MR. BLACK

MOD.ONE

< CHORUS / FLANGER >

User/Operations Reference Manual

REVISION A - AUGUST 2025

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INTRODUCTION:

Thank You for purchasing one of the most powerful analog modulation pedals produced to date! Yes, this is the long-awaited Mod.One, designed by Jack Deville and hand-built, one at a time, by Mr. Black Pedals in Portland, OR U.S.A.

The Mod.One is a VERY powerful, high-fidelity, pure-analog signal, BBD (bucket-brigade device) time-modulation pedal, capable of a litany of short-delay time-based effects and sounds. This manual will walk you through the basic principles of operation, details about what makes the Mod.One so special, and provide you with a few starting points so that you can sculpt your *perfect* analog time-modulation tone. Again, this pedal is very powerful, and a solid understanding of how to use it will be prove highly rewarding. Please, take a few to pour yourself a drink, get comfortable and enjoy the technical details and dry humor held within this document.

OVERVIEW:

In December of 2010, a new compact effects pedal shook up the effects world; that pedal was: the Mod Zero. Designed by Mr. Black's own Jack Deville, the Mod Zero redefined what was possible in a compact analog modulation pedal. Only about 250 Mod Zero's were ever made, and they are near rare as hen's teeth today. Jump forward 15 years, and that same engineer has applied a decade and half's knowledge, experience and improvements in available technology to realize the Mod.One. We are very proud of this beautiful, glorious analog modulator, and I believe that it will change the way that you look at and use time-based modulation effects.

The Mod.One was designed from the ground up with the primary objective of encapsulating and delivering three classic, swirling, and fluid analog modulation sounds: analog chorus, analog flange(r) and "high-band" analog flange(r), in one package. While the Mod.One delivers all three of these magnificent sounds independently, Mod.One's unique ability to seamlessly blend and morph between and through these different sounds redefines what is possible and offers an incredible tool for those seeking the ultimate in analog modulation. Mod.One's powerful modulation core is further expanded by awarding you precise control of the delay time, plus six distinct waveforms, and über-precise tap-tempo!

With its five powerful and independent controls, the Mod.One allows you to sculpt and craft your own unique signature analog modulation tone with intent, precision and ease. Please take a moment to learn more about how each of the controls work individually, and then in concert with each other, as a firm handle on the powerful tool in front of you will reward you with stunning modulation tones, tenfold over.

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CONTROL KNOBS AND FOOTSWITCHES:

Mod.One's five control knobs are relatively straightforward and intuitive, but there is some nuance in addition to a few clever design choices which will allow you to first carve a great tone, and then polish it to a diamond-shine, making it downright breathtaking.

Volume, Enhance & Speed:

Volume:	Active output level control
Full CCW:	-∞dB (Mute)
Full CW:	+7.31dB
General:	This control acts as a master output level for the Mod.One

Enhance:	Effect intensity control
Full CCW:	Light Effect
Full CW:	Pronounced effect, edge of self-oscillation
General:	Similar in sound and effect to the more common "Regeneration" control found on many flanger designs, the Mod.One's Enhance control taps from two locations rather than one, drastically expanding the intensity of the modulation. At full CW rotation, the Enhance control will kiss self-oscillation

Speed:	LFO rate/period control
Full CCW:	~0.16Hz (~6 seconds)
Full CW:	~8Hz (0.125 seconds)
General:	This is your LFO rate/period control, and it boasts a pretty wide range of speeds: Approx. 0.16Hz at full CCW rotation and approx. 8Hz at full CW rotation. *Note:* the tap-tempo footswitch drastically extends both extremes of the LFO speed range; more on that shortly

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Upper Limit / Lower Limit:

It is best to talk about these controls together as they are, without question, the most powerful and influential controls on the pedal.

Together, these controls form the active swept-delay range of your analog modulated delay line, with machinists' precision.

Longer delay times (lower control positions) yield delay-time ranges typically in-line with chorus effects, and shorter delay-times (higher control positions) push the circuit well beyond common flanger delay times, approaching the zero-point and the physical limits of the BBD itself. The illustration below may help to visualize these concepts and regions.

