

# **MIDI Drum Sequencer (MDS) v0.5**

## **Quick Start Guide**

### ***1. Introduction***

The MIDI Drum Sequencer (MDS) is designed to emulate hardware drum machines, allowing you to create and edit drum sequences (patterns) and combine them into entire songs. Patterns can be up to 32 steps long (longer patterns can be created by running two or more patterns in sequence). Patterns can be combined to run sequentially and/or in parallel, with virtually no limitation on the number of patterns involved or the complexity of their organization. Up to 8 instruments can be selected for each pattern, but if you need more than 8, you can have two patterns run concurrently (in parallel).

### ***2. Installation Requirements***

MDS was initially developed and tested under Pure Data v0.51.2 (64-bit) and Windows 7 SP 1 (64-bit). There's a good chance it will work on Linux and MacOS too, although it hasn't been tested.

Although it will probably run under earlier versions of Pure Data, there's no guarantee, and you may encounter problems if you're running a much older version of Pure Data or any of the required external libraries.

The following libraries, all of which can be installed using Deken (under the Help menu, click on "Find externals"), are required:

- tof
- cyclone
- else
- zexy
- iemlib
- easyflow

### 3. Editing Songs

When you start up MDS (either by double-clicking on the file “Drum-Sequence.pd” or starting Pure Data and opening the file), the following window will open (see Fig. 1).

