TELAR

A dynamic MIDI mapper for Sensel Morph's Thunder Overlay & Max for Live

User Guide

ABOUT TELAR

Telar is a dynamic MIDI mapper for Sensel Morph's Thunder Overlay.

Thunder's controls are split into a simple symmetric setup and an intuitive structure.

It also features a sophisticated preset system, designed with live performance in mind.

Each slider can be mapped to any one note (or chord), XYZ control or MIDI channel.

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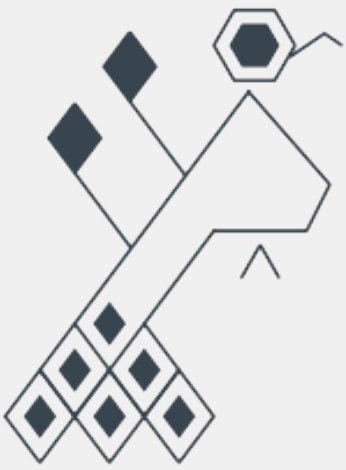
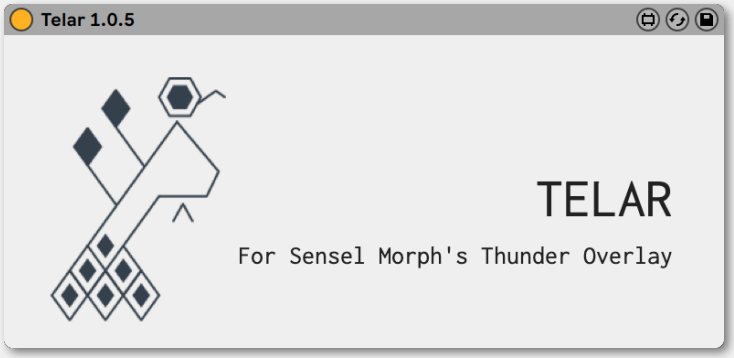
Front Page:
Detail from *James Tilly Matthews' "Air Loom" - "Illustrations of Madness"*
by John Haslam, 1810.