As the name implies, the Lower Limit control sets the maximum delay-time (f_{CLKMIN}) of the modulated delay line (the "lower limit," so to speak, of the BBD clock system); therefore it should be of no surprise that the Upper Limit control sets the minimum delay-time (f_{CLKMAX}) of the modulated delay line (the "upper limit," so to speak, of the BBD clock system). This unique approach allows you to fine-tune *exactly* what delay-time ranges you seek, and because of how they are designed adjusting one control does not throw the other control all out of whack, as many conventional "Manual" and "Width" control setups may.

It is important to note that the Upper Limit control's lower bound is set by the Lower Limit control's position, meaning that when the Upper Limit control is set to full CCW rotation, the upper limit (f_{CLKMAX}) is equal to the Lower Limit setting (f_{CLKMIN}).

Lower Limit:	f_{CLKMIN} (Minimum Clock Frequency / Maximum delay time)
Full CCW:	f_{CLKMIN} = 16.5KHz (31mS delay time)
Full CW:	f_{CLKMIN} = 261KHz (1.96mS delay time)
General:	Sets the longest delay time the LFO will sweep *down* to

Upper Limit:	f_{CLKMAX} (Maximum Clock Frequency / Minimum delay time)
Full CCW:	f_{CLKMAX} = f_{CLKMIN} (Lower Limit setting)
Full CW:	f_{CLKMAX} = 981KHz (521.9µS delay time)
General:	Sets the shortest delay time the LFO will sweep *up* to

A good rule of thumb is settings which generate longer delay times (around 9:30 and lower on each control) will create familiar chorus delay times, medium settings (10:00 – 2:00) will

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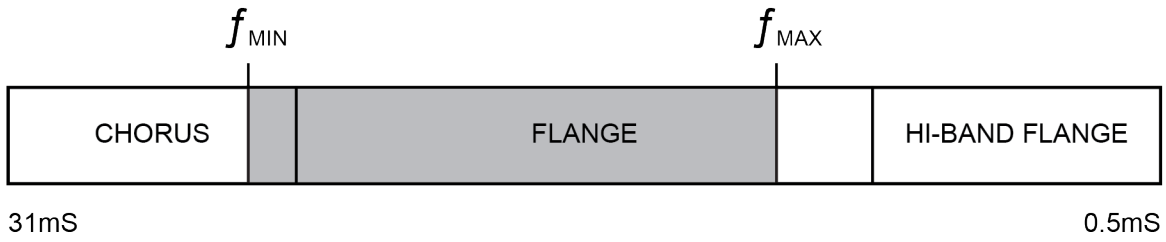
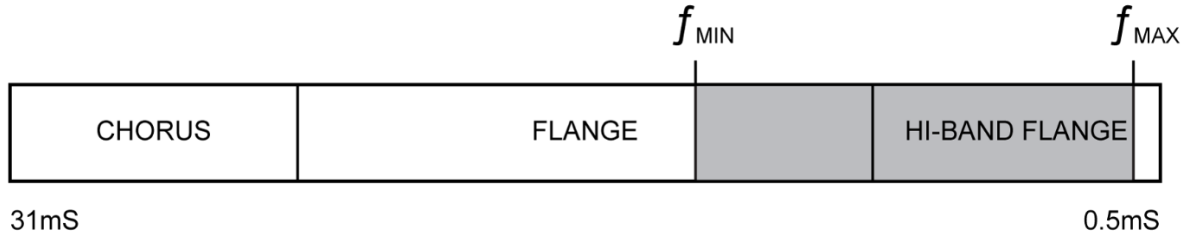
create more familiar flanger delay times, and pushing the control(s) above 2:30 will bring you into the “high-band flanger” arena.

