CRUMAR

MOJO 61



PHYSICAL MODELING
ORGAN AND ELECTRIC PIANO

USER'S MANUAL

www.crumar.it

Congratulations! You are now the lucky owner of the new Crumar Mojo 61, one of the finest digital keyboards of the modern era. It is a high quality instrument entirely conceived, developed and built in Italy with premium quality parts. This instrument is the the result of years of research in sound design, quality electronics and has been assembled with first class craftsmanship.
This new model follows in the footsteps of its predecessor produced from 2016 to 2026 with remarkable market success, establishing itself as a true standard for countless musicians worldwide. Its features and ergonomics remain unchanged, but the new version offers a reduced weight and is equipped with the renowned PULSE 6105WF waterfall keybed, made famous by our CRUMAR DK61 MIDI controller.
Experience, design, and technological development come together in a single instrument: Crumar Mojo61. We wish you many years of enjoyment and good music with your new Mojo 61, and, if we may give you a small piece of advice... you guessed it... please read this manual in its entirety and keep it in a safe place for future reference! Have fun!

The Crumar Team.

SAFETY INFORMATION

- Do not open the instrument. The instrument can be opened and repaired only by qualified personnel. Unauthorized opening voids the warranty.
- Do not expose the instrument to rain or moisture.
- Do not expose the instrument to direct sunlight.
- Be careful not to infiltrate powders and liquids inside the instrument. Nor on the outside.
- If liquids get inside the unit, remove the power immediately to prevent the risk of electric shock and contact a service center as soon as possible.
- Do not clean using abrasive cleaners as they may damage the surface.
- Please keep all packaging in case you need to transport the instrument to a service center.
- The instrument can be used in any Country that has a mains voltage between 100 Vac and 240 Vac.
- Do not touch the AC adapter with wet hands.

WARRANTY

- Crumar Mojo 61 is subject to 12 months manufacturer's warranty.
- Warranty extensions are at the discretion of the retailer.
- Damages caused by misuse, improper maintenance or transportation are not covered by this warranty.
- During the warranty period, the customer is entitled to repair or replacement of any parts considered defective at no charge.
- The possible replacement of the entire product is at the manufacturer's discretion.

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CONVENTIONS USED IN THIS MANUAL

Every time a button, an LED or any other control is referenced, it is done by the number that has been associated to it in the drawings found in chapters 3 to 8. When you're invited to "press & hold" a button, it is intended that the button should be kept depressed for at least 2 seconds.

You will find that some concepts might be repeated more than once, this happens because there could be a mention in a chapter, and a detailed explication in a later chapter.

We recommend you to read this manual with the instrument in front of you, so you can put into practice what you are reading and you can have an instant feedback of the notions here explained.

1. THE SOUNDS OF MOJO 61

VB3-II virtual tonewheel organ

This is the exact same software that powers the Crumar Mojo Classic and presents the same parameter set. VB3-II is the result of many years of study, research, experimentation and development of the simulation of a vintage Hammond B3 organ. It is the evolution of the GSi VB3 software which is still available as a plugin for digital audio workstations. In the last 15 years it has been considered the best simulation of a tonewheel organ by some of the most acclaimed jazz and rock organists and organ techs. The Crumar Mojo organ line is a best-seller in the "Clone Organ" market and now the new Mojo 61 offers you the possibility to take advantage of one of the best clone organs ever without compromises.

Pipe Organ



A pipe organ is not something you see every day, there are thousands of different pipe organs that differ by the number of stops, the number of manuals, the number and the type of pipes, their size, their position, etc. but we wanted to keep it simple and offer a pipe organ that would be easy to understand and inspiring to play, so we chose to offer a Baroque-style organ based on a single manual and 9 stops plus 3 couplers and the classic "tremulant" effect. This synth engine works as an hybrid synthesizer, uses additive synthesis and physical modeling, there are no samples involved. The expression pedal responds naturally and varies the amount of air that passes through the pipes. There is a total of 776 virtual pipes.

Combo Organs



The Mojo 61 features two simulations of very famous Italian transistor organs of the seventies, the VOX Continental and the Farfisa Compact DeLuxe. Each of these organs is simulated in every detail, reproducing the essence and the exact color of that gritty organ sound that was the cornerstone of rock bands like the Doors, the Pink Floyd and similar. The polyphony is full (all 61 notes at the same time) and all controls behave exactly like in the original instrument. One note: since both these organs were originally based on 49-note keyboards, we chose to bring the pedalboard tones to the first octave. The pedalboard tone has no settings.

Tines Electric Piano



There's no keyboardist without a good Rhodes electric piano sound. And the Mojo 61 offers what can be considered the best fusion between sound fidelity and playability. This synth engine is based on more than 10 years of experience on the **physical modeling simulation of a Rhodes electric piano**, everything in the "body" of each single note from the attack transient to the very last decay is purely simulated. Some minor elements are added from selected sampled sources, but the most important part of the sound is pure synthesis. Every element of the mechanical piano is virtually reconstructed in the Mojo 61, from the hammer, the hammer-tips, the tines, the tonebars, the pick-ups, the dampers, the output filter straight to the output jack, and they all behave exactly like in the real thing. Each of the 88 notes is simulated individually, and each note is a generator on its own, thus offering the full polyphony, no note stealing and a very natural and true to the original behavior. Plus, this new simulation features a very realistic sympathetic resonance that involves the whole "harp" that can vibrate and resonate every time a key is struck. It is really hard to tell the Mojo simulation from a real Rhodes piano, the level of realism and the number of details is very high.

Reed Electric Piano



Similarly to the previous instrument, the simulation of a Wurlitzer 200A electric piano is totally based on **physical modeling** with only a minor addition of sampled material. Same technique as before, every part of the mechanical piano is virtually reproduced in order to obtain the maximum level of realism and playability, including the sympathetic resonance. This piano has 64 notes and all of them can play at the same time.

Clavi Electric Piano



What's the funkiest keyboard ever? The Clavinet D6! And it's also one of the most sought-after vintage keyboards of the 2000's and probably one of the rarest to find on the used market. The Mojo 61 offers a simulation that will literally blow you away! This is pure **physical modeling**, no samples were used whatsoever and every single note is a generator on its own, just like the previous three instruments in this list. Every detail from the original stringed keyboard instrument is simulated and the polyphony, once again, is full (60 notes). This electric piano has no sustain pedal, but still it behaves like any other electro-acoustic instrument, has sympathetic resonances, reproduces the woollen yarn damper sound upon note release, and offers the exact same control set as a Clavinet D6: there are the four filters, the two pickup selectors and the damper lever. If you listen close enough, you'll also notice that the first 23 strings are round wound resulting in a fuller sound than the rest of the keyboard. No detail was left out in this simulation!

Acoustic Grand Piano

This sample-set comes from the factory sample library of the GSi Gemini and is based on the GSP-01 "Adaptive Sample Player" synthesis engine. It features a special "**Physical Modeling Piano Harp Resonance Simulator**" that adds natural resonances to the sound mimicking the behavior of a real piano harp. This is the only sound of the Mojo 61 that is mostly based on pre-recorded material and has no editing parameters.



Please note: each keyboard instrument simulated by the Mojo 61 respects the keyboard extension of the original instrument, so the tonewheel organ allows 61 notes for the two manuals and 25 notes for the bass pedalboard, the Pipe Organ allows 61 notes, both Combo organs feature 49 notes plus 12 bass notes on the first octave, the Tine piano allows up to 88 notes, the Reed piano allows 64 notes, the Clavi has only 60 notes (please notice that the first 5 notes of the keyboards will be muted), and the Acoustic Piano has 88 notes.

Tremolo / Auto-panner / Wha-Wha

Mojo 61 offers electric pianos and organs, so how could we miss such important effects in the chain? The Tremolo is a must in mono mode when combined with the Reed EP, and sounds great in square stereo with the Tines EP. And the Wha-Wha sounds so funky in combination with each and every piano sound.

Stereo Phaser

This is a 4-stage stereo phaser (two individual phasers slightly shifted), and offers parameters such as LFO speed and depth. Sounds great on the electric piano sounds.

Stereo Chorus

We've been listening to a selection of chorus effects for keyboards and guitars, ranging from the early analog BBD choruses up to the modern digital ones, but one that works really great on a vast variety of sounds is the two-voice BBD-based stereo chorus that Roland included in the RD-1000 and in many others of their instruments of the eighties. This is a simulation of that very chorus and sounds really great with the electric pianos.

Amp Simulator

And here comes the boutique amp collection. This processor simulates five among the most used guitar and bass amps of all times: the Fender Twin, the Marshall JCM-800, the Vox AC30, the Roland Jazz Chorus and the Fender BassMan. Each amp features a 3-way equalizer and an adjustable overdrive.

