

# Next DAW

Retro Sound Creator



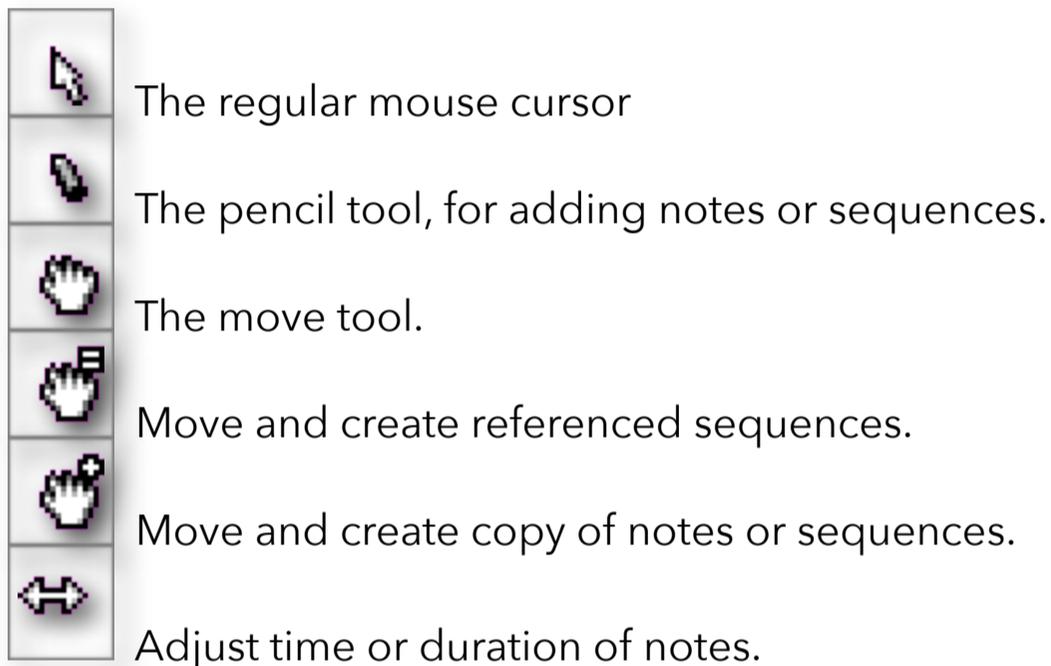
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## Getting Started

**A mouse is a requirement for using NextDAW**, without one, you will not be able to accomplish anything as the software uses it for most operations. At the moment, the Spectrum Next requires a PS/2 keyboard-mouse splitter, which you connect to your Spectrum Next, and can then connect your PS/2 mouse (and keyboard if your Next is not already connected to a keyboard). If you don't have a PS/2 mouse, people have had success using a USB to PS/2 converter.

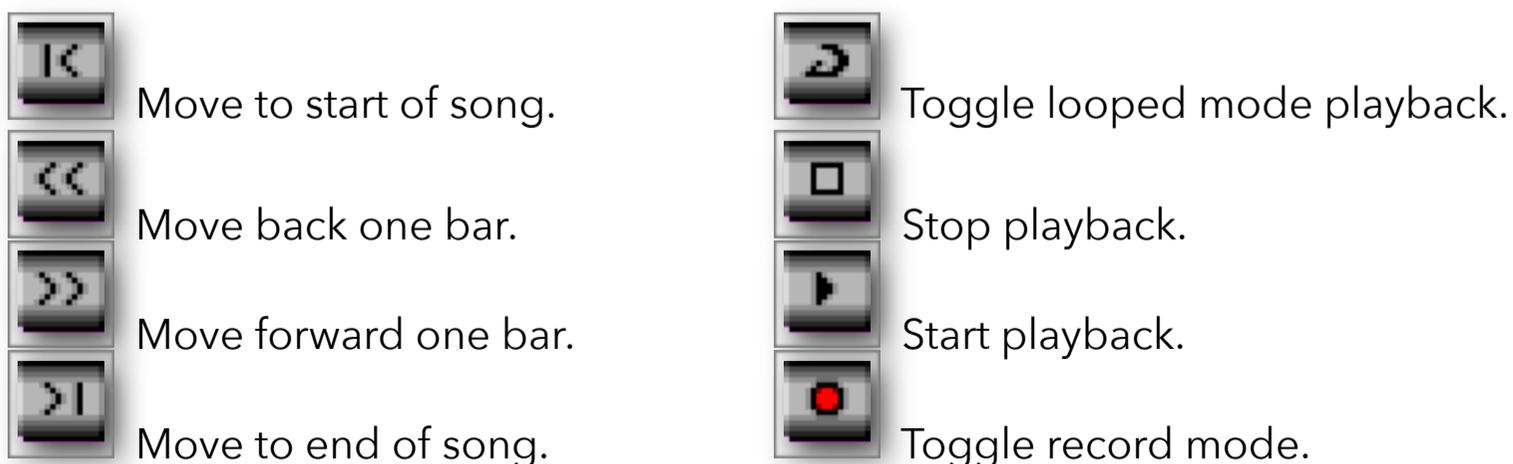
## The Mouse

Following is a list of common mouse pointers icons with a description of their most frequent usage.



## The Transport Bar

The transport bar located at the bottom of the screen controls the playback and record modes and is visible on most screen (the file browser being the noted exception).



## Piano Keyboard

The computer keyboard can be used to play your instruments using a piano style key layout, is mapped according to the following diagram, giving a total of playable 29 notes, or 2 octaves plus 5 semitones.