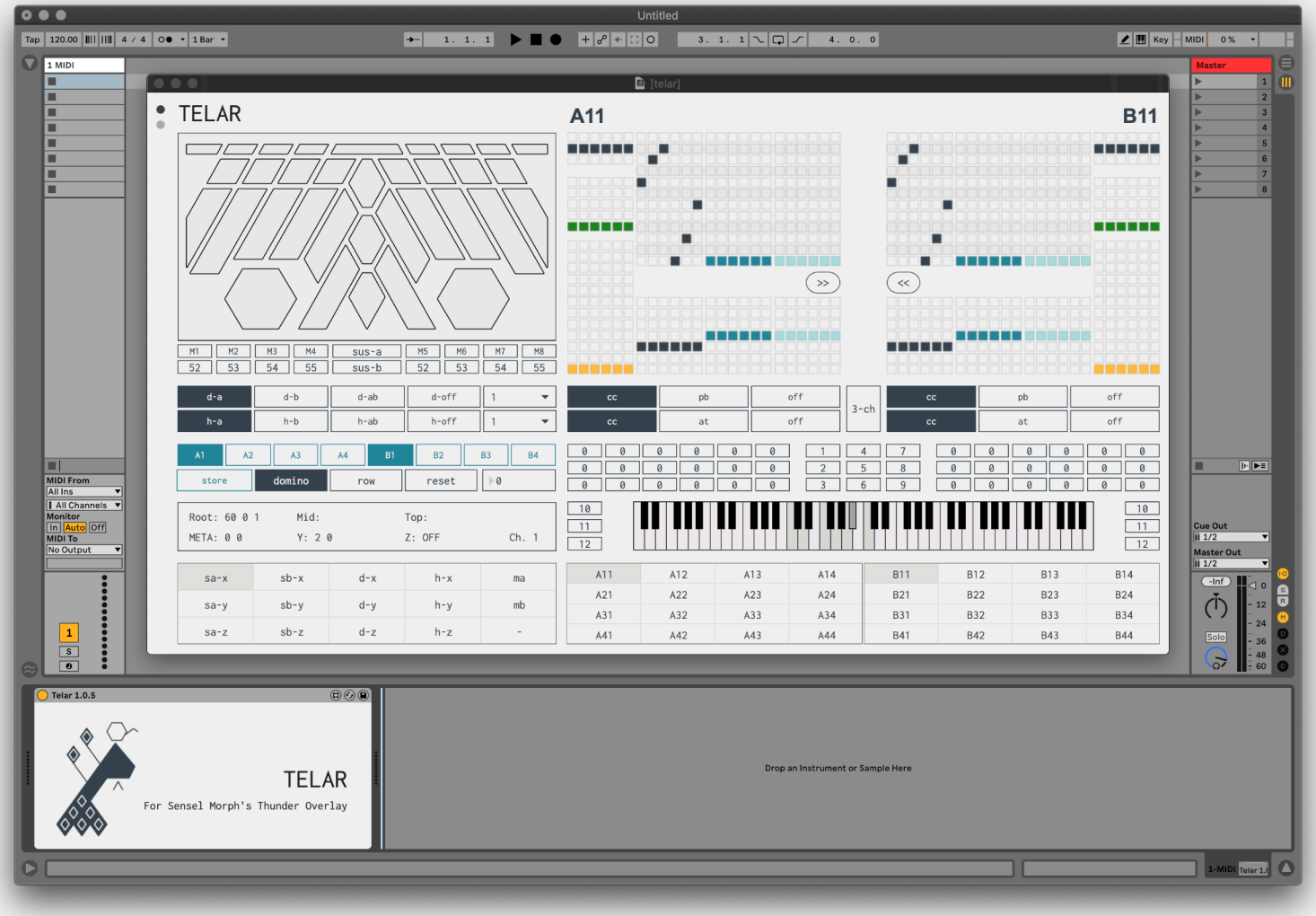
Opposite:
Folk Mayan art from the town Santa Catarina Palopó, Guatemala.

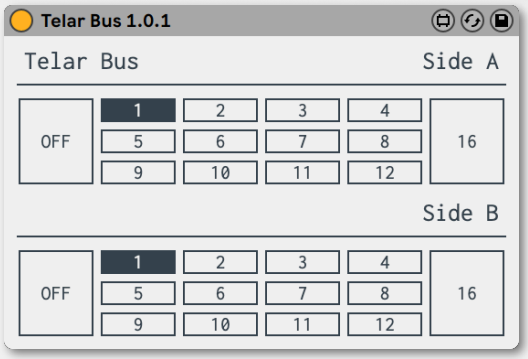


Telar comes with a suite of Max for Live MIDI devices, which are meant to interact with each other with a kind of modular design in mind.



The main device, **Telar.amxd** [all the devices will come with their version numbers as part of the title, e.g. ‘Telar.1.0.5,’ for you to keep track on any upgrades that may come along, but I’ll skip the version numbers here, as they will most likely change over time], comes with a basic splash page and a logo (in the shape of a bird), which serves as a button and allows you to open Telar’s **Editor Panel**. This device will not output any MIDI, and it’s meant to be placed on an independent MIDI track with the Sensel Morph selected as the input device.

