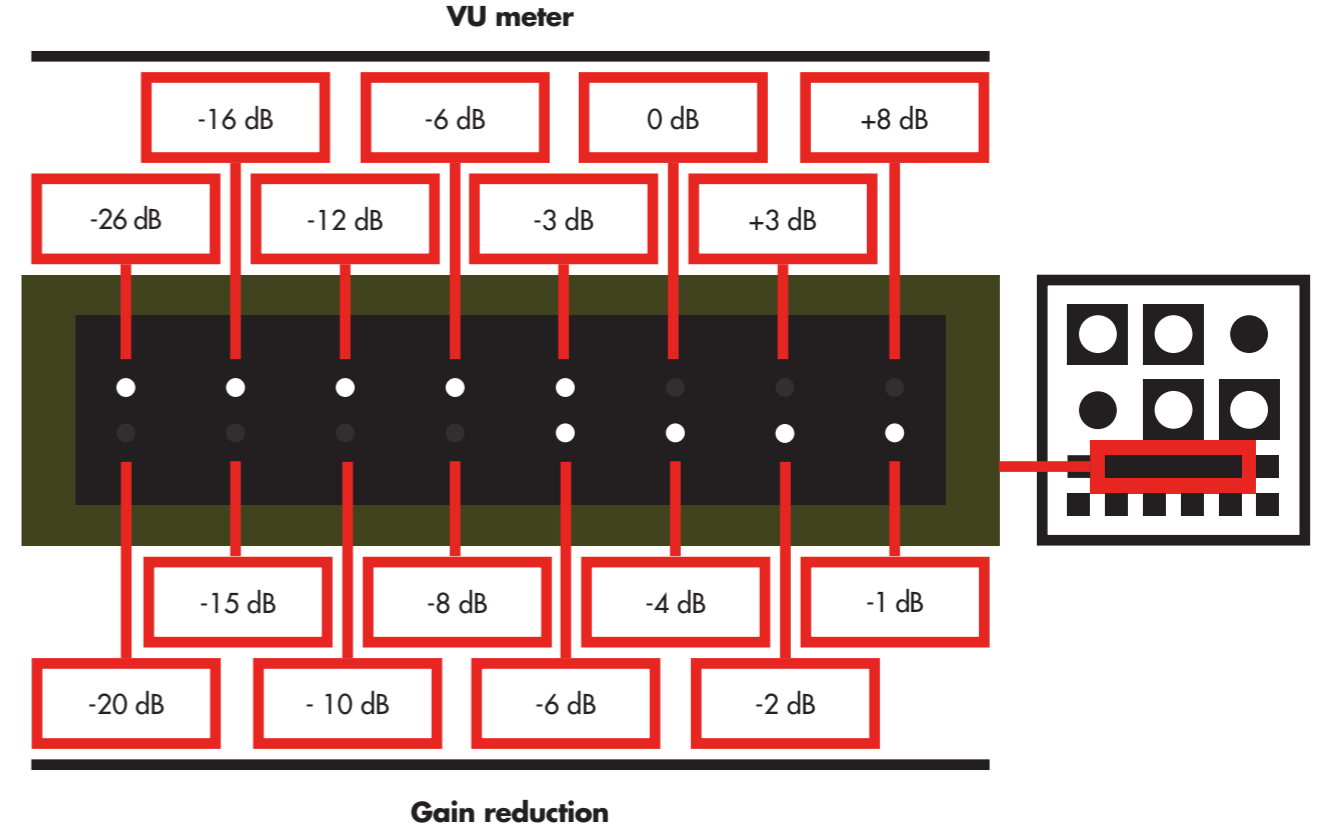
The compressor pot sets the amount of the MIDI controlled compression.

Table 3 : MIDI CC list

Param	CC
Compressor	12
Drive	13
Mix	14
Hi Cut	15
Level	16
Active	17
In Gain	18
Attack	19
Release	20
Lo Cut	21
Disto	22
Gate	23
Sidechain control	24

VU METER / GAIN REDUCTION DISPLAY

The 8 LEDs of the upper line act as a signal input VU-meter.
The 8 LEDs of the lower line display the gain reduction of the compressor.



Note about noise

BOUM is a high gain device (up to 75 dB depending on the pots positions and distortion settings).

With maximum In Gain and Fuzz distortion altogether, some extreme settings of the Compressor, Drive, Hi Cut and Level pots may lead to a certain amount of noise.

Even with its carefully designed low-noise circuits, BOUM can produce internal noise, but also amplify incoming noise. If you experienced too much noise under certain circumstances, first disconnect the input jack(s) to evaluate the noise coming from the source and the noise coming from BOUM itself.

Sometimes you can reduce the noise from your source with simple actions. For instance, depending on the machine, it could be turning the level up, disconnect or mute unused effects, oscillators or tracks, use a better power supply...

You can also use the included noise gate, but it's always better to reduce the noise from the source.