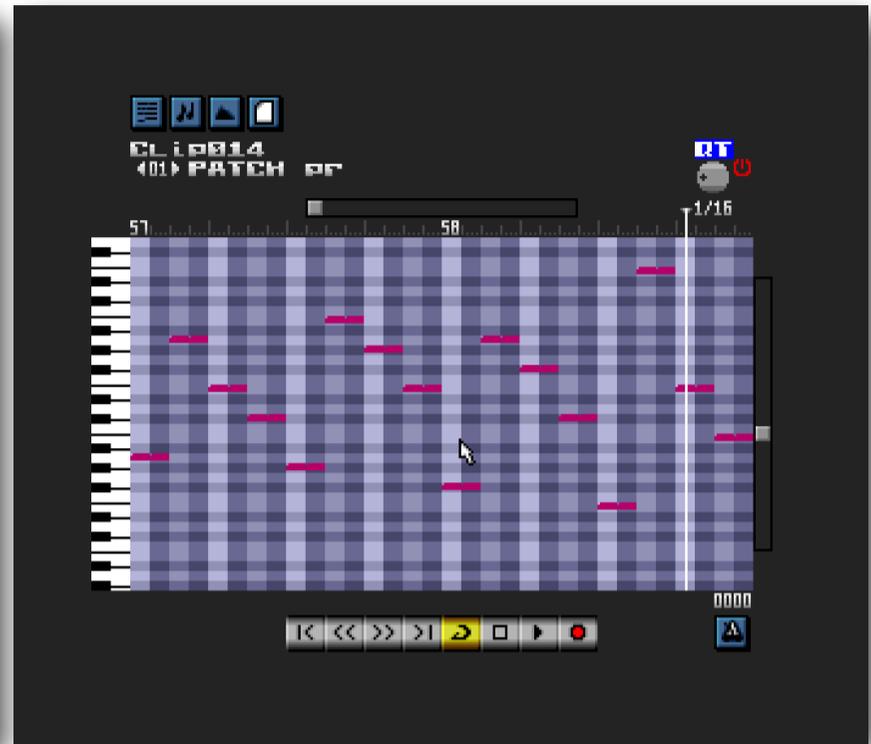
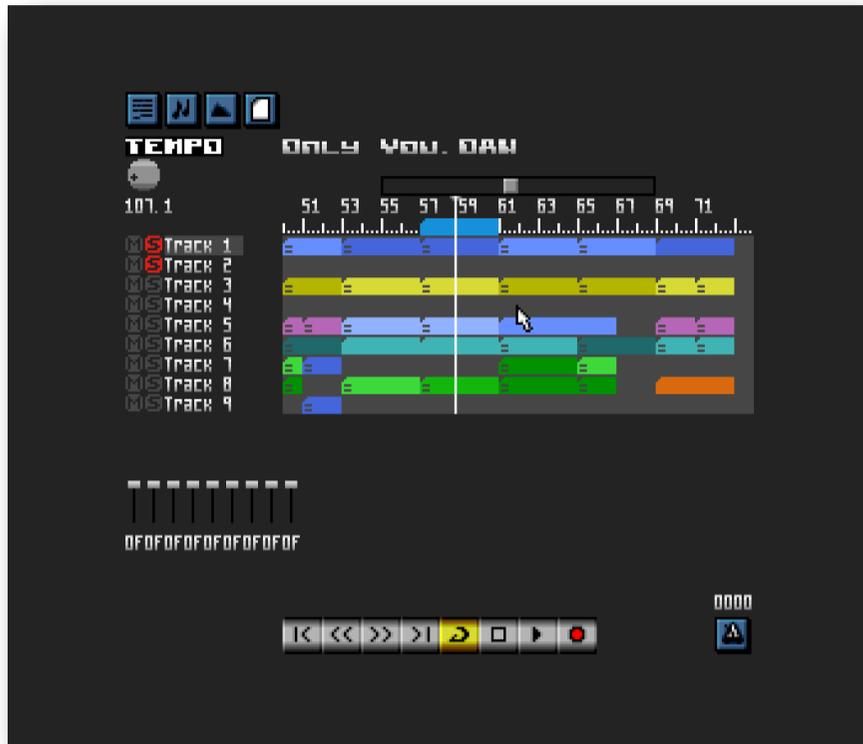
The top two rows play notes one octave above the bottom two rows.

You can use the SYM + R or T keys to transpose up or down octaves.

**\*TIP\*** Some users prefer to not transpose at the keyboard level, but instead transpose the instrument patches instead. Either approach works and have pros and cons, so see which suits your workflow.