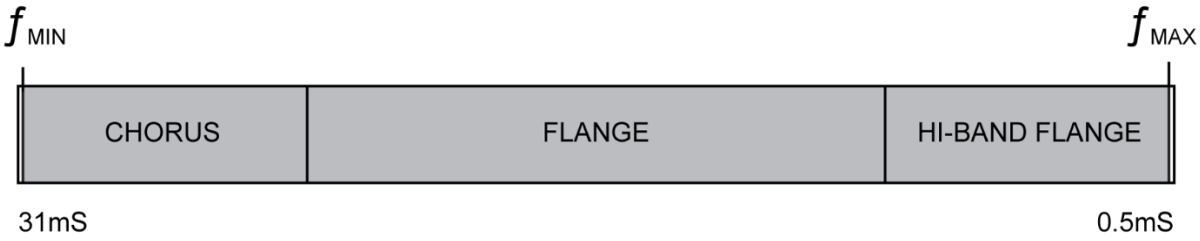
The illustration below is intended to display how these controls work together and offers an example of clock settings which yield a predominantly flange-y sound, dipping into light-chorus (active range shown in grey). This example setting can be accentuated/intensified by increasing the Enhance control.



Increasing the Lower Limit and moving the Upper Limit to near full CW rotation will yield a delay-time range which will begin towards the upper end of common flange times and peak well into the high-band flange range, as shown in the illustration below:



You can, of course, set your Lower Limit to full CCW and your Upper Limit to full CW (see illustration below) and sweep through the entirety of all three sounds and time regions, seamlessly morphing from chorus to flange, and then to high-band flange before heading back through flange to return to chorus, at which point the cycle begins anew (assuming a non-ramp waveform is selected).



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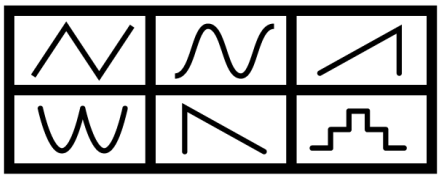
Wave Select and Footswitches:

Wave Select:	LFO Wave Selection
Tap/Press:	Advance/cycle through active waveforms
Sequence:	Triangle Wave → Sine Wave → Ramp-Up Wave → Hyper-Triangle Wave → Ramp-Down Wave → Step Wave → Triangle Wave → (...)
General:	This little button cycles through six different waveforms, which are then applied to sweep through the delay times that you've dialed in with the Limit controls. The pictogram, shown below, and next to the Tap-Tempo footswitch displays all six waveforms in their order, left to right, top row, then bottom row:



Note: The active wave is displayed, in real-time, by the Tap-Tempo LED indicator

On/Off:	Bypass/Engage
Tap/Press:	Toggle between bypass and effect modes
General:	The Mod.One features 2nd generation Click-Less relay true-bypass. The LED indicator above the footswitch displays the current state.

Tap-Tempo:	Tap-Tempo / [HOLD] Wave Select
Tap/Press:	Tap-Tempo (two tap system)
Hold [3 Sec.]:	Advance/cycle through active waveform
General:	The Tap-Tempo footswitch pulls double duty and can be used to set the speed/period of the LFO by tapping/pressing the footswitch twice: The first tap starts the time-capture window, the second tap records the time you've tapped in and applies it to the active waveform. *Note:* the second tap of the tap-tempo footswitch "re-starts" the active wave at the beginning of its cycle so that you can time the modulation sweep to your song perfectly. Holding the Tap-Tempo switch for approx. 3 seconds will allow you to advance/cycle through the waveforms upon release, just as the Wave Select button does.

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Note: The Mod.One's tap-tempo system is *VERY* precise, tracking your taps down to one half of one millisecond (0.0005 seconds), and offers a vast expansion of the available LFO speeds.

Slowest possible tap speed: 0.05Hz (20 Seconds).
Highest possible tap speed: 83Hz (12mS)

Note: If >20 seconds elapse after the first tap input, the Mod.One will reject/ignore the first tap input and resume waiting for your two tap inputs.

Note: Your active wave and bypass state are stored in internal non-volatile memory, rated for minimum duration of 21 years, and your Mod.One will remember which wave you were using, and whether you had the pedal on or off when you power it up.