Rotary Effect Simulator

There's no VB3-II without a great rotary effect. This is the exact same rotary effect featured in the Crumar Mojo, offering the same control set and the same sound.

Digital Reverb

This is a great sounding digital reverb that brings light and air to your sound. Sounds soft, smooth and deep, precise and alive, airy and so much realistic that's a real joy to have some in the mix.

Equalizer

This section contains a very basic 3-band equalizer. Use it to shape your sound for a perfect match with your amplification system.

3. THE COMMAND PANEL – part 1

In this chapter we get familiar with the command panel of the Mojo 61; for a better readability, the panel has been split into three parts. Numbers are used to reference to each control later in this manual.

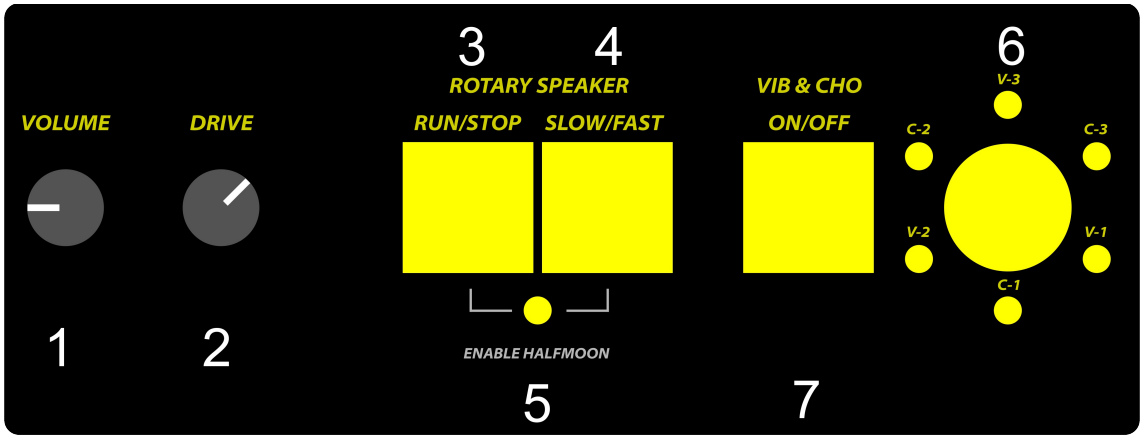


Fig. 1 - Command Panel part 1

1. Volume knob.

2. Drive knob, adjusts the overdrive level when the Rotary Speaker effect is active on VB3 and when a Static Amp is active on Combo organs or Electric Pianos.

3. RUN/STOP: press to stop the rotation of the Rotary Speaker effect, the corresponding LED will turn on; press again to re-start the rotation, the LED will go off.

4. SLOW/FAST: press to switch between the two speeds of the Rotary Speaker effect. The corresponding LED animates accordingly. Please note that the LED animation is not synchronized with the sound, it's only there for a better visual feedback. When the STOP speed is engaged, the LED animation halts. Depressing this button while in STOP mode will switch the speed and the LED will start animating again, even though there will be no effect on the sound until the STOP is disengaged using button n. 3.

5. This LED indicates that the support for the optional "Half-Moon" switch has been enabled, in this case buttons 3 and 4 are unresponsive. To enable and disable the "Half-Moon" support, press buttons 3 and 4 together.

6. Press this button to switch cyclically between the Vibrato/Chorus options. When playing VB3, there are 6 options (C1, C2, C3, V1, V2, V3); when playing the Combo organ "Compact DeLuxe" , only 4 options are available.

7. This button enables/disables the Vibrato/Chorus effect on the selected manual.

4. THE COMMAND PANEL – part 2

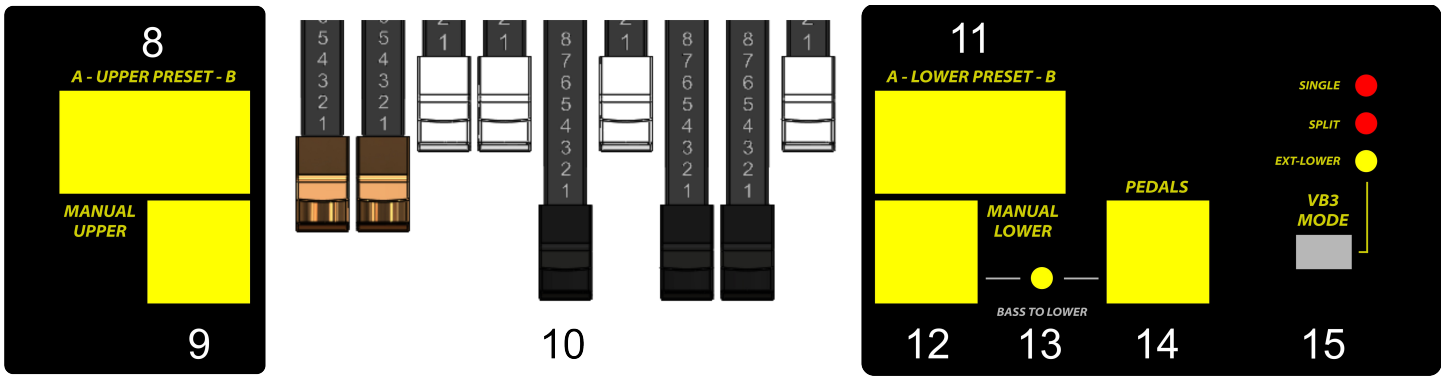


Fig. 2 - Command Panel part 2

8. Presets for the upper manual.

9. Upper manual selector / Upper HOLD function.

10. The drawbars. These are used for all organ sounds the Mojo 61 offers.

11. Presets for the lower manual.

12. Lower manual selector / Lower HOLD function.

13. This LED indicates the status of the "Bass-to-lower" function that can be enabled and disabled by pressing button n. 14 and then button n. 12.
It's possible to keep the PEDALS button depressed for 2 seconds to activate a split between the pedalboard and the lower manual.

14. Pedalboard selector.

15. MODE selector. Press to switch between SINGLE and SPLIT, press and hold to activate the EXT-LOWER mode.

5. THE COMMAND PANEL – part 3

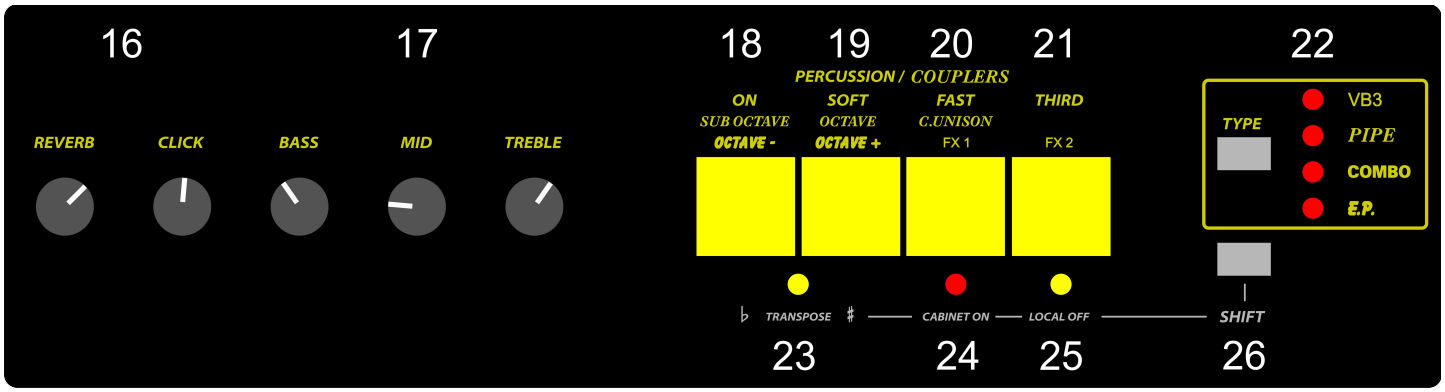


Fig. 3 - Command Panel part 3

16. Knobs for adjusting the Reverb level and the amount of key-click produced by VB3 and the Combo organs.

17. Equalizer section, works on top of everything.

18. Multi-function button n. 1.

19. Multi-function button n. 2.

20. Multi-function button n. 3.

21. Multi-function button n. 4.

22. Instrument type selection. Press this button to cycle between the four basic sounds (VB3, Pipe organ, Combo organ, Electric piano) from top to bottom. Pressing this button along with the SHIFT button cycles from bottom to top.

23. This LED indicates whether the transposition has been enabled.

24. This LED indicates the status of the Rotary Speaker effect or the Static amps.

25. This LED indicates whether the LOCAL-OFF function has been enabled. In a normal playing situation this LED should be off.

26. The SHIFT button. It is used in conjunction with other buttons for alternate functions and shortcuts that will be explained later in this manual.

