# JoMoX

# MBase01

### Analog Bass Drum Module

**Operating Manual**

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## Introduction

Thank you very much for using the MBase01! The MBase01 is a great sounding, dedicated bass drum module with a real analog sound production.
Actually it is a single voice analog synthesizer which is optimized for producing bass drum sounds. The MBase01 is fully controllable by Midi. Furthermore, there is an audio input to trigger the sound by a drum pad piezo pick up or an external audio signal.
The usage of this unique drum module is simple and self-explaining at most points. We recommend though to read this manual carefully to let you quickly explore all the MBase01's amazing musical possibilities.

Before we start just some important security instructions:

- Please use the MBase01 only in dry rooms. Please never let fluids or humidity penetrate to the device!

- Only use the original wall wart adapter. Other power supplies may damadge the MBase01 seriously!

- For cleansing of the MBase01, please use a slightly damp cloth, never solvents or agents!

- The MBase01 is a complex electronic device and should therefore be treated carefully!

- If any damadges or malfunctions occur, please immediatly turn off the device, unplug the power supply and contact your local music dealer or send an email to mail@jomox.de.

## 1. Connections

Turn off the device before you connect it to ther devices.
The MBase01 has following connections:

**On/Off 9V DC       Midi In        Midi Out  Trig In  Audio Out**

### 1.1. 9V DC

The provided 9V DC wall wart adapter has to be plugged into this
jack. Please don't use other wall wart adapters.

### 1.2. Midi In

Here you can hook up another midi capable device to control the
MBase01 by either a software sequencer, a controller box or any
other hardware device like e.g. a JoMoX XBase09, XBASE999/888.
Please use a cable that is as short as possible.

### 1.3. Midi Out

Connection of the MBase01 to a midi capable device to receive midi
sys ex dumps or note trigggers from the MBase01. Please use a
standard midi cable which is as short as possible.

### 1.4. Trigger In

Audio input to trigger the bass drum by an audio signal or drum pad.
Connect the Trigger In to an appropriate drum pad piezo pick up or
audio source, for instance the output of a mixer or a CD-Player.
Please use a standard 1/4" audio cable.

### 1.5. Audio Out

Outputs the audio signal of the MBase01. The output is mono
unbalanced and has a line level of about 0 dBu. Hook up the Audio
Out to an appropriate audio mixer or amplifier. Please note that, for
the choice of your amp system, the MBase01 can produce very high
levels at ultra low frequencies! Therefore, a correspondingly powerful
sound reinforcement system makes sense to use for the MBase01.
Please use standard mono ¼" audio cables.

## 2. Functional Description

This chapter describes the most important functions of the MBase01. Together with the following detailed descriptions of the sound and master parameters you will quickly be able to understand the functions of the MBase01.

### 2.1. Listening to preset sounds

As long none of the 16 leds lights up, the MBase01 is in preset mode. With the value knob you can recall 64 pre-programmed factory sounds as well as 10 user-programmable presets. The display shows up **< Pr0 >** to **< Pr9 >** for the user presets and **< r00 >** to **< r63 >** for the factory "ROM" sounds. The factory "ROM" sounds are stored in a flash memory area that can also be written by the user, but the endurance of error-free write cycles is limited by the specs of the microprocessor to about 1000 cycles. (For comparison: a cell phone battery has also a life cycle of about 1000 charge/discharge cycles). So please use the user presets **< Pr0 - Pr9 >** for frequent programming jobs and store the rarely changed archive material in the factory "ROM" or flash area for recall.
With the Play button you can trigger and listen to the sounds.

### 2.2. Control of the MBase01 by Midi

### 2.2.1. Note trigger

The MBase01 processes midi note commands. Thus, it can be triggered by any midi sequencer. If the MBase01 receives midi data on its own channel, a dot under the display lights up. The settings of the various midi functions are printed on the following page.

### 2.2.2. Parameter control by Midi controllers

All sound parameters can be controlled by midi controllers. The controller map can be found in the midi implementaion at the end of this manual.

### 2.2.3. LFO syncronisation with Midi clock

The tempo of the internal LFO can be synced to midi clock to generate rythmic modulations of pitch in the MBase01. All necessary parameters are described in chapter 4 Master Parameter. (please note that midi clock is always sent and received regardless of any midi channel)

### 2.2.4. SysEx Dump

The memory content of the MBase01 (means the presets) can be transferred to a midi sequencer or file player by a sysex dump. Only single presets are sent and received. So you can reorder your presets and store them back in another order. Thus the sysex transmission time is way shorter and doesn't make trouble with newer sequencer systems, which are less capable of handling continous midi data streams.