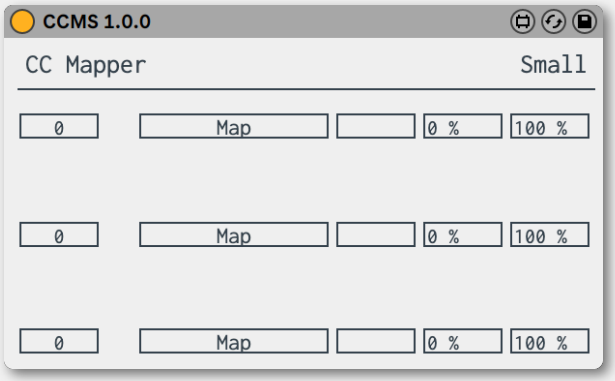




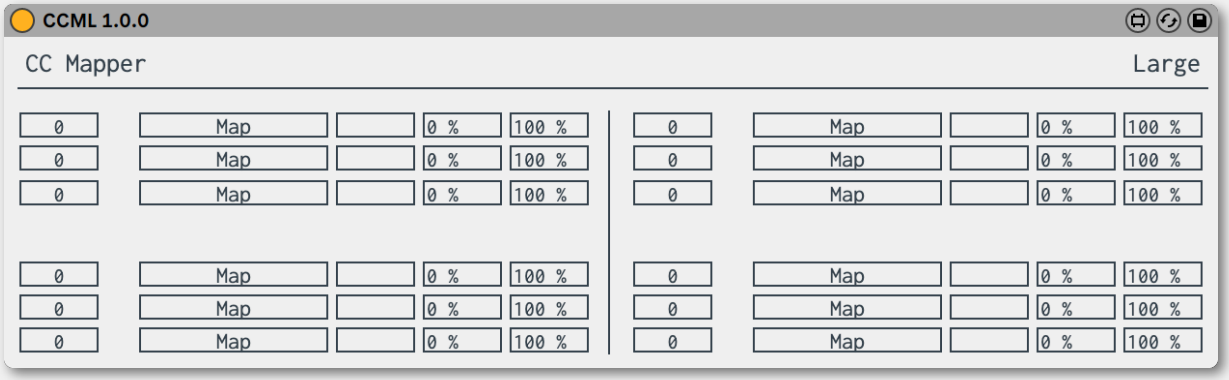
Then, comes the **Telar Bus.amxd** device, which you’re meant to place on a separate MIDI track for each instrument that you’d like to control. It will directly receive any signals routed from the main **Telar** device. You can choose which MIDI channel to let through and from which side on the Thunder (more on this later).

Following is a series of utility devices that will let you further manipulate CC data coming out of the **Telar Bus** device as you may see convenient:

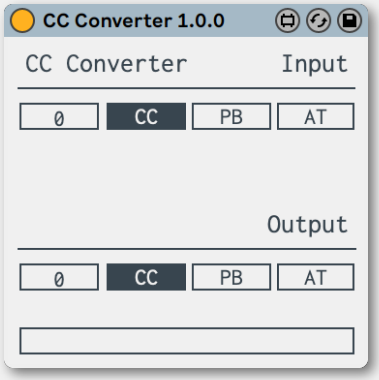
CC Mapper Small includes 3 CC remote map routings (so, for example, if you only need to use one of Thunder's hexagons, you can map its XYZ data with one instance of CCMS, or you can map all the Y data from the diamonds, etc.).



CC Mapper Large includes 12 CC remote map routings.



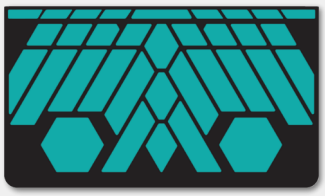
CC Converter allows you to convert incoming control data, whether it's CC or Pitch Bend or Aftertouch, to any one of those three types.