6. THE REAR PANEL

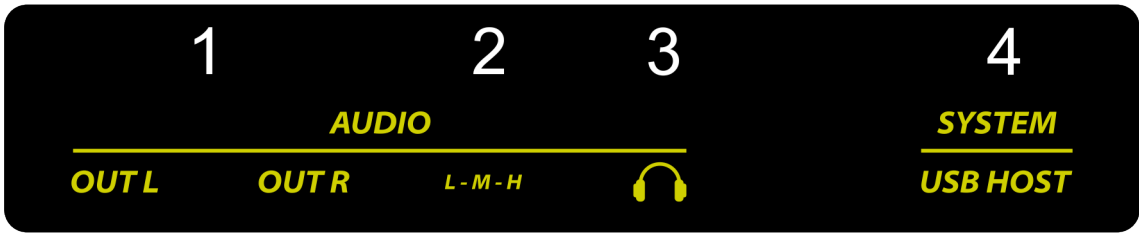


Fig. 4 - Back panel part 1.

1. Analog, line level, balanced, stereo audio output. Use your jack cords to connect the Mojo 61 to your amplification system. Preferably, use balanced cables.

2. Output level selection. The optimal choice is to leave this selector in the middle position (+4 dB); if you're connecting it to a home "consumer type" hi-fi system, use the "L" position (-10 dB); for more power use the "H" position.

3. Headphone output, max load = 32 ohm (check with your headphone specs). Best performance with studio grade 55 ohm headphones.

4. System USB 2.0 Type "A" ports, used for firmware updates and other connections.

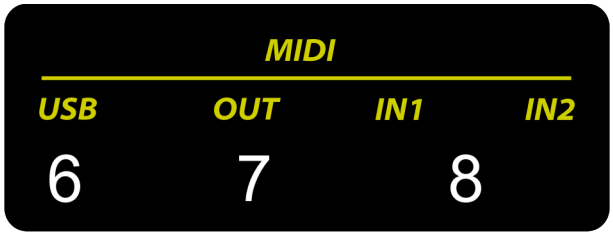


Fig. 5 - Back panel part 2.

6. Class-compliant USB-MIDI IN/OUT port, can be used to connect the Mojo 61 to your computer without using an external MIDI interface. It's used also for the connection of the USB Online editor.

7. Your Mojo 61 can also be used to control other MIDI equipment, this is the usual MIDI output socket.

8. These are two MIDI inputs internally merged together. If you want to connect an external keyboard to control your Mojo 61, just pick one of the two, they're identical. There are two because you might also want to connect a pedalboard, so you don't need an external MIDI Merger unit. These 2 MIDI IN connectors are capable of "Power-over-MIDI": this means that, if you connect a compatible "CRUMAR" " Power-over-MIDI" unit, for example our Mojopedals or our Lower Manual, this connection is also providing power to the connected accessory if a MIDI cable with 5 wires is used. "Power-over-MIDI" is not standard, every manufacturer uses its own system. Connectins something incompatilbe can damage your unit.

7. CONNECTING CONTROL ACCESSORIES

There are three additional Jack sockets on the back of the Mojo 61 that are used to connect pedals or the "half-moon" 3-way switch.



Fig. 6 - Pedal inputs.

9. Connect a traditional sustain pedal to this jack; the polarity is automatically detected when the instrument is powered on, so please make sure that the pedal is already connected before powering on.

10. Connect a 10-K ohm expression pedal to this jack; our Crumar long-throw pedal is the perfect choice, but other third party pedals might be compatible as well.

11. Half-Moon or Foot Switch input socket. Here you can connect our dual foot switch or our half-moon switch; the latter is activated by pushing buttons n. 3 and n. 4 together. You can secure it to the chassis of the instrument (or Lower Manual) using the screws that are coming with our halfmoon (HMS-20-BK).
This socket also accepts the dual foot switch (our CFS-12) that works concurrently with the panel buttons n. 3 and n. 4.

ABOUT THE SUSTAIN PEDAL

The sustain pedal is normally used when the Electric Piano sound is active and functions as a normal piano sustain pedal. However, when VB3 is active and the Rotary Speaker effect is on, the sustain pedal can be configured in a variety of ways by selecting the proper option in the editor's home page. It can switch Rotary speeds in latched or momentary mode, sustain the upper, the lower or both manuals, or just send the MIDI CC # 64 (pedal hold as per General Midi specifications).

8. HOW TO TURN THE MOJO 61 ON

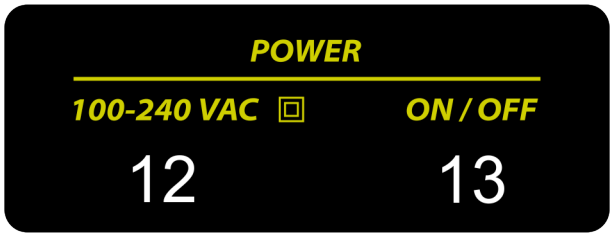


Fig. 7 – Power section.

The Mojo 61 comes with an AC cable, one end goes to the power outlet, the other end goes to the power socket on the back of the instrument, labeled with number 12. Push the switch n. 13, after a second you will see all the lights illuminating the control panel, and after 8 more seconds the instrument is ready to be played.

9. ALL ABOUT VB3

VB3 is the first instrument that can be selected by pushing the button n. 22 labeled TYPE. It is the simulation of a tonewheel organ and is the main sound engine of your Crumar Mojo 61. Just like the original organ, it consists of three manuals, the upper, the lower and the pedalboard, even though we have only one physical keyboard and one set of 9 drawbars. Nevertheless, Mojo 61 offers some smart solutions to make it fun and easy to play even without the additional lower keyboard.

First, select which MODE you wish to play by using button n. 15. It is very important, because the MODE establishes which manual the keyboard plays and which manual the drawbars must control.

Second, select which manual you're going to play and/or to control, by using the buttons n. 9 for the upper manual, button n. 12 for the lower manual, button n. 14 for the pedalboard.

Now an example is given in order to explain how different modes work. Let's assume that the upper manual is selected.

- MODE = SINGLE: the keyboard plays the upper manual and the drawbars control the upper manual registration;

- MODE = SPLIT: the keyboard is split in two parts, the left part plays the lower manual, the right part plays the upper manual; the drawbars control the upper manual (which, in this example, is selected); if we select the lower manual, the keyboard remains split but the drawbars will now control the lower manual;

- MODE = EXT. LOWER: the keyboard always controls the upper manual, the drawbars will control the manual that is currently selected. This is because the lower manual is expected to be played from an external MIDI keyboard.



The playable extension of the VB3 organ is 61 notes, from C (note 36) to C (note 96). Applying the transposition would not affect the playable extension, thus resulting in having mute notes at one of the extremes of the keyboard.

CHORUS / VIBRATO

VB3 supports the 6 selections of Chorus or Vibrato, just like the original tonewheel organs, and separate activation on the upper manual and/or the lower manual (that also includes the pedalboard) by using only one button. When the upper manual is selected, button n. 7 and its LED relate to the upper manual; when the lower manual or the pedalboard is selected, button n. 7 works on the lower manual. Of course the status (on or off) is remembered. *Shortcut: use button n. 7 along with the SHIFT button to toggle the effect on the other manual.*

DRAWBARS

We assume you already know what drawbars are and how they affect the sound of a tonewheel organ. If you don't, we invite you to search the web and read one of many documents that explain how tonewheel organs work. Our sole intention, in this chapter, is to explain that the 9 drawbars can work for both the upper manual and the lower manual, and the first 3 work for the pedalboard.

	1	2	3	4	5	6	7	8	9
VB3	16'	5-1/3'	8'	4'	2-2/3'	2'	1-3/5'	1-1/3'	1'
PIPE	Bourdon 16'	Fagotto 16'	Principal 8'	Flute 8'	Trumpet 8'	Oboe 8'	Flute 4'	Piccolo 2'	Mixture
COMBO F	Bass 16'	Strings 16'	Flute 8'	Oboe 8'	Trumpet 8'	Strings 8'	Flute 4'	Strings 4'	2-2/3'
COMBO V	16'	8'	4'	IV	Sinus	Master			
TW-BASS	16'	8'	RELEASE						

Fig. 8 - Drawbar function table.

Have a look at figure 8. The row labeled "VB3" indicates the pitch of each drawbar; the row labeled "TW-BASS" indicates that the first drawbar adjusts the 16' of the pedalboard, the second drawbar adjusts the 8' and the third drawbar adjusts the release time (simulation of the "string bass" function). Of course, in order to have drawbars adjusting the pedalboard, you have to select the pedalboard by pushing button n. 14. *Don't forget, first make sure which manual you have selected, then move the drawbars*.



Despite the printed digits from 1 to 8 and the 15 "clicks" that you feel when moving the drawbars, they actually send 128 MIDI values from 0 to 127. Drawbars are just like normal slider pots, only with the shape and the look of organ drawbars.