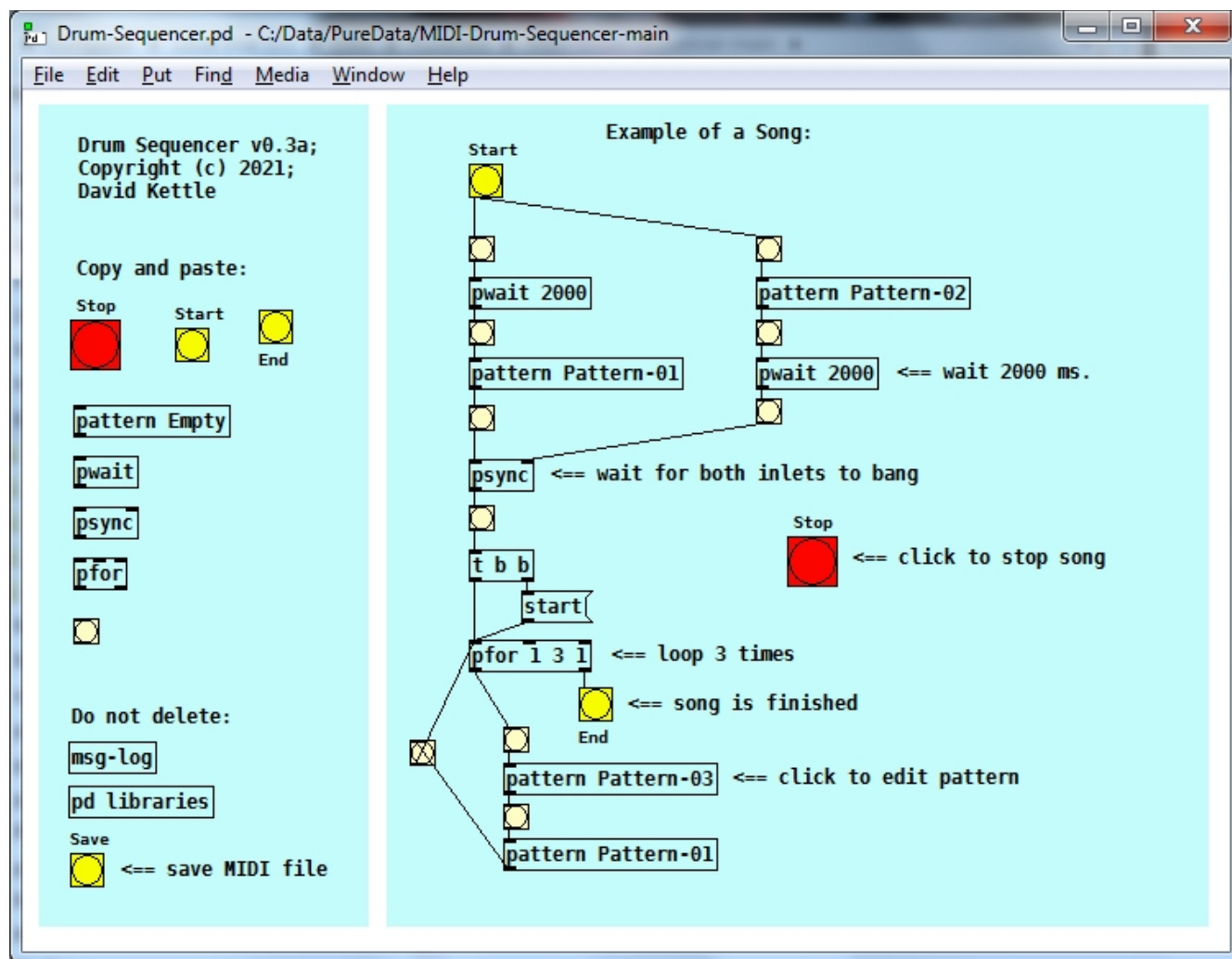


Fig. 1, Main Window

Although you can edit this file in Pure Data, it's recommended that you save a copy under a different name (the name of the song, for example) and make your changes to that file instead.

It's assumed that you have some familiarity with editing patches in Pure Data, although you don't need extensive knowledge. Patterns can be added or removed to your song by creating [pattern] objects, optionally specifying the file name as the first (and only) creation argument. For example, in the screen print above, there are 4 patterns: Pattern-

01, Pattern-02, Pattern-03 and Pattern-01 (the same pattern can be used in more than one place).

The initial starting point of the song is indicated with a [song-start] object (which takes no creation arguments), and the end of the song is indicated with a [song-end] object (which likewise takes no arguments). Patterns are connected by drawing lines from the outlet of one pattern to the inlet of another. You may wish to place a [bang] between them to monitor the progress of your song, although this isn't required. This will also allow you to start a song at some intermediate point, instead of the beginning point.

If you don't want a pattern to start immediately after the preceding pattern finishes, you can add a [pwait] object between them, specifying the wait time in milliseconds as the creation argument. For example, in the sample song above, Pattern-02 is followed by a wait or pause of 2000 ms (2 seconds).

If you have two patterns running in parallel, you can force them to synchronize by adding a [psync] object and connecting the outlets of both patterns to the two inlets of [psync]. For example, in the sample song above, Pattern-01 and Pattern-02 (followed by a wait of 2 sec.) are synchronized. In other words, the song will not continue until the [psync] object has received a [bang] on both inlets.

If you need to synchronize more than 2 patterns, unfortunately you have to use 2 or more [psync] objects, connected in a “ladder” formation, because [psync] has only 2 inlets.

You can create a loop using the [pfor] object, and within the loop run one or more patterns in a sub-network, which can even include sub-loops.

To play the song, click on the yellow “Start” button. To stop the song before it has finished, click on the red “Stop” button.

To save the output in a MIDI file, click on the yellow “Save” button in the bottom left corner of the window. You will be prompted for the name and location of the file to save into.

## 4. Editing Patterns

Patterns are created or modified in the [pattern] window (see Fig. 2). To open the pattern , click on the [pattern] object in the main window.

