TeensyDAW – Build and User Manual
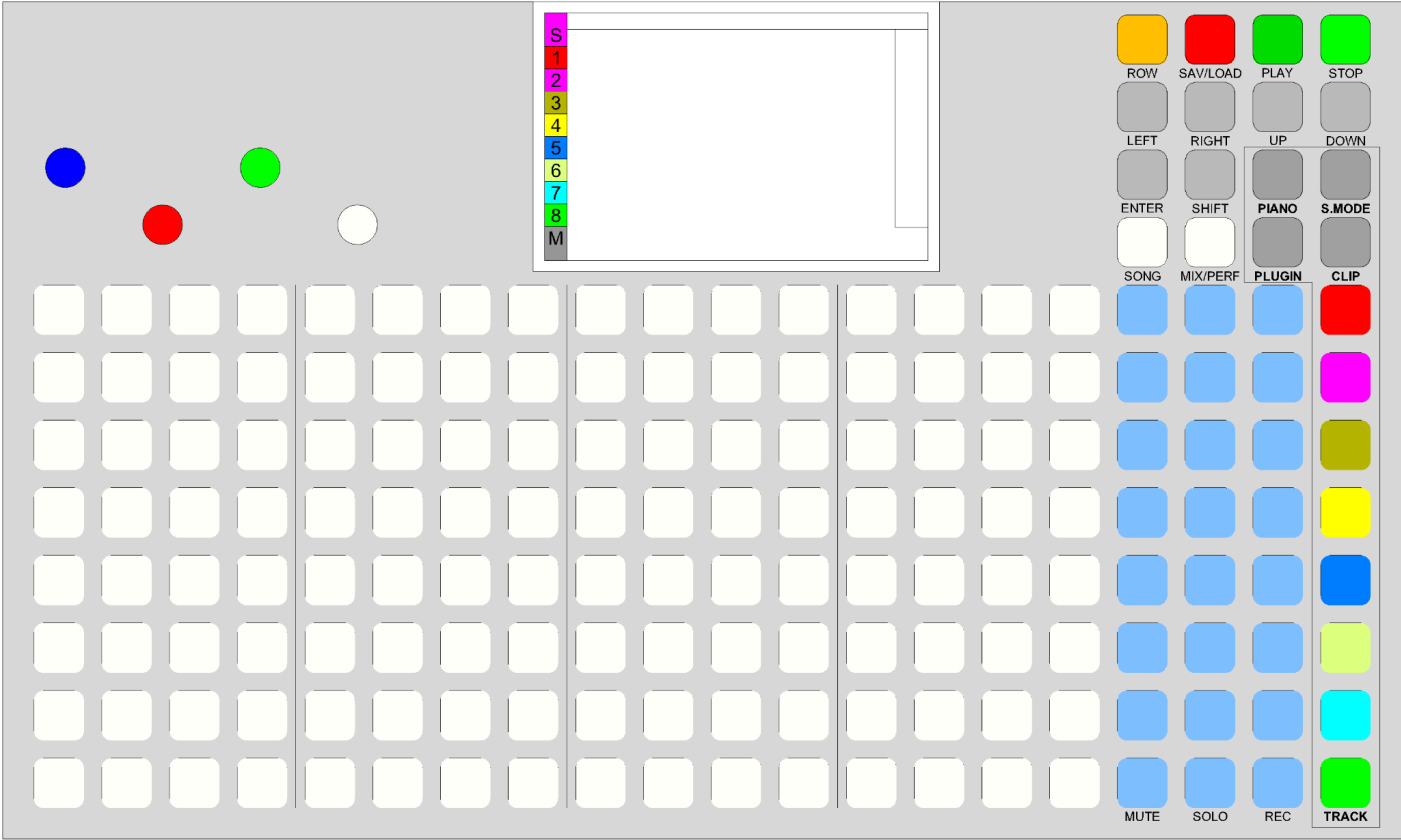
Manual and code are still work in progress

📌 Table of Contents

1. Introduction

TeensyDAW is a standalone sequencer based on the Teensy 4.1.
It features eight polyphonic tracks, each with eight clips. Every clip consists of
96 MIDI ticks and allows to play up to twelve simultaneous notes.
Clips can be arranged into a linear song structure using an arranger that supports up to 256 bars.
Each bar can store parameters such as clip selection, transposition, volume,
probability and plugin/playmode presets..
The song progression can be looped with customizable start and end points.

Each clip can have individual settings such as clock division, clip length,
MIDI output channel, musical scale, and active Playmode.

Multiple Playmodes are available for sequence generation.

Playmode	Description
Step	step Sequencer with Pianoroll style GUI
Random	mode with random notes, inspired by Marbles or Turing Machine
DropSeq	A "weighted" or subtractive sequencer with random reduction or density
bitRead	Reads a number from 0–256 as an 8-bit pattern and plays it across 12 voices
Analog	16 step sequencer with a classic potentiometer-style Interface
BeatArray	128 drum patterns for all 12 voices
Euclid	Polyphonic for all 12 voices, with adjustable steps and rotation
Rclid	Monophonic with controlled or random variation, similar to "Random"
.mid	Play (polyphonic) midi files (.mid) from SD Card

All play modes can be transferred into the active clip for further editing.
They can also be used in arrangement mode and deactivated if needed.

In addition to MIDI control, the system includes an audio engine with 16 internal plugins, Audio In
a mixer, and three effects (reverb, bitcrusher, delay).
Audio output is handled by the Teensy Audio Board.

The system is designed to run with external MIDI sync at 24 PPQN,
but it can also operate in internal sync mode.

2.   System Overview

The sequencer combines clips, tracks, and various play modes to create structured and dynamic MIDI sequences. These sequences can control external gear such as synthesizers, samplers, drum machines or trigger internal audio plugins directly. Each clip comes with its own set of parameters, including sequence length, clock division, scale, play mode, and MIDI output channel, offering precise control over playback behavior.

Every plugin can store up to eight presets that can be recalled in real time during song playback, allowing for flexible sound changes throughout a performance. Songs can span up to 256 bars and loop seamlessly between defined loop start and end points. Each bar in the arrangement can be individually configured with parameters like note transposition, bar velocity, probability and plugin/playmode preset selection.

Multiple play modes are available to encourage experimentation and creative sequencing. Before placing clips into the linear arranger, the clip launcher provides a flexible environment to test and mix different clips live, helping you discover musical combinations on the fly.

Perform mode presents a playable pad grid that generates punch-in effects. Parameter adjustments are also possible. This creates an environment perfect for live and improvised performances. Some parameters will need track selection and some are not available in perform mode.
In Perform mode, the Maingrid transforms into a big 16x8 button matrix . Each column either send a set chosen MIDI-cc message, or sets parameters for the internal Effects and each Track´s parameters such as Sequence length, clock division and note transposition.

3.   BOM and Build Guide

TeensyDAW was designed to even build by beginners. Mostly premade breakout Boards are used and no SMD Parts are needed. Only a few Thru Hole parts are needed and the Headers are very easy to solder. At the point of writing a final housing for the project has to be made. Still unsure about the material to use.

3.1.BOM

1x   Teensy 4.1
https://www.sparkfun.com/teensy#teensy4_1

1x   Teensy Audio Board Rev D
https://www.sparkfun.com/teensy-4-audio-shield-rev-d.html

8x   Adafruit Trellis PCB + Elastomere
https://www.adafruit.com/product/1616

3x   Adafruit Neotrellis PCB + Elastomere
https://www.adafruit.com/product/3954

1x   4" TFT Touch Display ST7796S
https://www.amazon.de/dp/B0CZRV3Q8T?ref=ppx_yo2ov_dt_b_fed_asin_title

4x   Encoder with push button 9mm
https://www.mouser.at/ProductDetail/652-PEC11H4225FS0024

2x   Adafruit Quad i2c DAC breakout board
https://www.adafruit.com/product/4470

12x   Stereo Jacks 3,5mm
https://www.mouser.at/ProductDetail/179-SJ3-35083A-TR

1x   Logic Level Converter 5V-3.3V
https://www.adafruit.com/product/757

11x   Flat Headers
https://www.mouser.at/ProductDetail/200-CES11402TS

1x   Custom PCB
https://aisler.net/p/XSYWSEJB

1x   100R   R5
3x   220R   R1, R2, R3
1x   470R   R4
1x   1N4148   D1
1x   1x14pin Header 9-10mm

3.2.Build Guide

1.) Start by soldering the Resistors, Capacitor and Diode to the PCB. Be aware of the Orientation of the Diode.

2.) Solder the Headers onto the PCB. Be Aware: Teensy Headers are on the Backside of the PCB.

3.) Solder the Jacks, USB-Sockets and Encoders to the PCB.

4.) Solder the 8 Trellis PCB´s to a Grid of 4 x 2, be aware of the Orientation of the Boards.

5.) Do the same for the 3 NeoTrellis boards in a 1 x 3 Grid.

Try to solder the PCB´s as flat as possible together.

To make TeensyDAW talk correctly to the (Neo)TrellisBoards you have to set the correct I2C address for each board (also the DAC´s). Please pay attention to the correct solder bridges, as TeensyDAW won´t run correctly if any mistakes had been made here.

Trellis Board Bottom View (LED´s facing down)

Board 1: A2	Board 2: A0, A1	Board 3: A1	Board 4: –
Board 5: A0, A1, A2	Board 6: A1, A2	Board 7: A0, A2	Board 8: A0

	A0	A1	A2
Board 1			X
Board 2	X	X	
Board 3		X	
Board 4			
Board 5	X	X	X
Board 6		X	X
Board 7	X		X
Board 8	X		

NeoTrellis Board:

Before soldering the Headers to the Teensy be sure to cut the Power Trace on the Teensy.