DRAWBAR PRESETS

Each manual (upper and lower) supports two "drawbar presets"; upper manual uses buttons 8A and 8B, lower manual uses buttons 11A and 11B. They work just like the reversed color keys of a console tonewheel organ, exactly the same way. They only store the values of the drawbars. When a preset is activated, moving the drawbars won't make any change to the sound; when a preset is activated on the upper manual, the percussion is disabled; to re-enable the drawbars, just re-select the manual you wish to control.

How to save a drawbar preset: select the desired manual, set the drawbars in the desired position, press and hold the desired preset button. You'll see the LED quickly blinking only once, indicating the end of the process.

THE HOLD FUNCTION

Probably you've noticed that, next to the labels “Upper” and “Lower”, there's a smaller label that reads “HOLD”. This is a special function that, when activated, momentarily disconnects the drawbars from the sound, allowing you to adjust the drawbars without affecting the sound, and get instantly to the new registration, as if it were a stored preset, the exact moment you deactivate the HOLD function.

Example: select the upper manual, set the drawbars the way you like and play a chord; now press the upper manual selection button again (button n. 9), you'll notice that the corresponding LED starts flashing; now move the drawbars to a new registration while still keeping the chord playing... hear, nothing changes to the sound; now push the HOLD button again. The new registration is now playing.

This is pretty much what organists use to do with console organs that have two drawbar sets per each manual.

PEDALS TO LOWER

To activate or deactivate this function, first press and hold the pedalboard selection button n. 14 and then press lower selection button n. 12. The yellow LED n. 13 stays on if this function is enabled. This function makes it possible to play the pedalboard tones along with the lower manual, one stacked on top of the other, with the difference that the lower manual will play across the whole keyboard, while the pedalboard will only play across the lower 25 notes. To activate a split between the pedalboard and the lower manual, keep the button n. 14 “PEDALS” depressed for two seconds.

PERCUSSION

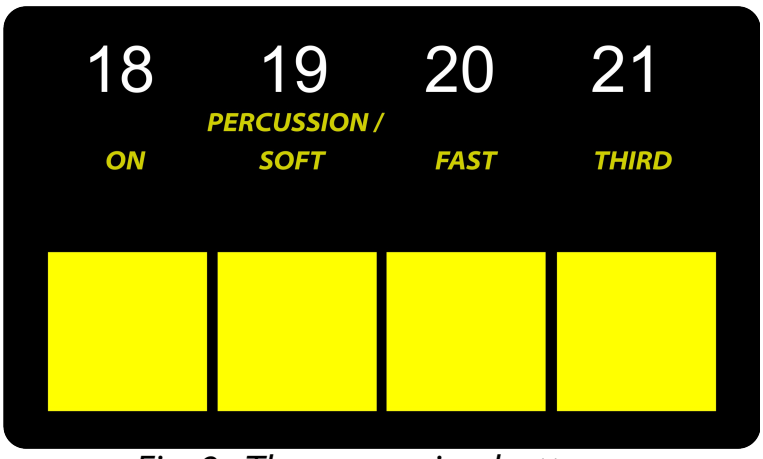


Fig. 9 - The percussion buttons.

It's a short, percussive sound that's added on top of the drawbar sound with the aim to reinforce the attack transient, adds something special to the organ sound.

– Button n. 18: Turns the percussion on or off. Please note that the percussion only works on the upper manual and, when activated, disables the sound of the last drawbar, exactly like in the original tonewheel organ.
– Button n. 19: if activated, the percussion volume is “soft”; otherwise it's louder.
– Button n. 20: selects the percussion decay time, a short (fast) decay when it's on, or a longer (slow) decay when it's off.
– Button n. 21: selects the harmonic used for the percussion sound, the third harmonic (drawbar n. 5) when it's on, second harmonic (drawbar n. 4) when off.
–

10. PLAYING THE PIPE ORGAN

Press the TYPE button n. 22 to shift to the next sound, the Pipe Organ. This is a one manual organ with 9 stops, 3 couplers and the tremulant motor. *One important thing: remember to increase the Reverb level a bit when playing this sound!*

PIPE	Bourdon 16’	Fagotto 16’	Principal 8’	Flute 8’	Trumpet 8’	Oboe 8’	Flute 4’	Piccolo 2’	Mixture

Fig. 10 - Pipe organ stops.

The drawbars, in this case, will function as on/off switches, just like the “stops” of a real pipe organ that can be pushed in (off) or pulled out (on). The middle position is the threshold, and the on/off transition is smooth. Every stop corresponds to a series of different pipes, some pipes are reused on certain note ranges. Pipes are organized differently across the stereo field, most generally the lower pitches are most audible on the left channel, and the high pitches are located more towards the right channel.

The Pipe Organ also supports presets A and B as well as the HOLD function, just like VB3. Please refer to the previous chapter.

COUPLERS

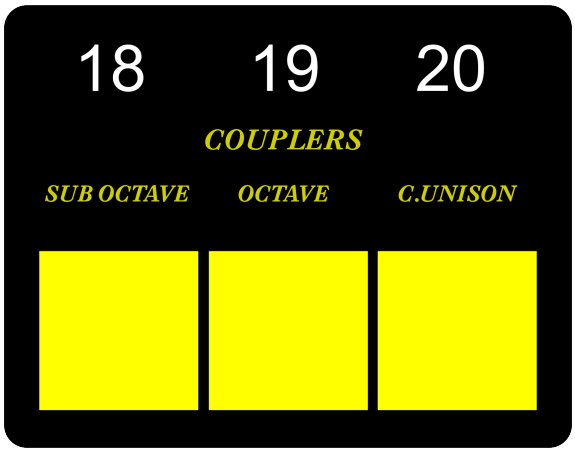


Fig. 11 - Pipe organ couplers.

The same buttons that were previously used for the percussion sound with VB3 are now used for the so-called “couplers”, which is a special mechanism of a pipe organ that allows a single note to play on multiple octaves.

Let's make an example: play the center C-note, now push button n. 18, this will activate the “SUB OCTAVE” coupler and you'll hear the lower C adding to the sound; now push button n. 19 that will activate the “OCTAVE” coupler, so that the higher C will also add to the sound; lastly, button n. 20 enables the “CANCEL UNISON” which will cancel the center note, i.e. the note that you are actually playing, leaving only the lower C and the higher C.



If the “CANCEL UNISON” coupler is enabled and the other two are disabled, you won't hear any sound. Actually, if you listen closely, you'll hear an airy attack sound like air that blows through the key and doesn't reach the pipes. Hey, it's physical modeling, after all!

TREMULANT MOTOR

This is an effect that can be activated using button n. 7. In pipe organs it's like a rotating vent that produces a sort of tremolo effect by alternating the air flow through the pipes.

11. COMBO ORGANS

Back in the seventies many bands that could not afford an electro-magnetic tonewheel organ used to buy smaller and less expensive transistor organs, mostly made in Italy. Two of the most famous models are perfectly imitated by your Mojo 61. Use the TYPE button n. 22 to activate the Combo organ sound. Deciding which Combo organ is activated from the Type button is done via the Editor web-app or a button shortcut explained later in this manual.

DRAWBARS

COMBO F	Bass 16’	Strings 16’	Flute 8’	Oboe 8’	Trumpet 8’	Strings 8’	Flute 4’	Strings 4’	2-2/3’
COMBO V	16’	8’	4’	IV	Sinus	Master			

Fig. 12 - Drawbars functions when playing Combo organs.

The row labeled “Combo F” refers to the “Compact DeLuxe” type. In this case, the drawbars will act as on/off switches having the middle position as the threshold.

The row labeled “Combo V” refers to the “Continental” type. Here the drawbars act as normal drawbars with one exception: the first 4 drawbars are the registers, the next two adjust the volume of the two waveforms, the last three remain unused. If either the 5th or the 6th drawbars are not pulled out, there will be no sound.

VIBRATO

The “Combo F” has 4 different vibrato types that can be selected using button n. 6 and can be turned on or off using button n. 7.
The four selections are labeled as seen in fig. 13 and are:

- V1 = Light Slow
- C2 = Light Fast
- V3 = Heavy Slow
- C3= Heavy Fast

The “Combo V” has no type selection, just the on-off switch.

12. ELECTRIC PIANO

Push the TYPE button n. 22 to activate the piano and start playing a little bit before going on with the reading of this manual.

You will probably notice that playing the electric pianos of the Mojo 61 has a particular vibe. These are not the usual samples that you've always found in all digital keyboards since the early 80's, instead, this is a real-time synthesizer that instantly reconstructs the sound of the electric piano while you play it, and you'll feel that it is alive, it breathes, reacts to your playing, and behaves just like the real thing.

There are a few things that you can test to prove that we are right. First, the dynamic response. Sampled instruments have a predetermined number of velocity layers. Here the dynamic is practically infinite, you will hardly hear twice the same attacks.