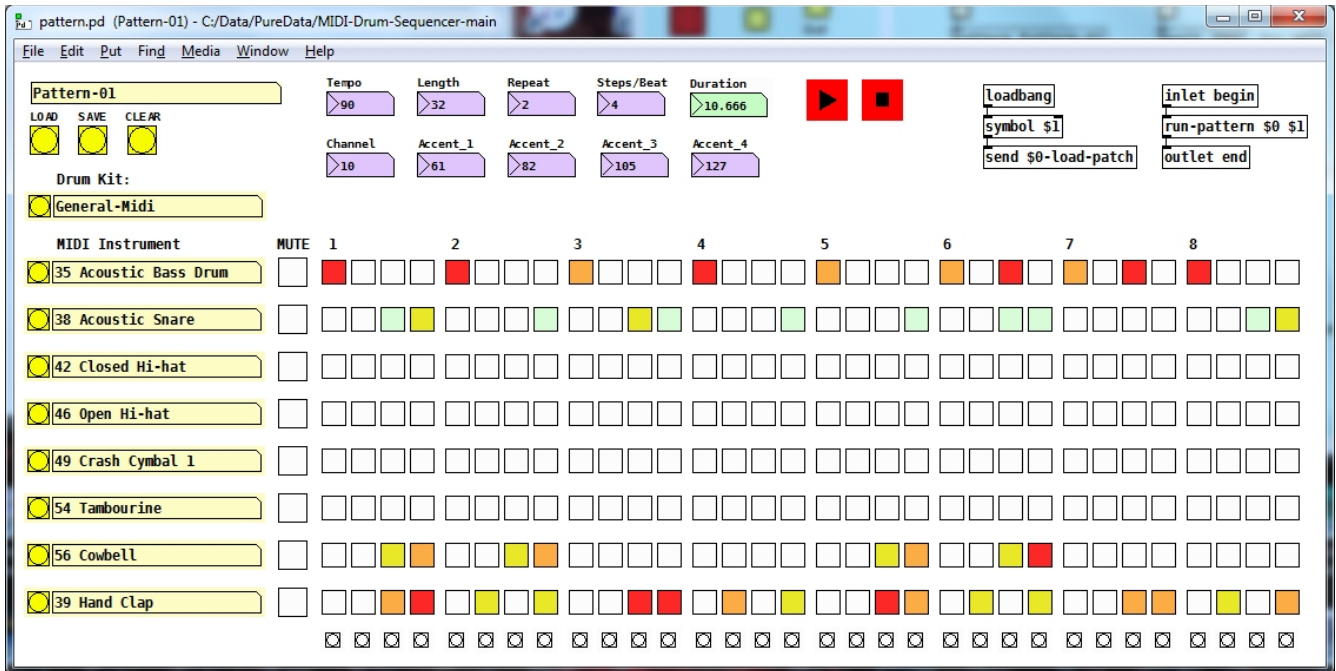


Fig. 2, Pattern Edit Window

Although you can add or remove Pd objects in this window, it's recommended that you don't, unless you're fairly knowledgeable about editing Pure Data patches. You should be able to create, save, load and modify patterns without modifying the Pure Data code in this window.

To load a pattern, save a pattern (possibly under a different name) or clear the pattern, use the three buttons in the top left corner, labeled “LOAD”, “SAVE” and “CLEAR”. The file name of the currently-loaded pattern is displayed above these three buttons (see Fig. 3).



Fig. 3, Load/Save/Clear a Pattern

To the right of these buttons, there are number boxes (see Fig. 4) in which you can enter the tempo (in BPM), the length of the pattern (the number of steps in the pattern, from 1 to 32), the number of times to repeat the pattern (from 1 up to some very large number), the number of steps per beat (from 1 to 32), the MIDI channel to send the output on (which defaults to 10, but can be from 1 to 16), and the four accent levels (this will be explained below). The total duration of the pattern, in seconds, will be automatically calculated and displayed in the green box labeled “Duration”.

Note that the actual MIDI device to send the output to is specified under “Media / MIDI Settings...” in the Pure Data menu bar. Your MIDI device must be connected before starting Pure Data (if it's a hardware drum machine) or already running (if it's a soft synth running on your computer).