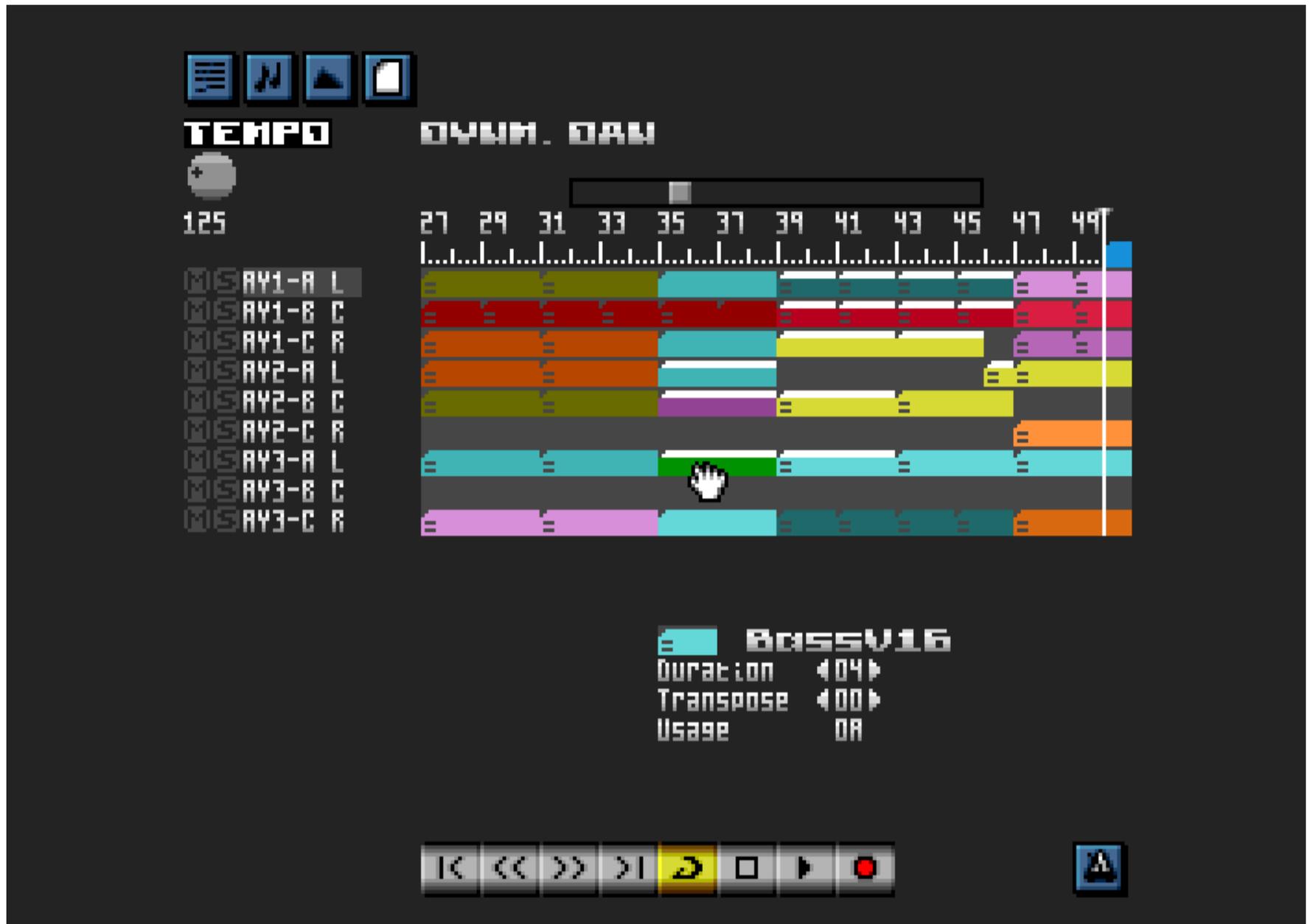
# Main Editor Pages

There are four main pages for creating music in Next DAW. These can be accessed by either clicking on the icons at the top/left of the screen, or using the hot-keys CAPS + 1...4. These will take you to the Arranger, Piano Roll, Patch Editor, and Load/Save editor pages.



# Song Arranger

The song arranger is the central place used to create sequences, and arrange them into a song.



## Layout

Areas of interest, from top to bottom are:

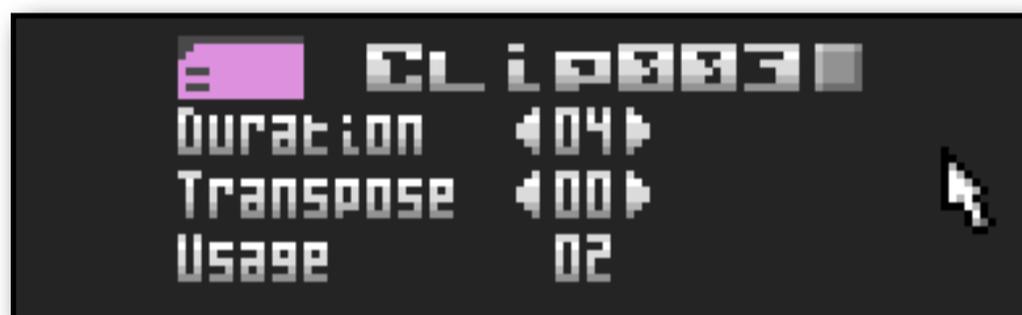
1. The metronome click track can be enabled/disabled by clicking on the icon at the top/right of the screen [NOTE: Sprite transparency is broken, so the icon does not change when clicked... please use your ears!]
2. The tempo can be set using the knob near the top/left.
3. You can scroll through the timeline using the top slider.
4. The loop region can be changed by click drag from left to right where you see the blue bar
5. Sequences are edited in the main window for the 9 available tracks.
6. Mute/Solo tracks by clicking on the M and S icons respectively.

# Sequences

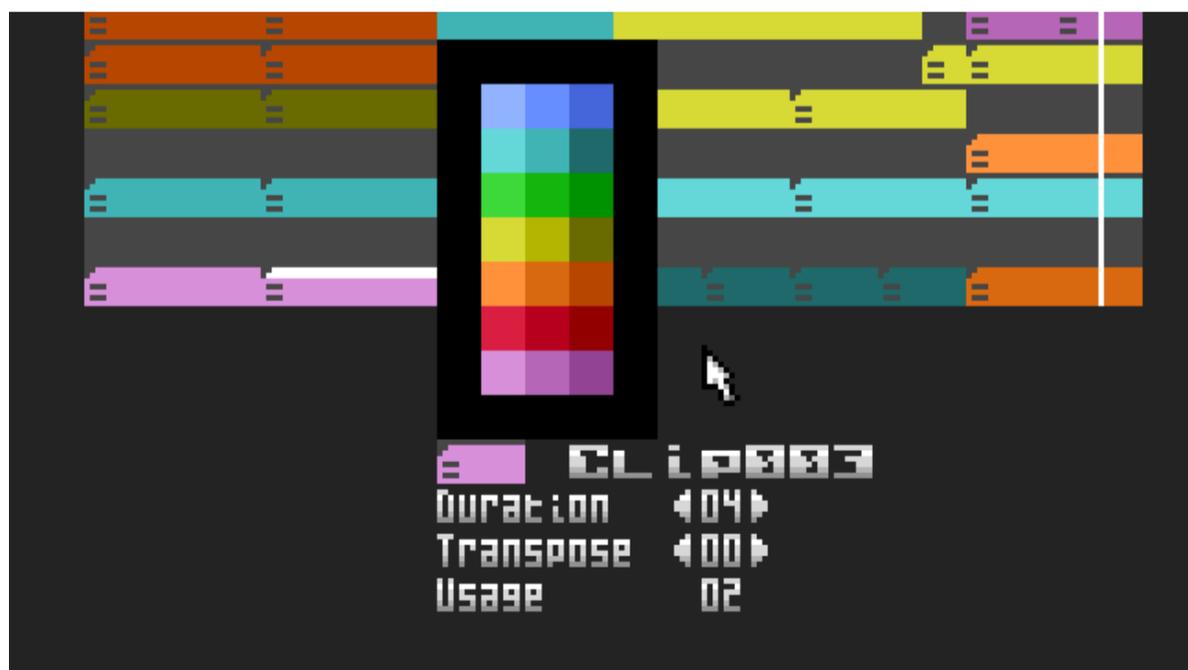
Sequences are small containers of notes that can be pieced sequenced together to create longer sections of music. For example, you could create a two bar bass part that can be repeated four times to create a longer eight bar part. This not only saves time, as you only need to create two bars of music, but also saves on memory, as the note data only needs to be stored once. You can also choose to make a copy of a sequence to, for example, make variations of a basic theme.

## Creating a Sequence

With the mouse pointer over the track window, holding CAPS will turn the mouse into a pencil indicating that you can create a new sequence. Clicking the LMB will create an empty two bar sequence. You can adjust the duration, colour, and name of the sequence in the sequence info area below the main track editor window.