The polyphony. The so-called *ROMplers* usually have a predetermined number of voices that are cyclically assigned to the playing notes, and these are usually more than the playing notes. The electric pianos in the Mojo 61 don't need to allocate extra voices because they behave just like the real thing, there's one moving element per key, so 88 playing keys = 88 voices (or 64 for the reed piano, 60 for the clavi piano).

If you haven't connected a sustain pedal to your Mojo 61 we invite you do to so now. Now put your foot on the sustain pedal and keep it depressed, then play a *ribattuto* (keep playing the same note). You will notice some timbral changes due to the fact that an element is vibrating (a tine or a reed) and the hammer continues to put it into vibration, but sometimes the hammer happens to accelerate the vibration, other times it happens to dampen it. Also the attack sound changes every time, because you're virtually stimulating something that is already moving.

Resonances. An electric piano, just like an acoustic piano, has an harp and a soundboard where metallic elements are put into vibration and, in turn, transmit their vibration to the other elements. This is called “sympathetic” resonance. Try this: play a note in the treble register (for example the last D), now push the sustain pedal and keep playing that note. You will notice that all other tines (or reeds) are put into vibration.

There is more, but we are confident that now you get the picture. Now back to the boring technical stuff. Won't you miss the effects?

Switching between the four available piano engines is done from the Editor web-app but can also be done using the preset buttons on the control panel. Shortcuts are explained later in this manual.

13. APPLYING EFFECTS TO COMBO ORGANS AND ELECTRIC PIANOS

The Multi-function buttons numbered 18, 19, 20 and 21 can be used for accessing the effects and other useful functions.



Fig. 14 - Multi-function buttons for Combo Organs and Electric Pianos

When playing a Combo Organ you can switch FX1 and FX2 by using respectively buttons n. 20 and n. 21. Choosing which effect is associated to FX1 or to FX2 is done from the Editor web-app but can also be done using a button shortcut explained later.

When playing an electric piano, the octave can be shifted down or up by using respectively button n. 18 or n. 19. These buttons are exclusive, the octave can be either down or up. To reset the octave simply depress the active button again.



The status of the effects is always remembered for each of the two Combo Organs and each of the four Piano sounds. Remembered settings include the on/off status of each effect along with all their parameter settings made from the web-app editor. To make sure that settings have been saved, press the active PRESET button again.

14. THE SHIFT BUTTON AND THE ALTERNATE FUNCTIONS

By pushing the SHIFT button n. 26 along with buttons 18, 19, 20 and 21 it is possible to access to other functions:

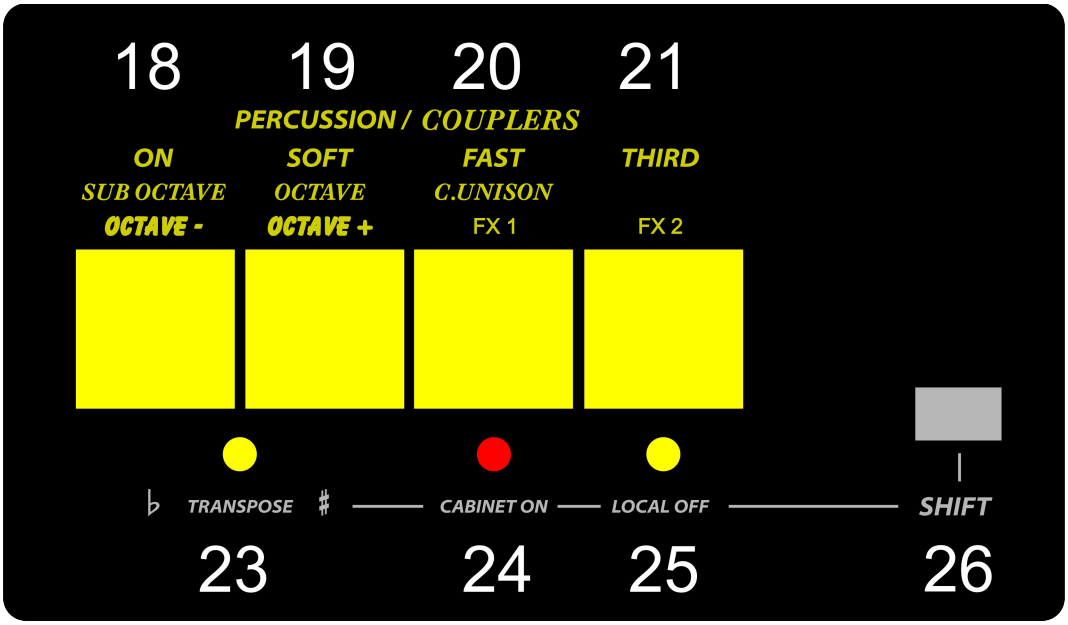


Fig. 15 - SHIFT functions

– SHIFT + button n. 18: transpose down by one semitone. It is possible to get down to -12 semitones.

– SHIFT + button n. 19: transpose up by one semitone. The higher limit is +12 semitones.

Note: When the transposition is active, the LED n. 23 is on.

– SHIFT + button n. 20: turns on or off the "Cabinet" simulation which, in case of VB3, refers to the Rotary Speaker simulator, and in case of Combo Organs or Electric Pianos, refers to the Static Amp simulator. When the Cabinet simulation is on, it is possible to adjust the overdrive amount using knob n. 2.

– SHIFT + button n. 21: this toggles the "Local Off" function that disconnects the keyboard from the internal sound generator and activates the alternative Tx Midi Channel as explained later in this manual.

15. ACCESSING THE EDITOR

Mojo61 editor offers many parameters that can be adjusted to obtain the desired sound or to change some global settings of the instrument. There are two ways to access the editor:

1. The remote MIDI editor, accessible through the MIDI-USB port and a computer or mobile device connected to the Internet.

You need a USB cable connected to the USB MIDI I/O port (like those used for connecting a printer to a computer), use it to connect Mojo61 to a computer, or to an Android device using an OTG adapter, or to an iPad using Apple's Camera Connection Kit. Once done, launch your CHROME browser and navigate to this website:

https://www.gsidsp.com/Mojo61

***PLEASE NOTE**: if you don't have CHROME, install it from Google, or from the Play Store (Android) or from the App Store (Apple). Other browsers may not be compatible.*

2. The internal editor, accessible through a Wi-Fi connection. Mojo61 will function as an hot-spot that creates its own private network to connnect to.

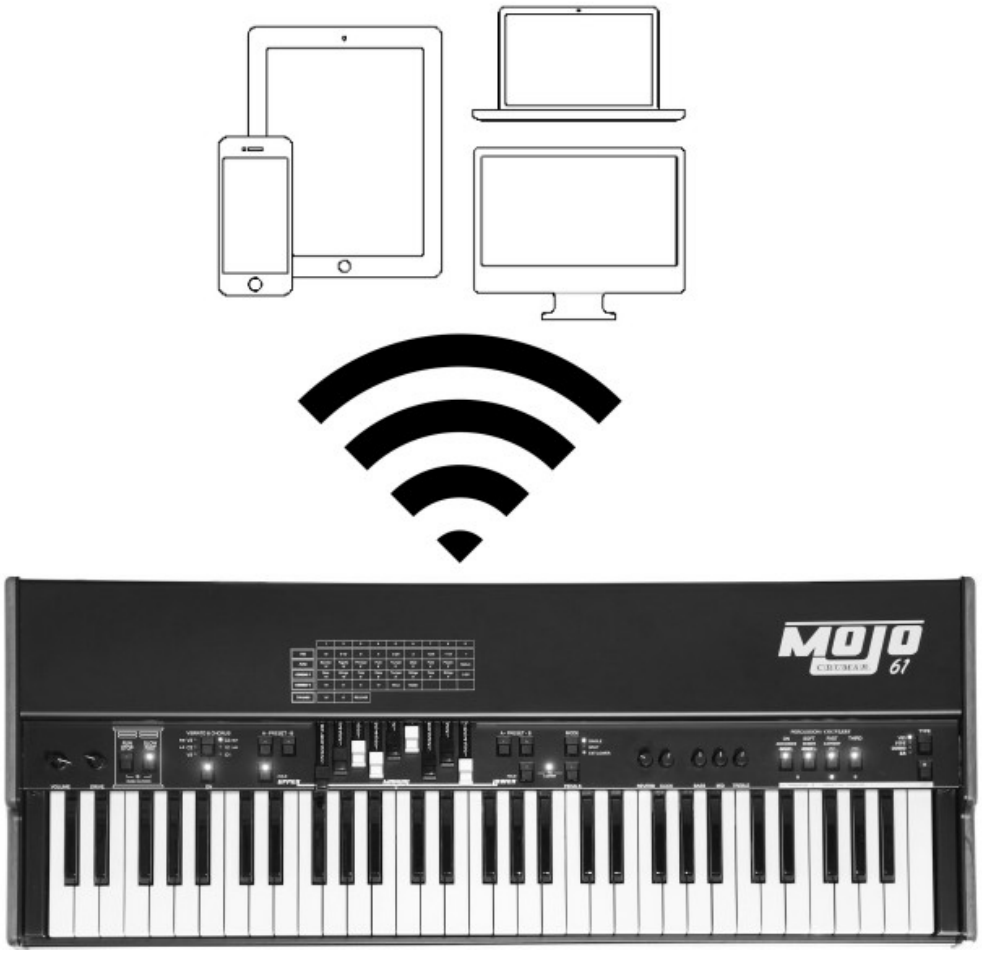
IMPORTANT: *Accessing the internal editor web-app requires the **Crumar Wi-Fi USB dongle** to be inserted into one of the two System USB ports located on the back of the instrument. The dongle must be inserted when the instrument is off.*
*The **Crumar Wi-Fi USB dongle** is an accessory and must be purchased separately.*



If you forgot your Wi-Fi password for accessing the Editor web-app, use a small screwdriver or a sharp pencil to push the button that hides behind the small hole near the headphone plug. The password will be re-set to "00000000".