### 2.2.4.1. Transmit dump

Set the connected midi device to record mode, activate the 2$^{nd}$ function and press the down button until "dMP" appears in the display. Transmission of the sysex dump is triggered by pressing the click of the value knob. The display reads "rDY".

### 2.2.4.2. Load dump

Activate the 2$^{nd}$ function and press the down button until the display reads " Ld" (load). By clicking on the value knob you set the device into record mode, which is displayed by a flashing LED display. As soon as you play back a previously recorded sysex dump, the MBase01 acknowledges the received preset by displaying "fin". The data is automatically stored in the actual preset number.

### 2.3 Control of the MBase01 by Trigger In

The Trigger In is an analog input which lets the MBase01 to be triggered by an audio signal, a click track or a drum pad pick up. It works in parallel to the midi control, so that triggering by midi and by analog trigger is possible at the same time. Also you can change the sound parameters by midi controllers during the triggering by Trigger In.

If the Trigger-In of the MBase01 receives a signal, the decimal dot next to the second digit flashes if the trigger mode was set to <diG>. Let's explain the usage of the Trigger In more detailed:

### 2.3.1. Triggering with a drum pad

- Just hook up an appropriate drum pad pick-up to the Trigger In.
- Adjust the trigger level with EXT TRIG to about <100>.
- Set Ext Env to <EnL> (Envelope Trigger).
- Set Trig Mode to <AnA> (Analog Trigger).
Increase the EXT TRIG level of the MBase01 until the device gives out a sound with a beat on the pad. Now you can adjust precisely how sensitive the MBase01 reacts to the velocity of your drum playing. Have fun!

### 2.3.2. Triggering with an audio signal

The MBase01 can be triggered by any audio signal. The audio material has to have enough high peaks to trigger the MBase01 properly. The higher and shorter those peaks are, the more precisely the triggering. Maybe you have to provide an own channel for triggering in the mixer setup and lower the bass EQ in it, although the direct signaling works perfect in most cases.

- Hook up the audio source (DJ mixer, CD player, etc.) to the MBase01.
- Set the Trig Mode to <diG> (Digital Trigger).
- Adjust the sensivity / trigger level with EXT TRIG to <000> and increase the value until the MBase01 triggers properly.
With this feature you can assert additional bass or a complete new kick drum to a DJ setup - without the need of a beat extractor or other additional tools. If the bass of the original signal is cut by an EQ, the MBase01 can totally replace the kick drum of the original track.
Another option is the enhancement of bass for weak and flat sounding drum loops. There is no easier way for bass drum replacement!
If the trigger level is set too high, then the input circuitry is overloaded and some part of the audio appears at the output heavily distorted (also depending on the trigger mode setup). This doesn't damadge the MBase01, and some of you might use this as a sound effect. Anyway...have fun whilst experimenting with your new JoMoX MBase01!

## 3. Sound Parameter

**Choosing with up/down buttons, change value with value knob**
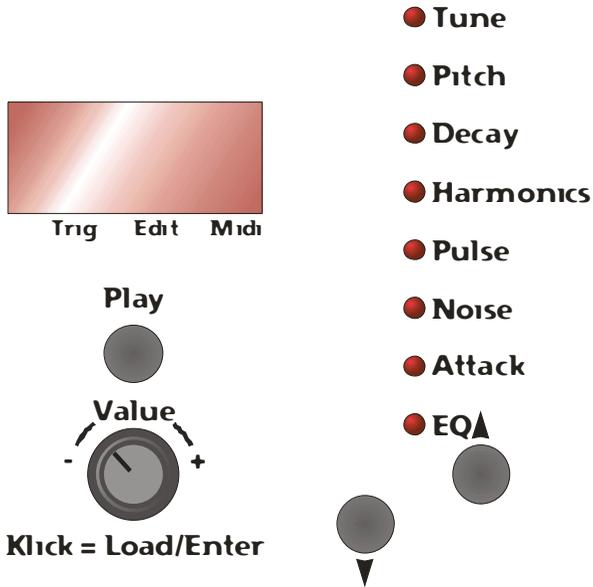


### 3.1. Tune                    < 000-255 >

This parameter determines the intensity of tune change. On a synthesizer this would be the modulation intensity of a simple envelope (Attack=0, Decay fixed adjusted) to the pitch of the VCO. A high value makes the typical 909 kick-in-the-gut effect, and a low value makes softer, 808-styled kick drums and bass tones.