- To edit the name, double click over it, edit, and hit the Enter key to exit this mode. A flashing square indicates that you are in this mode, and the position of the text input.
- Use the arrow buttons to the right of Duration to adjust the sequence's length in one bar increments. Up to a maximum of eight bars are allowed.
- Use the arrow buttons to the right of Transpose to adjust the sequence's transposition in semitone increments.
- To edit the colour, double click on the coloured block, and select the new colour from the swatch that pops up.



## Song Arrangement

This section will describe the workflow of editing sequences in the Song Arranger Editor to create a song. For info on editing the notes within a sequence, please refer to the Piano Roll Editor section of this manual.



Hovering the mouse over a sequence will turn the mouse cursor into a hand . You can select the sequence by clicking on it. Note that if no modifier keys are pressed, any currently selected sequences will be deselected.

Holding down the SYM modifier will add the sequence to the currently selected sequences, or deselect it if it is currently selected.

To move sequences, click and hold the LMB over a sequence and move it to the desired position.



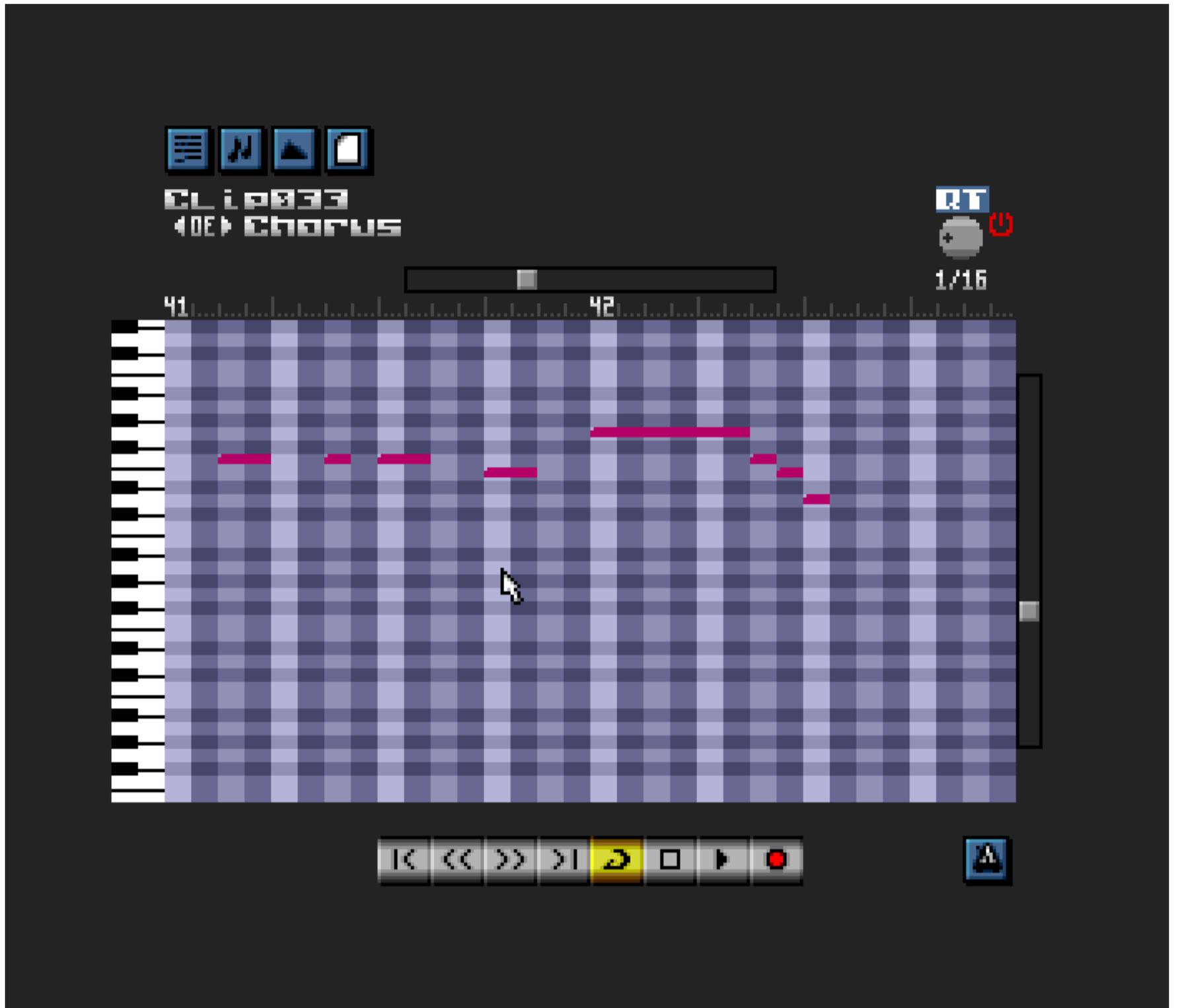
Holding down CAPS will make a referenced copy of the selected sequences. An equals (=) sign  will appear on the hand pointer to indicate this mode. Sequences that are referenced also have an equals (=) sign displayed to indicate this. Editing notes in a referenced sequence will effect all sequences linked to it.

Holding down CAPS + SYM will make a unique copy of the selected sequences, and any edits to these  will only effect it. A plus (+) sign  will appear on the hand to indicate this mode. If you create a referenced copy of a unique sequence, the same editing rules apply: all related sequences will be effected.

Press DELETE (CAPS + 0) to permanently delete all selected sequences. **USE WITH CAUTION AS UNDO IS NOT SUPPORTED!!!**

# Piano Roll Editor

Notes can be recorded and edited using the Piano Roll editor, and works in a similar way to a modern day DAWs.



## Overview

Below the editor buttons at the top/left of the screen you can see the name of the sequence clip currently being edited.

Below this, you will see the name of the default instrument Patch used to play notes in this clip, with its patch index to the left.

