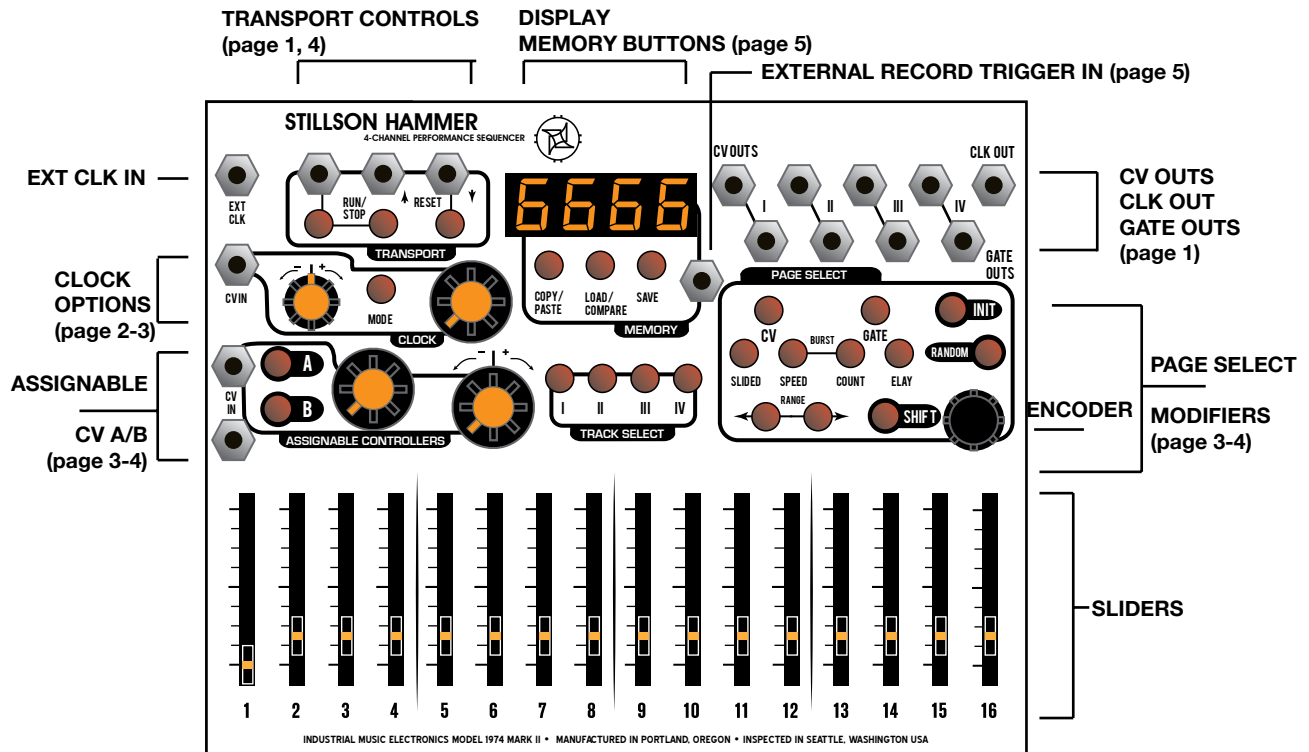


# INDUSTRIAL MUSIC ELECTRONICS

## STILLSON HAMMER MARK II

### OPERATIONS MANUAL OS v. 1.5



## QUICK START

Basic patch: Connect the CV OUT 1 to the 1V/Oct input of a VCO module. Patch this module into a VCA, whose volume is controlled by an envelope generator. Patch the GATE OUT 1 to this envelope generator's trigger/gate input. Repeat with additional outputs and external oscillators/VCA's, or use the additional CV outs to modulate other parameters of your instrument.

We recommend the use of INDUSTRIAL MUSIC ELECTRONICS modules such as the HERTZ DONUT, PISTON HONDA, and DOUBLE ANDORE with the STILLSON HAMMER. The MKII versions of these modules are specially designed to work the best with this sequencer. If you turn the large frequency knobs on either of these oscillator modules to the zero position while the 1v/OCT signal is patched to the sequencer, the basic pitch will correspond to the note and scale names shown on the STILLSON HAMMER's display. If you are using other models of oscillator, take care to adjust them so that all oscillators connected to the sequencer are playing in tune if given the same output voltage. Push the RUN/STOP button so it turns green and the sequence starts playing.

Next, select Track 1 by pressing its TRACK SELECT button. Next, push the GATE PAGE SELECT button and move some sliders so that the LEDs light up.

