A Seq24 User Manual

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1 Introduction

This document describes how to use *Seq24* [7], versions 0.9.2 and above.

Seq24 is a live-looping sequencer with an interface more like a hardware sequencer than the typical software MIDI sequencer. The contents of this document are derived in part from existing documents, such as the `SEQ24` file shipped with the Seq24 source code, and a printout from a long-lost wiki.

Seq24 is not a synthesizer. One needs hardware synthesizer, or a software synthesizer such as Timidity [8], FluidSynth [3], ZynAddSubYX [13] and Yoshimi [9] [10], AmSynth [1], Bristol [2], and others (see [4] for a fairly comprehensive list of "Linux" synthesizers).

Seq24 is meant to work a bit like an Alesis SR16 drum machine, which, for some, is a very intuitive and fast way to do MIDI. If one has worked with trackers like *SoundTracker* and *ShakeTracker*, then "you are a tracker guy and it gonna go fast". With *Seq24*, one creates several patterns, and then combine them.

There are a number of current authors of `Seq24` today, as one can see in figure 13 ("Help Credits") on page 15, and it figure 14 ("Help Documentation") on page 16. The original author is Rob C. Buse; where the word "I" occurs, that is probably him.

> Written by Rob C. Buse. I wrote this program to fill a hole. I figure it would be a waste if I was the only one using it. So, I released it under the GPL.

1.1 Seq24: What and Why?

`Seq24` is a real-time MIDI sequencer. It was created to provide a very simple interface for editing and playing MIDI 'loops'. After searching for a software based sequencer that would provide the functionality needed for a live performance, there was little found in the software realm. I set out to create a very

minimal sequencer that excludes the bloated features of the large software sequencers, and includes a small subset of features that I have found usable in performing.

1.2 Document Structure

The structure of this document is based on the user-interface of *Seq24*. The sections are basically provided in the order their contents appear in the user interface of *Seq24*. To help the reader jump around this document, multiple links and references are supplied.

Usage tips for each of the functions provided in *Seq24* are sprinkled throughout this document. Each tip occurs in a section beginning with "Tip:". Each tip is provided with an entry in the Index, under the main topic "tips".

Bug notes for some of the oddities found in *Seq24* are sprinkled throughout this document. Each bug occurs in a sentence beginning with "Bug:". Each bug is provided with an entry in the Index, under the main topic "bugs".

TODO items are also present, in the same vein. This document currently has a lot of them!

1.3 Let's Get Started!

Let us run *Seq24*, but run it without using *JACK*, which complicates the discussion of *Seq24*. The first thing to do is make sure one has no other sound application running (unless one wants to risk blocking *Seq24* or hearing two sounds simultaneously, depending on one's sound card and ALSA setup). Then start *Seq24* so that it uses ALSA for MIDI. Provide a default MIDI file so that all elements of the user interface can come into play. Also use the "&" character so that we get back to the command-line prompt.

```
$ seq24 click_4_4.midi &
```

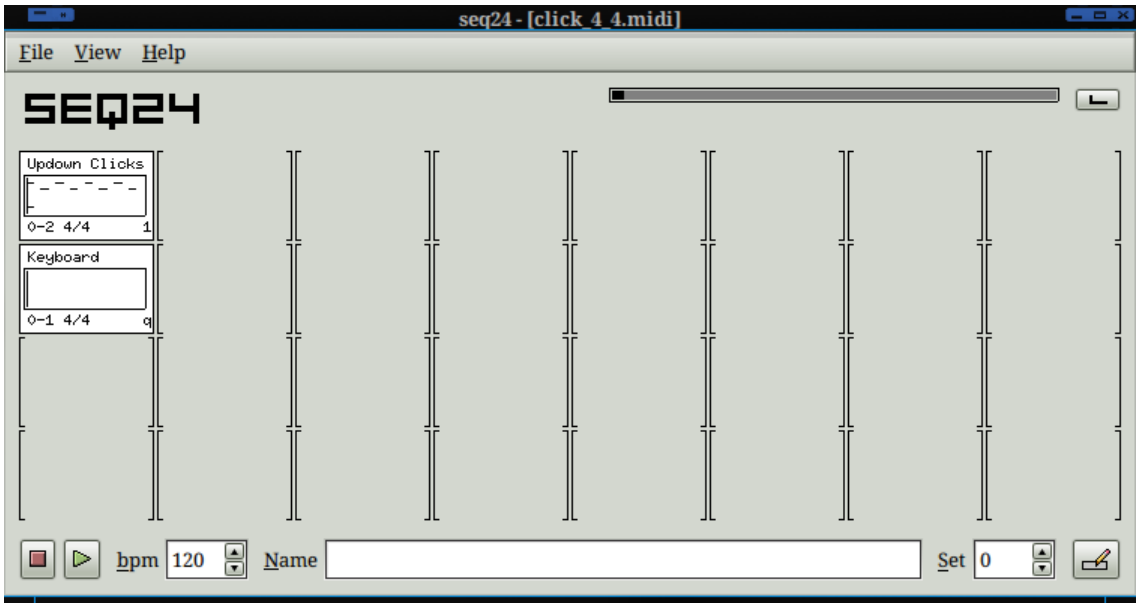

Figure 1: Seq24 Main Screen

Then the *Seq24* main window appears, as shown in figure 1 ("Seq24 Main Screen") on page 4.

As with most user-interfaces, holding the mouse over any button for a short period will let one view a short description of what it does.

The *Seq24* program is basically a loop playing machine with a simple interface. Before we describe this interface, it is useful to present some concepts.

2 Concepts

This section presents some useful concepts, while keeping them out of the way.

2.1 Concepts / Terms

This section doesn't provide comprehensive coverage of terms. It covers mainly terms that puzzled the author at first or that are necessary to understand the *Seq24* program.

2.1.1 Concepts / Terms / group

A *group* in *Seq24* is one of up to 32 previously-defined mute/unmute patterns in the active screen set. A group is a set of patterns that can toggle their playing state together. Every group contains all 32 sequences in the active screen set. This concept is similar to mute/unmute groups in hardware sequencers.

2.1.2 Concepts / Terms / loop

Loop is a synonym for *pattern*. Each loop is represent by a box in the Patterns window.

2.1.3 Concepts / Terms / MIDI clock

MIDI clock is a MIDI timing reference signal used to synchronize pieces of equipment together. MIDI clock runs at a rate of 24 ppqn (pulses per quarter note). This means that the actual speed of the MIDI clock varies with the tempo of the clock generator (as contrasted with time code, which runs at a constant rate).

2.1.4 Concepts / Terms / pattern

A *Seq24* **pattern** is a short unit of melody or rhythm in *Seq24*, extending for a small number of measures (in most cases).

Each pattern is editable on its own. All patterns can be layed out in a particular arrangement to generate a more complex song.

2.1.5 Concepts / Terms / performance

In the jargon of *Seq24*, a *performance* is an organized collection of patterns.

2.1.6 Concepts / Terms / queue mode

To be determined.

2.1.7 Concepts / Terms / screen set

The **screen set** is a set of patterns that fit within the 8x4 grid of loops/pattern in the Patterns panel. *Seq24* supports multiple screens sets, and a name can be given to each for clarity.

2.1.8 Concepts / Terms / sequence

Sequence seems to be another synonym for *pattern*, used in some of the *Seq24* documentation..

3 Menu

The *Seq24* menu, as seen at the top of figure 1 ("Seq24 Main Screen") on page 4, is fairly simple, but it is important to understand the structure of the menu entries.

3.1 Menu / File

The **File** menu is used to save and load standard MIDI files. It should be able to handle any Format 1 standard files that any other sequencer is capable of exporting.

The *Seq24* menu entry contains the sub-items shown in figure 2 ("Seq24 File Menu Items") on page 6. The next few sub-sections discuss the sub-items in the *File* sub-menu.

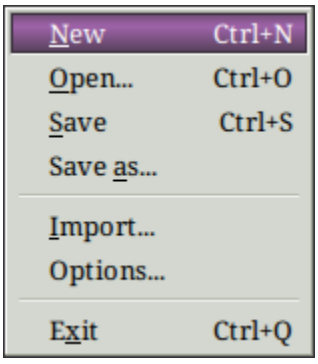

Figure 2: Seq24 File Menu Items

1. **New**
2. **Open...**
3. **Save**
4. **Save As...**
5. **Import...**
6. **Options...**
7. **Exit**

3.2 Menu / File / New

The **New** menu entry clears out any current song and patterns, along one to create news ones from scratch.

3.2.1 Menu / File / Open

The **Open** menu entry opens a song that had been saved previously. It opens up a standard GTK+ file dialog.

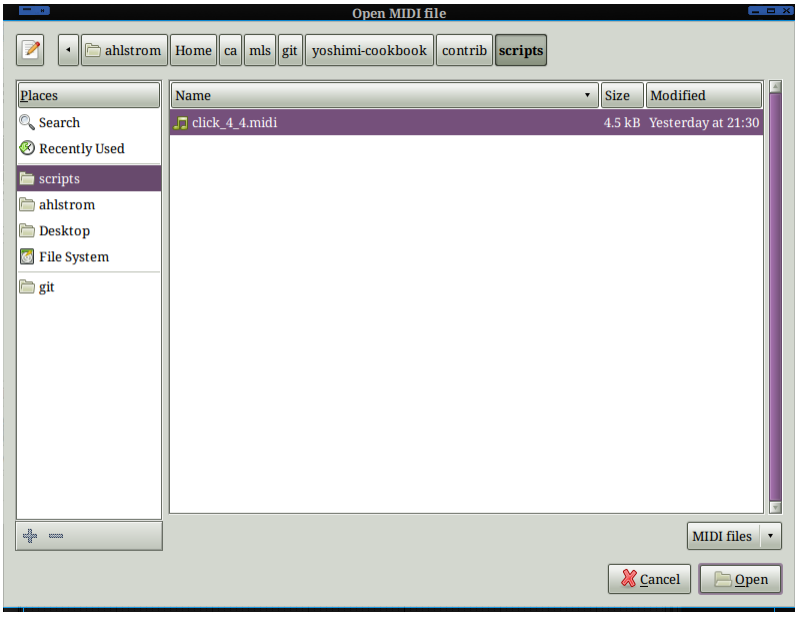

Figure 3: File Open

3.2.2 Menu / File / Save (As)

The **Save As** menu entry saves a song under a different name. It opens up a standard GTK+ file dialog.