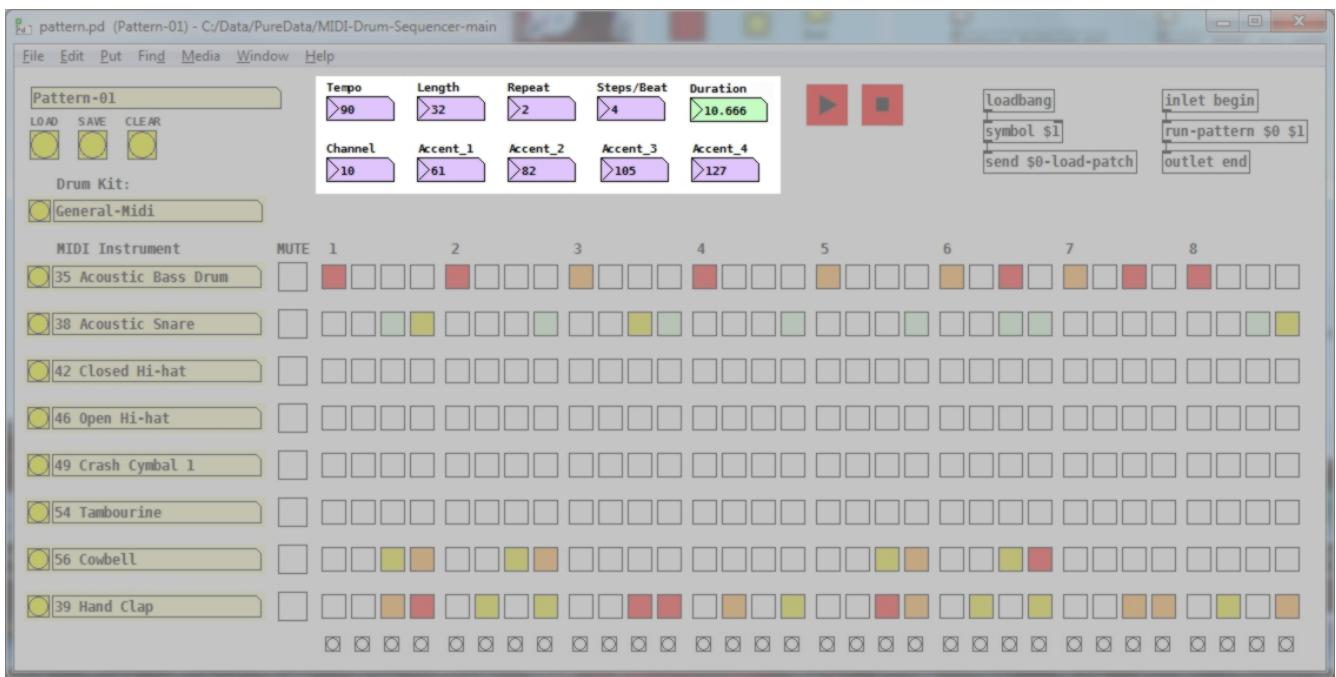


Fig. 4, Pattern Settings

You can select the drum kit you want to use by clicking on the yellow button under “Drum Kit” (see Fig. 5). The default drum kit contains the instruments defined in the General MIDI percussion map (see Appendix 1), but you may want to create your own drum kits for specific hardware or software percussion synths, limiting the options to those supported by the synth you want to use. Or you may want to translate the names to another language, or just use names of your own choosing. To create another drum kit, copy the file “General-Midi.txt” in the sub-folder “data” and save it under a different name. Be careful to keep the file in the same format, with one instrument per line, preceded by the MIDI note number for that instrument.