The attached VCA and envelope should be triggering and emitting sound. Next, push the CV PAGE SELECT button and move the sliders to set the pitches for each of your gated steps. See the TRACK OPTIONS text below for help in setting up your quantizer scale. The 16 sliders at the bottom of the module are used for programming all sequence data. Their function will change depending on the PAGE SELECTION. If the page focus is changed, the sliders will not program new data into the sequence unless they are moved slightly from their current physical positions.

## TRANSPORT CONTROLS:

Press the RUN/STOP button to start or stop the sequence. When running, it will advance at a rate set by the CLOCK controls. Even if the clock source is external, the sequencer will not run unless the mode is set to RUN (the button will light green if running, and red if stopped.) The jack above this button accepts external trigger signals and has the same effect as the button. If you hold SHIFT and push the RUN/STOP button, the light will go out and the transport will only be active if a gate is present at the RUN input.

While the sequencer is stopped, you can change the active step position by turning the ROTARY ENCODER. The ENCODER also has a built-in button. If you push down on the ROTARY ENCODER while the sequencer is

stopped, it will activate all four GATE OUTS. When you change the step by using the encoder, the display will show the value of the currently active step, programmed onto the appropriate parameter page. You may move the associated slider to program a new value at this time, using the display to set a precise value.

By pushing the RESET button, you will can use a trigger event to be fired from the middle jack. You can use this to reset other sequencers synchronized to the Stillson Hammer. The rightmost jack accepts a trigger signal that acts the same as the button. When a RESET event is received, the sequencer will reset all tracks to Step 1 when the next clock event is received. This is useful for synchronized playback with other instruments or sequencers, and also to internally align the four tracks if you are using multiple track lengths or clock divisions.

## **TRACK SELECT:**

These buttons correspond to the four CV/GATE tracks. When pressed, the track will be selected and the button will turn red (or orange if the track is muted.) Unselected (but active) tracks are colored green. Muted tracks that are not selected will not be lit. To mute or unmute a track, hold down SHIFT and press a TRACK SELECT button. Pressing the TRACK SELECT button twice in a row will open the TRACK OPTIONS page on the display (see below.)

## **CLOCK OPTIONS:**

By pressing the button in the CLOCK section, you can switch between Internal or External clock. The display will show ICLO or ECLO, and the button will turn green (internal) or red (external) to show your selection.

The Internal clock will run at a speed set by the combination of the large manual control knob, and the nearby CV input and attenuverter. The manual knob can set the tempo from approximately 30-300 BPM, with more range available through the use of the Clock CV input. If you are performing in Internal clock mode and want to avoid mistaken changes of tempo, hold down SHIFT and press the CLOCK button to turn off the large knob. The display will briefly read COFF and the button will not light up. Repeat to turn it back on.

In External clock mode, patch a gate or trigger signal into the EXT CLK jack in the corner. The sequence will not run without clock pulses coming in. We recommend a straight, square clock signal as new steps will be clocked in on the rising edge of the signal.

The CLK OUT jack in the opposite corner will emit a copy of the selected clock signal if the sequencer is running. It will be unaffected by any clock divider settings. Use this with the RESET signal to synchronize external equipment to the Stillson Hammer.

## **PAGE DESCRIPTIONS:**

### **CV:**

When selected, the sliders will edit the CV value of the step that will come out of the associated track's output. If the quantizer is enabled (see TRACK OPTIONS), the value displayed will consist of the note number and the octave. If the quantizer is off, the value will be displayed in volts. Use the two RANGE buttons below to select the octave range that the slider will represent. The range in volts will be briefly shown on the display.

For ease of editing, press the encoder button to reveal which steps have active gates on the slider LEDs.

You can slave the CV output to the behavior of that track's GATE output. Hold down SHIFT and press the CV PAGE button. The SHIFT button will illuminate when this mode is active.

### **SLIDE:**

Use the sliders to select the time it will take for a given step's CV value to transition to the next one. INITializing this page will reset all values to zero. The slide times are proportional to the tempo setting. The slide has a linear slope.

For ease of editing, press the encoder button to reveal which steps have active GATES on the slider LEDs.

### **GATE:**

When selected, the slider LEDs will light if an active GATE is programmed onto that step.

If the slider is pushed to its lowest position, the GATE will be turned off. The LENGTH of the GATE event is determined by the position of the slider, represented as a division of the length of one step. If the slider is set to the bottom position, the GATE will be disabled for that step. If the slider is set to the maximum position, it will cause the GATE output to fire for the maximum length, and TIE to the next GATE without retriggering.

When BURST is active, this page also controls the GATE length of the repeat burst events.

For ease of editing, press the encoder button to reveal which steps have active BURSTS on the slider LEDs.

## BURST- COUNT:

Select this page for the current track by pressing the "COUNT" page select key. When selected, the slider LEDs will light if an active BURST trigger is programmed onto that step. Note that bursts will not repeat unless you have programmed a value into the "SPEED" page.