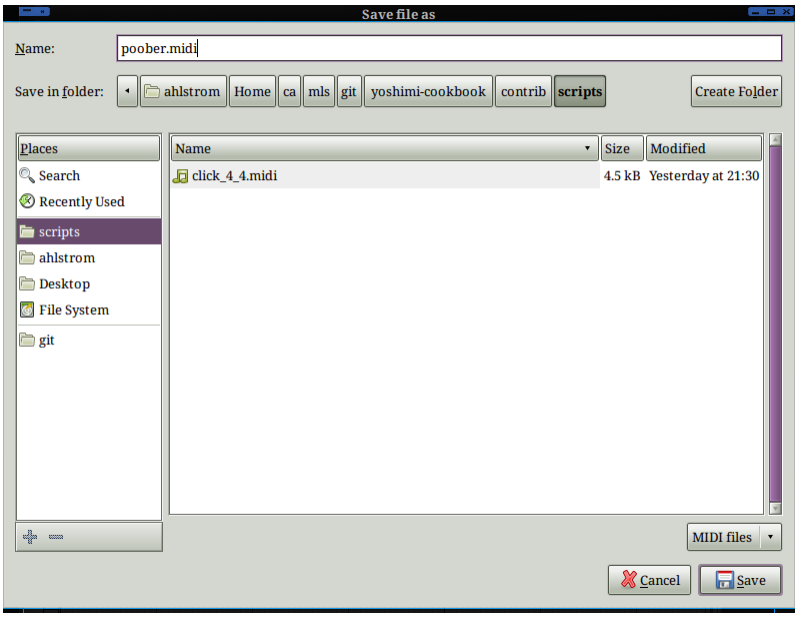

Figure 4: File Save As

The **Save** menu entry saves the song under its current name. If there is no current name, then it opens up a standard GTK+ file dialog.

3.2.3 Menu / File / Import

The **Import** menu entry allows one to import a MIDI file into a pattern.

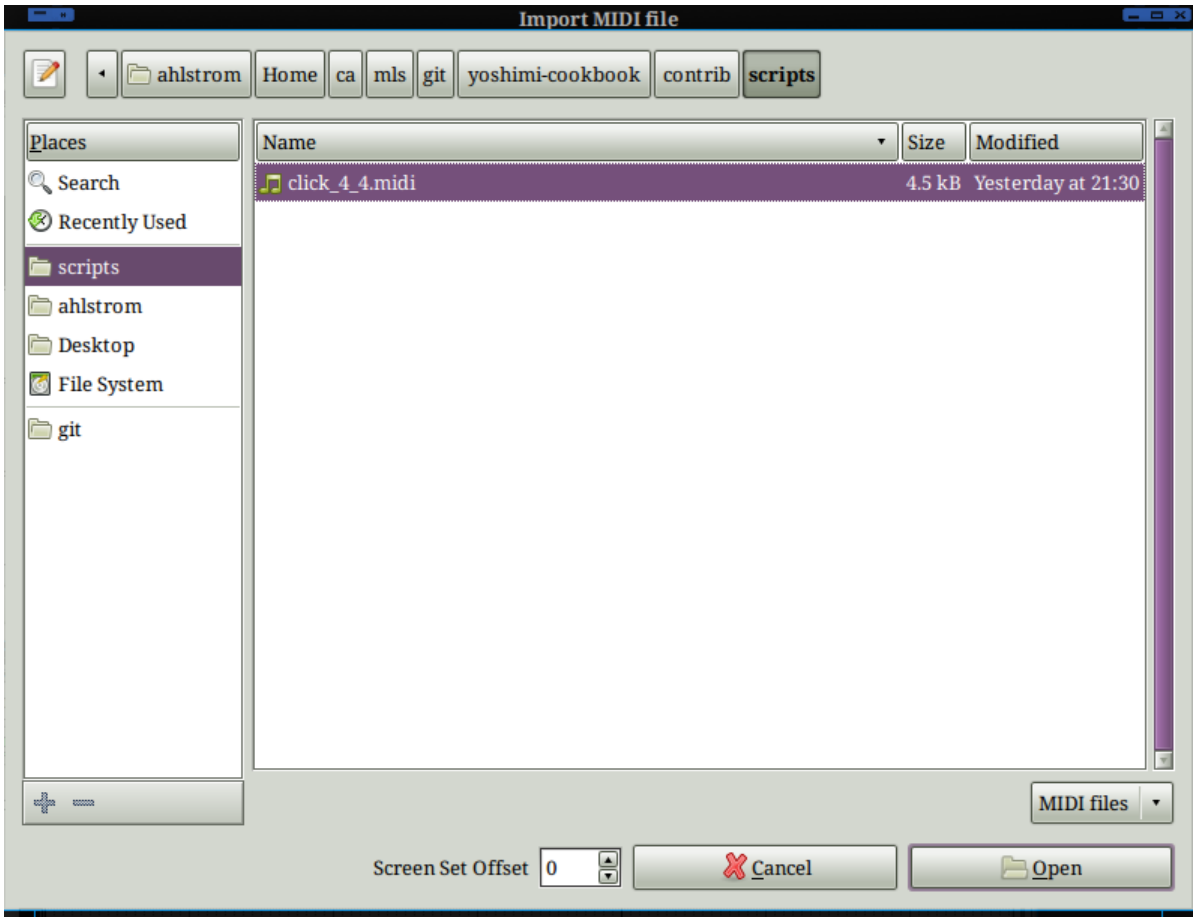

Figure 5: File Import

When imported, each track, whether a music track or an information track, is entered into its own loop/pattern box. The import operation can handle reasonably complex files, as shown in the following diagram, which shows an import of the `contrib/b4uacuse.mid` file, which contains a transcription of an Eric Clapton tune that we'd made over 20 years ago and had uploaded to the *GEnie* network service.

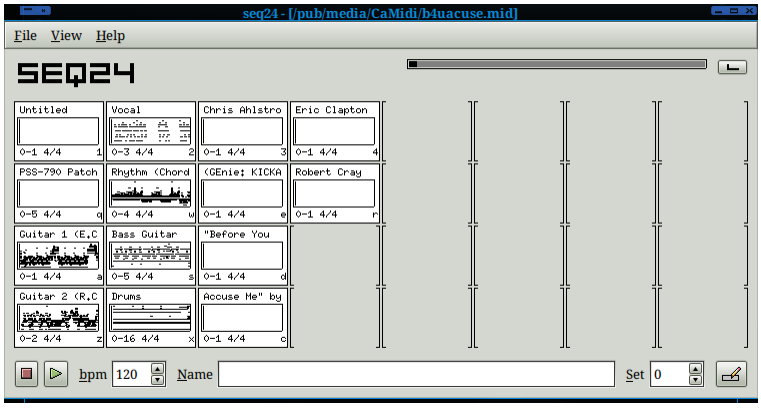

Figure 6: File Import

Unfortunately, this song was created before the days of General MIDI. It is scored for the Yamaha PSS-

790 consumer-level synthesizer. One can use our MIDI-conversion project (see reference [6]) to convert it to General MIDI format, including General MIDI drums.

3.2.4 Menu / File / Options

This menu provides a number of settings in one tabbed dialog, shown in the figure below. This window allows us to select which sequence gets the MIDI clock, and which incoming MIDI events control the sequencer.

3.2.4.1 Menu / File / Options / MIDI Clock

Provides a way to send the MIDI clock to one or more of the *Seq24* output busses. It is used to configure to what busses the MIDI clock gets dumped.

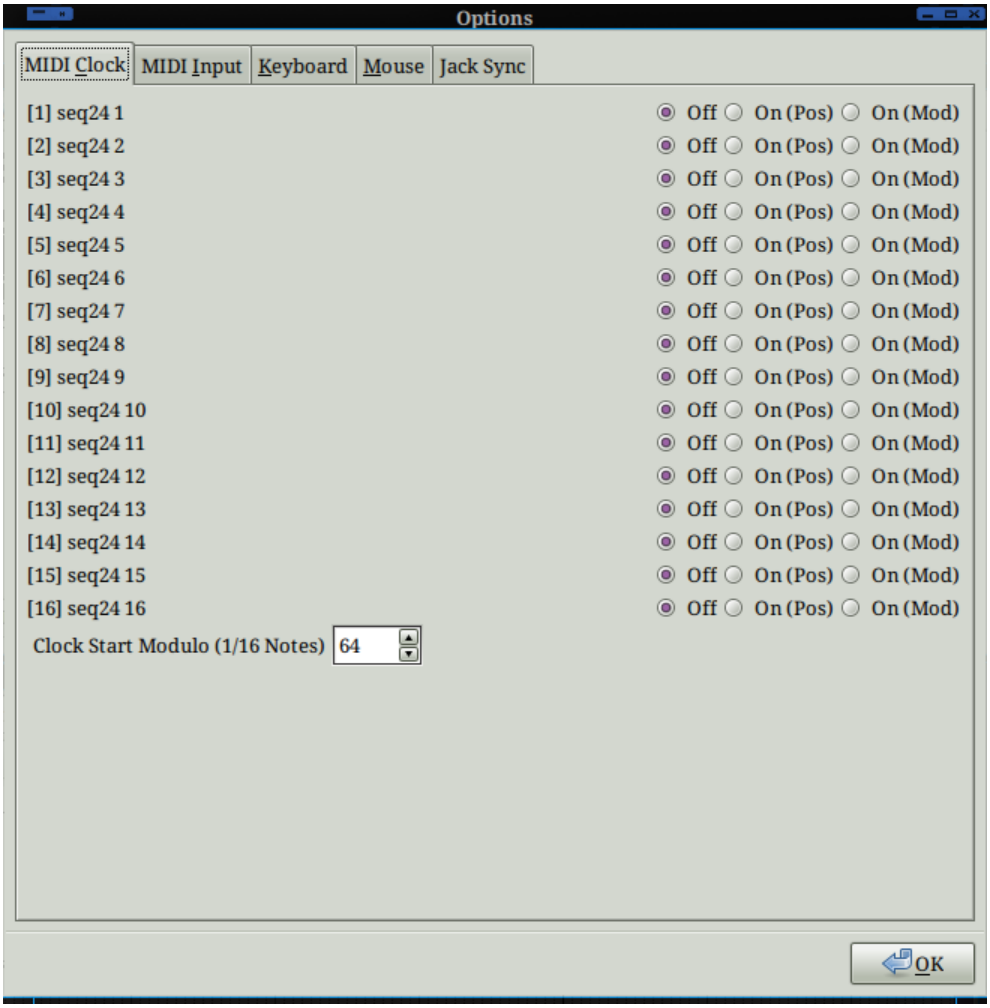

Figure 7: File Options MIDI Clock

The following elements are present in this dialog:

1. **Buss Name**
2. **Off**

3. **On (Pos)**
4. **On (Mod)**
5. **Clock Start Modulo**

1. Buss Name. These labels indicate the output busses of *Seq24*. They range from **[1] seq24 1** to **[16] seq24 16**.

2. Off. This setting disables the MIDI clock for the given output buss.

3. On (Pos). The MIDI clock will be sent to this buss. MIDI Song Position and MIDI Continue will be sent if playback is starting at greater than tick 0 in Song mode. Otherwise, MIDI Start will be sent.