Any modern mobile device (tablets and smartphones) or any modern computer (desktop or laptop) can be used to access the Editor web-app. The execution speed of the Editor depends on the CPU power of your device. When the Mojo 61 is on, use your device's network options to start scanning for existing Wi-Fi networks. The Mojo 61 should cast an SSID that starts with "Mojo-xxxxxxxx" where the "x" are replaced by an hexadecimal serial number that is unique to each unit. Complete the connection using the following password: 00000000 (eight times zero). The password can be changed later from the home screen of the Editor app and can be restored to its default value at any time by following the procedure described at page 11, point 4.
Once connected, open your favorite browser (Chrome, Safari, Firefox, Edge, etc.) and type the URL using the IP number http://**192.168.1.1**
The Editor home page should load into your browser like a normal web site. This can

be viewed either in portrait or landscape mode, the page should redraw itself accordingly. The Editor consists of an home page, four editing pages for the sound parameters (VB3, Combo, Piano and Effects), one further page for editing the Midi CC Map, and the button “SNAPSHOTS” that gives you access to the memory slots.



16. USING THE EDITOR

The Mojo 61 Editor is interactive: it can be used to adjust all sound parameters and other functions. Parameters are generally presented under the form of horizontal sliders for more convenience when using the app from a touch device. However, the app can also be used with the mouse from a conventional computer. An **in-line help** can be recalled by tapping on the question mark icon on the top right corner, or on the parameter names in the editing pages.

THE HOME PAGE



Here is where you can set all global options and functions.

GLOBAL OPTIONS

- TUNING: This accepts a range from A=430 Hz to A=450 Hz, with 440 Hz being the default value. Every time this setting is changed, a reboot is required in order for the new change to take effect.
- TX Channel: the MIDI channel used for sending messages to the output ports. Considering that VB3 uses 3 channels, if this is set to 1, the upper part will send on ch. 1, lower on ch. 2 and the pedalboard will send on ch. 3. The channel will be folded back if it exceeds 16, so if you set this to channel 15, you'll have upper on 15, lower on 16 and pedalboard on channel 1.
- Alt. Channel: this is the *alternative* Channel that can be used only when the instrument is set in Local-off mode.
- TX Velocity: decide when to send the information of Note-on velocity, whether always, never or according to the selected instrument (panel).
- CC Send: decide whether to send all Continuous Controller messages, only those used by the pedals, or none of them (thus only note messages will be sent).
- CC Presets: decide whether the CC messages related to the drawbars must be sent or not when a drawbar preset is recalled.
- Sustain pedal: decide the function of the sustain pedal when in VB3 mode.
- Split note: set the lowest note of the right part of the keyboard when the Split mode is used.
- Split octave: can shift the octave of the left part (lower manual) of the keyboard when using the Split mode.
- Combo Organ: decide which Combo Organ you wish to use.
- Piano Model: decide which Piano model you wish to use.

VIEW MIDI CC MAP

Access the MIDI CC map. See the paragraph “MIDI MAP” later in this manual.
WI-FI PASSWORD

The default password for connecting to the Mojo 61 is "00000000", it can be changed to any word of a max. length of 8 characters. It's preferable to use only letters and numbers and avoid special characters. Setting a custom password prevents others to connect to the Mojo 61 while we are performing on the stage. However, the Wi-Fi radio in the Mojo 61 is powered enough to serve a connection in a range of max. 1 – 5 meters (15 feet) - even though this distance may vary according to possible interferences - and accepts **only one connection at a time**, so there's no risk that two

devices are editing the Mojo 61 at the same time.

PAGE: EDIT VB3

This page shows all parameters related to the VB3 engine and the Rotary Speaker effect. Every time you scroll a fader left or right, you can read the current value on top of it.

PAGE: EDIT COMBO

This page shows all parameters related to the two Combo Organ simulations.

PAGE: EDIT PIANO

This page shows all parameters related to the two electric piano simulations.

PAGE: EDIT EFFECTS

This page shows the parameters related to the effects that can be used with the Combo Organs and the Electric Pianos. Effects are organized in colored boxes.

PAGE: MIDI MAP

The MIDI Map page can be reached from the button in the home page or by clicking/tapping on the MIDI CC assigned to each parameter. It is possible to assign any of the 127 CC numbers to any parameter, and more than one parameter can be assigned to the same CC, if necessary, but this means that when that specific CC number is received, all parameters assigned to it will change accordingly.

BUTTON: SNAPSHOTS

Click or tap this button in order to store or recall one of the eight available snapshots.

17. BRIEF EXPLANATION OF ALL ORGAN PARAMETERS

- **Generator**: select a tonewheel generator from this list. Each generator is based on actual values as measured from real console organs of the B/C/A series.
- **Generator Shape**: select between OFF (no shaping) or 3 levels of CUT and 3 levels of BOOST. These will modify the amplitude chart of the generator values according to different positions along the generator. This parameter does not apply any equalization to the sound. Levels 1 can boost or cut starting from wheel n. 25; levels 2 start from wheel n. 52; levels 3 start from wheel n. 72.
- **Leakage**: adjusts the background hum & hiss.
- **Crosstalk**: adjusts the amount of crosstalk caused by the analog circuitry. This is a very important element of the tonewheel organ sound.
- **Xtalk Shape**: since the crosstalk consists of both bass and treble tones, this parameter mixes between the presence of one or the other, left towards a "rumble" noise, right towards a "brilliant" noise.
- **Complex wheels**: are special tonewheels only used for the first 12 tones wired with the pedalboard. Unselecting this parameter will use standard sinus tonewheels.
- **Foldback on 16'**: the first 16 wheels wired to the keyboards are usually folded back, thus starting from wheel n.13 rather than from wheel n.1. If you wish to use the first 12 wheels on the manuals, uncheck this option but you should also uncheck the Complex wheels.
- **Resistor wires**: are the small wires that in the vintage organ connect the keyboards to the generator. This parameter offers three different values: "Console: NEW", as specified by the original B3 specifications; "Console: OLD", resulting in a more present low-end; "Spinet", same as "Console NEW" but without the foldback.
- **Drawbar trims**: the 9 slider below this section can be used to adjust the presence of each drawbar. This will apply above the actual drawbar registrations for both the upper and the lower manual.
- **Percussion settings**: set the parameters of the percussion circuit such as the level when it's on normal or soft, the decay time when it's on slow or fast, the overall level, and the loudness loss when the volume tab is set to normal.
- **Perc Paradise Mod**: this is a "hack" that causes the percussion to never decay. What's special in this is that if you activate the scanner vibrato effect, you'll notice that the vibrato is applied to the rest of the drawbars but not to the percussion tone.
- **Other settings**: here you can adjust the depth of the vibrato circuit and the mix amount that affects the chorus settings, plus some parameters related to the generation of the KeyClick noise. Read the tool-tips for more details.
- **Preamp Bass / Treble**: adjust the frequency response of the organ's built-in preamp circuitry.