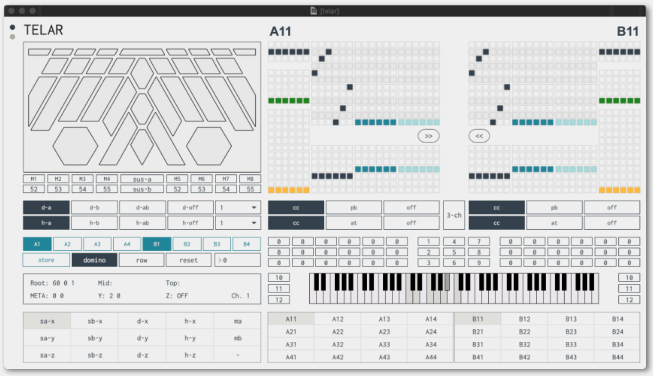


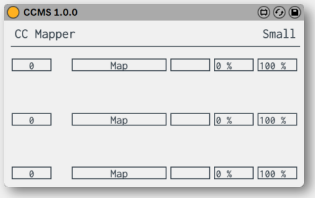
For each slider in Telar you have the option to send either CC data or Pitch Bend, on the X axis, or Aftertouch on the Z axis, but these controls are meant to send independent values with each slider (in order to have MPE control of an instrument, or to send independent control for each finger, each being routed to its own MIDI channel). If you wanted, for example, to have one control send global Pitch Bend, then you would use the CC Converter for that.

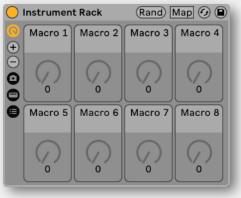
MIDI ROUTING

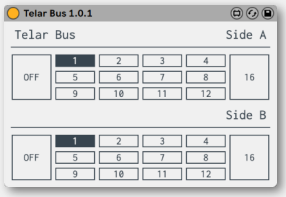
Telar's MIDI signal flow works as follows: the Sensel is connected to the computer (via USB or Bluetooth), then into Live; an instance of Telar's main device is inserted on a MIDI track, with its input set to the Sensel Morph; another track (or set of tracks) will receive this MIDI signal via the Telar Bus device and send one or a combination of MIDI channels coming from the main device out; in addition, the control data can be converted or sent out as remote mappings to control any parameter in Live. MPE control of an instrument is also possible by routing the signal out to any kind of inter-application MIDI connection you might have (on a Mac, it's the IAC Bus in Audio MIDI Setup) and then back into the MPE device.