4. On (Mod). The MIDI clock will be sent to this buss. MIDI Start will be sent and clocking will begin once the Song Position has reached the start modulo of the specified size (see the next item's description). This setting is used for gear that does not respond to Song Position.

5. Clock Start Modulo. Clock Start Modulo (1/16 Notes). This value starts at 1 and ranges on upward to 16384. It defaults to 64. It is used by the **On (Mod)** setting discussed above.

3.2.4.2 Menu / File / Options / MIDI Input

The only item in this tab is the single MIDI input buss provided by *Seq24*: **[0] seq24 0**.

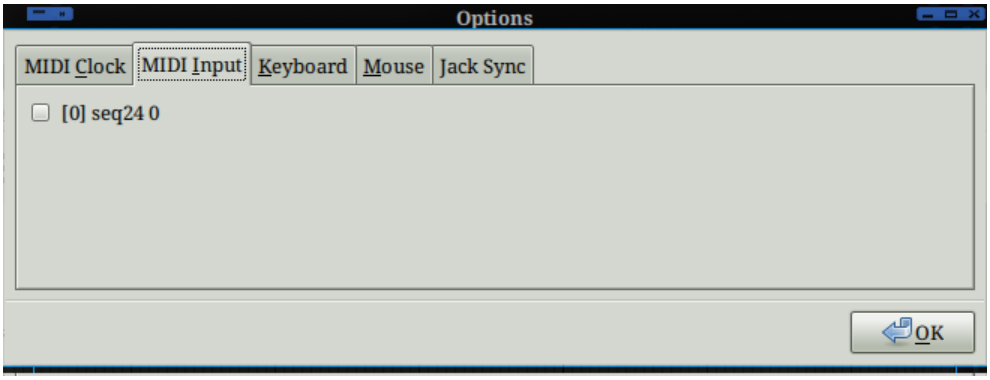

Figure 8: File Options MIDI Input (Condensed View)

This item, if checked allows **Seq24** to be used to record MIDI information from another source, or pass it through to the output busses that are configured to allow pass-through.

3.2.4.3 Menu / File / Options / Keyboard

Seq24, as befits a professional product, allows extensive use of keyboard shortcuts to make operations go faster than when using a mouse.

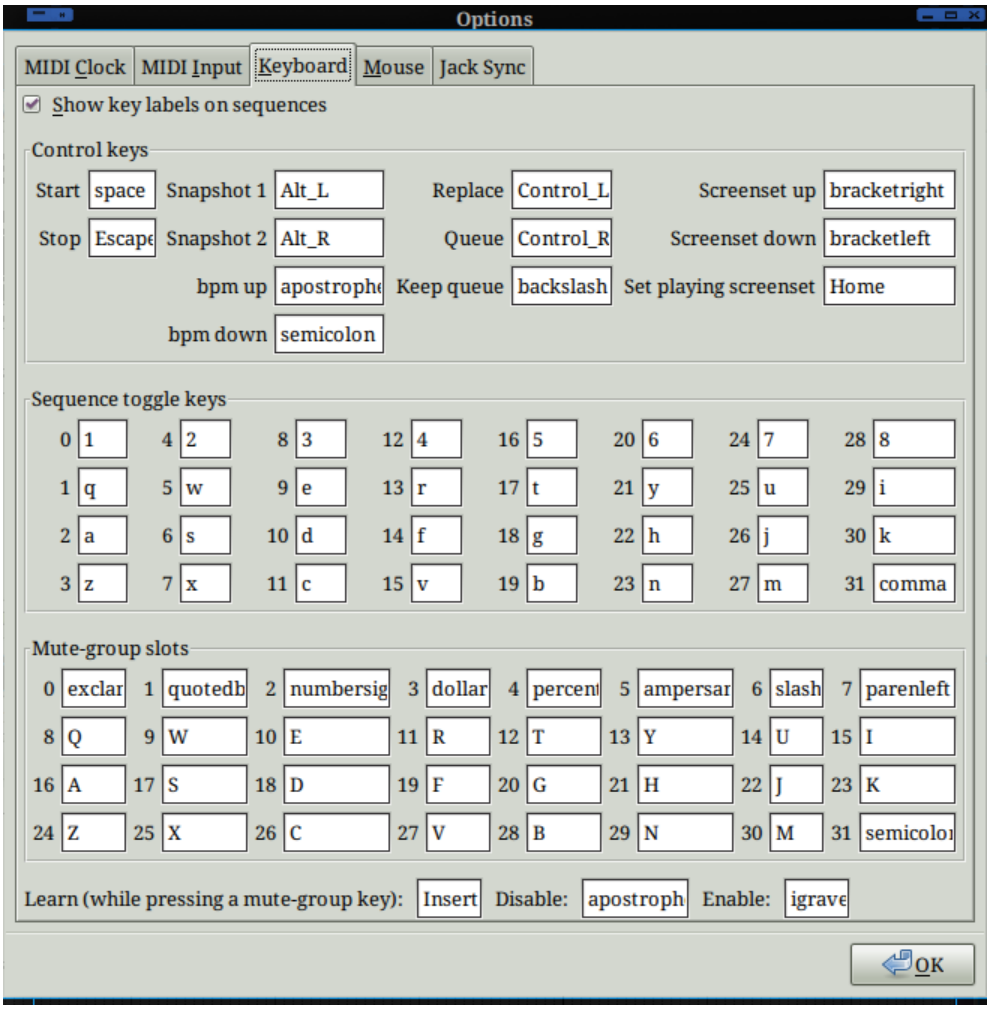

Figure 9: File Options Keyboard

We won't attempt to cover every user-interface item in this dialog, just the categories.

1. **Show key labels on sequences**
2. **Control keys**
3. **Sequence toggle keys**
4. **Mute-group slots**
5. **Learn**
6. **Disable**
7. **Enable**

1. Show key labels on sequence. This item, if enabled, shows the key labels in the lower-right corner of each loop/pattern in the Patterns window.

2. Control keys. This block of fields provides shortcut keys for many operations of *Seq24*.

1. **Start**. Key: **space**.
2. **Stop**. Key: **Escape**.
3. **Snapshot 1**. Key: **Alt_L**.
4. **Snapshot 2**. Key: **Alt_R**.
5. **bpm up**. Key: **apostrophe**.

6. **bpm down**. Key: **semicolon**.
7. **Replace**. Key: **Control_L**.
8. **Queue**. Key: **Control_R**.
9. **Keep queue**. Key: **backslash**.
10. **Screenset down**. Key: **bracketleft**.
11. **Screenset up**. Key: **bracketright**.
12. **Set playing screenset**. Key: **Home**.

Note that some of the keys have positional mnemonic value. For example, for BPM control, the semicolon is at the left (down), and the apostrophe is at the right (up).

TODO: One thing we need to figure out is just what this "snapshot" feature provides. Another thing is the "queue" and "keep queue" features.

3. Sequence toggle keys. Each of these keys toggles the playing/muting of one of the 32 loop/pattern boxes. These keys are layed out logically on the keyboard, and can also be shown in each loop/pattern box. No need to list them all here!

4. Mute-group slots. Each of these keys operates on the mute-grouping of one of the 32 loop/pattern boxes. These keys are layed out logically on the keyboard, and can also be shown in each loop/pattern box. No need to list them all here!

TODO: One thing we need to discover is just what this mute-grouping means.

5. Learn. Learn (while pressing a mute-group key). This items sets the key used to initiate a learn mode. It is the **Insert** key by default.

6. Disable. TODO: What gets disabled? It is the **apostrophe** key by default.

7. Enable. TODO: What gets enabled? It is the **igrave** (back-tick) key by default.

There is much to learn about this learn/enable/disable triad!

3.2.4.4 Menu / File / Options / Mouse

This item selects the mouse-interaction method.

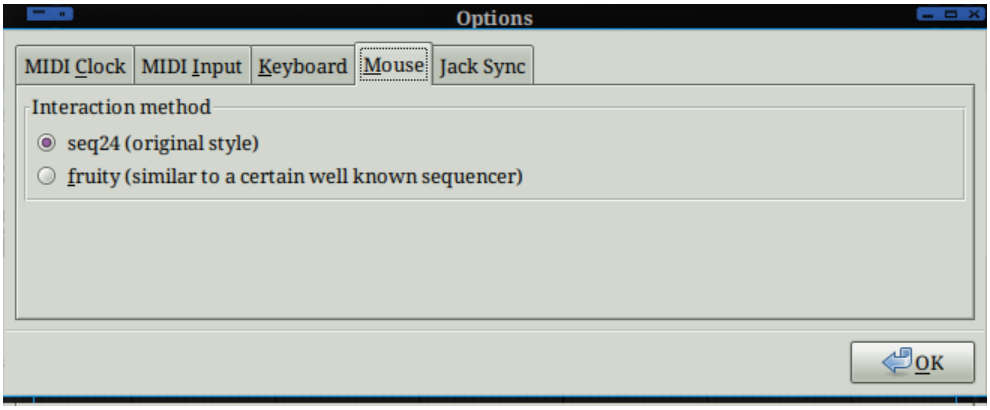

Figure 10: File Options Mouse (Condensed View)

The default method is **seq24 (original style)**. The alternate method is **fruity (similar to a certain well known sequencer)**.

The alternate method is presumably that of the *Fruity Loops* (now *FL Studio*) sequencer.

TODO: But we currently have no idea what that means.

3.2.4.5 Menu / File / Options / Jack Sync

This tab sets up options for JACK synchronization.