Parameters for the Rotary speaker are:

- **Horn slow / fast**: adjust the speed offset of the horn for when the speed is on slow or on fast.
- **Bass slow / fast**: same as above but for the bass rotor.
- **Horn up / down**: adjust the acceleration and deceleration times of the horn for the transitions between the slow and fast speeds. When the brake is engaged, the power is taken off from the motor so the horn slows down until stopping only driven by the centrifugal force, so the time between fast and stop may be longer than from fast to slow.
- **Bass up / down**: same as above but for the bass rotor.
- **Balance**: adjusts the balance between the horn and the bass rotor.
- **Ambience**: a real amplifier stays in a real environment causing the microphones to capture the sound reflections as well as the direct sound coming from the speakers. This parameter adjusts the amount of environmental reflections.
- **Cabinet**: adjusts the amount of resonances caused by the wooden cabinet.
- **Mic Angle**: adjusts the angle between the two microphones at the horn, ranging from 0 (both microphones in the same spot) to 180 degrees (microphones at the opposite sides of the cabinets). This simulation considers only three microphones, two for the horn and one for the bass rotor.
- **Mic Distance**: adjusts the distance between the microphones and the cabinet. A longer distance results in more sound dispersion, a shorter distance results in a deeper proximity effect.
- **Horn EQ**: not all vintage rotary speakers have the same quality for what concerns the sound coming from the horn, some are brighter, some are duller or maybe just well balanced. This parameter lets you adjust the treble response of the horn sound.
- **Mid reflections**: adjusts the amount of sound reflections happening in the middle of the stereo field.
- **Doppler intensity**: the so called “Doppler” effect is the fundamental of the “Leslie” effect that causes the sound to be cyclically untuned while the sound source (the speaker) gets farther or nearer to the listened; this parameter lets you adjust the amount of this effect that is mostly caused by the sound reflections over the walls around the amplifier.
- **Dry Leak**: some of the dry sound coming from the speakers does not reach the rotating elements and is mixed with the rotating sound. Use this parameter to adjust the amount of dry signal you want to be mixed in.
- **Bass Port**: a real Leslie cabinet has a hole in the back that serves for two reasons: 1) lets the heat from the motors ventilate out from the cabinet and 2) acts as a bass tuning port, like those found on modern speakers. If you put a microphone in front of this hole you get nothing but sub-bass frequencies. Use this parameter to adjust the amount of sub-bass you want to get into the mix.
- **Tube feedback**. This is a very important parameter that works on an aspect of the whole amplification system that can drastically vary both the dynamic response and the frequency response, as well as have an impact on the

overdrive. When a Leslie cabinet is set very close to the Hammond organ and is played at a high volume, there's some sort of feedback between the tubes, the transformers and the pickups of the Hammond and the speakers of the Leslie, resulting in a sound that tends to get "fatter", the attack is "punchier" and the distortion is aggressive, giving you the feeling that some sort of energy is looping between the organ and its amplifier. Now, a genuine Leslie 122 or 147 is only 40W of power, but if you try to connect your Hammond organ to a 100W guitar amp such as a Marshall JCM900 or a Fender Twin you'll notice that the amp starts going in feedback even if you don't play any note on the organ. This is... pure analog power! Try this parameter at small steps, it can drastically change the sound in both a pleasant or unpleasant way, according to your tastes.

- **Stop Position**: you can use this parameter to find a position where the horn and rotor should "preferably" stop when you set the speed lever in the brake position and the "Front Stop" option is enabled. Please consider that not always the position you've set is reached with precision, it depends mostly on the Ramp Down times you've set... after all it's virtual reality, baby! It takes into account the kinetic energy, the gravity, the belt friction...
- **Noises**: well, a real rotary effect is far from being a silent amplifier. Your microphones will pick up not only the sound but also the wind generated by the rotating elements, and the relays that switch between the fast and slow motors. Use this parameter to adjust the amount of noises you want to get into the mix.
- **Memphis Style**: check this parameter to unplug the motors that drive the bass rotor. This way, the bass stays motionless while the horns keep spinning.
- **Front Stop:** this very sought after function causes the horn and the bass rotor to stop always in a "sweet" spot every time the brake is engaged. VB3-II uses a simple algorithm that produces this effect in a very pleasant and seamless way that you won't even notice when you're braking the rotors.
-

Notes on the rotation speeds.

All sliders in the edit pages, whenever moved, displays the readout in either MIDI or actual value, when available. As for the Rotary speaker's rotation speeds and times, values are shown in Hz and Seconds. To convert Hz to RPM (revolutions per minute), just multiply the Hz value by 60. For example, the horn, when the Horn Slow parameter is set at 64, rotates at 0,77 Hz which translates in 46,2 RPM. All the speed values can be varied between 50% and 150% of the center value. The ramp up and ramp down times are in seconds, and can be varied between 50% and 500% of the center value.

Center values are:

- Horn slow: 0,77 Hz →46,2 RPM
- Horn fast: 6,9 Hz → 414 RPM
- Bass slow: 0,72 Hz →43,2 RPM
- Bass fast: 6,4 Hz →384 RPM
- Horn ramp up: 1 second

- Horn ramp down: 0,8 seconds
- Bass ramp up: 6 seconds
- Bass ramp down: 3,5 seconds

These times are average values as measured by a wide sample of well working and serviced vintage Leslie 122, 142, 147 and 145 models.

Due to kinetics energy, when the Rotors ramp down from fast to brake and the Front Stop option is disabled, they take a bit longer to get to full stop position.

18. SHORTCUTS

Some of the functions that are normally accessed from the Editor web-app can also be accessed using key-combinations on the command panel. Here's a summary:

- Switch between the two Combo Organ sounds: use UPPER PRESET A for Combo Type "F" and UPPER PRESET B for Combo Type "V".

- Switch between the four Piano sounds: use UPPER PRESET A for Tine Piano and UPPER PRESET B for Reed Piano; use LOWER PRESET A for Clavi Piano and LOWER PRESET B for Acoustic Piano.

- Switch between Square, Triangle and Mono Tremolo: press & hold the multi-function button n. 20 labeled "FX1", the effect turns off for a short while then turns on again with the new setting.

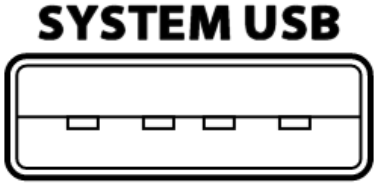
- Switch between Phaser and Chorus: press & hold the multi-function button n. 21 labeled "FX2", the effect turns off for a short while then turns on again with the new setting.

- Set the split point: press SHIFT + MODE button n. 15, the Split LED starts blinking, now play the desired split note on the keyboard (you won't hear any sound), the LED restores its previous position and the split point is now set and saved.

- Reset the transposition: press SHIFT + press & hold either button n. 18 or n. 19, the transpose LED n. 23 should turn off and the transpose amount is now zeroed.

- When playing VB3, it is possible to toggle the Chorus/Vibrato effect on the other manual by pressing SHIFT + button n. 7, i.e. if the upper manual is selected, using this shortcut, the effect is toggled on the lower manual.

19. THE USB PORTS



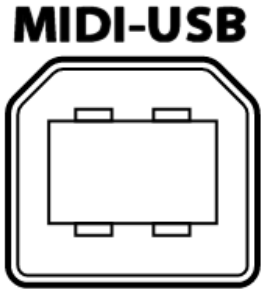
The Mojo 61 includes 2 Type-A "host" USB 2.0 ports. These are mainly used for updating the software or for accepting external accessories.

An interesting use for a USB system port is the possibility to connect a "Class-compliant USB-MIDI device", i.e. one of the many MIDI devices that don't need special drivers when they are connected to a conventional computer. The Mojo 61 will recognize USB-MIDI devices and will use them along with any other MIDI equipment connected to either one or both the classic MIDI inputs located on the rear panel. This way you can connect up to 3 MIDI devices that send messages to the Mojo 61, for example a keyboard, a pedalboard and a control surface.

Please avoid connecting unsupported devices to this port. Please note that this port can supply a max of 250 mA of current. ***Don't use this port to charge mobile devices.***

Original CRUMAR accessories that can be connected to the SYSTEM USB ports:

- Original USB Wi-Fi dongle for accessing the web-app editor
- Mojopedals 2018
- G.M.LAB D9U – d-i-y drawbar controller
- G.M.LAB D9X – d-i-y drawbar controller with extended features
- G.M.LAB MJU – d-i-y Midi Jack USB



An additional Type-B USB 2.0 port is present at the back side of the Mojo 61 that provides Class-compliant USB-MIDI IN/OUT connection to your computer. Use this port to connect the Mojo 61 to your computer software. No drivers are needed for Windows, OS X and Linux. Use this port to connect the USB cable for USB online editor.

20. MIDI FUNCTIONS AND IMPLEMENTATION CHART

Mojo 61 has a very functional and complete MIDI implementation. It can send and receive messages related to each single control and each single parameter; all physical controls located on the control panel have fixed MIDI CC assignments, while all sound parameters accessible from the Editor web-app can be freely assigned by the user. Every time a CC value is received, if it affects something that should be visible on the panel via LEDs, these turn on or off accordingly.