Cutting the trace that connects the "5V" pads will isolate the USB power from the rest of the circuit board. Please refer to the [schematic](#) for details. If the original connection needs to be restored, the pads can be soldered together.
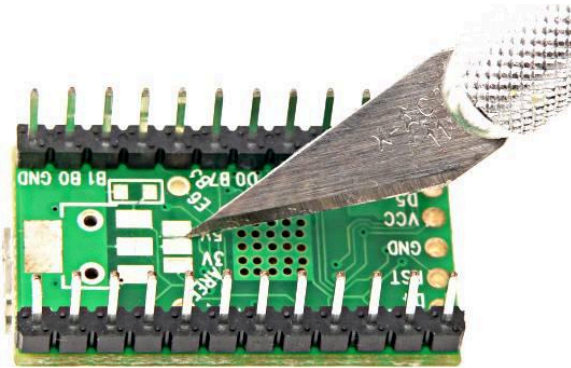
Source: [pjrc.com](#) TeensyDAW Headers must be soldered on the opposite side as in this picture!!

3.3.Uploading

Download the Teensyduino Loader from [www.pjrc.com](#), get the actual Release of TeensyDAW at https://github.com/steven-law/TeenSequencerV2/releases/

Before uploading the TeensyDAW FW, the DAC´s have to be programmed first. Please use the dacChangeAdress.ino file on one of the DAC´s to rewrite it´s I2C address. Mark this one with a marker. This DAC will be placed at UC15.

Run dacTest.ino to make sure that everyone of the thirdteen I2C devices has its unique Address.

Prepare the SD card by loading all files from the folder "TeensyDAW SD Card" onto a SD Card. Ensure to use branded SD Cards like Kensington or SanDisc (SDXC UHS 30MB/sec Application Performance Class 2 (A2)). The folder contains all the project files aswell as the playable and recorded MIDI and .raw (Audio) files. Feel free to use custom MIDI/raw files, be sure to keep the name restrictions.

Load the firmware.hex file into the Teensy Loader. Connect the Teensy´s Micro USB to your Computer, connect TeensyDAW´s USB-A to a Powersource. Press Upload. The Upload Process will take a few seconds to finish. Your Display should light up and the initial Boot process should start. If you have any troubles, be aware that the prepared SD card is inserted, all I2C addresses are soldered correctly and everything is connected to the PCB.

4. Basic Operation

4.1. Navigation

TeensyDAW´s GUI was designed to be fast and everything to be accessible with only a few button presses. Some parameters are not directly accessible but hopefully intuitively arranged, so they´ll be easy to remember.

4.1.1. ROW

Sets the active "Row". Most pages have up to 16 parameters to edit. The ROW button sets the active Set of parameters to be controlled with the four encoders. For a better appearance, the 4 active parameters will be displayed in the encoder colors. Touch the display on the very right side, on the field of the parameters, (~1 cm from the screen's right edge) to select each row. Top: Row 1, midTop: Row 2, midBottom: Row = 3, Bottom: Row = 4. Touch the screen on the most right position to switch fast between the different rows.

4.1.2. SAVE/LOAD

Press and Hold SAVE/LOAD and press one of the top lid Main Grid buttons to save the active Song. Press and Hold SAVE/LOAD and press one of the bottom lid Main Grid buttons to load the desired Song. All parameters from all Clips, active Plugins, Playmodes and Pages will be saved as dat File (not readable) onto the SD Card. In case of a crash load the "last" project on the "Step 16" Button.

Press and Hold SAVE/LOAD and press one of the 4th Row lid Buttons to export the desired song as a midi file that can be loaded into any DAW or MIDI file player. An external Program "DAWtoMIDI.exe" will export your active Project to a MIDI file without the need of removing the SD from the Device.

4.1.3. PLAY

Start the actual Playback of the Song. If you press PLAY and nothing happens be sure your clips and Arranger are filled with content. TeensyDAW will always play in a loop from startpoint to endpoint of the Song. If pressing PLAY while the clock is already running each Track´s internal clocks will reset to Zero

4.1.4. STOP

Stop the Playback immediately. Each Track´s internal clocks will reset to Zero. Saves the actual project to SD Card. In case of a crash or when forgotten to save, load the last project with the "Step 16" button.

4.1.5. CURSOR Buttons

For fine control of the cursor position. Press and hold SHIFT and one of the cursor buttons to set the brightness of the LED´s.

4.1.6.ENTER

Used to enter Notes in one of the Track´s clip-edit pages. Used for copying the last edited Bar in one of the arranger/songmode pages. Used for copying the Playmodes into the active clip for further, detailed editing..

4.1.7.SHIFT

Mostly used for the "hidden" parameters. Press shift and rotate the desired Encoder to access such as StepFX Channel, presetNr for Plugins or LED brightness.

Press and hold SHIFT and one of the cursor buttons to set the brightness of the LED´s.

4.1.8.PIANO

TeensyDAW has a built in MIDIPiano, allowing to either play any Track live or record into the desired Track. The Piano layout is C0 Bottom left, C7 is TOP left. Depending on the selected scale, the Piano will light up the scales active Keys. Tho, unlit Keys still can be played. The Piano will always output the Track´s active MIDI Output Channel.

Press and hold PIANO and any Track Button to enter the desired Piano page. Depending on the last screen, you´re still able to edit those parameters.

4.1.9.PLAYMODE

If any Track´s Playmode is not Step, the parameters for this Playmode will be displayed on this page. Use ROW to switch between the different Potentiometer Rows to edit the desired parameters. Press and hold PLAYMODE and any TRACK button to enter the Playmode view.

4.1.10.SONG

Press and hold SONG with any of the 16 lid Main Grid buttons to enter the desired Songpage (Page 1-16) each Page contains 16 bars of the 256 Bar long song.

4.1.11.MIX/PERF

Press and hold MIX/PERF and one of the lit buttons, will open up to the most various Pages:

Lid Key	Page	Main Grid controls:
1	Mixer Gain	Track Gains
2	FX Sends Track 1-4	Track sends
3	FX Sends Track 5-8	Track sends
4	Reverb	Track sends
5	Bitcrusher	Track sends
6	Delay	Track sends

7	Perform	Perform values
8	Cliplauncher	active Clips

A detailed description of each page can be found in Chapter "Internal Audio Engine".

4.1.12.PLUGIN

For each Output Channel (MIDI + Plugins) the parameters for this Plugin will be displayed on this page. Use ROW to switch between the different Potentiometer Rows to edit the desired parameters. Press and hold PLUGIN and any TRACK button to enter the desired Plugin view. When any MIDI Channel is set as Output. TeensyDAW will show a set of 16 free assignable MIDI CC sets. Each set can have its own CC-Channel Set as well as its own CC-Value Set, meaning you can freely combine any of the 8 CC-Channel Sets with any of the 8 CC-Value Sets in the arranger.

4.1.13.CLIP

Mainview for entering Notes into a Tracks active Clip. Each Track has 8 independent Clips with their own SeqLength, ClockDivision, Midi output channel and active scale.

Press and hold CLIP and any TRACK button, to get into the last edited Clip.
Press and hold CLIP and any of a Track´s first 8 Maingrid buttons to select a clip.
Alternatively switch to ROW = 2 and turn the white Encoder (4th) to select a clip to edit.

Use ROW to switch between the different Potentiometer Rows to edit the desired parameters.