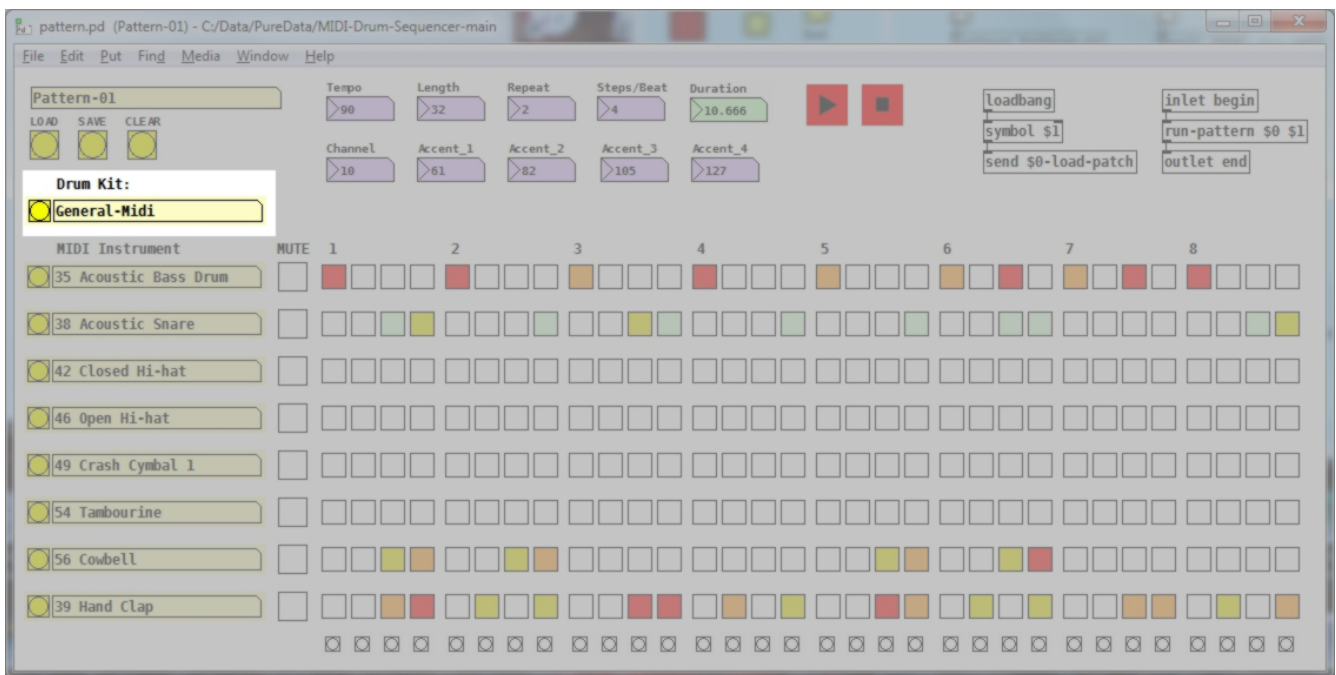


Fig. 5, Selecting a drum kit



Fig. 6, Selecting instruments from the drum kit

The percussion instruments you want to use are selected by clicking on the yellow buttons on the left side of the window (see Fig. 6). Each pattern can use up to 8 instruments, and these can be different for each pattern. So although there's a limit of 8 instruments for each pattern, if you want to use more than 8, you can create two or more



patterns that run in parallel. When you click on one of the yellow buttons, a drop-down list of the percussion instruments in the currently-selected drum kit will be displayed, from which you can select the instrument you wish to use.

Each instrument can be selectively muted by clicking on the box in the column labeled “MUTE” (see Fig. 7). The box will be changed to red if the instrument is currently muted; otherwise, it will be empty (white).



Fig. 7, Muting instrument tracks

Finally (and most importantly), the patterns for each instrument are entered using the grid of squares to the right (see Fig. 8).

The amount of accent to apply to each hit can be set to one of four levels. To specify the four levels (in terms of MIDI note velocity), use the four boxes at the top of the window, mentioned previously, labeled “Accent 1”, “Accent 2”, “Accent 3” and “Accent 4”. They can be set to any value between 1 and 127 (the range of values used by MIDI to indicate “velocity”). They would normally increase in value, from left to right, but you can set them to any values you wish, within the range of 1 to 127.