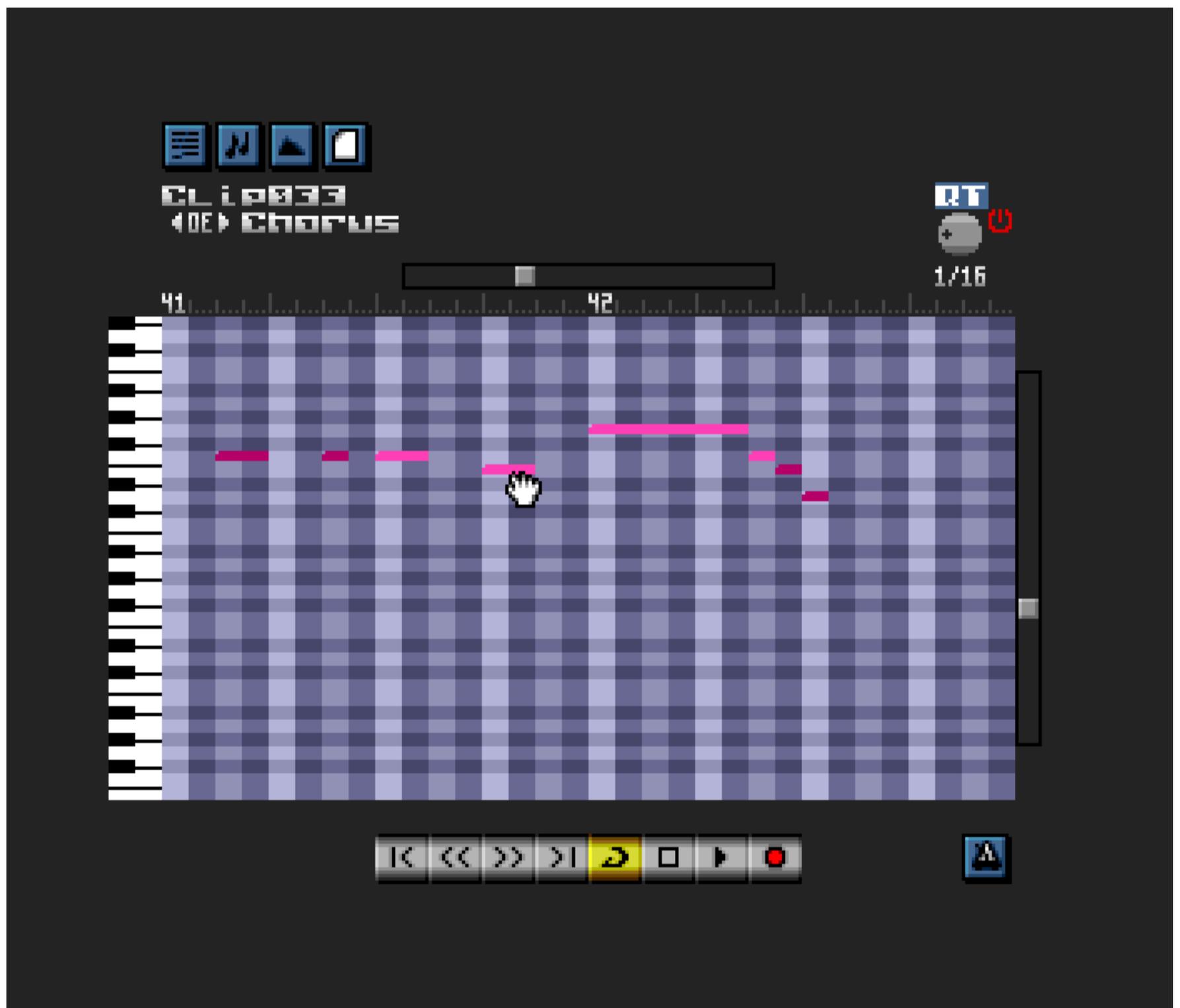
Finally, the main Piano Roll is used to edit notes. The horizontal scroll bar can scroll along the timeline of the sequence. Bars that lie outside the duration of the sequence will be rendered darker. The vertical scroll bar let's you adjust which range of notes will be displayed.

\* Even though you can place notes outside the sequences duration, they will not play back in your song.

## Patches

The default patch to note playback can be selected using the top-most left/right arrows at the top/left, and holding down CAPS will move in increments of 10. If you have a note selected in the piano roll below, you can assign the patch to use for that specific note using the Patch selection below the default one. When set to DEFAULT, the notes will fall back to play the clip's default patch.

## Editing Notes



CAPS + Click/Drag/Release to create and edit the duration of a note in the main piano roll area.

Hovering over the left or right edge of a note and click/dragging lets you adjust the start time or duration of a note. Click/dragging in the centre of a note will move the selected notes.

Marquee drag selection to select a group of notes. Holding SYM will add these to the currently selection, otherwise it will just select the newly notes in the marquee region.

CAPS + 0 [DELETE] deletes the currently selected notes.

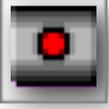
CAPS + 6/7 moves the selected notes up/down one semitone.

SYM + 6/7 moves the selected notes up/down one octave.

CAPS + 5/8 move selected notes left/right by the quantize setting amount.

**TIP: THIS IS EXTREMELY USEFUL WHEN YOU HAVE VERY SHORT NOTES, AS THE EDITING CAN BE TRICKY WITH THE LOW RES SCREEN!!!**

## Recording

You can arm recording by clicking on the transport bar's record button  while in the piano-roll editor. You can record notes outside the edited sequence's time range, so you need to ensure that it is in the current playback range. The easiest approach is to set the loop region to the current sequence by clicking on the sequence then press CAPS + L in the Arranger Editor, then enter the Piano Roll.

Enabling loop playback (SYM + L, or using the transport loop button ) is handy as it will allow you play the sequence repeatedly to practice your performance before arming the record mode.

If the playback is paused, and recording is armed, pressing the piano keyboard notes will step record notes at the current playhead position with the duration set to the current quantization length. The playhead will then move forward by that amount. If the song is playing, you can record your performance live. Once you stop playback (SPACE toggles it), record mode will be automatically disarmed to prevent you accidentally recording additional notes.

**BE CAREFUL!!! REMEMBER TO TURN OFF THE RECORD ARM IF IN STEP MODE, OR CHANGE YOUR MIND!!!!!!**

## Quantization

At the top/right you will see a control knob names QT which is used to adjust the note quantization settings. The knob is used to set the granularity in either normal, dotted, or triplets. The power button is used to enable or disable quantization. Pressing CAPS + Q will quantize the starting position of any selected notes, and CAPS + SYM + Q will quantize the durations of any selected notes.