4.2.Flowchart

Clock

Track

Arranger

Ext Synth   Internal Audio Engine

Plugins

Mixer/FX Sends

FX

Output
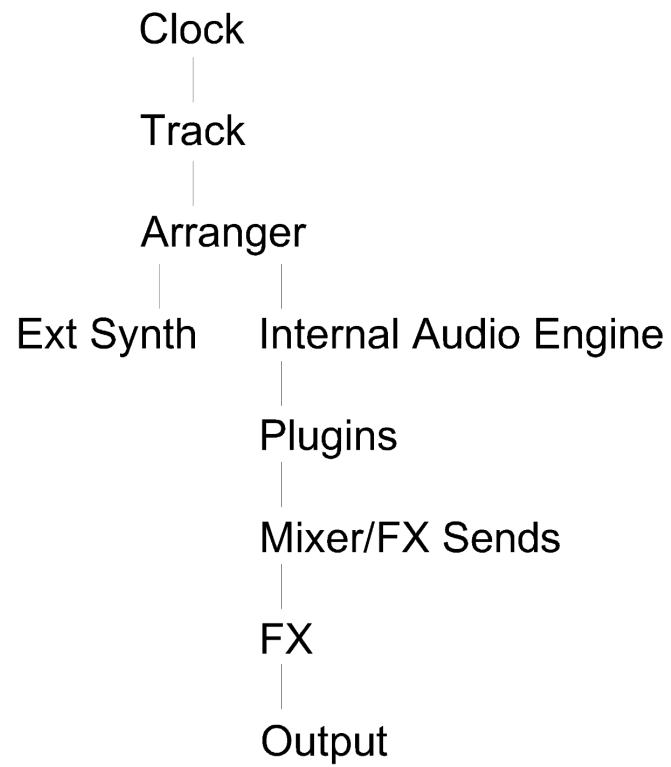
4.3.Songmode/Arrangermode

Press and hold SONG and the first lid maingrid Button
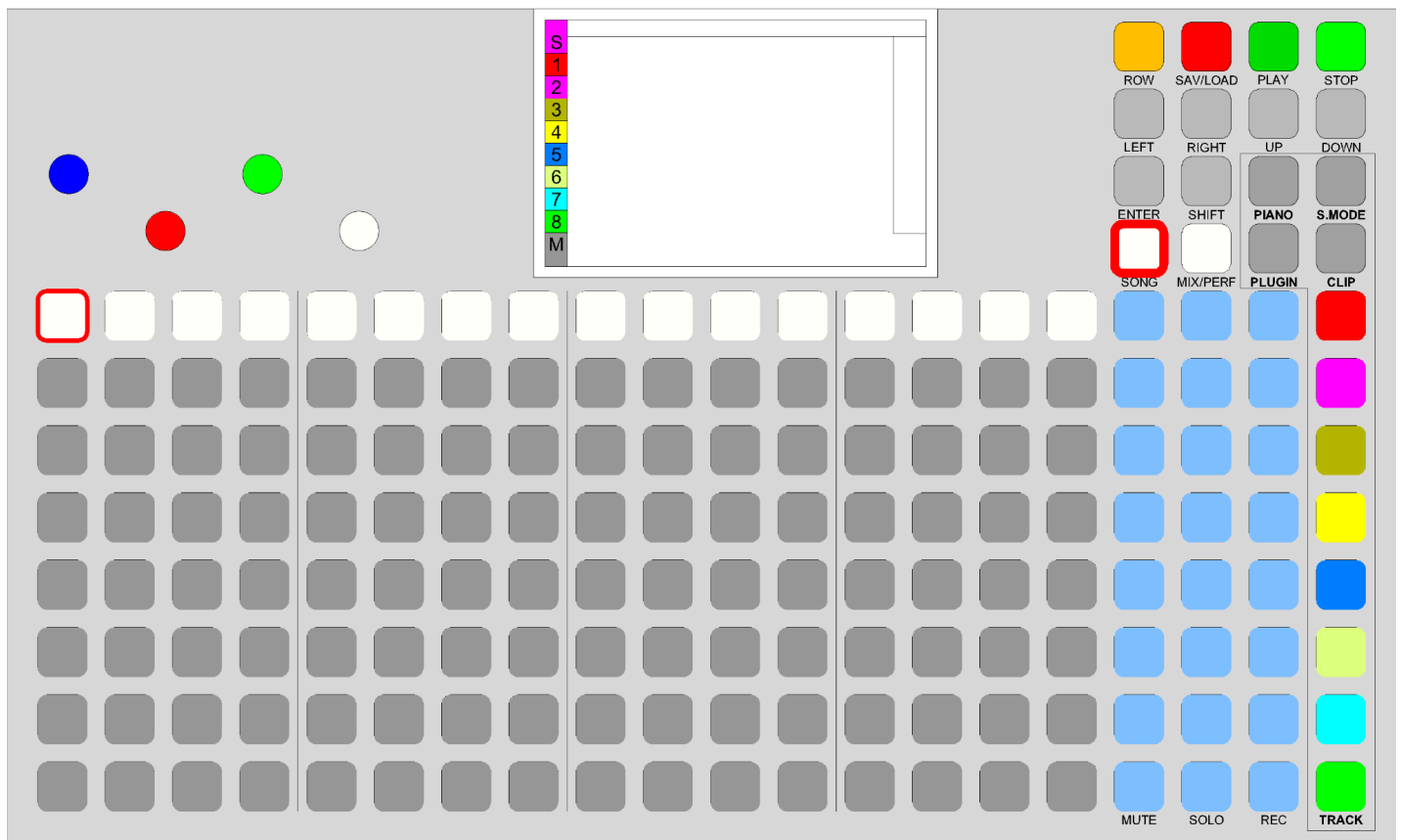
Each lid button represents one of the 16 Songpages, each containing 16 bars. 16 bars x 16 bars/pages = 256 bars in total. TeensyDAW is always playing a loop from the Start of loop to the End of the loop.

By default, the Startpoint is 0 and the Endpoint is 4, so it will loop over a 4 bar long "song".

4.3.1.Enter Clips to play in Arrangermode

In TeensyDAW, there are many ways to enter clips into the arranger.

With the cursor:
Move the cursor with the blue (X-Axis->Bar) and red (Y-Axis->Track)(Row = 1/2/3) to a desired Position and Rotate the green Encoder to the desired clip.

Enter Button:
After setting up a first clip, press ENTER for any other Clip to copy its preferences (ClipNr, Transpose, Velocity, Probability, CC Sets).

Main Grid "slow":
Move the cursor to the desired Y-Position and press any Main Grid Button to set with this clipNr. Do this for every clip that should be arranged.

Main Grid "medium":
Press and Hold any TRACK buttons. Press any button on the Main Grid. The vertical position determines the desired ClipNumber, the horizontal position determines the desired bar. Repeat this for every clip that should be arranged.

Main Grid "fast":
Set the cursor to the desired Cliop Position and press and hold the first Track and first Bar Button and the last Track´s and bar´s Button. (Top-left to bottom right). This copies all preferences from the first clip to the others (ClipNr, Transpose, Velocity, Probability, CC Sets).
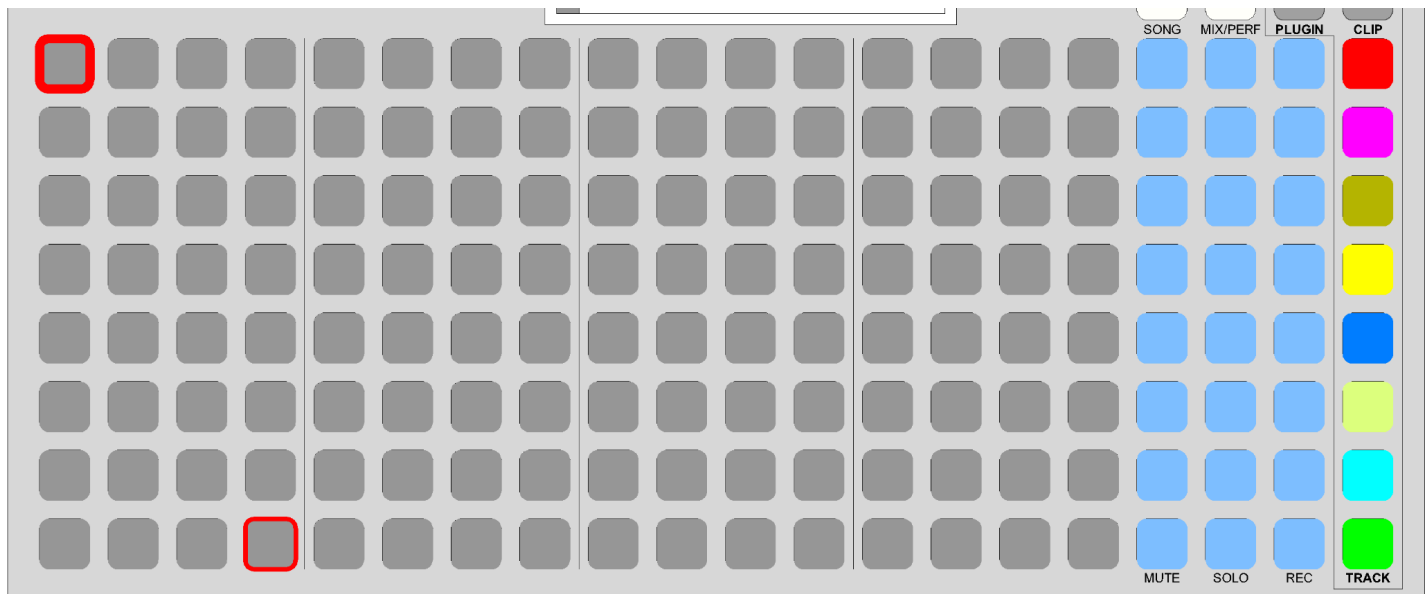
The **Main Grid "fast"** method is probably the fastest method to get a first arrangement into TeensyDAW. Further editing is always needed.

After pressing the two buttons, the maingrid should now light up between the two points that you've pressed. Also the screen should show the selected clips.
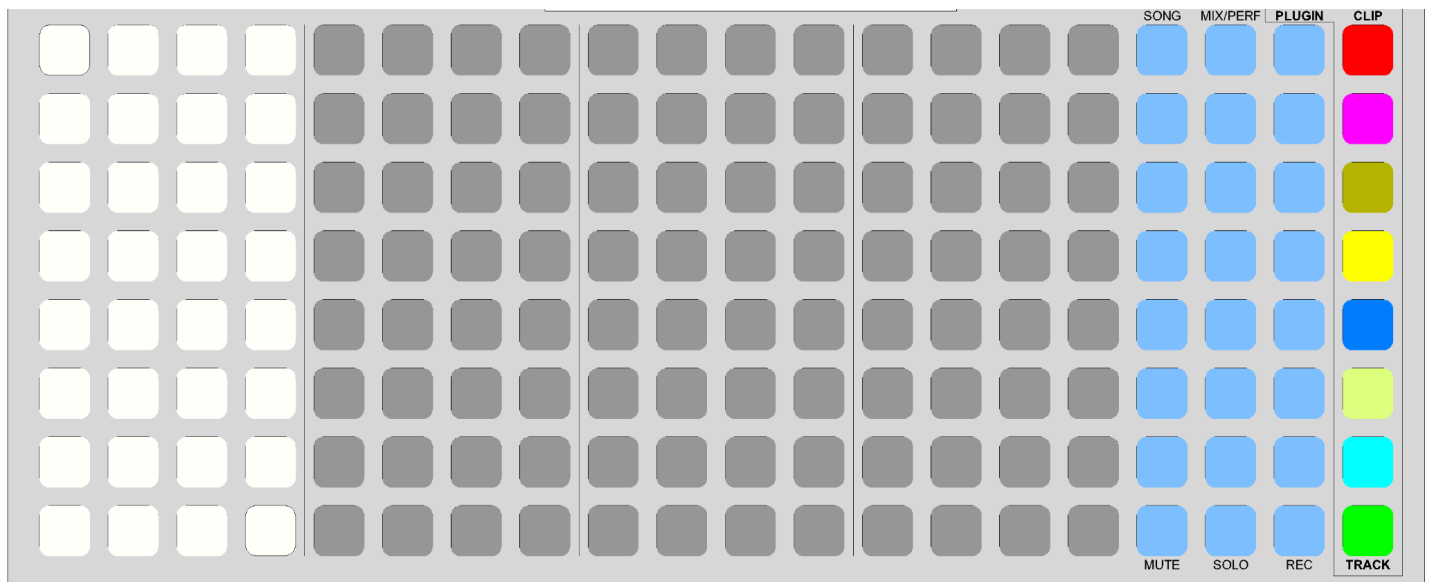
The arrangement for the first 4 bars on all Tracks is applied.