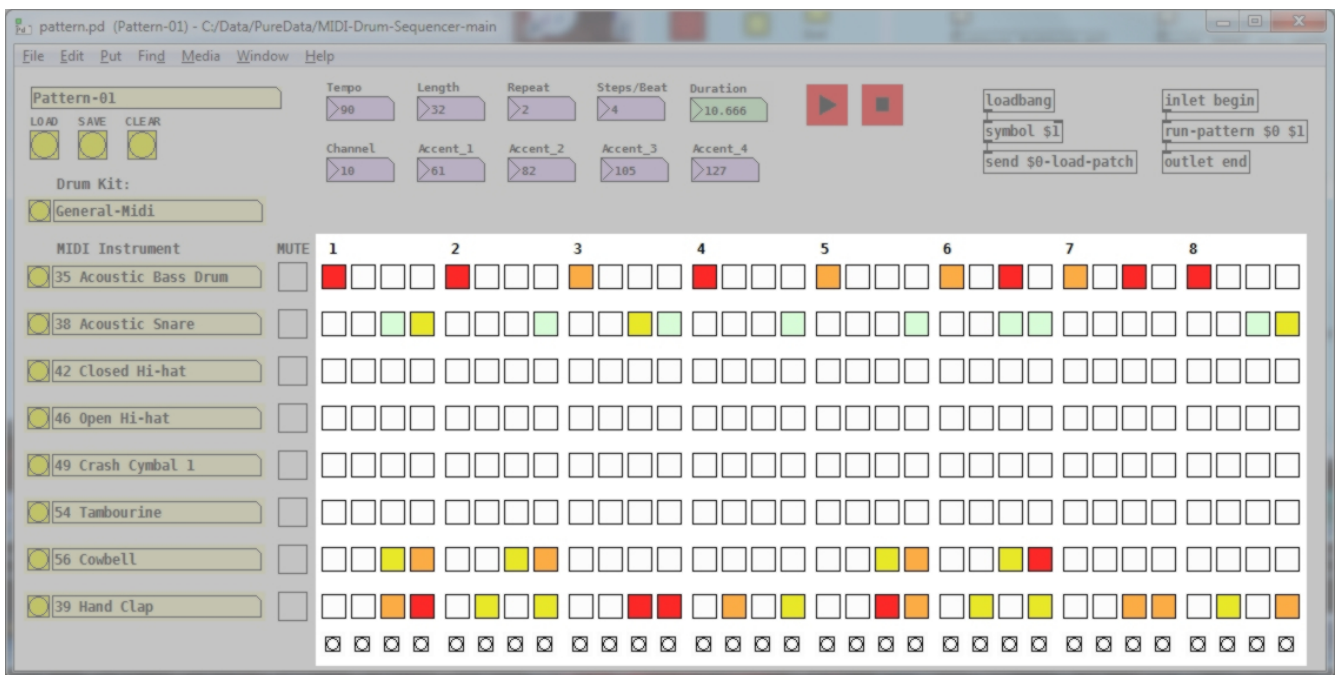


Fig. 8, Entering drum patterns

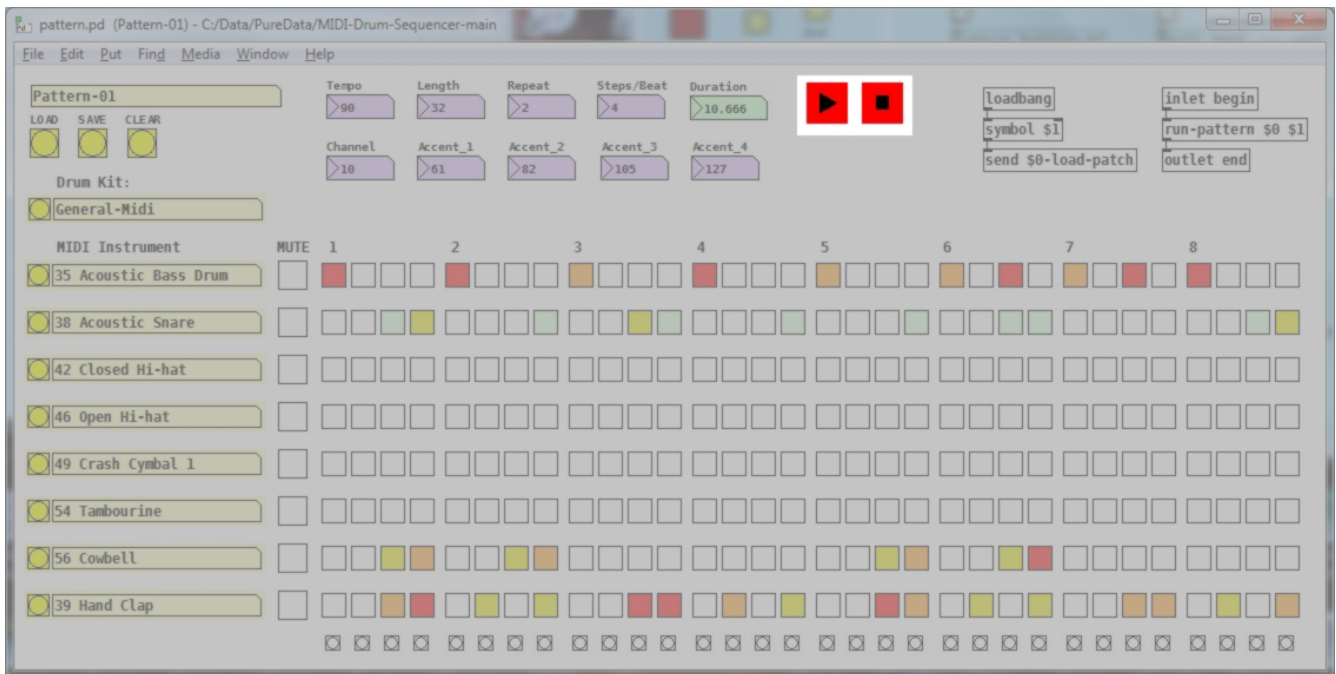


Fig. 9, Running the pattern

The first time you click on one of the steps in the pattern, it will be set to level 1 and the colour will change to light green. If you click on it a second time, it will be set to level 2 and the colour will change to yellow. If you click on it a third time, it will be set to level 3 and the colour will change to orange. And if you click on it a fourth time, it will be set

to level 4 and the colour will change to red. Finally, if you click on it a fifth time, it will be turned off and the colour will change back to white.

To run or stop the pattern, use the two red transport buttons at the top of the window (see Fig. 9). As the pattern runs, the small “LED's” at the bottom of the window will flash on and off.

## **5. Getting Support**

If you run into problems or have questions, please visit the project repository on Github:

<https://github.com/dfkettle/MIDI-Drum-Sequencer>