The BURST function causes the GATE OUTPUT for a track to repeat itself when its step is triggered, also known as "retriggering" or "ratcheting". You can choose the amount of repetitions, as well as enable the BURST from this page.

To assign a BURST to a step, move the slider upwards. If a slider is at the bottom of its travel, the BURST for that step will be inactive. Watch the display to see the exact number of repeat events that you are programming.

For ease of editing, press the encoder button to reveal which steps have active GATES on the slider LEDs.

## BURST - SPEED:

This page controls the delay before a BURST event repeats. If you program this page, its data will only be useful for steps with active GATE and BURST. The speed setting will not be updated if a BURST is currently running. You must activate a new BURST from the COUNT page to change the repeat rate.

For ease of editing, press the encoder button to reveal which steps have active BURST triggers on the slider LEDs.

## DELAY:

Use the sliders to program the time offset for each step's GATE. This is expressed as a division of one step length. A slider set to the minimum position will give no DELAY to the GATE. If the delayed GATE event overruns the step's length, it will be reset at the end of the step unless the corresponding GATE length on the original step is set to Tie.

For ease of editing, press the encoder button to reveal which steps have active GATES on the slider LEDs.

## MODIFIER BUTTONS:

### INIT

The INIT key initializes sequence parameters. You must hold it down while pushing other buttons. You may do this with any of the PAGE SELECT keys, or you may initialize entire tracks by holding it down and pressing any of the TRACK SELECT keys.

### SHIFT

The SHIFT key adds alternate functionality to other buttons or sliders.

Hold SHIFT and press the CLOCK button to disable the operation of the large clock rate knob, for live performance convenience.

Hold SHIFT + ENCODER buttons while pressing a RANGE key to increment or decrement the currently playing preset. Unless in Random transport mode, the preset will change when the sequence reaches Track 1's reset point.

Hold SHIFT + ENCODER buttons while moving a slider on any page to set all steps on that page to that slider value, as if you were moving all 16 of them at once.

## RANDOM

Hold RANDOM and press any PAGE key to randomize its slider values. The same can be done with a TRACK SELECT button to randomize an entire TRACK's basic parameters. When RANDOMizing a track, hold down the SHIFT key as well, to cause a deeper randomization across all pages (including CV destinations)

Hold RANDOM and press the LOAD key to load a random sequence from the MEMORY.

## CV A/B - ASSIGNABLE CONTROLLERS

The two external A/B inputs combine with the action of the large manual controls to modify selected parameters of the sequence. The Stillson Hammer expects voltages in the range of 0 to +5V. Voltages outside of this range should not damage the unit, but will have no effect on the sequence.

The two external A/B channels must be programmed by holding down either of the two buttons. While holding down the buttons, move the sliders to program the value for each step. Think of the sliders in this mode as "attenuators per step", where the incoming

CV (or manual control value) will be multiplied by the slider value before being sent out to the selected destinations. Each track can have very different CV programs all sharing the same two control sources, so a single preset can provide hours of performance variation if appropriately programmed.

To assign the controller to a destination, hold down CV A or B, and press a PAGE button so the destination button lights up green.

The manual control on CV channel B is bipolar: the center position is zero, turning it counterclockwise subtracts from the page's programmed value, and turning it clockwise adds to the value.

## TRACK OPTIONS:

Press a TRACK select key twice. The page select LEDs will turn off and the display will change. Use the ENCODER button or the three keys immediately below the display to select the editing target.

## TRACK LENGTH

The leftmost button (and two digits) show the step length of the sequence. When the button is illuminated green, you can use the rotary encoder to set the length from 2 to 16 steps. Different tracks can have different lengths, so you can use the RESET button to set the sequence position of all tracks to step 1 when they get misaligned.

## QUANTIZER ROOT:

The third digit in the display shows the scale root. When the middle button below the display is illuminated green, you can use the rotary encoder to change the root of the track's scale. If the display reads “—” on the right side, the quantizer is disabled. If it says “12”, it's 12-tone quantized. Otherwise, the letter shows the root of the scale, with the “.” meaning “sharp”. Changing the root note in this mode will cause a post-quantizer shift of the absolute position of the slider, so you can change the “key” of the sequence by modifying the root.

## QUANTIZER SCALE TYPE:

The last digit in the display shows the scale type. When the rightmost button below the display is illuminated green, you can use the rotary encoder to change the root of the track's scale. Setting the type to “—” or “12” will override the root selection.

## SCALE TYPES REFERENCE:

Quantizer off --  
All Semitones 12  
Major |—|  
Minor |—|.   
Dorian d  
Lydian L  
Phrygian P  
Mixolydian Y  
Locrian l  
Fifths and Octaves 5  
Major Triad 3  
Minor Triad 3.  
Major 6th 6  
Minor 6th 6.  
Major 7th 7  
Minor 7th 7.