Note: The clock division of a clip (to be set in the clip editor) determines how many copies of the clip will be set when entering a clip. (f.e. Clock division = 3 -> Teensy DAW will set 3 clips when pressing a desired bar)

4.3.2.Edit Song/Arranger Parameters
It is possible to change any clip´s preferences at any given time. Move the cursor to the desired clip, select the desired row and turn the needed Encoder to set the parameter. Each Parameter can be set individually for each clip.

Clip Edit Page Parameters				
	Row 1	Row 2	Row 3	Row 4
Blue Encoder	Bar (Cursor X)	Bar (Cursor X)	Bar (Cursor X)	Sync to External
Red Encoder	Track (Cursor Y)	Track (Cursor Y)	Track (Cursor Y)	Tempo
Green Encoder	ClipNr	Probability	CC channel Set	Startpoint
White Encoder	Note Transpose	Bar Velocity	CC Value Set	Endpoint

Bar: Moves the cursor in X (horizontal) direction.

Track:
Moves the Cursor in Y (vertical) direction, also sets the desired clip when entering clips only via the main grid.

ClipNr:
Edits the clipNumber when the cursor is on a desired clip. The Clip Number is the Top left number in each clip

Note Transpose:
Transposes the desired clip in the set amount of transposition. The Transposition is shown in the bottom left value of each clip

Probability:
Sets the play probability for the desired clip. The probability is shown as rounded corners of each clip.

Bar Velocity:
Sets the velocity for the desired clip. The Velocity is shown in the thickness of each clip.

CC channel Set:
When Playmode is "Step" a Set of 16 cc Controls is given. CC channel Set is one of eight control sets where only the desired cc CHANNELS are stored.

CC value Set:
Same as CC channel SET, only for the stored values. So it is possible to freely combine 8 x 16 CC Value Sets with 8 x 16 CC channel Sets while the song is running.

Sync to External:
Switch between syncing to external Gear over Serial, USB Device and USB Host. Start, Stop and Clock is sent.

Tempo:
Sets the desired Tempo between 50 - 255 bpm.
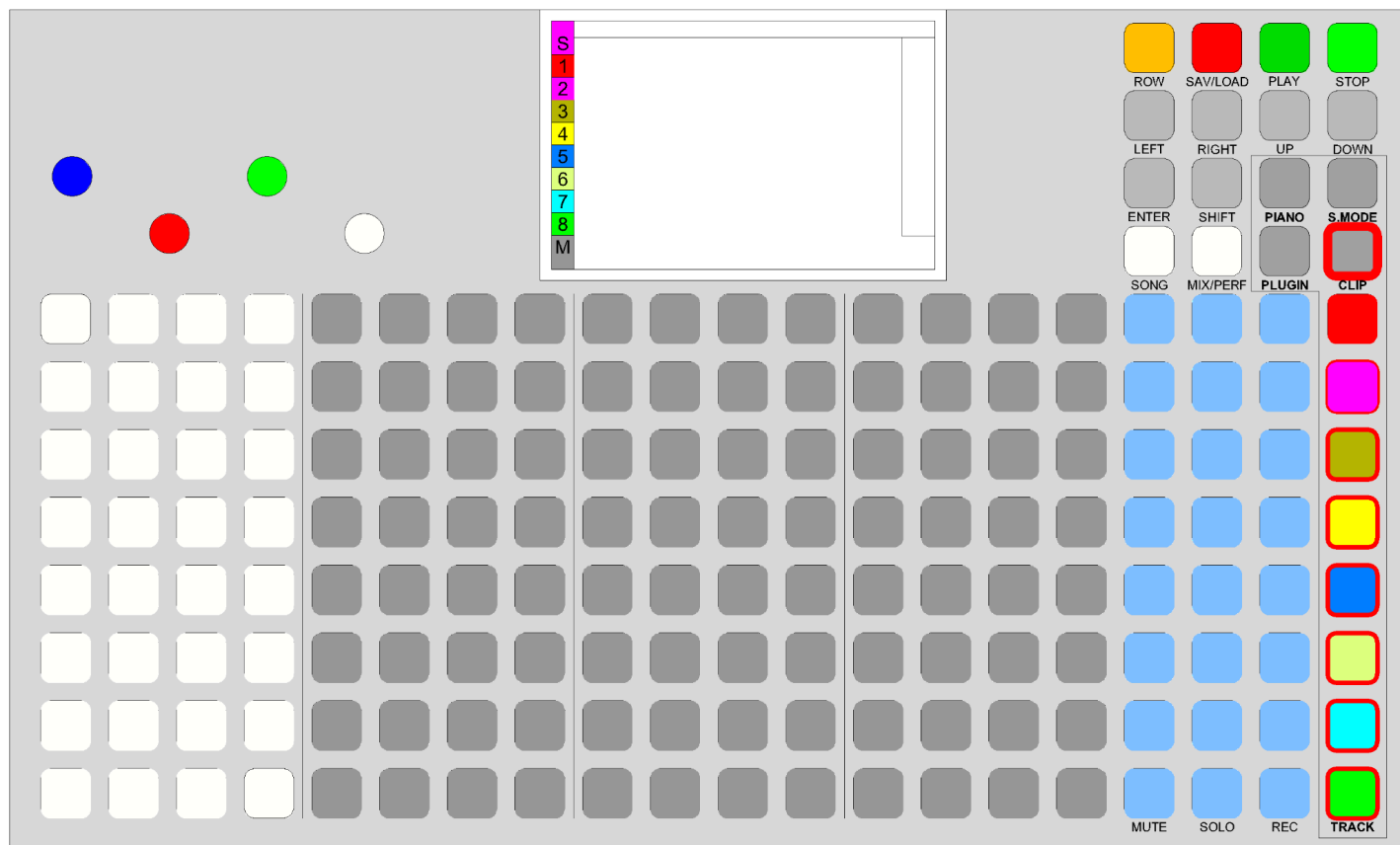
Startpoint:
Sets the Startpoint of the Song. When Loop is at Loop-Endpoint the Song will start over at Startpoint.

Endpoint:
Sets the Endpoint of the Song. When Song is at Endpoint the Song will loop over at Startpoint.

4.4.Clip-edit mode

Press and hold CLIP and any of the track buttons. This switches to the desired clip-edit Window.

4.4.1.Enter Notes into a Clip

As in Arranger mode. The Y position determines the note to set. To switch between octaves, press ROW once the Orange bar on the most right is in its 2nd position and rotate the 4th Encoder (white) to the desired Octave. The Octave Range goes from 0-11.
For a desired Notelength rotate the 3rd Encoder (green) to the desired value. A Notelength is the amount of MIDI Ticks (24ppqn) a note is active.

To enter notes into a clip, you can either:

Use the Main Grid:
Use the buttons like any other 16 step sequencer. Press any step (in a track´s line) to set a note with the desired Notelength. For longer (tied) notes, press and hold the desired first step, then press the desired last step TWICE!

Use the cursor:
Move the cursor to the desired position, press ENTER to set a note at this note and MIDI Tick with the desired step-Length. You can also use a stylus and take advantage of the touchinput (Experimental).

Use the internal Keyboard:
Press and Hold PIANO and any TRACK button to enter the Tracks Piano. The LED´s represent the active Notes from the selected scale. Bottom Row is Octave 0 top Row is Octave 7. Play Live or record into active Clip by pressing a Track´s REC Button.

Use external MIDI:
Set the External Midi Channel to the Desired Track Number. F.e. Track 1 receives messages from Channel 1, independent from the Track´s Outputchannel.. Play Live or record into active Clip by pressing a Track´s REC Button.

4.4.2.Deleting single Notes from a clip

There are two ways to delete a single Note from the clip:

Use the Main Grid:
Press any Main Grid button, that is lid through the desired note, to delete it. Be aware that the cursor Y-Position is on the correct Note.

Use the cursor:
Move the cursor to any position of the note and press ENTER.

The erased Note will be deleted from the Display and the Main Grid instantly.

4.4.3.Clip Parameters

As the Arranger, each Track provides some parameters to influence the behaviour of the active clip

Song/Arranger Page Parameters				
	Row 1	Row 2	Row 3	Row 4
Blue Encoder	Tick (Cursor X)	Sequence Length**	Playmode	Offset
Red Encoder	Note (Cursor Y)	Clock Division**	Scale	
Green Encoder	StepFX *(cc Chan)	step Length**	MIDI Chan Out	Reserved
White Encoder	Velocity	Octave	ClipNr	

Tick:
Moves the cursor in X (horizontal) direction. The Move increment equals the step length. Fine adjustments can be done with the cursor buttons.

Note:
Moves the Cursor in Y (vertical) direction, also sets the desired clip when entering clips only via the main grid.