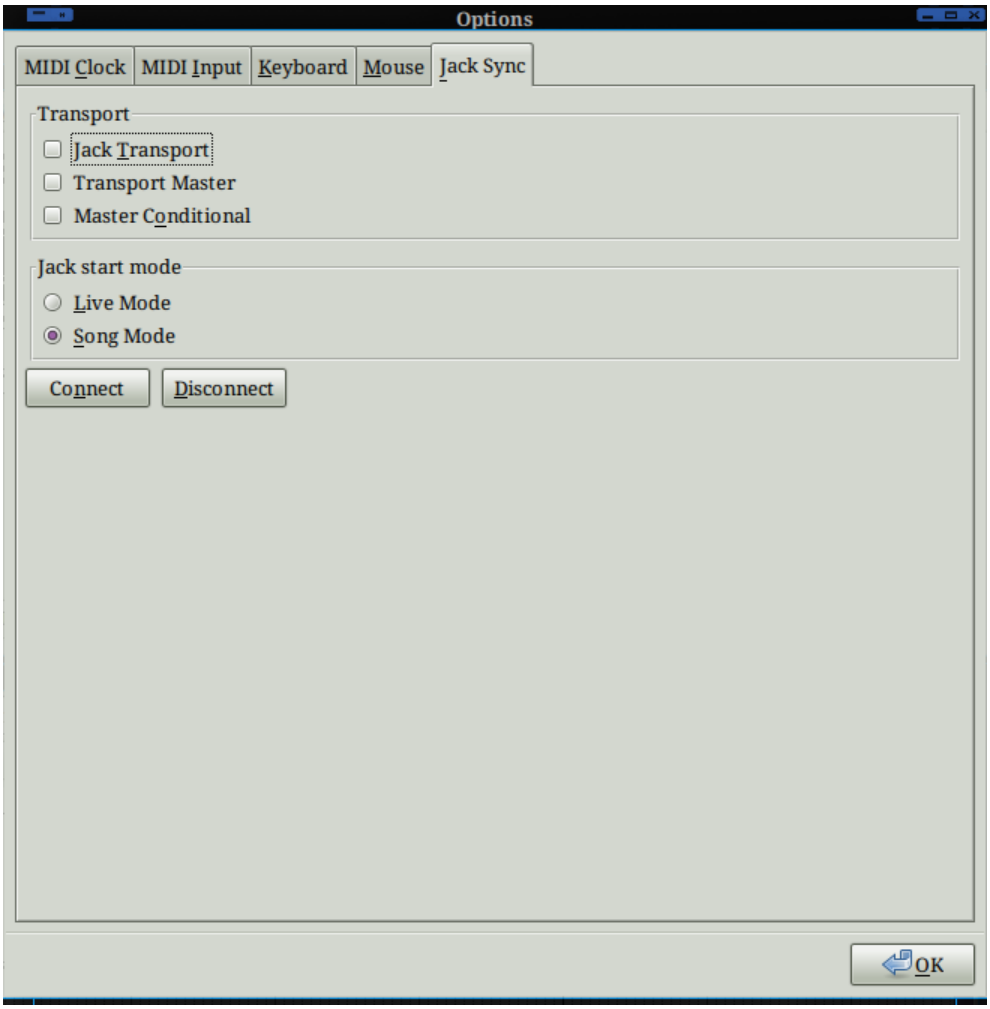

Figure 11: File Options Jack Sync

1. **Transport**
2. **Jack start mode**
3. **Connect**
4. **Disconnect**

1. Transport. This items collects the following settings:

- **Jack Transport**. Enables synchronization with JACK Transport.
- **Transport Master**. *Seq24* will attempt to serve as the JACK Master.
- **Master Conditional**. *Seq24* will fail to serve as the JACK Master if there is already a Master set.

2. Transport. This items collects the following settings:

- **Live Mode**. Playback will be in live mode. Use this option to allow muting and unmuting of loops.
- **Song Mode**. Playback will use only the Song Editor's data.

3. **Connect.** Connect to JACK Sync.
4. **Disconnect.** Disconnect from JACK Sync.

3.3 Menu / View

This menu item has only one entry, **Song Editor**, which is already covered by a button at the bottom of the Patterns window. Selecting this item bring up the Song Editor window.

3.4 Menu / Help About...

This menu entry shows the "About" dialog.

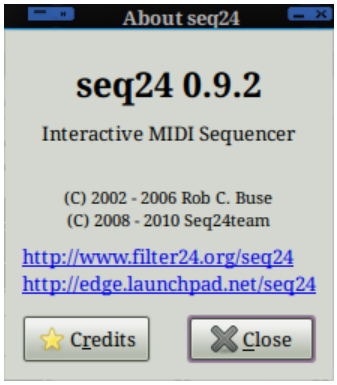

Figure 12: Help About

That dialog provides access to the credits for the program, including the authors and the project documentor.

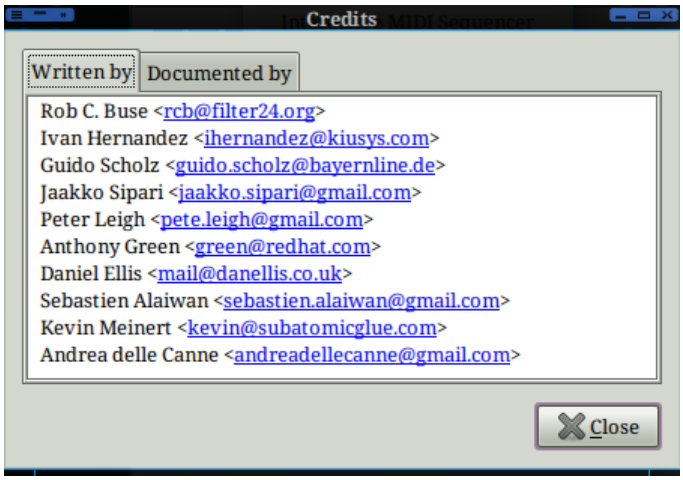

Figure 13: Help Credits

Shows who has worked on the program, with the original author at the top of the list.

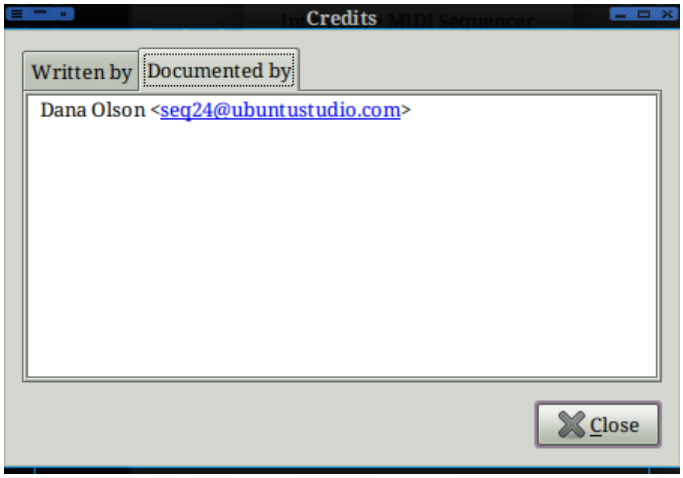

Figure 14: Help Documentation

Shows who has documented this project. Say, maybe "we" can get "our" name their someday! :-)

4 Patterns Panel

Seq24 works with the idea of patterns (loops) that are repeated all along a song. One composes and edits small patterns, and combines them to create a full song. This is a powerful way to work, and makes one productive within an hour.

The *Seq24 Patterns Panel* is the main window of *Seq24*. See figure 1 ("Seq24 Main Screen") on page 4. It is here one manages a set of patterns (see section 2.1.7 ("Concepts / Terms / screen set") on page 6), manages the configuration, and opens the pattern or song editors.

For exposition, we break it into a top panel, a pattern panel, and a bottom panel. Note that the *Seq24* main menu is discussed in section 3 ("Menu") on page 6.

4.1 Patterns, Top Panel

The top panel of the Pattern window is simple, consisting of the name of the program and a couple of controls.

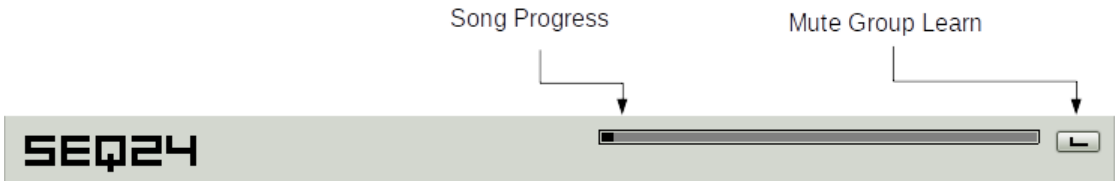

Figure 15: Patterns Panel, Top Panel Items

1. **Song Progress**
2. **Mute Group Learn**

1. Song Progress. This bar shows a number of small black cursors that show the progress of the song through the various patterns. For short patterns, the progress is fast. For patterns that last longer, the progress is slow. This field shows that something is going on, but that is about as useful as it gets. Note that the individual loops/patterns have their own moving progress cursor, a tall thin line in each box.

2. Mute Group Learn. This button is also known as the "L" button. Click this button, and then press a mute-group key to store the mute-state of the sequences in that key.

See the **File / Options / Keyboard** menu entry to bring up the dialog showing the available mute-group keys and the corresponding hot-key for the "L" button.

One can toggle the playing status of up to 32 previously defined mute/unmute patterns (groups) in the active screen set, similar to hardware sequencers. This toggling is done either by one of the *group toggle* keys or by a MIDI controller, both assigned in the `/.seq24rc` file. A mute/unmute pattern (group) is stored by holding a *group learn* key ('Insert' by default) while pressing the corresponding *group toggle* key. There are also keys assigned to turn on/off the group functionality.

4.2 Patterns, Main Panel

The main panel of the Patterns window provides a grid of empty boxes. Each box represents a loop or pattern. One sees only 32 loops in the main panel. This is a screen set, as discussed in section 2.1.7 ("Concepts / Terms / screen set") on page 6. One can switch between sets by using the '[' and ']' keys on the keyboard, or by using the spin-widget-driven, labelled set. There are a total of 32 sets, for a total of 1024 loops/patterns.