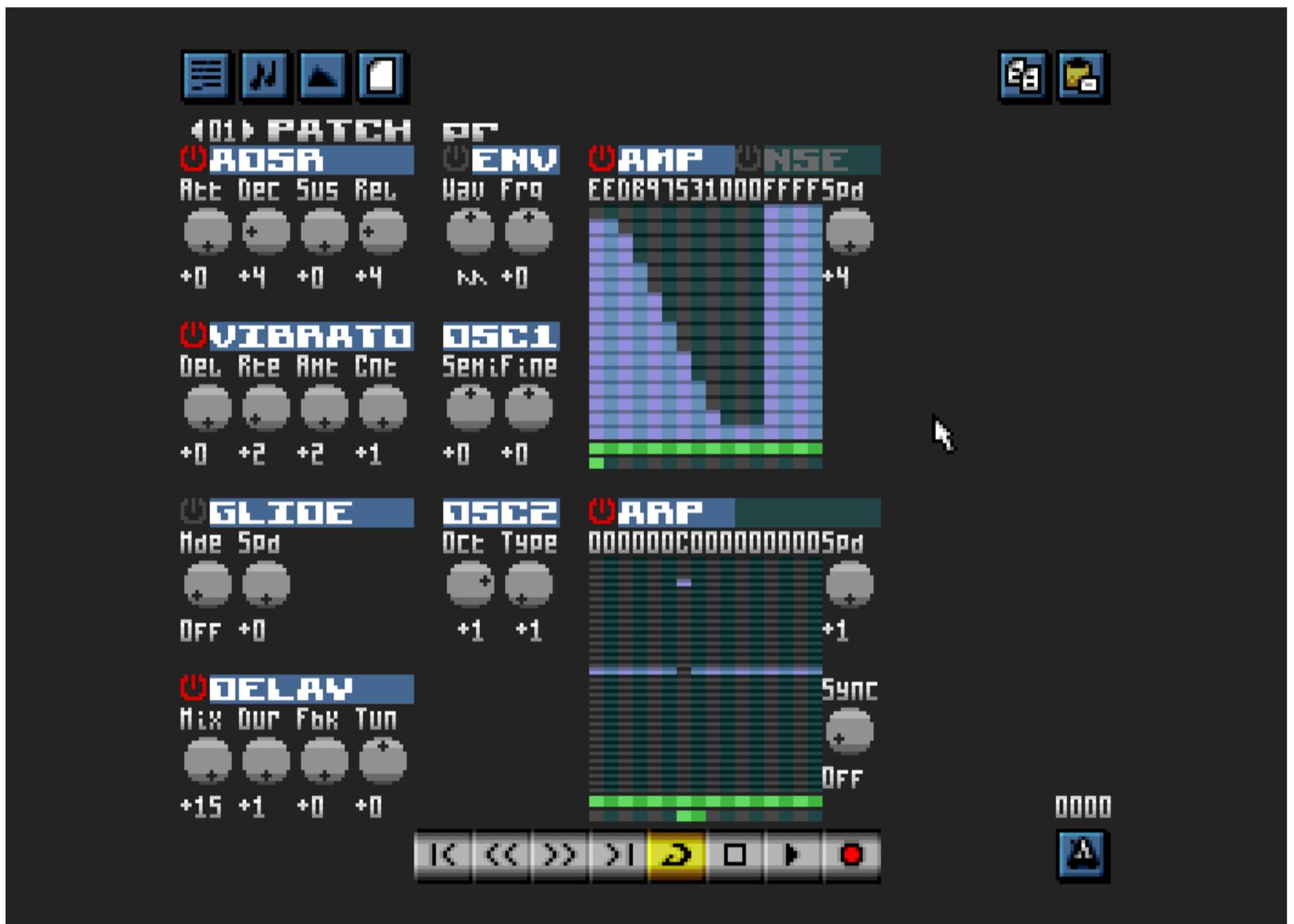
## Legato

If a note's end time is less than 1/16th note to the next note's start time, the next note will play with a "glide" from the previous note's pitch. The glide is dependent on the current patch settings, so you need to enable it and adjust the settings to taste. If it is disabled, legato mode is not active. Notes that are not within 1/16th will be played without glide, regardless of the patch's glide settings.

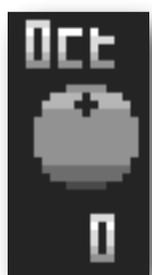
## Patch Editor

The patch editor is where you will be creating instruments for your compositions, and contains a wealth of features to make this both an easy and rewarding experience.

The controls are arranged by feature in an intuitive order. The power button can be used to enable each feature you want to use. Only enable if you use them, as they take up valuable CPU computation. The toggle is also useful to A/B compare with and without the feature.



## Controls



Knob controls are adjusted by click/holding on the round knob icon and moving the mouse up and down. The further you the mouse is from the start position in the horizontal axis from the control, the value will change in larger steps, allowing for coarser adjustment of the values which is useful for larger ranged knobs.

**ADSR** is used to create the amplitude contour of your instrument.

- **Att** - The attack time to reach full amplitude. This phase is triggered when a note starts.
- **Dec** - The decay time to reach the sustain amplitude, which starts after reaching full amplitude.
- **Sus** - The amplitude level that is held when a note is being played.
- **Rel** - The release time to reach zero amplitude. This phase is triggered when the note ends.

For Att, Dec and Rel, lower values are faster, higher values are slower.

**VIBRATO** modulates the frequency of the note being played to add expression to your instrument.

- **Del** [Delay] - The delay before the vibrato effect start.
- **Rte** [Rate] - The duration of one modulation cycle. Use higher values for longer durations.
- **Amt** [Amount] - Higher values give a more pronounced effect.
- **Cnt** [Count] - **Amt** will increase each vibrato cycle for this many cycles.

This is useful for increasing the vibrato intensity the longer the note is played for.

Due to how the frequency calculation works with the AY sound chip, lower pitched notes have a larger spacing than higher pitched notes. Therefore, higher pitched instruments usually require less vibrato than lower ones - but always experiment, esp. for special effects! As with all things audio, use your ears, not your eyes!

To create a slow vibrato that builds up, start with a moderate delay, a small value for rate, a very small value for Amount, and a moderate value for Count. 10, 3, 0, 3 is a good starting point.

**GLIDE** is used to smoothly transition between notes. See piano editor for details on legato playback.

- **Mde** [Mode] The type of glide. Choices are Speed based, Time based, or Chromatic (semi-tones).
- **Spd** [Speed] How fast the glide is. Higher values are slower for Speed and Time based glide. For Chromatic mode, this is the number of semitones to step each update.