StepFX *(ccChan)
Sends a desired MIDI CC Command (CC_Channel & CC-Value) at the desired Tick. Set the StepFX (CC-Value) per Tick, edit any note on that tick for the desired CC-Channel. (Since MIDI CC is not Polyphonic). Rotate the green Encoder (3rd, Row = 1) to set the active CC-Value.Press SHIFT and rotate the green Encoder (3rd) to set the active CC-Channel.
Set ccC to "prgCh" to send MIDI Program Changes to the desired MIDI Output.
The StepFX is shown in the radius of each note.

Velocity
Sets the velocity for the desired and following notes . The Velocity is shown in the thickness of each note.

Sequence Length
Set the overall sequence length in MIDI Ticks **for the active clip**. Max Length = 96.
**Takes effect on all Playmodes.

Clock Division
Sets the Clock Division **for the active clip**. The clock division is a dividor from the internal "main clock". Due to the architecture of storing Notes internally, the clock division takes effekt of how long each note is played. F.e. a Note played with clock Division with 2 is played twice as long as the same Note with a clock division of 1. It also determines how many clips are set at a press of a button in arrangermode.
**Takes effect on all Playmodes.

Step Length

Sets the standard steplength for desired and following notes. You can also create longer notes freely with Main Grid or recorded from the internal Piano or external MIDI input.

Octave

Sets the actual Octave to be shown on the screen. Some Playmodes rely on this parameter.

Playmode

Sets the active Plamode **for the active clip.** Some Playmodes need to have notes in the grid (monophonic playmodes must be placed on any "C") for the rhythmic part (f.e Random)

Scale

Sets the musical scale **for the active clip.** Some Playmodes rely on this parameter.
**Takes effect on some Playmodes.

MIDI Chan Out

Sets the MIDI Output Channel **for the active clip.**
**Takes effect on all Playmodes.

ClipNr

Sets the active Clip Number. ClipNumber to EDIT not to Play, this happens in arranger mode.

Offset

Little helper to set notes on Swing via Main Grid, (f.e. Offset of 3, sets the desired notes 3 ticks to the right of the pressed Main Grid button.)

4.4.4.Copying a Clip

To Copy an entire Clip to another Clip one, go to Row = 2 and rotate the white encoder (3rd). The Clip to copy into is the actual clip + direction you moved the encoder.

Rotate clockwise = actual clip +1, rotate counter clockwise = actual clip -1.

4.4.5.Deleting a whole Clip

Select the desired Clip, press ENTER + SHIFT simultaneously to delete all Noteinformations from this Clip.

4.4.6.MIDI Output Channels

Press ROW until the Row = 3 (orange bar is in the 3rd position) and move the green Encoder (3rd) to select an Output-Channel.

0	CVCV Gate Output
1-16	Serial MIDI
17-32	USB MIDI as Device (for MAC, PC, or any other MIDI capable USB-Host)

33-48   USB MIDI as HOST (to connect any USB Synthesizer or Drum Machine to the Teensy)
48-64   Internal Synth-Engines (Audio-Plugins)

0	CV	CV/Gate Output
1 - 16	SR1 - SR16	Serial MIDI
17 - 32	UD1 - UD16	USB MIDI as Device (connect to a HOST, f.e. PC)
33 - 48	UH1 - UH16	USB MIDI as HOST (connect to a Device, f.e. Synth)
48 - 64	"Various Names"	Internal Synth Engines (Plugins)

4.4.7.Export a Song

It is possible to export an existing arrangement to standard midi files for further processing. There are two Options to export an active arrangement/song to a .mid MIDI file.

Be aware that only the Noteinformations from any CLIP is processed, if there is any other Playmode running in the arranger then "step", the export will not work on these bars. Tho, every Playmode can be copied into any clip, which will then export this part.

1.) **Exporting to the onboard SD Card**
Press and hold SAVE and click any of the lid buttons on the 4th Maingrid row.
Each button represents a "songnumber" that will be added to the filename. So it's possible to write up to 9 different sound files onto the inbuilt SD Card. Power off the TeensyDAW, eject the SD Card from the Teensy and put the SD Card into your PC. Copy the desired .mid files to any folder on the PC and load them into any DAW of your choice. The Export Process takes up to several seconds depending on the song length.

2) Exporting over PC
TeensyDAW provides a little tool to directly export an active arrangement from the Teensy to your PC without hassling with the inbuilt SD-Card.

- Download the latest version of "toMidi.exe" from the TeensyDAW Github repository.
- Download the latest version of "toMidi.py" from the TeensyDAW Github repository.
- Copy both files to any directory of your choice.
- Connect the TeensyDAW to your PC via USB, check the used Port
  google.com/search?q=arduino+check+port
- Open "toMidi.exe", enter the Port number (f.e. com6 or COM5 ,both inputs are valid)
- "toMidi.exe" will create a .txt file and the desired .mid file with the full arrangement (one Miditrack per TeensyDAW-track) in the current directory.

Drag and Drop the exported midi file to any DAW/Sequencer of your choice for further editing.

5.   Quick Start

For This Tutorial connect a drum machine via Serial MIDI (DIN to TRS Type A like Korg etc) to the MIDI Output of the Teensy DAW. Set the drum machines MIDI Input channel to 10.

Optionally connect a (Bass)Synthesizer, and the drum machine, via a MIDI Merger to the TeensyDAW. (USB is also possible!).

In the TeensyDAWset the first four Tracks MIDI Channels also to 10 (Track 1 -4).
Set Track 5´s MIDI Channel to the Synth´s Input Channel.

Use the first track for the KickDrum, the second Track for the Snare/Clap, 3rd for closed Hihats and the last for open Hihats. **Don't forget to set the corresponding Note for each voice!** Place your Notes along the grid.
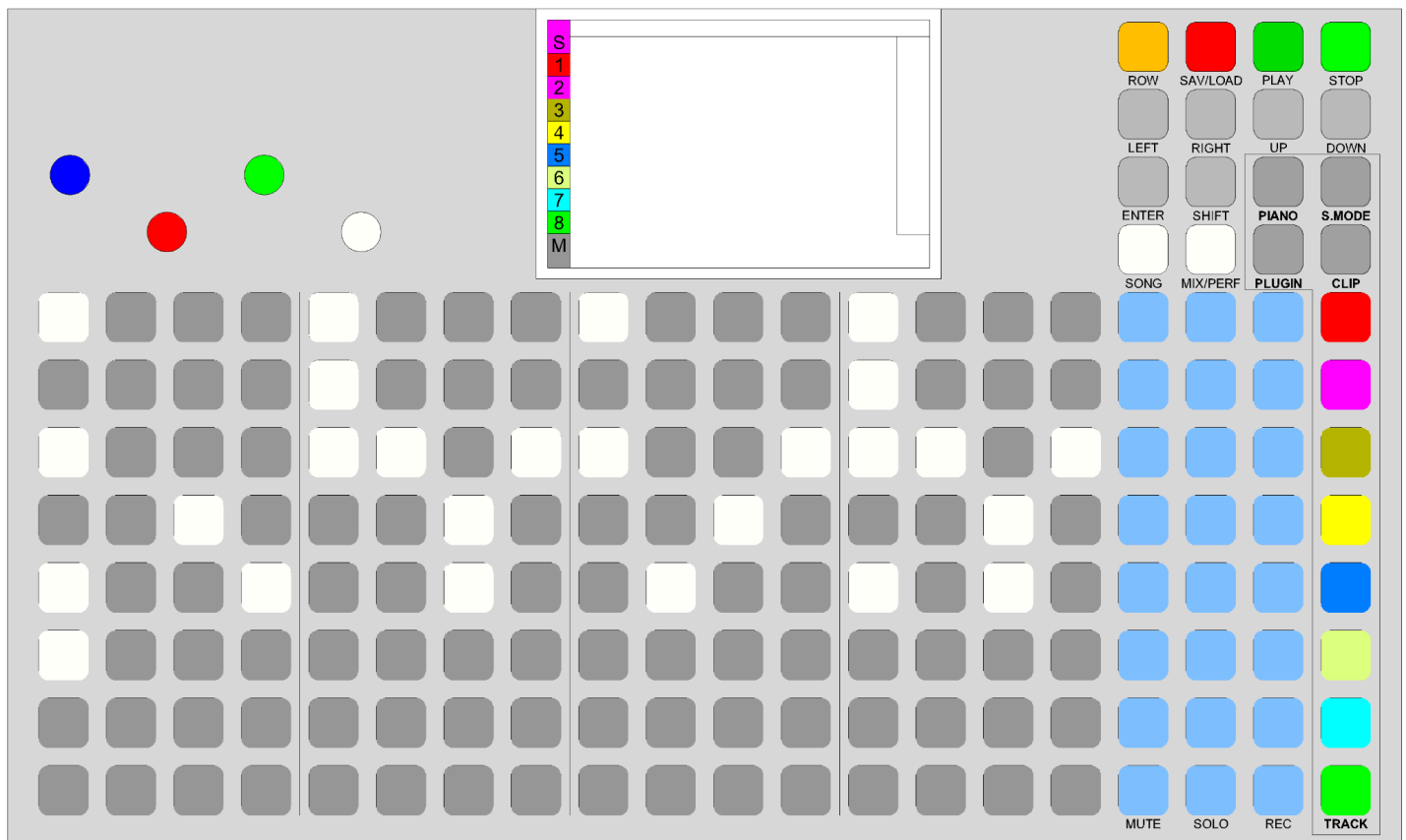
Your Maingrid might now look like this.
Go to the first Songpage as described earlier and place Clip (Cursor on most top position) 0 from Track 1, Bar1 to Track 5, Bar 4 into the Arrangement.