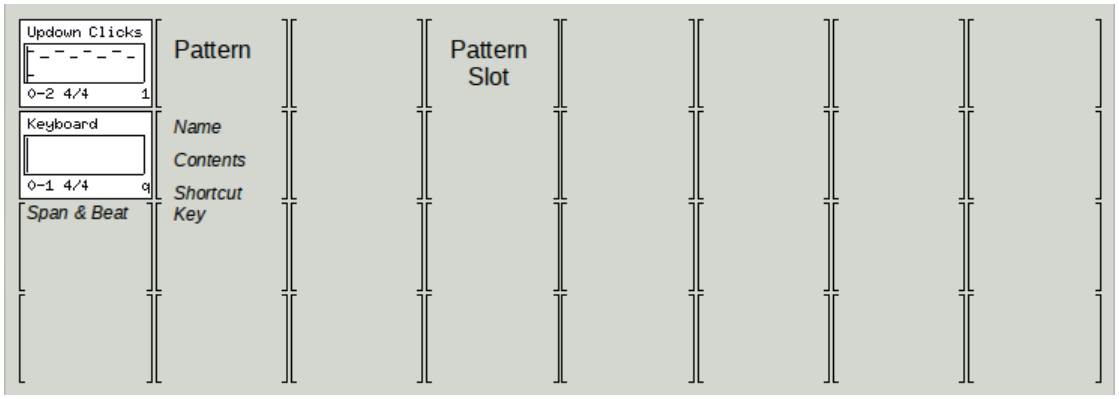

Figure 16: Patterns Panel, Main Panel Items

1. **Pattern Slot**
2. **Pattern**

4.2.1 Pattern Slot

An empty box is a slot for a pattern. By right-clicking on an empty box one brings up a menu to create a new loop, as well as some other operations:

Figure 17: Empty Pattern, Right-Click Menu

1. **New**
2. **Paste**
3. **Song / Mute All Tracks**

1. New. Creates a new loop or pattern. Clicking this menu entry fills in the empty box with an untitled pattern, and brings up the Pattern Editor so that one can fill in the new pattern.

2. New. Pastes a loop or pattern that was previously copied.

3. Song / Mute All Tracks. This item is the one item in the **Song** context menu; it mutes all tracks (or loops/patterns?)

4.2.2 Pattern

A filled pattern slot is referred to informally as a pattern. A pattern is shown in the Pattern windows as a filled box with the following items of information in it:

- **Name**. This line contains the name or title of the pattern, to help reference it when juggling a number of patters.
- **Contents**. The contents of the pattern provide a fairly detailed and distinguishable representation of the notes or events in the pattern. Also, when the song is playing, a vertical bar cursor tracks the position of the playback of the pattern or loop; it returns to the beginning of the box every time that pattern starts over again.
- **Span**. This pair of numbers shows the starting measure of the pattern and the measure just after the end of the pattern. For example, "0-2" means one measure, and it is the first measure. (TODO: verify this conjecture)
- **Beat**. This pair of numbers is the standard time-signature of the pattern, such as "4/4" or "3/4".
- **Shortcut Key**. If the display of shortcut keys is enabled (see section 3.2.4.3 ("Menu / File / Options / Keyboard") on page 11), then the key noted in the lower-right corner of the pattern can be pressed to toggle the mute/unmute status of that pattern. This action is an alternative to left-clicking on the pattern.

Right-clicking on an already-filled box will toggle the status of the pattern between mute (black?) and unmuted (white?).

By right-clicking on an already-filled box, one brings up a menu to allow one to edit a existing one, or perform a few other actions specified in the context menu. Here is that menu:

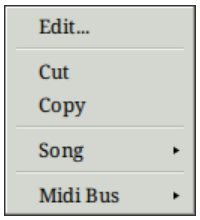

Figure 18: Existing Pattern, Right-Click Menu

Here one can select the MIDI bus/channel. One can also clear all performance data for the pattern.

1. **Edit...**
2. **Cut**
3. **Copy**
4. **Song/**
5. **Midi Bus/**

1. Edit. Edits an existing loop or pattern. Clicking this menu entry brings up the Pattern Editor so that one can modify the existing pattern.

2. Cut. Deletes and copies an existing loop or pattern.

Bug: This operation seems to have no effect. The loop or pattern remains in place.

3. Copy. Copies an existing loop or pattern. The pattern can then be pasted elsewhere in the Patterns panel.

4. Song. Clicking this menu entry brings up a small popup menu:

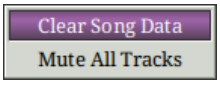

Figure 19: Existing Pattern, Right-Click Menu, Song

1. **Clear Song Data**
2. **Mute All Tracks**

1. Clear Song Data. Selecting this filled-box right-click menu item causes that box's loop/pattern to be removed from the song. This means that it disappears from the Song Editor window, and so will not be played when the song plays.

2. Mute All Tracks. Selecting this filled-box right-click menu item causes... TODO. Cannot yet see that this does anything, NEEDS EXPERIMENTATION.

3. Midi Bus. Selecting this filled-box right-click menu item brings up a list of the 16 MIDI output busses that *Seq24* supports:

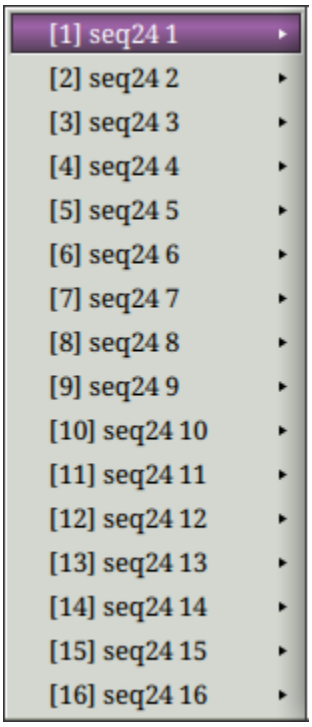

Figure 20: Existing Pattern, Right-Click Menu, MIDI Bus

For each of these bus items, another pop-up menu allows one to specify the MIDI output port for that bus:

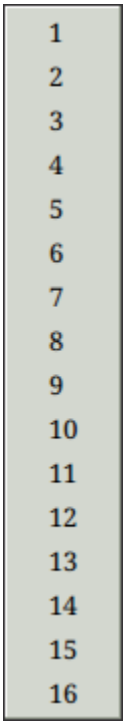

Figure 21: Existing Pattern, Right-Click Menu, MIDI Bus Ports

4.2.3 Pattern Keys and Click

This section recapitulates all the clicks and keys that perform actions in the Pattern windows. Some additional clicks and keys are noted here as well.

4.2.3.1 Pattern Keys

Hitting its assigned keyboard key will also toggle its status. Below is the grid that is mapped to the loops/patterns on the screen set. This grid can be changed in the Keyboard options tab.

```
[ 1   ][ 2   ][ 3   ][ 4   ][ 5   ][ 6   ][ 7   ][ 8   ]
[ q   ][ w   ][ e   ][ r   ][ t   ][ y   ][ u   ][ i   ]
[ a   ][ s   ][ d   ][ f   ][ g   ][ h   ][ j   ][ k   ]
[ z   ][ x   ][ c   ][ v   ][ b   ][ n   ][ m   ][ ,   ]
```

These characters are shown in the lower right corner of each pattern, as an aid to memory.

The '[' and ']' keys on the keyboard switch between sets.

We're not sure about the functionality of the next keys. The handling of 'Alt' is generally taken over by the window manager.

Holding 'Alt' will save the state of playing sequences and restore them when 'Alt' is lifted.

Holding 'Left Ctrl' and 'Alt' at the same time will enable one to flip over to new sequences briefly and then flip right back upon lifting 'Alt'.

Holding 'Right Ctrl' will queue a on/off toggle for a sequence when the loop ends. Queue also works for mute/unmute patterns (groups); in this case every sequence will toggle its status after its individual loop end.

Pressing the 'keep queue' key (by default, the backslash key) assigned in the */.seq24rc* file activates permanent queue mode until you use the temporary Queue function again pressing 'Right Ctrl'.

4.2.3.2 Pattern Clicks

Left-clicking on a pattern-filled box will change its state from muted (white) to playing (black) when the sequencer is running.

Holding down 'Left Ctrl' while selecting a sequence (pattern) will mute all other sequences and turn on the selected sequences.

By clicking and holding the left button on a sequence, one can drag it to a new location on the grid. The box will disappear while dragged, and reappear in the new location when dropped.

4.3 Patterns, Bottom Panel

The bottom panel of the Patterns window provides way to control the overall playback of the song.

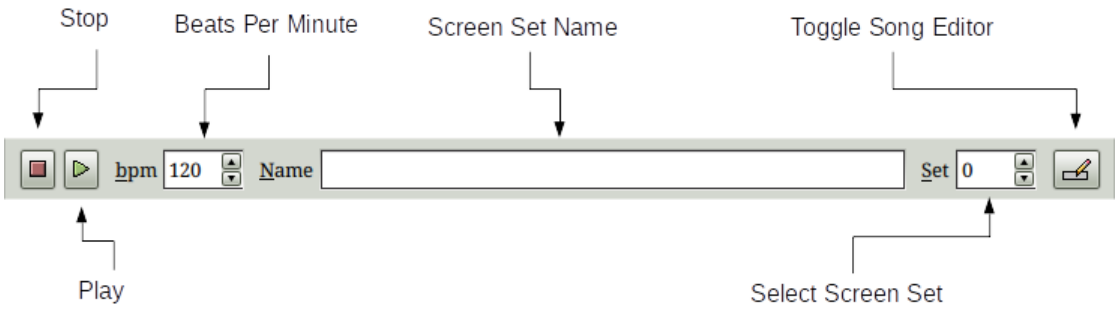

Figure 22: Patterns Panel, Bottom Panel Items

1. **Stop**
2. **Play**
3. **bpm**
4. **Name**
5. **Set**
6. **Toggle Song Editor**

1. Stop. The red button stops the playback of the song and all its loops/patterns. It is not clear if it also sends MIDI Off messages on all notes.

2. Play. Starts the playback of the whole song.

3. bpm. The spin widget adjusts the "Beats Per Minute" or BPM value. The range of this field is from 20 bpm to 500 bpm, with a default value of 120 bpm. Although this field looks editable, it is not. Most keystrokes that are entered actually toggle one of the pattern boxes.

4. Name. Each of the 32 available screen sets can be given a name by entering it into this field.

5. Set. This spin widget selects the current screen set. The values in this field range from 0 to 31, and default to 0. Although this field looks editable, it is not. Most keystrokes that are entered actually toggle one of the pattern boxes.

Bug: While one is typing in the name of the set in this field, the keystrokes will affect the panel window, causing playback to start and pattern boxes to be toggled!

5 Pattern Editor

The *Seq24 Pattern Editor* is used to edit and preview a pattern, as well as to configure its buss and channel settings.