### 3.2. Pitch                   < 000-255 >

This parameter determines the basic pitch of the bass drum. Sub basses down to 10 Hz or relatively high tones are possible. Don't mistake this with the Tune parameter. With most kinds of

instruments this parameter is called "tune", but because everybody knows the 909 and its specific tune, we called it pitch.

### 3.3. Decay                    < 000-255 >

Controls the decay time (length) of the kick drum.

### 3.4. Harmonics              < 000-255 >

Control of harmonics of the VCO. The almost sinusoid wave form of the kick drum oscillator can be continously shaped into a parabolic wavform. That results in a harder, timpani-like sound that differs clearly from a simple distortion.

### 3.5. Pulse                   < 000-255 >

Change of the pure pulse part of the attack (see also attack parameter). Pulse is a clicking pulse shape waveform at the begin of the kick drum which goes to the VCA.

### 3.6 Noise                    < 000-255 >

Change of the pure noise part of the attack (see also attack parameter). Noise makes a more clap-like (or wet) sound in the attack. Please note that the EQ parameter also influences this sound. With high EQ values you will hardly or not hear the noise part of the kick drum, because the high frequencies of the noise are filtered by the EQ.

### 3.7. Attack                  < 000-255 >

Important for the understanding of the bass drum attack section is the following: Pulse and noise are mixed together and the mix is controlled again by attack intensity. If zero is set here, you won't notice any change on pulse or noise. If attack or pulse is set to zero, the signal flow is interrupted for them individually. So you can

achieve bass drums without any attack, or only pulse or only noise, or even the mix of them together.


### 3.8. EQ                                    < 000-255 >

Smoothes the output of the kick drum sound production with a flat slope filter. For a value of 000 the filter is opened at maximum, for 255 closed at maximum. Note: changes of the noise parameter can only be heard with an opened filter.


### 3.9. Value knob

Please note that the value knob uses an encoder with 2 detents per value step. This is because of the specs of the used encoder part and not a malfunction.
The value knob is used for selection of a preset or adjustment of parameter in edit mode. As soon a value is changed, it is indicated by a lighting red dot right down in the display (Edit On).
By clicking on the value knob (pressing it) during any edit modes the preset can be reloaded from memory and the Edit On display disappears. The click function serves also as an enter key for some functions like storing of parameters and sysex dump.


### 3.10. Play button

Manual trigger of sound.
Selection of 2nd function by pressing play and up button simultaneously. See also 4.9. 2nd function.

## 4. Master Parameter

**Selection with up/down buttons, changing values with the value knob. If after 5 seconds no further input is made with the value knob, the unit switches automatically back to sound parameter or preset selection.**

MidiCh ● Ext. Trig
Split Mode ● Ext. Env
Pitch Mode ● Trig Mod
LFO Wave ● Sys Dmp
LFO Speed ● Sys Load
LFO Int ●
LFO Sync ●
Store ●

Trig   Edit   Midi

2nd Funct
Up+Play

Play

Value
-  +

Klick = Load/Enter

### 4.1. Midi Ch(annel)          < 001 - 016 >

Defines the midi channel on which the MBase01 sends and receives midi. Following midi data is received: note on/off, -number, midi-clock, program change, CC controller, sysex data. Transmitted data: note on/off, -number, program change, sysex data.

### 4.2. Split Mode          < SM1 / SM2 >

<SM1> The bass drum is only played by standard note C1 with the internally stored pitch.
<SM2> The bass drum is played over the whole keyboard, varying the pitch of the VCO depending on the key pressed.

### 4.3. Pitch Mode          < Lin / SEM >

<Lin>  The bass drum pitch (the VCO frequency) is output as a linear frequency over the keyboard in Split Mode 2 (see above).
<SEM> The bass drum pitch (the VCO frequency) is output in musical semitone intervals over the keyboard.  The usable range is approximately 3 octaves. So it is possible to turn the MBase01 into a little bass synthesizer, if you turn tune low and decay long. The long decaying tone can now be played in melodies.


### 4.4. LFO Wave          < SuP / Sdo / tri / reC >

With the LFO you can produce periodic pitch changes (vibrato). The wave parameter determines the LFO wave form:
<sup> saw up / saw tooth with ascending ramp /|
<sdo> saw down / saw tooth with decending ramp |\
<tri>  Triangle / trianglular wave form with ascending and descending ramp /\
<rec> Rectangular / jumping from maximum to minimum value.