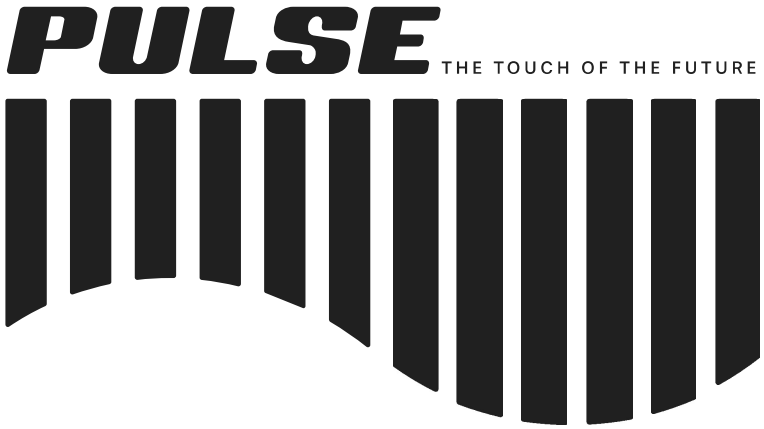
MIDI implementation chart v. 2.0				
Manufacturer: Crumar	Model: Mojo 61	Version: 1.0	Date: November 2017	
		Transmit/Export	Recognize/Import	Remarks
1. Basic information				
MIDI channels		3	3	
Note numbers		61	127	First C=note 36 – Transposed by -24/+24 semitones
Program change		Yes	Yes	Values 0 to 7
Bank select response? (Yes/No)		No		
If yes, list banks utilized in remarks column				
Modes supported:	Mode 1: Omni-On, Poly (Yes/No)			
	Mode 2: Omni-On, Mono (Yes/No)			
	Mode 3: Omni-Off, Poly (Yes/No)			
	Mode 4: Omni-Off, Mono (Yes/No)			
	Multi Mode (Yes/No)			
Note-On Velocity (Yes/No)		Yes		
Note-Off Velocity (Yes/No)		Yes		
Channel Aftertouch (Yes/No)		No		
Poly (Key) Aftertouch (Yes/No)		No		
Pitch Bend (Yes/No)		No		
Active Sensing (Yes/No)		No		
System Reset (Yes/No)		No		
Tune Request (Yes/No)		No		
Universal System Exclusive:	Sample Dump Standard (Yes/No)	No		
	Device Inquiry (Yes/No)	No		
	File Dump (Yes/No)	No		
	MIDI Tuning (Yes/No)	No		
	Master Volume (Yes/No)	No		
	Master Balance (Yes/No)	No		
	Notation Information (Yes/No)	No		
	Turn GM1 System On (Yes/No)	No		
	Turn GM2 System On (Yes/No)	No		
	Turn GM System Off (Yes/No)	No		
	DLS-1 (Yes/No)	No		
	File Reference (Yes/No)	No		
	Controller Destination (Yes/No)	No		
	Key-based Instrument Ctrl (Yes/No)	No		
	Master Fine/Coarse Tune (Yes/No)	No		
	Other Universal System Exclusive	No		
Manufacturer or Non-Commercial System Exclusive		Yes	Yes	
NRPNs (Yes/No)		No		
RPN 00 (Pitch Bend Sensitivity) (Yes/No)		No		
RPN 01 (Channel Fine Tune) (Yes/No)		No		
RPN 02 (Channel Coarse Tune) (Yes/No)		No		
RPN 03 (Tuning Program Select) (Yes/No)		No		
RPN 04 (Tuning Bank Select) (Yes/No)		No		
RPN 05 (Modulation Depth Range) (Yes/No)		No		
2. MIDI Timing and Synchronization				
MIDI Clock (Yes/No)		No		
Song Position Pointer (Yes/No)		No		
Song Select (Yes/No)		No		
Start (Yes/No)		No		
Continue (Yes/No)		No		
Stop (Yes/No)		No		
MIDI Time Code (Yes/No)		No		
MIDI Machine Control (Yes/No)		No		
MIDI Show Control (Yes/No)		No		
If yes, MSC Level supporte				
3. Extensions Compatibility				
General MIDI compatible? (Level(s)/No)		No		
Is GM default power-up mode? (Level/No)		No		
DLS compatible? (Levels(s)/No)		No		
(DLS File Type(s)/No)		No		
Standard MIDI Files (Type(s)/No)		No		
XMF Files (Type(s)/No)		No		
SP-MIDI compatible? (Yes/No)		No		

21. MIDI MAP

PARAMETER NAME	C.C. NUMBER	REMARKS
Volume	7	
Drive	76	
Reverb	91	
Key-click	75	
Bass	8	
Middle	9	
Treble	10	
Drawbar Upper n.1	12	For all organs
Drawbar Upper n.2	13	For all organs
Drawbar Upper n.3	14	For all organs
Drawbar Upper n.4	15	For all organs
Drawbar Upper n.5	16	For all organs
Drawbar Upper n.6	17	For all organs
Drawbar Upper n.7	18	For all organs
Drawbar Upper n.8	19	For all organs
Drawbar Upper n.9	20	For all organs
Drawbar Lower n.1	21	Only VB3
Drawbar Lower n.2	22	Only VB3
Drawbar Lower n.3	23	Only VB3
Drawbar Lower n.4	24	Only VB3
Drawbar Lower n.5	25	Only VB3
Drawbar Lower n.6	26	Only VB3
Drawbar Lower n.7	27	Only VB3
Drawbar Lower n.8	28	Only VB3
Drawbar Lower n.9	29	Only VB3
Drawbar Pedals n.1	33	Only VB3
Drawbar Pedals n.2	35	Only VB3
Vibrato Type	73	Values: VB3 = 0, 25, 50, 76, 101, 127; Combo F = 0, 42, 84, 127
Vibrato Upper Switch	31	For all organs
Vibrato Lower Switch	30	Only VB3
Percussion On	66	Also Pipe Organ Sub-Octave
Percussion Soft	70	Also Pipe Organ Octave
Percussion Fast	71	Also Pipe Organ Cancel Unison
Percussion Third	72	
Pedals-to-lower	55	
Pedalboard release time	56	
Rotary Effect Switch	85	
Rotary Effect Slow/Fast	1	Values: 0 = slow, 127 = fast
Rotary Effect Run/Stop	68	Also sends CC#1 value 64 when speed = stop
FX1 Switch	92	
FX2 Switch	93	
Static Amp Simulator Switch	88	

KEYBOARD VELOCITY

Mojo 61 can send notes with or without velocity according to the instrument selected with the Type button n. 22. If VB3 or Combo Organ is selected, notes are sent with a fixed velocity value of 127 but the first key contact is used (fast key triggering). If Pipe Organ or EP is selected, velocity is sent. Key-off velocity is always sent. Any transposition or octave shifting applied to the internal sound generator is also applied to the transmitted note messages.
Mojo61 features a keyboard designed by CRUMAR to offer the best organ experience: Model PULSE 6105WF.



PEDALS

The sustain pedal always sends CC #64 with values 0 or 127 when the EP is selected. To send CC #64 also in VB3 mode, this must be activated from the Global Options in the Editor's home page. The expression (Swell) pedal sends CC #11.

OTHER

The instrument type selection can be remotely done by sending Program Change events with the following values: 0 = VB3, 1 = Pipe Organ, 2 = Combo “F”, 3 = Combo “V”, 4 = Tine Piano, 5 = Reed Piano, 6 = Clavi Piano, 7 = Acoustic Piano.

22. CONNECTION WITH LOWER MANUAL



The Mojo61 Lower Manual is a highly practical and elegant add-on for your Mojo61, allowing you to transform your instrument into a full dual-manual organ in seconds. The two units are mechanically designed to fit perfectly together: simply place your Mojo61 on top of the Lower Manual, letting the rubber feet slide into the dedicated holes on the metal top panel. Once seated, the two units are securely locked in place.
Connecting the Lower Manual is just as straightforward. Use the included MIDI cable, plug one end into the Lower Manual's MIDI OUT port, and the other end into either of the two MIDI IN ports on the Mojo61. These ports provide power to the Lower Manual, so no external power supply is required.
Mojo61 immediately recognizes the original CRUMAR Lower Manual and automatically configures it, bypassing any DIP-switch settings on the unit (see the Lower Manual Quick Guide for more details). Enable the EXT-LOWER function on your Mojo61 and enjoy the full dual-manual experience.



The Lower Manual is designed to operate exclusively as the GREAT manual for the VB3 sound engine, while the Mojo61's main keyboard functions as the SWELL. With all other Mojo61 sounds, including combo organs and pipe organs, the Lower Manual is not active while capable of sending out MIDI data.

23. SPECIFICATIONS

Technical specifications:

- power rating: 100 ~ 240 Volts A.C.
- output level: selectable -10 dBu, +4 dBu, High Gain (~ +10 dBu)
- headphone output max load: 32 ohm
- Dimensions : cm89.5 x cm35.6 x cm11 - 35.24" × 14.02" × 4.33".
- Weight : kg 9 - 19.84 lbs.

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