Press PLAY.

If everything was set up correctly your drum machine should now play your desired drum pattern. Play with MUTE and SOLO buttons for a first perfomance. Use the Song/Arranger Parameters to alternate the running Sequence.

Note: The actual Volume of any played note is a product of Note Velocity (from Clip), Bar Velocity (from Song) and Mixer Velocity (from Mixer).

6. Inputs

TeensyDAW has a dedicated Input System. This means that the four active Parameters (except for Clips and Songmode) have standardized input methods. Plugins, Sequence Modes, FX´s and Mixerpages can all be equally controlled by either:

- Touchscreen
- Encoders
- Maingrid
- Mouse
- Midi

Switch between the four Sets of Parameters with ROW Button. Some parameters are fixed to a meaningful range (f.e. Octaves go from 0-11)

6.1. Touchscreen

Touch the Screen on a desired pot position, swipe up or down to set the desired volume. The most bottom pressed position equals a Value of 0, vice versa, the most top position sets a value of 127. Touch the screen on the most right position to switch fast between the different rows.

6.2. Encoders

Move the desired Encoder to set the desired Value. Push and turn the Encoder to rotate the pot faster.

6.3. Maingrid

For Mixer: Each Maingrid line represents its Track. This gives 16 Volume levels ranging from 0 - 127.

For FX-Mixers: Each Maingrid line represents its Track. Each line is divided into four parts for Dry-, FX1 Send-, FX2 Send- & FX3 Send- Volumes. This gives 4 Volume levels for each track ranging from 0 - 127.

For Plugins and Sequencermode: The main grid is split horizontally in 4 parts each two lines in heigth. This gives 32 parameter values ranging from 0 - 127 for the desired pot.

The LEDs will always show the actual value independently from the Input Source.

6.4. Mouse

Move the Mouse to the desired position and turn the mouse wheel or press and hold the left mouse button, swipe up and down to in-/decrease the parameter values.

6.5. MIDI

To be implemented and documented.

7. Playmodes

Each Playmode has individual controls to generate a Sequence. Some Modes need to have Notes placed inside the Clip-Sequencer and will only generate Pitch, others will generate Pitch and Rhythm on their own. Many Playmode will rely on the clip-based Parameters: Seq-Length, Clock-Division, Playmode, Scale and midiChOut.

Press the 3rd button on Row = 3 to copy the active Playmode into the active clip. This allows for further and detailed editing.

Each Playmode is Trackbased, so each Track will have it´s own settings and Note-Memory. It is also possible that up to all Tracks play the same Playmode but with their very own Settings.

Each playmode provides 8 Presets, these Presets can be set per Bar in Songmode with the ccC parameter. To edit any preset go to the Tracks Playmode page. Press and hold SHIFT and rotate the blue Encoder (1st).

In return, the Playmodes (Except "Step") themself are not Clipbased, they will "Run" as long ANY Clip of the Track in the arrangement is active (clipNr = 0-7) but can change its preset per bar.

Since the architecture of the polyphony it is not possible to set the same notes across different octaves at the same time (f.e. C0 + C2 is not allowed, where C0 + C#2 is allowed, last entered Note priority).

7.1. Step (Poly)

Step is the main Sequencer of TeensyDAW and is set to default by all Tracks. In step it is possible to set up to 12 polyphonic notes along a 96 MIDI Tick long sequence. With the standard MIDI clock of 24 ppqn (Clock Division = 1) the clipLength is equal to 1 Bar or 16 x 16th notes.
Use the Velocity and StepFX parameters per Note to alter your sound.
To enter Notes read Chapter: "Enter Notes into a Clip"

Clip Edit Page Parameters				
	Row 1	Row 2	Row 3	Row 4
Blue Encoder	Tick (Cursor X)	sequence Length	seq Mode	Offset
Red Encoder	Note (Cursor Y)	clock Division	scale	rotate active Note
Green Encoder	*CC chan/ cc val	step Length	Midi Channel Out	
White Encoder	Velocity	active Octave	active Clip	

7.2. Random (Mono)

A monophonic mode that generates notes randomly, inspired by systems like Marbles or the Turing Machine. It creates random sequences, with the possibility to set the amount of "bit-Lock/DejaVu" (Amount of randomness, with DejaVu at its maximum Position the current sequence is completely locked). Controls over the maximum Sequence length and rotation of the sequence are also available. Set a range for randomness over Velocity and StepFX.

*Note Pattern (Rhythmic) must be set in the active Clip. Will Generate Pitch.

Playmode Random Parameters				
	blue Encoder	Red Encoder	Green Encoder	White Encoder
Row 1	Octave min	Octave max	Volume min	Volume max
Row 2	max Steps (<=16)	Dejavu	Rotate	
Row 3	StepFX min	StepFX max		
Row 4				

7.3. DropSeq (Mono)

A weighted or subtractive sequencer that will play a set semi random sequence, depending on the set "weight" for each note of the chosen Octaverange. It consists of 12 Notes + Rest and you assign a weight to each note . At Each Pulse Step (Trig from Clipnotes !!Only use any "C"!!), The Weights are evaluated and the Note with Maximum Weight is Chosen. If 2 or more notes share the same weight, the First Note takes Priority. The User Specified "Drop" Value is then Subtracted from this Note. This Process Repeats until Any of the Note Weights reaches a value of Reset. All the Chosen Notes Thus Form a Sequence that will be Played.

*Note Pattern (Rhythmic) must be set in the active Clip. Will Generate Pitch.

Playmode DropSeq Parameters				
	blue Encoder	Red Encoder	Green Encoder	White Encoder
Row 1	Drop	Reset	Octave min	Octave max
Row 2 "weight:"	C	C#	D	D#
Row 3 "weight:"	E	F	F#	G
Row 4 "weight:"	G#	A	A#	B

7.4. Bitread (Poly)

Interprets numbers from 0 to 256 as 8-bit patterns and plays them across the 12 voices. This mode is useful for creating rhythmic patterns from numeric values, translating binary data into musical sequences.

**Will generate Rhythm. Will generate Pitch.

Playmode BitReadParameters				
	blue Encoder	Red Encoder	Green Encoder	White Encoder
Row 1	C	C#	D	D#
Row 2 "weight:"	E	F	F#	G
Row 3 "weight:"	G#	A	A#	B
Row 4 "weight:"	Vol min	Vol max	StepFX min	StepFX max

7.5. PotSeq (Mono)

A step sequencer mimicking the interface of an analog sequencer, using a potentiometer-style layout. It allows for a hands-on approach to sequence generation, with control over 16 steps in the pattern. Play with the Clip´s maxSteps and Clock Division to alternate this Playmode´s behaviour.

**Will generate Rhythm. Will generate Pitch.

	blue Encoder	Red Encoder	Green Encoder	White Encoder
Playmode PotSeq Parameters				
Row 1	Step 1	Step 2	Step 3	Step 4
Row 2	Step 5	Step 6	Step 7	Step 8
Row 3	Step 9	Step 10	Step 11	Step 12
Row 4	Step 13	Step 14	Step 15	Step 16

7.6. BeatArray (Poly)

A collection of 128 predefined drum patterns designed to cover various rhythmic styles. Each of the 12 voices can be assigned a different pattern, making it suitable for rhythm experimentation and exploration.

**Will generate Rhythm. Will generate Pitch.

	blue Encoder	Red Encoder	Green Encoder	White Encoder
Playmode Beats Parameters				
Row 1	C	C#	D	D#
Row 2 "weight:"	E	F	F#	G
Row 3 "weight:"	G#	A	A#	B
Row 4 "weight:"	Vol min	Vol max	StepFX min	StepFX max

7.7. Euclid (Poly)

A polyphonic mode that applies Euclidean rhythms to all 12 voices. You can adjust the number of steps and rotation, providing a way to create complex rhythms based on mathematical principles. Each of the 12 voices can be assigned a different pattern, making it suitable for rhythm experimentation and exploration.

**Will generate Rhythm. Will generate Pitch.

Playmode Euclid Parameters				
	blue Encoder	Red Encoder	Green Encoder	White Encoder
Row 1	C	C#	D	D#
Row 2 "weight:"	E	F	F#	G
Row 3 "weight:"	G#	A	A#	B
Row 4 "weight:"	Vol min	Vol max	StepFX min	StepFX max

7.8. Rclid (Mono)

A monophonic Euclidean sequencer with added random modulation. It combines predictable Euclidean rhythms with a random variation for each step, introducing unpredictability while maintaining a structured rhythm.

**Will generate Rhythm. Will generate Pitch.

Playmode Rclid Parameters				
	blue Encoder	Red Encoder	Green Encoder	White Encoder
Row 1	maxSteps	Offset	DejaVu	rotate
Row 2	Octave min	Octave max	Velocity min	Velocity max
Row 3	StepFX min	StepFX max		
Row 4				

7.9..mid (Poly)

Play any .mid midi file directly from SD Card. The .mid Playmode is designed to play along your song. Since the overall architecture of the TeensyDAW is clip-based, the .mid Playmode gives the opportunity to play a melody that is not limited to the 96 Ticks per Clip. The file can be interchanged on the fly. Up to 128 midi files can be stored on the SD-Card. ("**0.mid**" - "**127.mid**"). In addition to the played melody, StepFX can be applied to your notes. Set the StepFX range to add shuffled variations to a midiCC of choice. Set a desired "loop-length" in Bars with the maxBars Encoder. maxBars works independently from the actual "file-length".

At the time of writing it is not possible to switch between different .mid midi files in songmode.

When selecting a new file, the sequence will be automatically played at the correct resolution. But that behaviour can be manipulated with the clock mult/div encoder.