### 4.5. LFO Speed          < Mid / 041-290 >

Speed of LFO modulation. This value displays the speed of the LFO directly in BPM (Beats Per Minute). Each waveform runs through once in a quarter of the selected tempo beat.
<Mid> The lowest value shows midi-clock syncronisation. The speed of the LFO is controlled by midi-clock and adapts to the speed of the master sequencer. Also with midi-clock the waveform runs through once in a quarter of the received beat clock.


### 4.6. LFO Int(ensity)          < 000-255 >

Controls the intensity of the LFO. A value of 0 shuts the LFO off.


### 4.7. LFO Sync          < FrE / SYn >

<FrE>   The LFO runs free.
<SYn>   The LFO restarts with each key trigger. For instance, it is also suitable to use the LFO as a second pitch envelope.

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## 4.8. Store

I you want to store a sound preset, go on Store. The display blinks and shows the current preset number. Now select the wanted preset number you want to store the sound to by the value knob if it is different to the current one.
Clicking on the value knob performs the storage process. This automatically contains a copy function, because if you store a non-edited preset to another location than the actual preset, the MBase01 stores an identical copy of that preset to the other location.

## 4.9. 2nd Functions

**Select by pressing UP and PLAY button at the same time (upmost LED flashes). If not an input is made by the value knob or the up/down buttons within 5 seconds, the  device returns to sound parameter or preset selection.**

### 4.9.1. Ext(ernal) Trig(ger) 2nd Funct < 000 - 255 >

Controls the sensivity of the Trigger In. The higher this value is, the more sensitive is the input and so it can be well adapted to any kind of the used audio/trigger source.
The value is stored globally if a sound preset is stored (see 4.8. Store).
If the Trigger In is overloaded by the trigger source, the signal can be heard heavily distorted at the output of the kick drum.
This also depends of the following parameters Ext Env and Trig Mode. This, being an unwanted but harmless side effect, can be used to whatever musical expressions are wanted.

### 4.9.2. Ext(ernal) Env(elope) 2nd Funct < int / EnL >

<int> The analog envelope of the trigger signal does not influence the volume envelope of the  bass drum. The trigger input is a bit less sensitive.

<EnL> The analog envelope of the trigger signal does affect the volume envelope of the bass drum in a small range. The trigger input is more sensitive in general.

### 4.9.3. Trig(ger) Mode 2$^{nd}$ Funct < AnA / diG >

<AnA> The trigger signal triggers only the internal analog trigger circuitry. This makes the bass drum sound very dynamic to the trigger signal. But the LFO can not restart (sync) to the analog trigger and the attack signals are very dependent from the trigger source, which is good for pad triggering of the MBase01. This mode is very useful for playing the MBase01 dynamically by hand or feet with a trigger pad.

<diG> The trigger signal triggers also the digital processor and starts a global trigger which is displayed in the LED display by flashing of the mid decimal point. Therefore the triggering is very sensitive and the sound is almost not influenced by the trigger signal. The attacks are very precise and the LFO can restart and sync on the beat. This mode is very useful to post-process steady running club material from CD or vinyl.

## 5. MBase01 Midi Implementation

### 5.1. Sound Parameter

| BASS DRUM | Controller No. | Value range | Internal resolution |
|-----------|----------------|-------------|---------------------|
| Tune | 100 | 0..127 | 256 |
| Pitch | 101 | 0..127 | 256 |
| Decay | 102 | 0..127 | 256 |
| Harmonics | 103 | 0..127 | 256 |
| Pulse | 104 | 0..127 | 256 |
| Noise | 105 | 0..127 | 256 |
| Attack | 106 | 0..127 | 256 |
| EQ | 107 | 0..127 | 256 |

### 5.2. Note Commands

| Instrument | Split Mode 1 | Split Mode 2 |
|-----------|--------------|--------------|
| | Note Number | Note Number |
| Bass Drum | C1   (36) | C1..F3 |

## 5.3. System Exclusive Data

Only actual chosen preset hex dumps are sent and received with Sys Ex data because the sound control is normally done with midi cc controllers.

The System Exclusive control command line looks as follows:

$F0(SysEx begin), $31(JoMoX- manufact. code), $7F(Command Sys Ex dump), $57(Product code), $XX(Preset No.),XX(Data0),XX(Data1),..., $F7(End of SysEx)

12 bytes (0..255) of data per preset are transmitted. They are split into MSB (bit 7) in Data0 and LSB 0..127 in Data1. The MSB (Most significant bit) is coded in Data0 = 1 or = 0, depending if bit 7 of the actual byte was set or cleared.

The numbers and digits of Sys Ex sequences are shown, as always, in hexadecimal signs.

And finally...

Service, tips and tricks:

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We wish you lots of fun on creative usage of our products!

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