**DELAY** acts similar to an echo effect.

- **Mix** [Mix] How much of the delay effect to apply.
- **Dur** [Duration] The time between each delay signal.
- **Fbk** [Feedback] How much vibrato to apply.
- **Tun** [Tuning] Used to detune the delay's output pitch.

The delay is a powerful way of not only getting echo effects but to also create big thick phat sounds. This comes at a cost though, as it uses an additional AY channel. It also requires some planning on the composer's side when arranging your songs, as you need to leave space in the Arranger Editor tracks for the additional channel to use. See the **OSC2** section below for additional information.

**ENV** uses the hardware envelope generator to modulate the amplitude of the note being played.

- **Wav** [Waveform] The envelope shape. Sawtooth and Triangle are generally the most useful.
- **Frq** [Frequency] The frequency of the waveform is a multiple of the current played note's frequency. 0 is the same frequency, 1 is double, 2 is quadruple, and so on. Negative divide by 2,4,8,...

## OSC1

- **Semi** [Semitone] This parameter adjusts the pitch of the instrument in semitone increments.
- **Fine** [Fine tune] This parameter adjusts the pitch of the instrument in semitone increments.

Fine tuning is a great way to get big fat sound by layering instruments together, or using a second oscillator as described in the next section.

**OSC2** These controls only have an effect when the **DELAY** effect is enabled.

- **Oct** [Octave] Transpose the second oscillator in octave increments.
- **Type** This controls which additional channel to use for the second oscillator. The options are described in the table below.

The Spectrum Next support 9 AY audio channels (1-9) which are assigned to either the left, center, or right stereo output. The assignment is as follows.

Channel	Output
1	Left Stereo Output
2	Left and Right Stereo Outputs
3	Right Stereo Output
4	Left Stereo Output
5	Left and Right Stereo Outputs
6	Right Stereo Output
7	Left Stereo Output
8	Left and Right Stereo Outputs
9	Right Stereo Output

This allows you to create music with nice stereo imaging, e.g. pads to the left, melody on the right, and drums in the center. As the center channels output to both left and right channels, they are inherently louder than the left and right channels. You should also take this into consideration when creating your musical masterpieces! One trick is to adjust the volume of the instrument to balance out the mix. See the **AMP** section below for more details.

The **OSC2** type has six assignment options.

Type	Description
+1	Use the next channel from this one.
+2	Use the channel two channels away from this one.
+3	Use the channel three channels away from this one.
<L	Use the next available LEFT channel.
^C	Use the next available CENTER channel.
>R	Use the next available RIGHT channel.

The following matrix should show how the mapping works in practice.

Channel Playing Patch	Stereo Output	Type = +1	Type = +2	Type = +3	Type = <L	Type = ^C	Type = >R
1	L	2	3	4	4	2	3
2	C	3	4	5	4	5	3
3	R	4	5	6	4	5	6
4	L	5	6	7	7	5	6
5	C	6	7	8	7	8	6
6	R	7	8	9	7	8	9
7	L	8	9	1	1	8	9
8	C	9	1	2	1	2	9
9	R	1	2	3	1	2	3

## Arpeggiators

The arpeggiators are powerful tool for creating complex textures, rhythms, and periodic patterns. Each patch can optionally arpeggiate Amplitude, Noise, and Pitch, and are enabled using the Power buttons. Some editors are shared, so click on the heading to enable editing that arpeggiator. In the diagram below, the Noise arpeggiator is enabled and active for editing. The Amplitude arpeggiator is not active, shown by the greyed out heading, and is disabled as the power light is off.



- Each arpeggiator has 16 steps.
- The number across the top show the data value of the step.
- The middle are is where you can draw in the values with the mouse.
- Holding down the CAPS key BEFORE clicking the mouse and dragging it allow you to draw lines.
- The first row below the data values is used to enable or disable the step: **RED** for disabled, **GREEN** for enabled.
- The next row is used to set the loop region. Click the left mouse button to set the start point, and the right to set the end point. The arpeggiator will play from the start when a note is played, and when it reaches the end point it will return to the start point.



- The **Spd** knob is used to control the speed of the arpeggiator, with higher values being slower.
- The Pitch arpeggiator at the bottom has an additional **Sync** knob to control how notes are triggered for each step. The default is **Off** which will play the Amplitude ADSR normally. The **On** mode will re-trigger the ADSR but the current amplitude level will be retained. Finally, the **Hard** mode also re-triggers the ADSR but the amplitude will be reset to zero.