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TECHNOLOGY, PARTS AND SIGNAL PATH:

The Mod.One features a 100%-analog signal path employing premium-grade, low-noise, tight-tolerance passives and semi-conductors, as well as a RoHS compliant modern-production 1024-stage BBD for its core delay-device, ensuring exceptional reliability and clean, pure tone.

Mod.One's BBD clock is generated via a complex, high-precision digital control system, which is directly responsible for its striking clarity, super-precise tap-tempo, multiple waveform options and the incredibly high maximum clock speeds/very short minimum delay-times that Mod.One can achieve.

The Mod.One also proudly employs our 2nd generation Click-Less relay true-bypass system, endowing extended service life, and clear, un-colored bypass-signal integrity. The Click-Less true-bypass system has been field-proven for over 15 years and has flawlessly bench-tested in excess of >400,000 on/off cycles without wear, fault, or hiccup.

The Mod.One was also designed to include a unique wear-leveling algorithm within its non-volatile storage system. With sustained extremely heavy use (e.g.: 250+ shows per year, engaging/disengaging the Mod.One >50+ times per show) the potential for having to re-select your last selected active wave when first powered up could, in theory, present itself about 21 years down the line, but the three redundant safety nets built into the system, ensure that even if some glitch were to occur within non-volatile two decades down the road, your Mod.One will "self correct" and resume the last waveform and bypass state you selected.

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TIPS N TRICKS, & FINAL NOTES:

The Mod.One is a *WILDLY* powerful analog modulation pedal with incredible versatility. While it can seem intimidating and complex, its clever design makes it remarkably easy to dial in great tones, and with the capability and precision of the Upper and Lower Limit controls, carving out the perfect time-based modulation is a snap. Here are some tips that you may find useful.

Mod.One was intentionally designed to sound fantastic with all the knobs at noon, so if you'd like to jump right in and just enjoy the pedal, simply set all knobs to noon and trim your Volume control to the desired output level. It's that easy. You're gonna sound great.

If you'd like to put a little time in and craft a great tone, I can offer my approach… As designer and engineer of this circuit, I always start with all controls set to full CCW rotation (off), then adjust the Volume control to match that of my bypassed signal. I then set Speed and Enhance controls to noon and begin advancing the Lower Limit control until I find my "base" sound or "launch pad." Gradually roll on the Upper Limit control and listen for the peak of the sweep, then tune to the point that you find most desirable. Trim the Enhance control until you find that magic position that gives you the sweep, depth and swirl you love. Select your wave and tap in the tempo of your song/passage and get after it!

As a numbered sequence:

1. Set all controls to full CCW
2. Match Volume to bypass level
3. Set Speed and Enhance to 12:00
4. Advance Lower Limit control to find "base" / "launch pad"
5. Begin rolling on Upper Limit control and listen for desired peak
6. Trim Enhance to desired depth
7. Select Wave and set Speed via knob or tap-tempo
8. PLAY LOUD

Note: At full CW rotation (maximum setting) of the Enhance control, the Mod.One will kiss self-oscillation; low(er) Lower-Limit, Upper-Limit and Speed control settings make this a lot easier to achieve. I encourage you to exercise restraint when approaching the full CW rotation of the Enhance control, and back it off a smidge if you do achieve self-oscillation and/or do not want that wild savagery.

I always recommend placing the Mod.One *after* any compression, distortion, fuzz etc., and if your amplifier has an effects loop available: use it. Mod.One has excellent headroom, and you can thank me later.

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A WORD ABOUT BBDs AND NOISE:

It is vitally important to note and remember that the Mod.One *is* a BBD (bucket-brigade device) circuit. By modern standards, BBDs are utterly abysmal time-delay solutions "boasting" a 73:1 S/N ratio (which was fair back in the mid 1970's when this technology began showing up in effects units), with somewhat restricted headroom and less than optimal fidelity, but within these quirks and limitations lies a seductive allure unique to these devices. Clever noise reduction and headroom expansion circuitry have been included in Mod.One's design, and while these innovations *drastically* improve performance and reduce the BBD line's natural hiss, please remember: this is an OLD technology that is imperfect by nature, "noisy" by modern standards and can be overloaded/pushed into clipping with modern equipment. While this may seem like a list of negatives and/or a potential dissuasion, there is a visceral charm held within the technology, and their inherent limitations, flawed character and that unpredictable "smearing," is found by many, including myself, to be highly musical, delightfully engaging, and fully irreplaceable resulting in a magic that *only* a BBD can deliver.