SPECIFICATIONS

Inputs

Connectors :	1/4" phone jacks
Input type :	single ended
Impedance :	1 MOhm
Max input level :	+20 dBu (@ 1% THD+N)

Sidechain input : 1/8" mono jack

Outputs

Connectors :	1/4" phone jacks
Output type :	single ended
Impedance :	100 Ohm
Max output level :	+20 dBu

Dry signal specifications

THD+N :	0.025 % @ 1kHz (20 Hz - 20 kHz, 0 dBu)
Frequency response :	- 0.005 dBu @ 20 Hz - 0.004 dBu @ 20 Hz
Dynamic range :	108 dB

Wet signal specifications

(no compression, boost mode, minimum drive) :	
THD+N :	0.038 % (@ 1 kHz, 0 dBu)
Frequency response :	- 0.78 dBu @ 20 Hz + 0.69 dBu @ 20 kHz
Dynamic range :	89 dB

General

Dimensions :	145 x 145 x 65 mm
Weight :	762 g

Power supply

Input :	100 to 240 VAC 50 to 60 Hz, 0.6 Amp
Output :	+15 VDC, 1 Amp, center positive
Dimensions :	74 x 43 x 35 mm
Weight :	165 g

DUE TO CONTINUOUS PRODUCT IMPROVEMENT, THESE SPECIFICATIONS ARE SUBJECT TO CHANGE WITHOUT NOTICE.

Reset

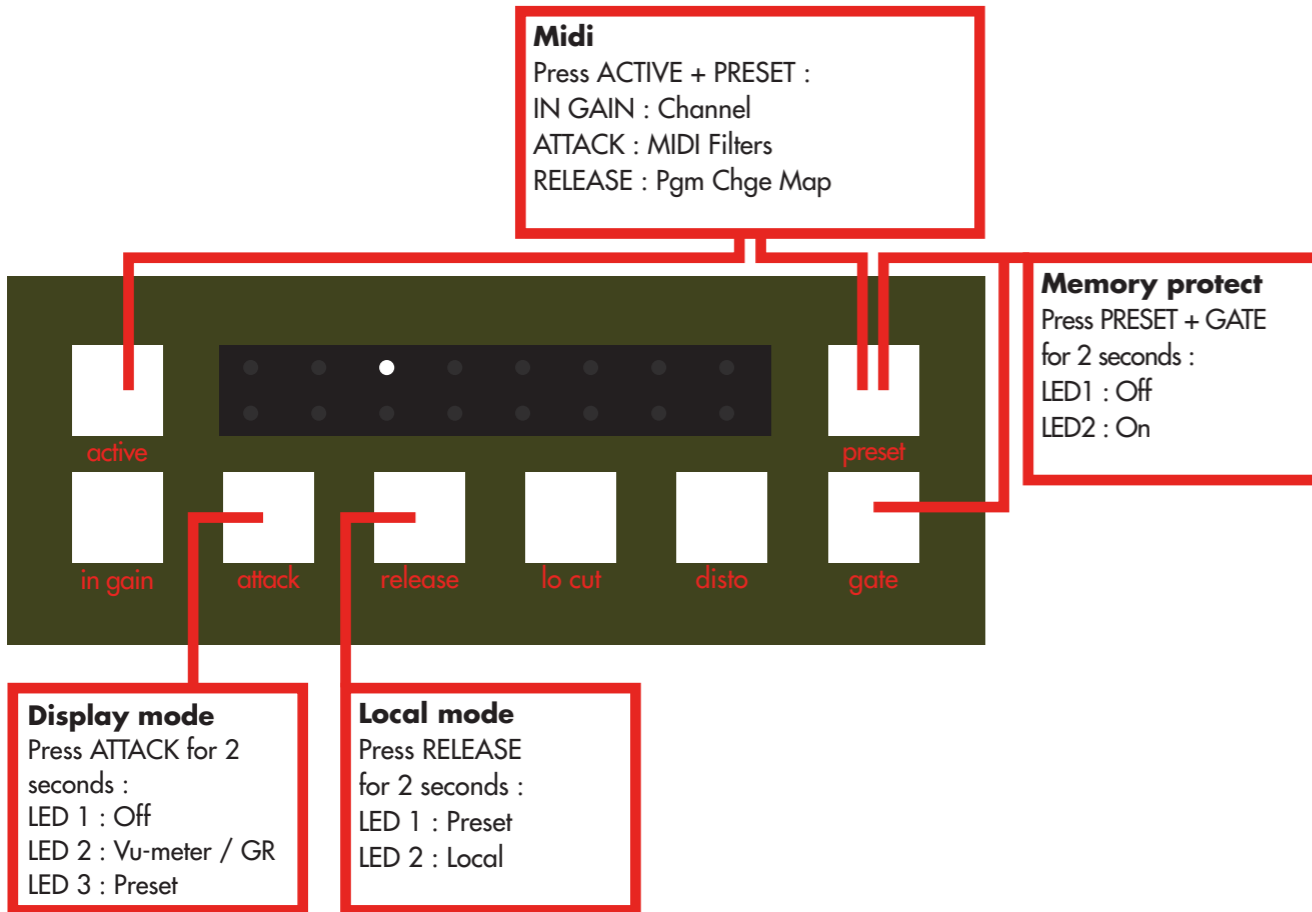
If you want to restore the default system settings, power up BOUM while pressing the ACTIVE and IN GAIN switches.

The ACTIVE and IN GAIN switches are lit and the 16 LEDs will display a little animation for 3 seconds.

If you want to restore the 12 Factory Presets, power up BOUM while pressing the PRESET and GATE switches.

The PRESET and GATE switches are lit and the 16 LEDs will display a little animation for 10 seconds.

SHORTCURTS SUMMARY



ARTWORK : H5 (P. MANAS & L. HOUPLAIN).
ILLUSTRATIONS : PIERRE MANAS.

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Product features, specifications, availability and informations in this manual are subject to change without notice.



Tested to comply with FCC Standards for office use. This device complies with Part 15 of the FCC Rules.

Operation is subject to the following two conditions :

- (1) This device may not cause harmful interference and
- (2) this device must accept any interference received, including interference that may cause undesired operation.