**Will generate Rhythm. Will generate Pitch.

Playmode .mid Parameters				
	blue Encoder	Red Encoder	Green Encoder	White Encoder
Row 1	File	StepFX min	StepFX max	clock mult/div
Row 2	maxBars			
Row 3				
Row 4				

8.   Internal Audio Engine

The Internal Audio ENgine consists of 16 internal audio plugins, a mixer and three Effect Slots. Each Plugin can be driven by every Track.

Be aware: Plugins are not Trackbased, meaning one Plugin could be played by several Tracks, but the Plugin would try to play all Notes from those Tracks. This will lead to unexpected behaviour or even a crash. It is possible that one plugin will be played meaningfully by several Tracks if they don't share the Plugin's InputChannel at the same played bar.

To select a Plugin, set Row = 3, and rotate the green Encoder (3rd) to the desired Plugin. Press and Hold PLUGIN and any TRACK of choice to enter the Plugins parameter page.

Each Plugin has up to 16 controls for sound manipulation.
Each Plugin is capable of storing 8 presets.

When saving a song the 16 Plugin´s Parameter Values for each´s 8 available Presets, will get stored/saved onto the SD Card. Custom waveforms or recordings won't be available after a reboot.

Flowchart:

Internal Audio Engine

Plugins

Mixer/FX Sends

FX

Output
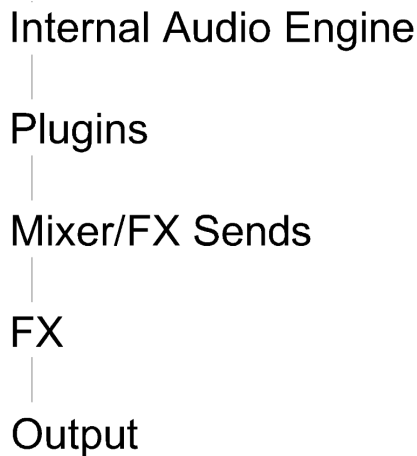
8.1.Plugins
8.1.1.String (Poly)

The synthesized plucked sound plugin emulates a guitar with up to 12 voices, where each voice corresponds to a note per octave. For example, the note C triggers the first voice, C# triggers the second, and so on. Each voice's volume can be individually adjusted. Each Voice has velocity control.

Plugin Strings Parameters				
	blue Encoder	Red Encoder	Green Encoder	White Encoder
Row 1	Velo 1	Velo 2	Velo 3	Velo 4
Row 2	Velo 5	Velo 6	Velo 7	Velo 8
Row 3	Velo 9	Velo 10	Velo 11	Velo 12
Row 4				

8.1.2.1OSC (Mono)

This plugin offers a subtractive synthesizer voice with controls for waveform, oscillator volume, and LFO modulation of both pitch and filter frequency. The filter section allows adjustments for cutoff, resonance, sweep, and type. Envelope controls for attack, decay, sustain, and release shape the sound's evolution, while LFO settings control modulation depth and frequency for dynamic movement in the sound.

Plugin 1OSC Parameters				
	blue Encoder	Red Encoder	Green Encoder	White Encoder
Row 1	Waveform	OSC Vol	LFO Freq pitch	LFO Level
Row 2	Env Level (Filter)	LFO Waveform	LFO Freq Filter	LFO Level
Row 3	Filter Freq	Resonance	Sweep	Type
Row 4	Attack	Decay	Sustain	Release

8.1.3.FM2 (Mono)

A simple 2 Operator FM Synthvoice with modulator and carrier.

The modulator generates a waveform that modulates the phase (or frequency) of the carrier oscillator. The result is classic FM synthesis, where the harmonic content of the carrier is shaped dynamically by the modulator. This Plugin will create unique sounds brom Basses to spacy Effects.

Plugin FM2 Parameters				
	blue Encoder	Red Encoder	Green Encoder	White Encoder
Row 1	mod Waveform	modulator ratio	modulator Vol	carrier Waveform
Row 2 "weight:"	mod Attack	mod Decay	mod Sustain	mod Release
Row 3 "weight:"	Attack	Decay	Sustain	Release
Row 4 "weight:"				

8.1.4.mDrum (Poly)

The RAW Sample Player plugin is designed to play .RAW audio samples directly from the SD card. Samples are grouped into sets called banks. Each bank contains one sample per instrument type: Kick (K), Snare (S), Hi-Hat (H), Clap (C), Percussion (P), FX (F), and Extra/Alternate FX (X). When a bank is selected, triggering an instrument will play the corresponding raw sample from that bank. All samples are expected to be in a fixed RAW format, for example 16-bit mono PCM at 44.100Hz.. Each bank has its own individual volume control. There is no pitch shifting or time stretching—samples are played back as-is, directly from the card.

Plugin mDrum Parameters				
	blue Encoder	Red Encoder	Green Encoder	White Encoder
Row 1	Bank Kick	Bank Clap	Bank Hats	Bank Snare
Row 2 "weight:"	Bank Percussion	Bank FX	Bank FX	Bank *
Row 3 "weight:"	Vol 1	Vol 2	Vol 3	Vol 4
Row 4 "weight:"	Vol 5	Vol 6	Vol 7	Vol 8

8.1.5. Drum (Poly)

The Drum (Poly) Plugin synthesizes drum sounds using internal oscillators and modulators. It supports kick, snare, hi-hat, and toms, each with dedicated parameters. The kick offers frequency, sweep, drive, and decay controls. The snare includes frequency, sweep, noise level, and decay. The hi-hat provides frequency, resonance, attack, and decay. Three toms have individual frequency controls and a shared decay. Sounds are not yet finely tuned, so users are encouraged to explore and find effective parameter settings.

Plugin Drum Parameters				
	blue Encoder	Red Encoder	Green Encoder	White Encoder
Row 1	Kick Freq	Kick Sweep	Kick Drive	Kick Decay
Row 2	Snare Freq	Snare Sweep	Snare Noise	Snare Decay
Row 3	Hat Freg	Hat Resonance	Hat Attack	Hat Decay
Row 4	Tom1 Freq	Tom2 Freq	Tom3 Freq	Toms Decay

8.1.6. Adtv (Mono)

The Adtv (Poly) plugin allows you to build custom chords by dialing in up to four individual notes. Each note is assigned its own waveform and volume, giving you full control over the harmonic content and timbre of the chord. After the voices are summed, the signal passes through a low-pass filter with adjustable cutoff frequency, resonance, envelope sweep, and release time. This setup makes it easy to shape both the harmonic and dynamic character of the sound. The plugin is designed for simple to advanced chord synthesis.

Plugin Adtv Parameters				
	blue Encoder	Red Encoder	Green Encoder	White Encoder
Row 1	Waveform 1	Waveform 2	Waveform 3	Waveform 4
Row 2	Note 1	Note 2	Note 3	Note 4
Row 3	Vol 1	Vol 2	Vol 3	Vol 4
Row 4	Filter Freq	Resonance	Sweep	Release

8.1.7.Boom (Mono)

The Boom (Mono) plugin is a punchy, 808-style drum voice designed for creating heavy, bassy kick sounds with an aggressive character. It includes built-in compression to enhance the impact and produce pumping, saturated "boom" effects. The sound is shaped using sweep, noise, overdrive, and decay controls, allowing for everything from tight kicks to long, distorted sub hits. The integrated compressor features threshold, attack, release, ratio, and knee width parameters, along with manual and automatic makeup gain. An additional "Hysteria" control introduces unpredictable or extreme behavior for more experimental results.

Plugin Boom Parameters				
	blue Encoder	Red Encoder	Green Encoder	White Encoder
Row 1	Sweep	Noise	Overdrive	Decay
Row 2	Threshold	Attack	Release	Hysteria
Row 3	Ratio	Kneewidth	Auto Make up	Make up
Row 4				

8.1.8.dTune (Mono)

The dTune (Mono) plugin is a dual-oscillator synthesizer voice designed for rich, harmonically dense sounds. Each oscillator has independent pitch control with both coarse and fine detuning, allowing for subtle beating or wide detuned effects. You can choose separate waveforms and set individual volumes for each oscillator, making it easy to layer tones for a fuller sound. The signal then passes through a multimode filter with adjustable cutoff frequency, resonance, envelope sweep amount, and selectable filter type. A standard ADSR envelope shapes the final amplitude, giving control over the dynamic contour of the sound.

Plugin dTune Parameters				
	blue Encoder	Red Encoder	Green Encoder	White Encoder
Row 1	Waveform 1	Detune 1	Volume 1	
Row 2 "	Waveform 2	Detune 2	Volume 2	
Row 3	Filter Freq	Resonance	Sweep	Type
Row 4	Attack	Decay	Sustain	Release

8.1.9.Nord (Mono)

The synthesizer features two oscillators with adjustable waveforms, detune, and a VCO mix for blending their levels. The sound passes through a multimode filter with controls for cutoff frequency, resonance, and filter type, and is modulated by both an envelope and a low-frequency oscillator (LFO). The envelope has attack, decay, sustain, and release controls for shaping the sound's evolution. The LFO adds modulation with selectable waveforms, frequency, and level. Together, these controls allow for dynamic, evolving sounds with full envelope and modulation control.

	Plugin Nord Parameters			
	blue Encoder	Red Encoder	Green Encoder	White Encoder
Row 1	Waveform 1	Waveform 2	Detune 2	VCO Mix
Row 2	Env Level	LFO Waveform	LFO Freq	LFO Level
Row 3	Filter Freq	Resonance	Sweep	Type
Row 4	Attack	Decay	Sustain	Release

8.1.10.SF2 (Mono)

The SF2 Player on the TeensyDAW uses sample files that are hard-flashed into the device. The plugin allows you to adjust the SF2 file and volume. From Chellos to Violas, there are many Instruments to choose from. The filter section provides controls for cutoff frequency, resonance, sweep, and filter type, allowing you to modify the tonal characteristics of the sound. The envelope has attack, decay, sustain, and release parameters to shape the sound's evolution over time. These controls provide the flexibility to create a variety of sounds using the SF2 samples.