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## ***Appendix 1: General MIDI Percussion Map***

27 High Q	54 Tambourine
28 Slap	55 Splash Cymbal
29 Scratch Push	56 Cowbell
30 Scratch Pull	57 Crash Cymbal 2
31 Sticks	58 Vibra Slap
32 Square Click	59 Ride Cymbal 2
33 Metronome Click	60 High Bongo
34 Metronome Bell	61 Low Bongo
35 Acoustic Bass Drum	62 Mute High Conga
36 Electric Bass Drum	63 Open High Conga
37 Side Stick	64 Low Conga
38 Acoustic Snare	65 High Timbale
39 Hand Clap	66 Low Timbale
40 Electric Snare	67 High Agogô
41 Low Floor Tom	68 Low Agogô
42 Closed Hi-hat	69 Cabasa
43 High Floor Tom	70 Maracas
44 Pedal Hi-hat	71 Short Whistle
45 Low Tom	72 Long Whistle
46 Open Hi-hat	73 Short Guiro
47 Low-Mid Tom	74 Long Guiro
48 Hi-Mid Tom	75 Claves
49 Crash Cymbal 1	76 High Woodblock
50 High Tom	77 Low Woodblock
51 Ride Cymbal 1	78 Mute Cuica
52 Chinese Cymbal	79 Open Cuica
53 Ride Bell	80 Mute Triangle

81 Open Triangle

82 Shaker

83 Jingle Bell

84 Belltree

85 Castanets

86 Mute Surdo

87 Open Surdo