## TRANSPORT OPTIONS:

Press the middle key in the “TRANSPORT” control section to enter the TRANSPORT OPTIONS menu. The page select LEDs will turn off, and the display will change. Press the encoder button (or the buttons immediately below the display) to select the parameter to edit. To exit this mode, press any page select key.

## CLOCK DIVISOR:

The leftmost button (and leftmost two digits) in the display show the clock divisor for the track. You can divide the incoming clock by 1-32. Use the rotary encoder while selected to change this parameter. We recommend leaving Track 1's divider at 1, since the preset changes are decided when Track 1 resets, and longer clock divisions could cause a long delay before the commanded preset is finally loaded.

## TRANSPORT MODE:

The rightmost button (and rightmost two digits) in the display show the transport mode.

Fd: FORWARD MODE: A track will start at step 1 and proceed to the maximum step set as the TRACK LENGTH. When this happens, it will reset to 1.

Pd: PENDULUM MODE: A track will start at step 1 and proceed to the maximum step set as the TRACK LENGTH. When this happens, the sequencer will start to run backwards to step 1, and repeat.

Rd: RANDOM MODE: A random step will be selected

when the divided clock arrives at the track.

## **CONNECTING TO OTHER SEQUENCERS:**

For best results when using one clock source or sequencer to control multiple Stillson Hammers (or other sequencers), use a Multiple module or stackable patch cables to send the master clock and reset signals to all connected sequencers. Don't "daisy chain" the clock signals.

## **COPY/PASTE**

To copy a page of data to the copy buffer, hold down the COPY/PASTE button and push a PAGE SELECT button. The COPY/PASTE button should light up red. To paste this data, select your destination track and page, hold down the COPY/PASTE button, and push your desired destination's PAGE SELECT button. You can also copy entire tracks by holding COPY/PASTE and pressing a TRACK SELECT button.

## **MEMORY - PRESET STORAGE**

The Stillson Hammer MkII can store 32 preset sequences in nonvolatile memory.

Press the LOAD button to show the intended load source. You can change this by turning the rotary encoder. To cancel out of this selection, press the ENCODER button. Otherwise, press the LOAD button again to load the selected sequence when Track 1 resets. You can also command LOAD operations by holding down the RANDOM button before pressing LOAD, or by SHIFT + ENCODER + RANGE to increment/decrement the sequence.

Press the SAVE button to show the intended SAVE destination. You can change this by turning the rotary encoder. To cancel out of this selection, press the ENCODER button. Otherwise, press the SAVE button again to save the selected sequence.

## **EXTERNAL RECORD TRIGGER:**

A gate signal arriving at this jack will cause the voltage preset at the CV B jack to be recorded into the current step on the CV page of the currently selected track. This jack accepts voltages from 0-5V, so select the CV range "0-5V" if you would like the track's output to resemble the voltage input. Otherwise, the 0-5V input range will be mapped to the slider range set by the RANGE buttons on the track. Note that this CV input is not calibrated, so do not expect precise tuned voltage operation in this mode. Experiment with different quantizer,

CV voltage shift, and clock division/track length settings for each track, so that the single input voltage and record trigger can dramatically alter different parts of the sequence as each track is selected.

## **TEST MODE/CALIBRATION**

USE CAUTION WHILE IN TEST MODE. YOU CAN ACCIDENTALLY ERASE ALL OF YOUR SEQUENCES IF YOU PUSH THE TRACK 4 KEY.

To access TEST MODE, hold down the LOAD button while turning your modular system's power on. All the buttons should light up red, and they will turn green if you press the GATE page button. Measure the voltage coming out of any of the CV output jacks with a voltmeter. If it does not equal 8 volts, turn the trimpot on the back of the module until it does.

To safely exit TEST MODE, press the TRACK 1 button. To erase the entire sequence memory, press the TRACK 4 button.

## **SEQUENCE STORAGE CHIP**

The storage chip is a Microchip 25LC512 in DIP package. It stores 32 sequences. You can replace it with a new chip, and back up the data to computer by using the Industrial Music Electronics model 1991X-2 ROM programmer board and a Microchip PicKit2. Do not insert or remove the chip while the module is powered up.

When you are installing a new, blank chip into the socket, you MUST enter TEST MODE and perform the ERASE command, or the sequencer will not operate correctly.

## **MORE INFORMATION:**

<http://www.industrialmusicelectronics.com/modules/stillson/>

**Find this document, firmware updates, media files, and additional information here.**

## **SUPPORT:**

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**Write to this address if you need more help.**