In summary: Killer pedal. Play as loud as you possibly can.

TECHNICAL SPECIFICATIONS:

Input Impedance:	≈470KΩ
Output Impedance:	≈2KΩ
Dry Freq. Response:	≈22KHz - ≈15Hz
BBD Freq. Response:	≈11.6KHz - ≈66.4Hz
BBD S/N Ratio:	≈73:1db
Bypass:	Click-Less True-Bypass
Power Requirement:	Regulated 9VDC (2.1mm negative center-pin)
Current Draw:	53mA @ 9VDC; >=100mA supply recommended
Dimensions:	4.75" x 3.725" x 2.10" (120.65MM x 64.62MM x 53.54MM)
Weight	13.25oz (375g)

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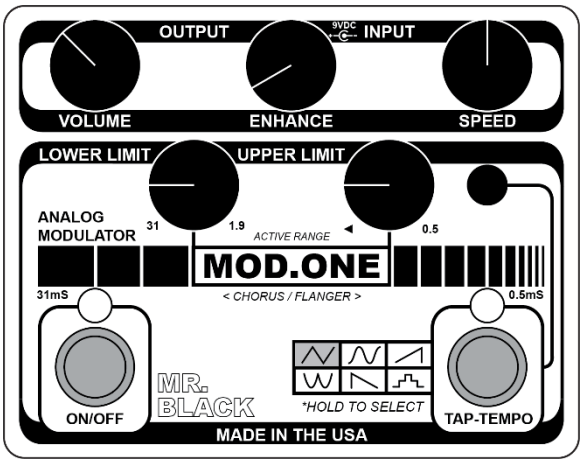
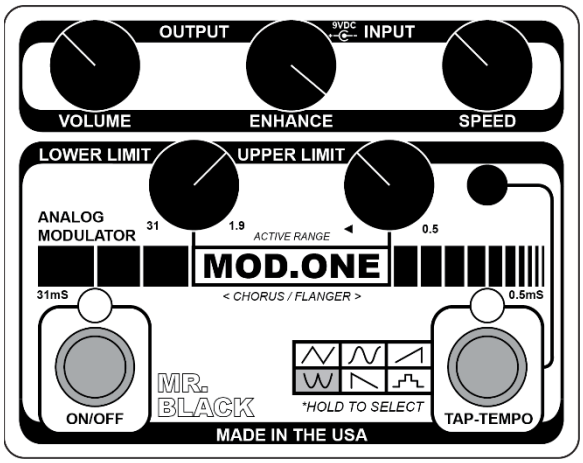
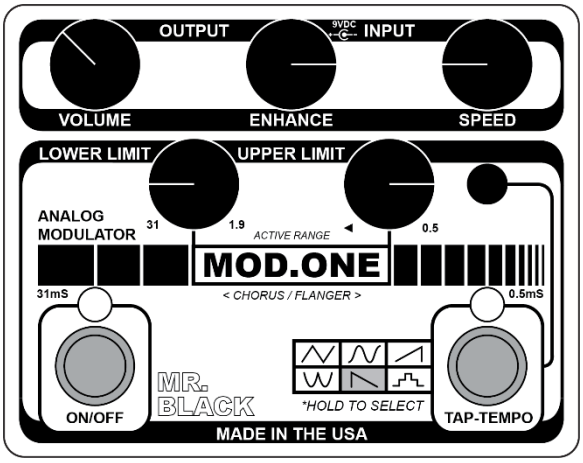
SAMPLE / EXAMPLE SETTINGS:



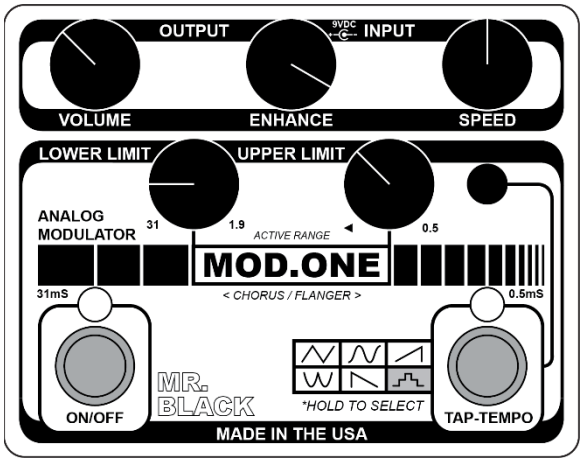
Classic Chorus



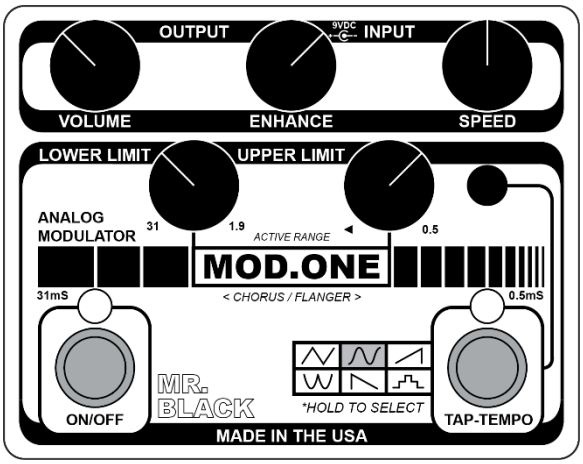
Classic Flanger



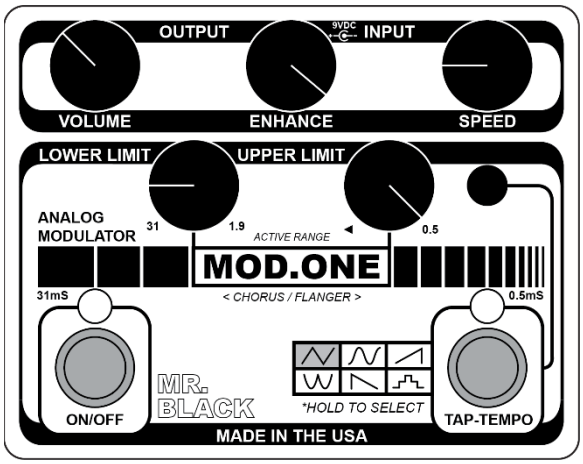
Long Fall Down



"Robot Sex"



Soft Sine Flange



"Full Send"

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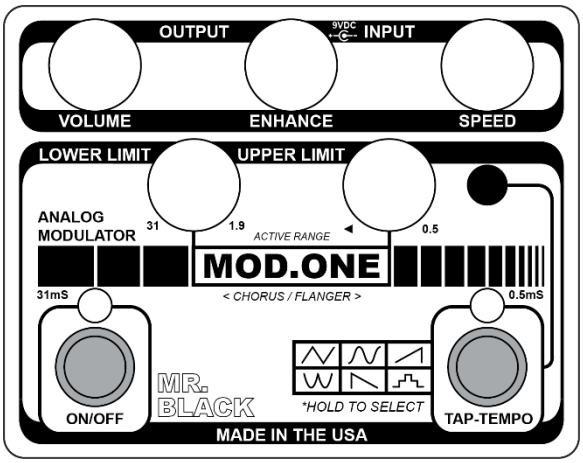
USER SETTINGS:



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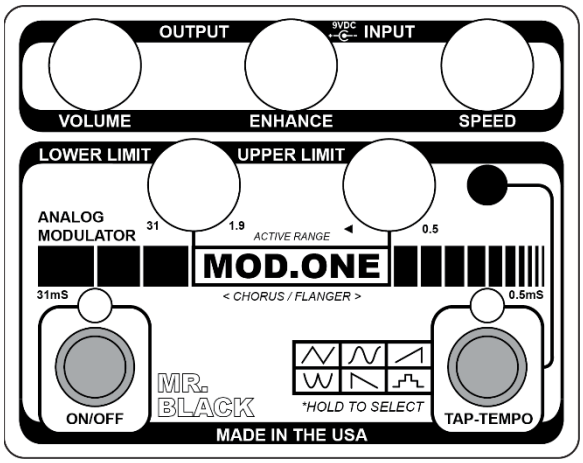