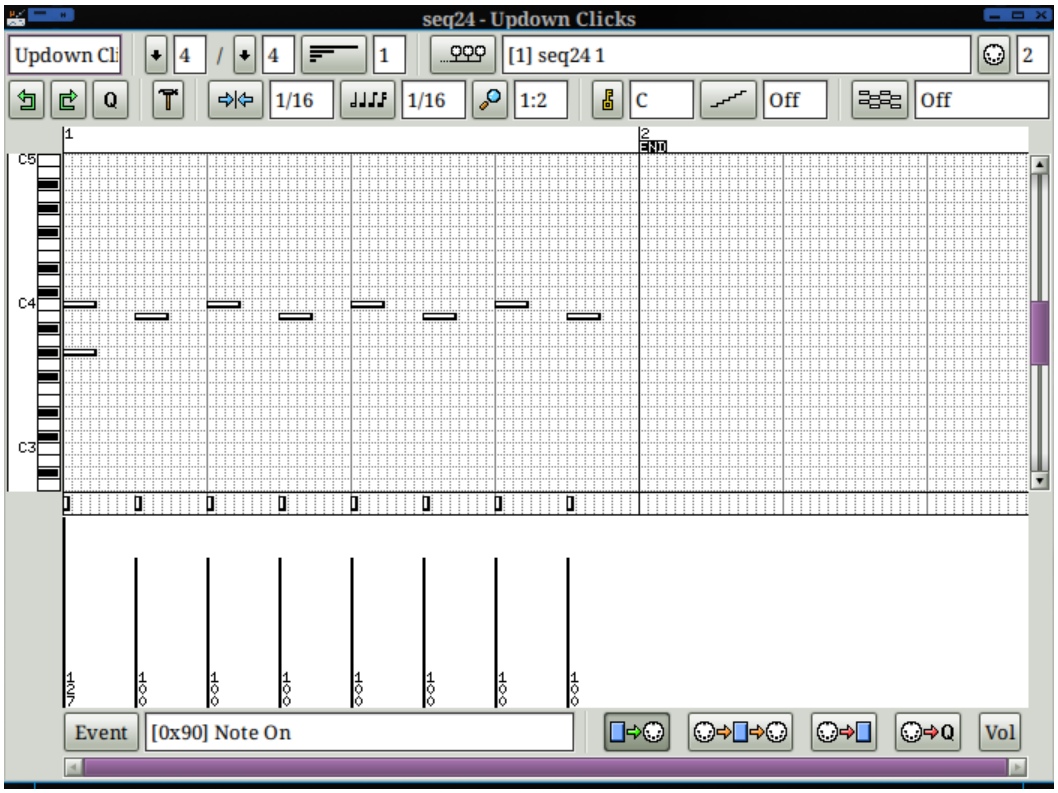

Figure 23: Pattern Edit Window

This dialog is quite complex. For exposition, we break it into a first panel, a second panel, a bottom panel, and a piano-roll/events section.

1. **First Panel**
2. **Second Panel**
3. **Piano-Roll/Events Panel**
4. **Bottm Panel**

5.1 Pattern Editor, First Panel

The top bar of the pattern (sequence) editor lets you change the name of the pattern, the time signature of the piece, how long the loop is, and some other configuration items.

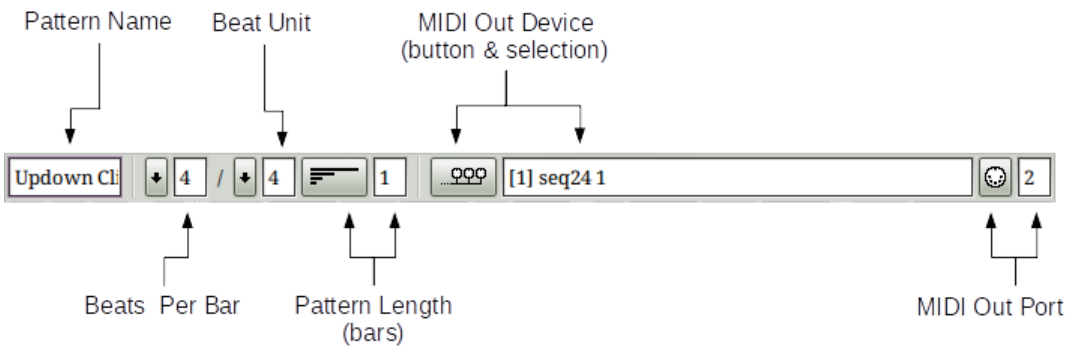

Figure 24: Pattern Editor, First Panel Items

1. **Pattern Name**
2. **Beats Per Bar**
3. **Beat Unit**
4. **Pattern Length**
5. **MIDI Out Device**
6. **MIDI Out Port**

1. Pattern Name. Provides the name of the pattern. This name should be short and memorable. It is displayed in the Patterns window.

2. Beats Per Bar. Part of the time signature, and specifies the number of beat units per bar. The possible values range from 1 to 16.

3. Beat Unit. Part of the time signature, and specifies the size of the beat unit: 1 for whole notes; 2 for half notes; 4 for quarter notes; 8 for eight notes; and 16 for sixteenth notes.

4. Pattern Length. Sets the length of the current pattern, in measures. The possible values range from 1 to 16, then 32, and 64.

(It would sure be nice to have a value that represents "indefinite", so that the loop or pattern would be more like track, and perhaps not be repeatable.)

5. MIDI Out Device. This setting specifies one of the 16 MIDI output busses provided by *Seq24*. The settings look a lot like figure 20 ("Existing Pattern, Right-Click Menu, MIDI Bus") on page 20.

6. MIDI OUT Port. This settings select the MIDI output channel, or port. The possible values range from 1 to 16.

5.2 Pattern Editor, Second Panel

The second panel of the pattern editor provides a number of additional settings.

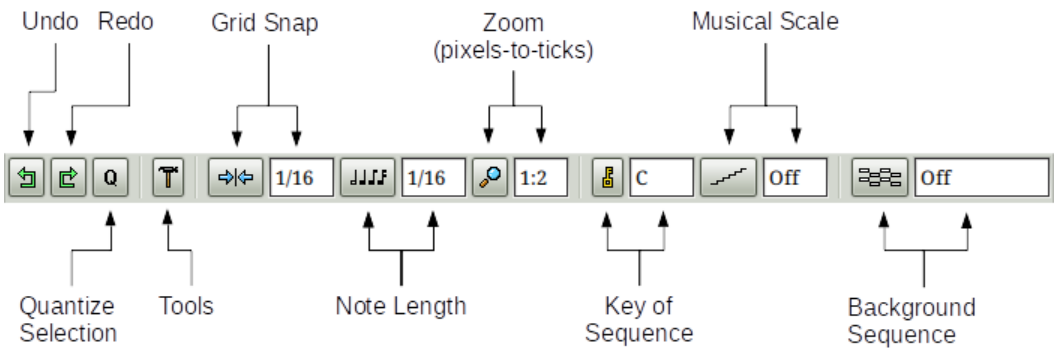

Figure 25: Pattern Editor, Second Panel Items

1. **Undo**
2. **Redo**
3. **Quantize Selection**
4. **Tools**
5. **Grid Snap**
6. **Note Length**
7. **Zoom**
8. **Key of Sequence**
9. **Musical Scale**
10. **Background Sequence**

1. Undo. The Undo button will roll back any changes to the pattern from this session.

2. Redo. The Redo button will restore any undone changes to the pattern from this session.

3. Quantize Selection. Pressing this button will quantize the selected events, presumable as per the **Grid Snap** setting.

4. Tools. This button brings up a nested menu of tools for modifying selected events and notes.

Figure 26: Tools Context Menu

1. **Select**
2. **Modify Time**
3. **Modify Pitch**

Select provides two sets of selections for notes: **All Notes**, which selects all notes in the pattern; **Inverse Notes**, which inverts the selection of notes.

Note that the left mouse button also lets one select multiple events and notes.

Modify Time offers two ways to tweak the timing of the selected note: **Quantize Selected Notes**, which quantizes the selected notes, presumably the same way as the **Quantize** ("**Q**") button; **Tighten Selected Notes**, which presumably is a less strict form of quantization. (Need more information).

Modify Pitch has only one entry, **Transpose Selected**, which brings up the following sub-menu:

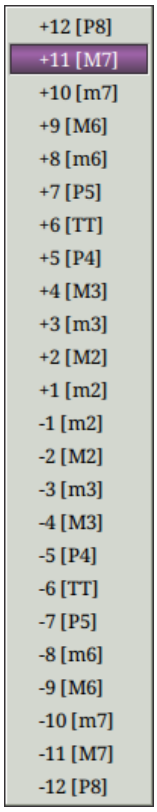

Figure 27: Tools Transpose Selected Values

5. Grid Snap. Grid snap selects where the notes will be drawn. The following values are supported: 1, 1/2, 1/4, 1/8, 1/16, 1/32, 1/64, and 1/128. Additional values are also supported: 1/3, 1/6, 1/12/, 1/24, 1/48, 1/96, and 1/192.

6. Note Length. Note Length determines what size they will be. Like the **Grid Snap** values, the following values are supported: 1, 1/2, 1/4, 1/8, 1/16, 1/32, 1/64, and 1/128. Additional values are also supported: 1/3, 1/6, 1/12/, 1/24, 1/48, 1/96, and 1/192.

7. Zoom. Zoom is the relation between MIDI pixels and ticks, written as "pixels:ticks. For example, 1:4 = 4 ticks per pixel. Supported values are 1:1, 1:2, 1:4, 1:8, 1:16, and 1:32.

8. Key of Sequence. Selects the desired key for the pattern. The following scales are supported: C, C#, D, D#, E, F, F#, G, G#, A, A#, and B.

9. Musical Scale. Selects the desired scale for the pattern. Only the following values are supported: Off, Major, and Minor.

One can select which **Musical Scale** and **Key** the piece is in, and *Seq24* will grey out those keys on the piano-roll that are not in the key.

10. Background Sequence. One can select another pattern to draw on the background to help with writing corresponding parts. The button brings up a small menu with values of **Off** and [**0**]. Presumably, the 0 is a set number. Under that entry, a menu like the following appears.

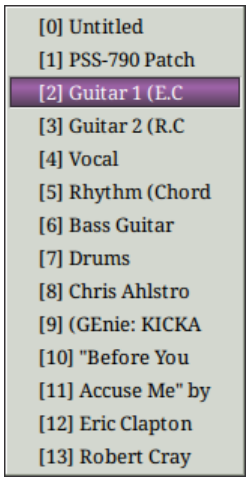

Figure 28: Sample Background Sequence Values

5.3 Pattern Editor, Piano Roll

The piano roll is the heart of the pattern (loop, sequence) editor. It is a bit different in style than other editors.