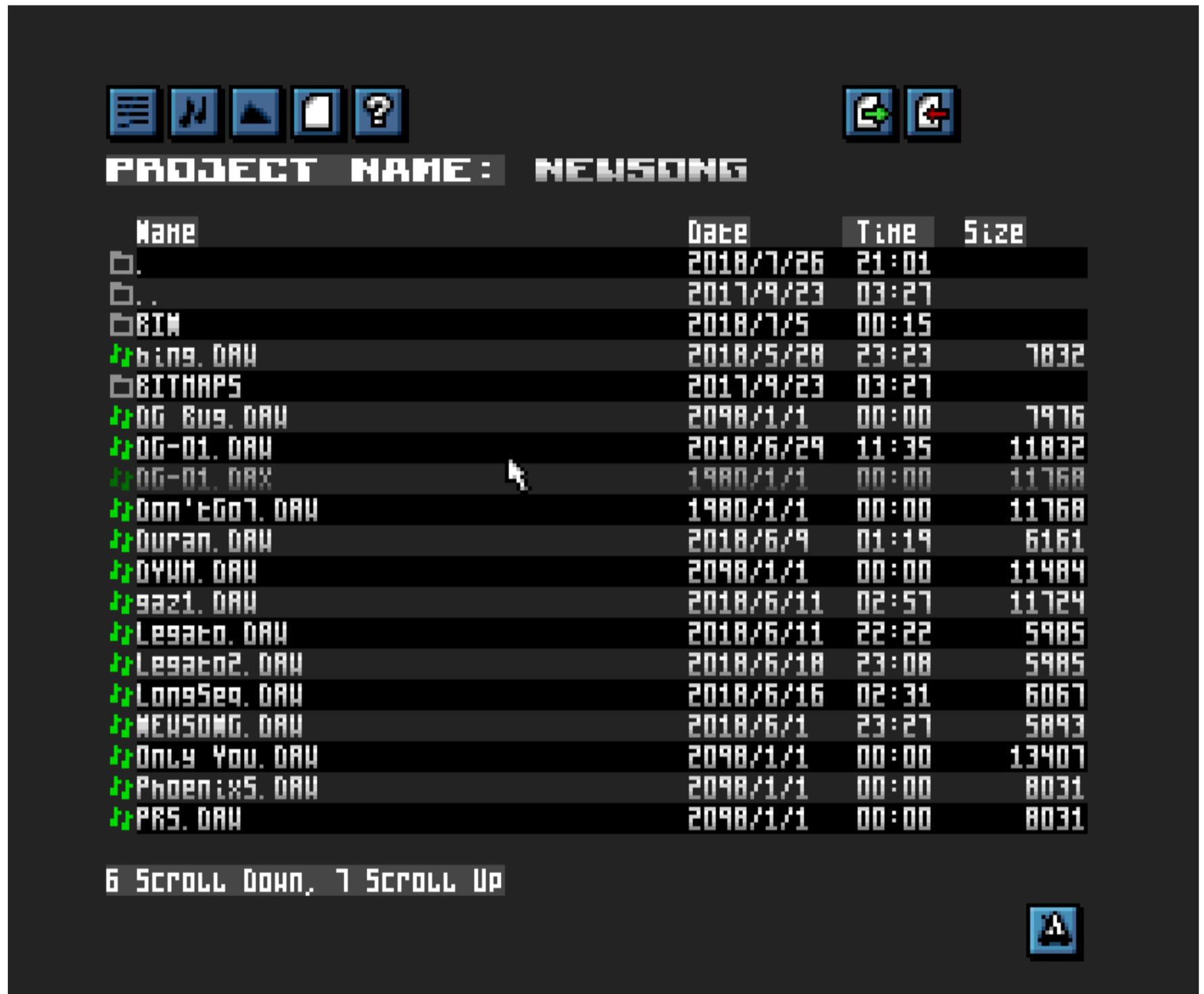
Disabling a step is useful to the Amp and Noise arpeggiators as it lets you disable the square wave and/or noise wave for various effects. Sometimes you only want noise for a step, sometimes only the square wave, and sometimes both. You can even disabled both if you choose to to do.

**TIP! To reduce the overall volume of an instrument, you can use the AMP arpeggiator, and reduce it there. The ADSR volume still applies, but will be scaled by the AMP arpeggiator values.**

- The AMP values modify the volume level (0...15)
- The NOISE values modify the pitch of the noise (0...31)
- The ARP values modify the pitch of the note being played, in semi-tone steps (-15...+15)

# File Operations

This screen is used to browse, load, save, and export your songs.



## Loading Projects

To load an existing project, browse for the .DAW file and either double click on the filename, or single click the filename and press the LOAD button. You will be prompted to confirm this action.

## Saving Projects

If saving a song for the first time, you will want to give it a meaningful name. Simply double click on the existing name and edit it, and as always, ENTER to finish. Browse to a suitable location, click on the SAVE button, and confirm your decision. When a song is

saved, NextDAW will automatically create a backup of your song. As this will create a lot of files, we recommend that you create a folder per song so keep things organised.

**IMPORTANT!!! As with any software, you should backup your data on a regular basis!**

## Exporting

Once you have completed your masterpiece, you will undoubtedly want to use it in your own software, or listen to it using the provided .DOT command NextDaw music player.

The process is much the same as saving a project, but click on the EXPORT button (instead of clicking on the SAVE button), which will create a .NDR file (NextDaw Runtime).

**TIP! Before exporting, you should set the Loop region in the arranger otherwise playback will not be correct.**

## Playback with NDAWPLAY .DOT command

To play back the song the NDAWPLAY .DOT command file needs be placed in your BIN folder if you haven't already done so. In NextZXOS, locate the .NDR file, select it, and it will be played automatically. You can also choose the play it from the command line by using **.NDAWPLAY <NAME>.NDR** when you are inside the directory where the file exists.

## Playback with from your own ASM code

More info will follow.

# Hot Keys Reference

## Common Hot Keys

<b>CAPS + 1</b>	Open Arranger Editor.
<b>CAPS + 2</b>	Open Sequence Editor (only works if you have previously opened it by double clicking on a sequence).
<b>CAPS + 3</b>	Open Patch Editor.
<b>CAPS + 4 / CAPS + J [LOAD]</b>	Enter the File I/O Editor Page.
<b>CAPS + C</b>	Toggle Click track (the metronome).
<b>SPACE</b>	Toggle play / stop.

## Patch Editor Hot Keys

<b>CAPS + Z [COPY]</b>	Copy current patch
<b>CAPS + V</b>	Paste copied patch to current patch

## Song Arranger Hot Keys

<b>CAPS + N</b>	Move playhead to previous bar.
<b>CAPS + M</b>	Advance playhead to next bar.
<b>SYM + N / , (comma)</b>	Move playhead to start of loop region.
<b>SYM + M / . (period)</b>	Move playhead to end of loop region.
<b>SYM + CAPS + N</b>	Move playhead to start of song.
<b>SYM + CAPS + M</b>	Move playhead to end of song.
<b>CAPS + L</b>	Toggle loop mode on/off.
<b>SYM + L</b>	Set loop region to selected sequence range.
<b>CAPS + Z [COPY]</b>	Copy selected sequences.
<b>CAPS + V</b>	Paste copied sequences are current playhead position as REFERENCES.
<b>CAPS + SYM + V</b>	Paste copied sequences are current playhead position as UNIQUE COPIES.
<b>CAPS + G</b>	Glue selected sequences. Selection must be two adjacent seq on same line.

## Piano Roll Hot Keys

<b>CAPS + A</b>	Select all notes.
<b>CAPS + 6</b>	Transpose selected notes down one semitone.
<b>CAPS + 7</b>	Transpose selected notes up one semitone.
<b>SYM + 6</b>	Transpose selected notes down one octave.
<b>SYM + 7</b>	Transpose selected notes up one octave.
<b>CAPS + 5</b>	Nudge selected notes left by quantization amount.
<b>CAPS + 8</b>	Nudge selected notes right by quantization amount.
<b>CAPS + 0 [DELETE]</b>	Delete selected notes.
<b>CAPS + Q</b>	Quantize start time of selected notes.
<b>SYM + Q</b>	Quantize duration of selected notes.