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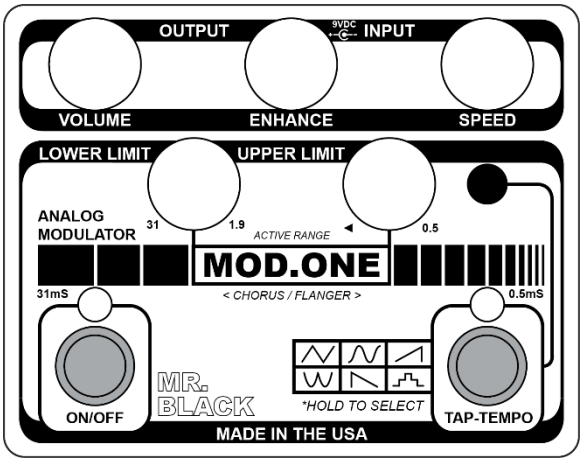

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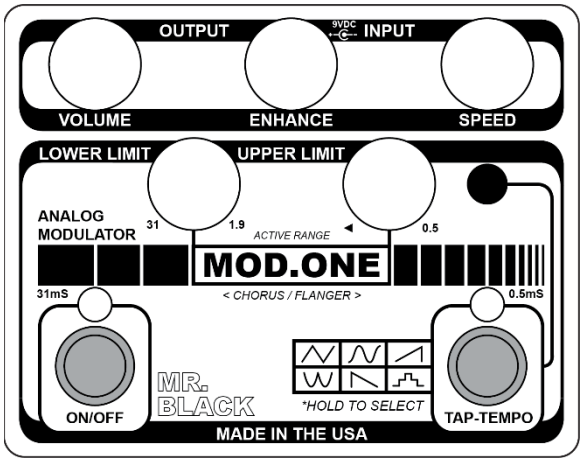

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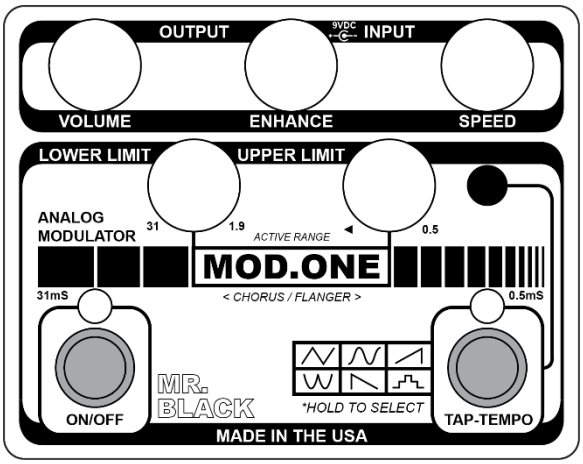

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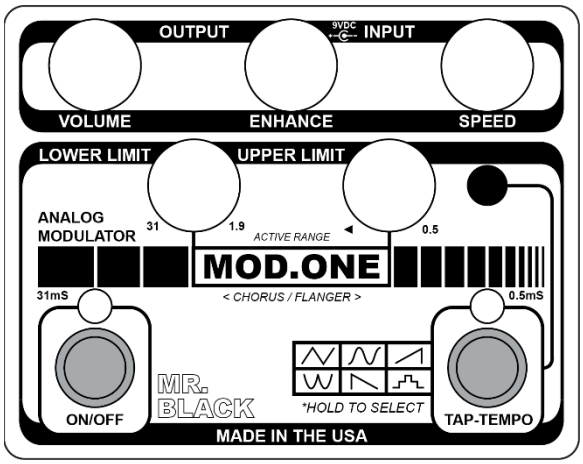

User Setting 6

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