	Plugin SF2 Parameters			
	blue Encoder	Red Encoder	Green Encoder	White Encoder
Row 1	Waveform	Volume		
Row 2				
Row 3	Filter Freq	Resonance	Sweep	Type
Row 4	Attack	Decay	Sustain	Release

8.1.11.PWM (Mono)

This is a mono synth voice with a single oscillator, designed for PWM sounds. It features controls for pulse width (PW), volume, PWM frequency, and level. The LFO modulates pitch and filter frequency, with adjustable waveform, frequency, and level. The filter section includes cutoff, resonance, sweep, and type controls. Envelope settings for attack, decay, sustain, and release allow you to shape the sound's dynamics and evolution.

	blue Encoder	Red Encoder	Green Encoder	White Encoder
Plugin PWM Parameters				
Row 1	PW	Volume	PWM Freq	PWM Level
Row 2	Env Level	LFO Waveform	LFO Freq	LFO Level
Row 3	Filter Freq	Resonance	Sweep	Type
Row 4	Attack	Decay	Sustain	Release

8.1.12.Raw (Mono)

This plugin plays raw mono sample files at 44.1kHz, 16-bit quality. You can select a sample bank and choose a specific sample file to load. It also includes a volume control for adjusting the output level. The filter section allows for adjustments to the cutoff frequency, resonance, sweep, and filter type. Envelope controls for attack, decay, sustain, and release shape the sound's dynamics over time.

	blue Encoder	Red Encoder	Green Encoder	White Encoder
Plugin Raw Parameters				
Row 1	Sample Bank	Sample File	Volume	
Row 2				
Row 3	Filter Freq	Resonance	Sweep	Type
Row 4	Attack	Decay	Sustain	Release

8.1.13.Draw (Mono)

This plugin lets you draw your own waveform directly on the screen and instantly play it. You can control the smoothing of the drawn waveform for a cleaner sound and delete the waveform if you don't like the result. There is also a volume control to adjust the output level. The filter section includes cutoff frequency, resonance, sweep, and filter type controls. Envelope settings for attack, decay, sustain, and release allow you to shape the sound's evolution.

Plugin Draw Parameters				
	blue Encoder	Red Encoder	Green Encoder	White Encoder
Row 1	Smooth/delete	Volume		
Row 2	drawn Waveform			
Row 3	Filter Freq	Resonance	Sweep	Type
Row 4	Attack	Decay	Sustain	Release

8.1.14.Rec (Mono)

This plugin allows you to record any line signal from the input and play it instantly. The recorded waveform is not saved onto the SD.Card, when saving a song.. You can adjust the recording volume and playback volume for the captured signal. The filter section offers controls for cutoff frequency, resonance, sweep, and filter type. Envelope settings for attack, decay, sustain, and release let you shape the sound's dynamics over time.

Plugin Rec Parameters				
	blue Encoder	Red Encoder	Green Encoder	White Encoder
Row 1	Rec File	Rec Volume	Play File	Play Vol
Row 2				
Row 3	Filter Freq	Resonance	Sweep	Type
Row 4	Attack	Decay	Sustain	Release

8.2.Mixer

8.2.1.Mixer Page 1

Sets the Overall Gain for each Track, also shows the actual Mute and Solo states, just as the Controlboard does.

Note: The actual Volume of any played note is a product of Note Velocity (from Clip), Bar Velocity (from Song) and Mixer Velocity (from Mixer).

8.2.2.FX Sends Page 1

Sets the

Dry: Volume that is only the Dry Audio Signal. Set to "0" to only hear the sound with FX.

FX1: Volume from each Track (1-4) that is sent to the first FX slot (Reverb)

FX2: Volume from each Track (1-4) that is sent to the second FX slot (Bitcrusher)

FX3: Volume from each Track (1-4) that is sent to the third FX slot (Delay)

8.2.3.FX Sends Page 2

Sets the

Dry: Volume that is only the Dry Audio Signal. Set to "0" to only hear the sound with FX.

FX1: Volume from each Track (5-8) that is sent to the first FX slot (Reverb)

FX2: Volume from each Track (5-8) that is sent to the second FX slot (Bitcrusher)

FX3: Volume from each Track (5-8) that is sent to the third FX slot (Delay)

8.3.Effects

Three internal Effects are available: Reverb, BitCrusher and Delay.
Read below for further Information.

8.3.1.FX Page Reverb

Reverb simulates the natural reflections of sound in a physical space, adding depth and atmosphere to audio. The roomsize control adjusts the perceived size of the virtual space, making the reverb feel like anything from a small room to a vast hall. Damping affects how quickly the high frequencies fade out, simulating the absorption of sound by surfaces in the room—more damping results in a warmer, softer reverb, while less damping preserves brightness and clarity. Together, these controls shape how spacious, reflective, and realistic the reverb effect feels.

FX Reverb Parameters			
	blue Encoder	Red Encoder	Green Encoder	White Encoder
Row 1	Roomsize	Damping		

8.3.2.FX Page BItCrusher

This effect will create a gritty, digital distortion by reducing the resolution and detail of the incoming audio signal. It works by lowering the bit depth, which introduces quantization noise and makes the sound more raw and harsh, and by reducing the sample rate, which causes aliasing and adds digital artifacts. By adjusting the bit depth and sample rate, you can go from subtle degradation to extreme, crushed textures, often used for lo-fi, glitch, or experimental sounds.

FX Bitcrusher Parameters			
	blue Encoder	Red Encoder	Green Encoder	White Encoder
Row 1	Bitdepth	Samplerate		

8.3.3.FX Page Delay

Delay creates an echo effect by repeating the incoming sound after a short time. The time control sets the interval between the original sound and its repetitions, allowing anything from tight slapback echoes to long, spaced-out delays. Feedback determines how much of the delayed signal is fed back into the input, affecting how many times the echo repeats. Low feedback gives a quick, fading echo, while high feedback creates a more intense, repeating effect that can build into dense textures.

FX Delay Parameters				
	blue Encoder	Red Encoder	Green Encoder	White Encoder
Row 1	Time	Feedback		

8.4.Perform mode

Perform mode presents a playable pad grid that generates punch-in effects. Parameter adjustments are also possible. This creates an environment perfect for live and improvised performances. Some parameters will need track selection and some are not available in perform mode.

Each column does either send a set chosen MIDI-cc message, or sets parameters for the internal Effects and each Track´s parameters such as Sequence length, clock division and note transposition. **To make any Track "Listen" to perform mode, press each Track´s TRACK button to activate this Track. The Color will switch from the Track Color to white.**

The Maingrid will show each column's active parameter but also shows the actual ROW on the bottom row.

Perform Parameters				
	blue Encoder	Red Encoder	Green Encoder	White Encoder
Row 1	MIDI CC Channel	MIDI CC Channel	MIDI CC Channel	MIDI CC Channel
Row 2	MIDI CC Channel	MIDI CC Channel	MIDI CC Channel	MIDI CC Channel
Row 3	MIDI CC Channel	MIDI CC Channel	MIDI CC Channel	MIDI CC Channel
Row 4	MIDI CC Channel	MIDI CC Channel	MIDI CC Channel	MIDI CC Channel

Column controls:
1.) Master Vol
2.) Dry signal
3.) FX1 send
4.) FX2 send
5.) FX3 send
6.) FX1 Roomsize
7.) FX1 Damping
8.) FX2 Bitdepth
9.) FX2 Samplerate
10.) FX3 Time
11.) FX3 Feedback
12.) Master Filter Freq
13.) Master Filter Resonance
14.) Track Clip Length
15.) Track Clockdivision
16.) Track Note Transposition

8.5. Cliplauncher

This is TeensyDAW´s Cliplauncher mode, that users may be familiar with from Ableton Live, Bitwig or AKAI Force. Press any Key on the Main Grid to select the Track´s active Clip. Turn the blue Encoder to switch between bars. Next to the Arranger/Songmode this is also a way to structure a complete song, be aware that you won't have controls over the clip parameters like Note Transpose, and probability.

9.   MIDI Integration and Clock

Supports external MIDI clock at 24 PPQN. Also receives Start and Stop Commands to be in Sync with other Sequencers. Also supports Sync In/Out via the 3.5mm Sync I/O Jacks.

10.   External programs:

TeensyDAW provides several external program to send or receive project files between the device and a PC.

10.1. DAWtoMIDI

DAWtoMIDI lets you convert your actual project to a MIDI file and saves that file into the same directory as where the .exe file is placed. This midi file can be loaded into any DAW of your choice. Open the .exe file, enter the actual Port number (can be found in Windows DeviceManager), press enter. After a moment, a MIDI file will appear in the folder.

10.2. EXCELLtoDAW

EXCELLtoDAW is a small helper program to place an arrangement into the actual project of TeensyDAW. Use the Google Spreadsheet provided in the zip file. Open the toArranger Tab. either try one of the preconfigured arrangement styles or create a new one. Set the desired Clip Number (0-7, 8) on each column(bar) for each track. Copy (only the Arrangement-section) into the toArranger.txt file that is in the same folder as EXCELLtoDAW.exe. Start the program, enter the actual Port number (can be found in Windows DeviceManager), press enter. After a moment, TeensyDAW will show a message that it received a new Arrangement.

11.   Saving and Loading Projects

This section will cover the saving and loading mechanisms...