5.3.1 Pattern Editor, Piano Roll Description

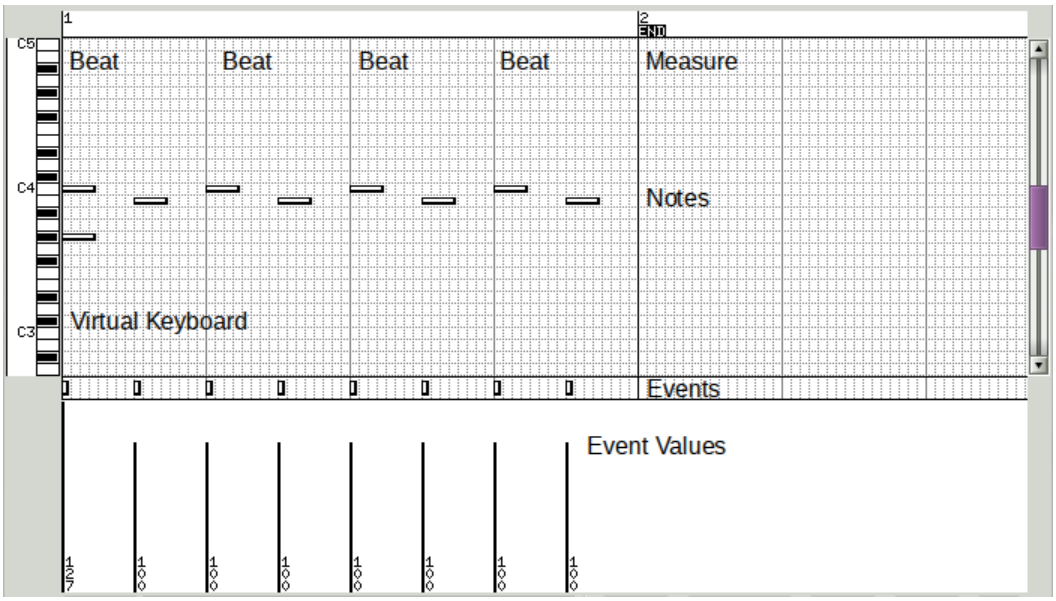

Figure 29: Pattern Editor, Piano Roll Items

1. **Beat**
2. **Measure**
3. **Virtual Keyboard**
4. **Notes**
5. **Events**

6. **Event Values**

1. Beat. The light vertical lines represent the beats defined by the configuration for the pattern.

2. Measure. The heavy vertical lines represent the measures defined by the configuration for the pattern. Also note that the end of the pattern occurs at a measure, and is marked by a blocky **END** marker.

3. Virtual Keyboard. The virtual keyboard is a fairly powerful interface. It shows, by shadowing, which note on the keyboard one will be drawing. It can be played with a mouse, to preview a short motif. It can show marks to indicate off-scale notes, to make them easy to avoid.

4. Notes. Musical notes are indicated by short bars. The bars provide a visual representation of the pitch of the note and the length of the notes

5. Events. The small (just a few pixels high) Events windows shows discrete events, such as Note On and Note Off and their velocities, or various control and their values.

6. Event Values. The events values for the currently selected category of events are shown in this window as vertical lines of a height proportional to the value.

5.3.2 Pattern Editor, Event Editing

Note editing is a bit different with *Seq24*, since it requires two mouse buttons in many cases. There are some new laptop touchpads from FocalTech that have only one mouse button, and use positioning to determine if the click is a left or right click. The Linux drivers for this touchpad aren't sophisticated enough (as far as we know) to handle converting a two-fingered press properly. We've found that a good solution is to use a four-button USB trackball configued with an easy middle-button setup. It's easier than a touchpad, anyway.

On both the note (grid) window and the event window, **holding** down the **right** mouse button will change the cursor to a pencil and put the editor into 'draw' mode.

Then while still **holding** the **right** mouse button, click the **left** mouse button to **insert** new notes. Many people find this combination strange at first, but once one gets used to it, it becomes a very fast method of note manipulation.

Pressing the **middle** mouse button will let one change the length of the note.

The **left** mouse button lets you select multiple events which can then be clicked and moved, cut (Ctrl-X), copy (Ctrl-C), or pasted (Ctrl-V). When the notes are selected, you can delete them with the Delete key.

For the appearance of selected events (orange), see figure 30 ("Piano Roll, Selected Notes and Events") on page 29.

Right-clicking on the event strip (directly under the piano roll grid) will allow you to add/select/move midi events (not note on/off messages) somewhat like the piano grid.

The event value (data) editor (directly under the event strip) is used to change note velocities, channel pressure, control codes, patch select, etc. Just left-click+drag the mouse across the window to draw a line. The values will match that line. Any events that are selected in the paino roll or event strip can have their values modified with the mouse wheel.

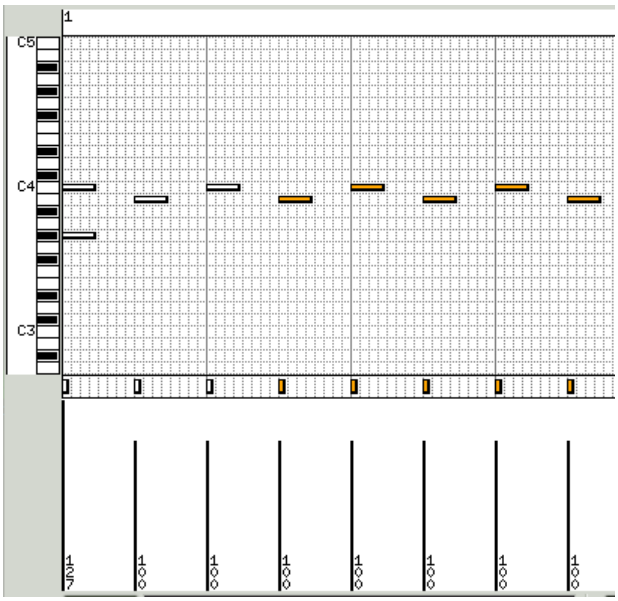

Figure 30: Piano Roll, Selected Notes and Events

TODO

5.4 Pattern Editor, Bottom Panel

TODO

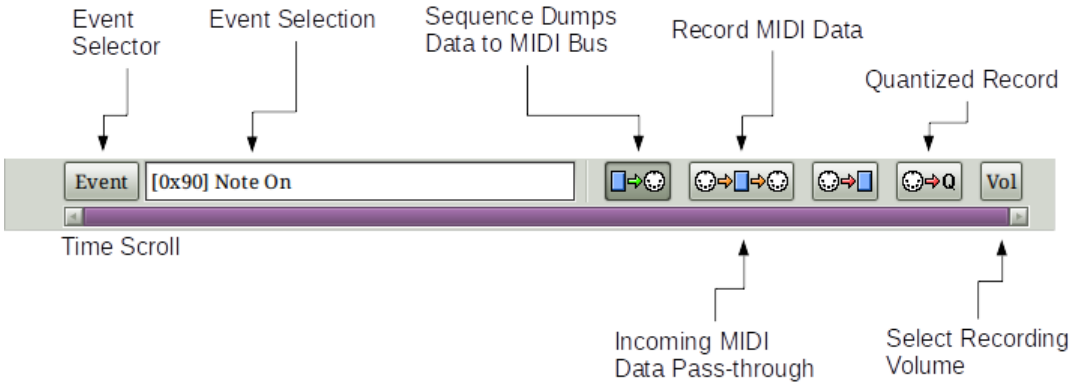

Figure 31: Pattern Editor, Bottom Panel Items

TODO

6 Song Editor

The *Seq24 Song Editor* is used to combine all of the patterns into a complete tune.

TODO

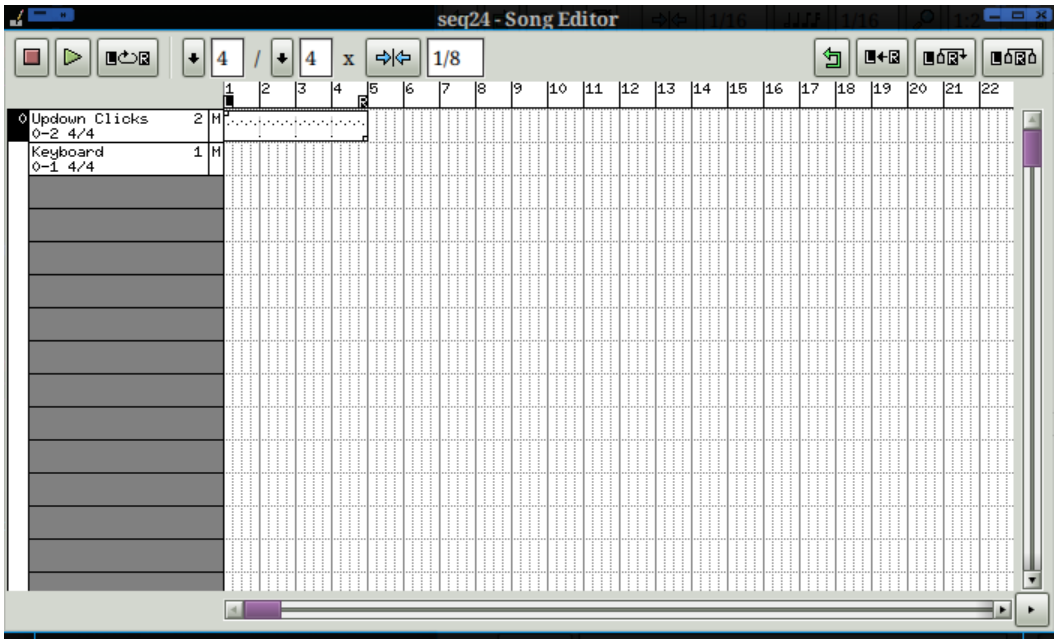

Figure 32: Song Editor Window

This dialog is not too complex, but For exposition, we break it into a top panel and the rest of the window.

6.1 Song Editor, Top Panel

TODO

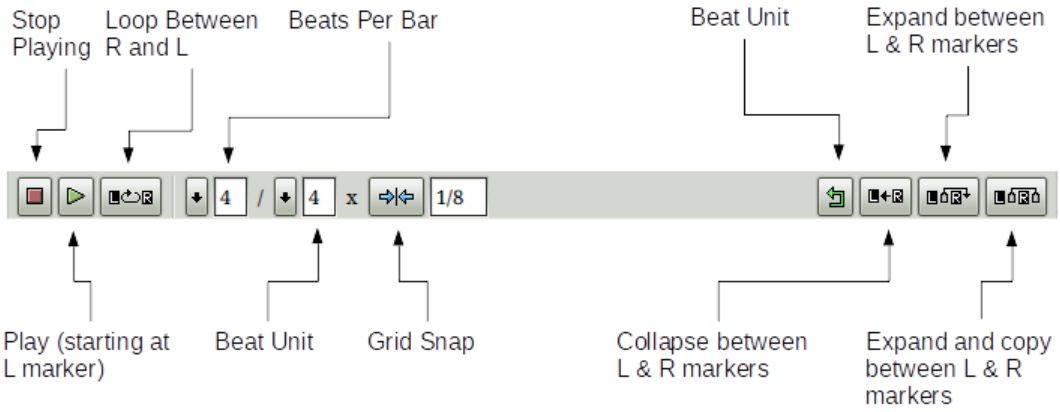

Figure 33: Song Editor, Top Panel Items

TODO

6.2 Song Editor, Arrangement Panel

TODO

See the figure at the top of this section.

TODO

7 Seq24rc Configuration File

The *Seq24* configuration file is called `.seq24rc`, and it is stored in the user's `$HOME` directory.

After you run *Seq24* for the first time, it will generate a `.seq24rc` file in your home directory. It contains the the data for remote MIDI control, keyboard control, and MIDI clock.

7.1 Seq24rc MIDI Control Section

For each pattern, we can set up MIDI events to turn a pattern on, off, or to toggle it. This setup is in the MIDI Control section of `.seq24rc`, and begins with an "INI" group marker `[midi-control]`.

THe MIDI Control section is implicitly broken into subsections, though those subsections are marked with comment-lines for better comprehensibility. The subsections of the MIDI Control section are:

1. **pattern group**. Consists of 32 lines, one for each pattern box shown in the Pattern window.
2. **mute in group**. Consists of 32 lines, one for each pattern box shown in the Pattern window.
3. **automation group**. Each item in this group consists of one line.
    1. **bpm up**. Consists of one line.
    2. **bpm down**. Consists of one line.
    3. **screen-set up**. Consists of one line.
    4. **screen-set down**. Consists of one line.
    5. **mod replace**. Consists of one line.
    6. **mod snapshot**. Consists of one line.
    7. **mod queue**. Consists of one line.
    8. **mod gmute**. Consists of one line.
    9. **mod glearn**. Consists of one line.
    10. **screen-set play**. Consists of one line.

We see the following lines in the MIDI Control section, which is broken into groups or subsections marked by comments:

```
[midi-control]
74

# pattern group
 0  [0 0 0 0 0 0]   [0 0 0 0 0 0]   [0 0 0 0 0 0]
 1  [0 0 0 0 0 0]   [0 0 0 0 0 0]   [0 0 0 0 0 0]
 2  [0 0 0 0 0 0]   [0 0 0 0 0 0]   [0 0 0 0 0 0]
...     ...             ...             ...
31  [0 0 0 0 0 0]   [0 0 0 0 0 0]   [0 0 0 0 0 0]

# mute in group
32  [0 0 0 0 0 0]   [0 0 0 0 0 0]   [0 0 0 0 0 0]
33  [0 0 0 0 0 0]   [0 0 0 0 0 0]   [0 0 0 0 0 0]
...     ...             ...             ...
63  [0 0 0 0 0 0]   [0 0 0 0 0 0]   [0 0 0 0 0 0]
```

```
# bpm up
64  [0 0 0 0 0 0]   [0 0 0 0 0 0]   [0 0 0 0 0 0]

# bpm down
65  [0 0 0 0 0 0]   [0 0 0 0 0 0]   [0 0 0 0 0 0]

# screen set up
66  [0 0 0 0 0 0]   [0 0 0 0 0 0]   [0 0 0 0 0 0]

# screen set down
67  [0 0 0 0 0 0]   [0 0 0 0 0 0]   [0 0 0 0 0 0]

# mod replace
68  [0 0 0 0 0 0]   [0 0 0 0 0 0]   [0 0 0 0 0 0]

# mod snapshot
69  [0 0 0 0 0 0]   [0 0 0 0 0 0]   [0 0 0 0 0 0]

# mod queue
70  [0 0 0 0 0 0]   [0 0 0 0 0 0]   [0 0 0 0 0 0]

# mod gmute
71  [0 0 0 0 0 0]   [0 0 0 0 0 0]   [0 0 0 0 0 0]

# mod glearn
72  [0 0 0 0 0 0]   [0 0 0 0 0 0]   [0 0 0 0 0 0]

# screen set play
73  [0 0 0 0 0 0]   [0 0 0 0 0 0]   [0 0 0 0 0 0]
```

The number (74) is the number of lines in the MIDI Control section.

The first number is the pattern/sequence number in the main window, which ranges from 0 to 31. Each set of brackets corresponds to a MIDI filter. The MIDI filter in the leftmost brackets is the *toggle* filter. The MIDI filter in the middles brackets is the *on* filter. The MIDI filter in the rightmost brackets is the *off* filter. If the incoming MIDI event matches the filter, it will either [toggle], [on], or [off] the pattern/sequence, respectively.

The layout of each filter inside the bracket is as follows:

[OPR INV STAT D1 D2min D2max]

where

- **OPR = on/off**
- **INV = inverse**
- **STAT = MIDI status byte** (channel ignored)
- **D1 = data1**

- **D2min = data2 min**
- **D2max = data2 max**

If **on/off** is set to 1, it will match the incoming MIDI against the **MIDI status byte** pattern and perform the action (on/off/toggle) if the data falls in the range specified. All values are in decimal.

The **inverse** field will make the pattern perform the opposite action (*off* for *on*, *on* for *off*) if the data falls outside the specified range. This is cool because one can map several sequences to a knob or fader.

The last three fields describe the range of data that will match.

7.1.1 Seq24rc MIDI Control Pattern Group

Complex? Here is an example for the some of the first 32 lines, which comprise the *pattern group*. The following is an example of responding to Note On events for note 0, with any velocity, to turn the pattern on, and Note off events for note 0, and any velocity, to turn the pattern off.

```
  Toggle                 On                      Off
1 [0 0 0 0 0 0]      [1 0  144 0 0 127]       [1 0 128 0 0 127]
```

The **toggle** field is off (inactive).

The **on** field is on (active). Inverse is inactive. The **MIDI status byte**, 144, is 0x90 (hex), which is a Note On event on channel 0. However, the channel is ignored. **data1** is 0, and **(**data2) can range from 0 to 127.

The **off** field is on (active). The **MIDI status byte**, 128, is 0x80 (hex), which is a Note Off event on channel 0. Again, the channel is ignored. **data1** is 0, and **data2** can range from 0 to 127.

So, basically, pattern 1 starts when any Note On is received, and it stops when any Note Off is received.

The following example would map a row of sequences to one knob sending out changes for Control Code 1:

```
  Toggle                 On                      Off
0 [0 0 0 0 0 0]      [1 1 176 1   0   15]     [0 0 0 0 0 0]
1 [0 0 0 0 0 0]      [1 1 176 1  16   31]     [0 0 0 0 0 0]
2 [0 0 0 0 0 0]      [1 1 176 1  32   47]     [0 0 0 0 0 0]
3 [0 0 0 0 0 0]      [1 1 176 1  48   63]     [0 0 0 0 0 0]
4 [0 0 0 0 0 0]      [1 1 176 1  64   79]     [0 0 0 0 0 0]
5 [0 0 0 0 0 0]      [1 1 176 1  80   95]     [0 0 0 0 0 0]
6 [0 0 0 0 0 0]      [1 1 176 1  96  111]     [0 0 0 0 0 0]
7 [0 0 0 0 0 0]      [1 1 176 1 112  127]     [0 0 0 0 0 0]
```

The **on** field is on (active). Inverse is active. The **MIDI status byte**, 176, is 0xB0 (hex), which is a Control Change event (channel ignored). **data1** is 1, which is the controller number for a Modulation Wheel. The **data2** ranges are set so that, as the controller data increases (as the modulation-wheel knob is turned, so to speak), patterns 0 through 7 come on one at a time until all are running.

7.1.2 Seq24rc MIDI Control Mute In Group

This section controls 32 groups of mutes in the same way as defined for `[midi-control]`, and is in fact placed in the `[midi-control]` section.

A group is a set of patterns that can toggle their playing state together. Every group contains all 32 sequences in the active screen set (see after).

So, this part of the MIDI Control section is used for muting and unmuting (and toggling) a group of patterns.

7.1.3 Seq24rc MIDI Control Automation Group

1. **bpm up.** Increases the BPM (speed) of the sequencer based on MIDI input.
2. **bpm down.** Decreases the BPM (speed) of the sequencer based on MIDI input.
3. **screen-set up.** Increases the active screen-set of the sequencer based on MIDI input.
4. **screen-set down.** Decreases the active screen-set of the sequencer based on MIDI input.
5. **mod replace.** TODO.
6. **mod snapshot.** TODO.
7. **mod queue.** TODO.
8. **mod gmute.** TODO.
9. **mod glearn.** TODO.
10. **screen-set play.** TODO.

7.2 Seq24rc Mute-Group Section

This section is delimited by the `[mute-group]` construct.

```
[mute-group]
1024
 0 [0 0 0 0 0 0 0 0] [0 0 0 0 0 0 0 0] [0 0 0 0 0 0 0 0] [0 0 0 0 0 0 0 0]
 1 [0 0 0 0 0 0 0 0] [0 0 0 0 0 0 0 0] [0 0 0 0 0 0 0 0] [0 0 0 0 0 0 0 0]
 2 [0 0 0 0 0 0 0 0] [0 0 0 0 0 0 0 0] [0 0 0 0 0 0 0 0] [0 0 0 0 0 0 0 0]
...      ...               ...               ...               ...
31 [0 0 0 0 0 0 0 0] [0 0 0 0 0 0 0 0] [0 0 0 0 0 0 0 0] [0 0 0 0 0 0 0 0]
```

The initial number, 1024 is..... WHAT?

In this group are the definitions of the state of the 32 sequences in the playing screen set when a group is selected. group [state of the first 8 sequences] [second 8] [third 8] [fourth 8]

After the list of sequences and their MIDI events, you can set *Seq24* to handle MIDI events and change the following:

MORE TO ADD HERE FROM the SEQ24 file!!!!!!!!!!

8 Summary

In summary, we can say that you will find *Seq24* intriguing.

There are some topics that this document does not yet treat ...:

9 References

The *Yoshimi* seq24 reference list.

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