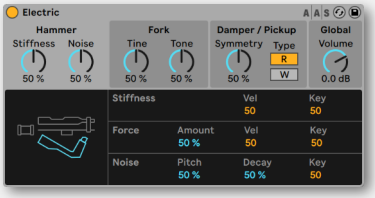








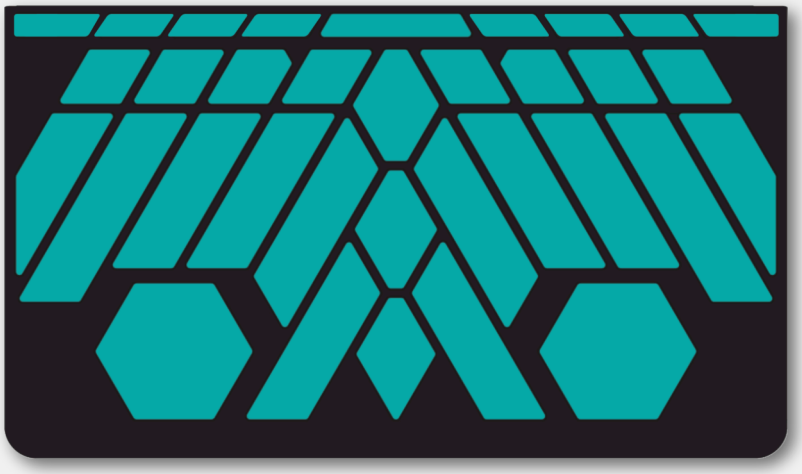




IAC BUS

EXTERNAL MIDI

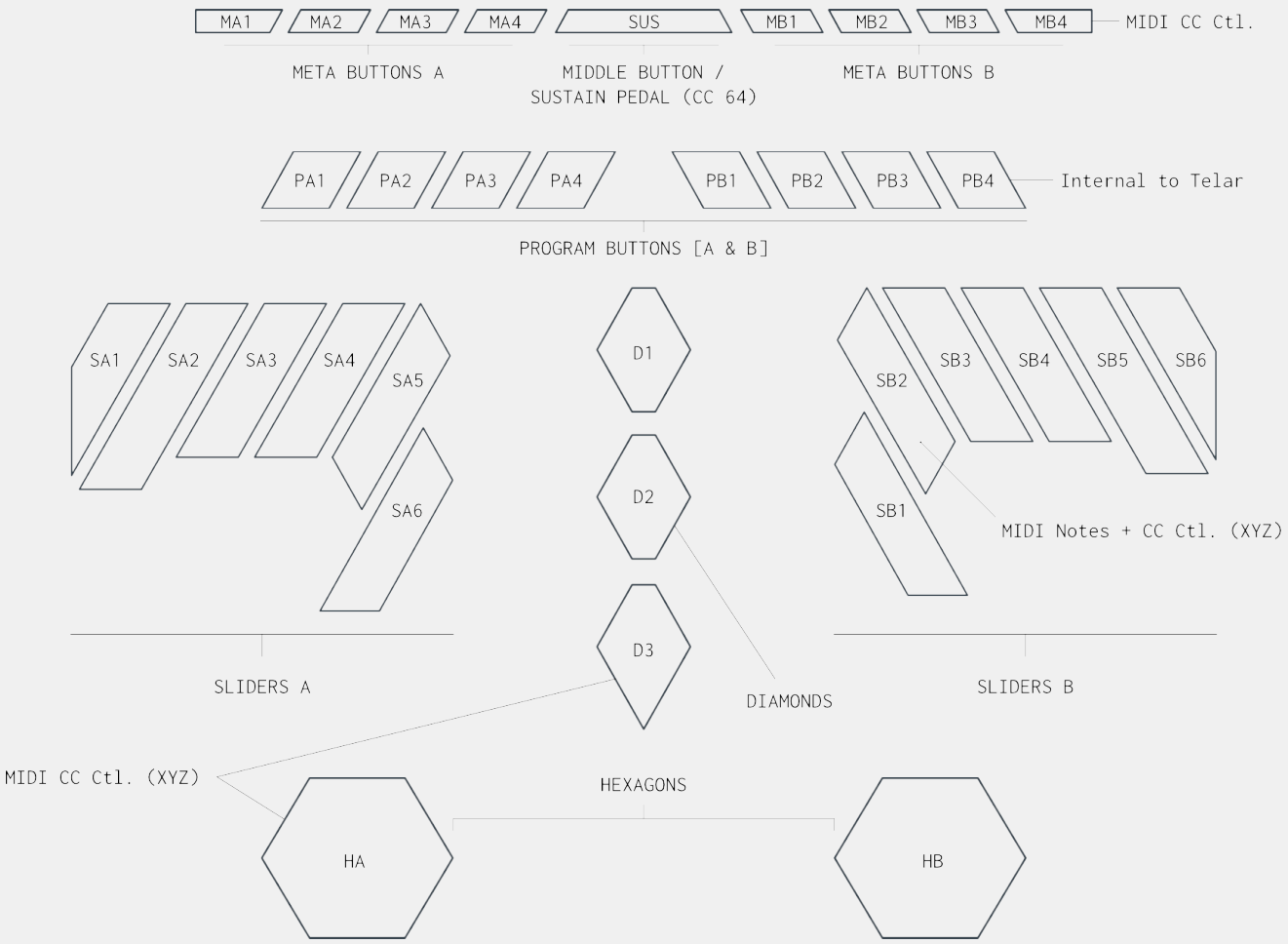
OVERVIEW



The layout of the Thunder can be broken down as follows:

- The top layer of buttons are called **Meta Buttons** (except the center button which is reserved as a **sustain pedal**), meant to, say, trigger a clip in Live, etc.
- The next layer down (the square buttons) are **Program Buttons**: they provide a combination of 32 presets in total that you can recall in real time (each preset will consist of an independent routing configuration of all the other controls).
- The **Sliders** are reserved for note and CC performance data.
- The three **Diamonds** and two **Hexagons** are reserved for global CC data.

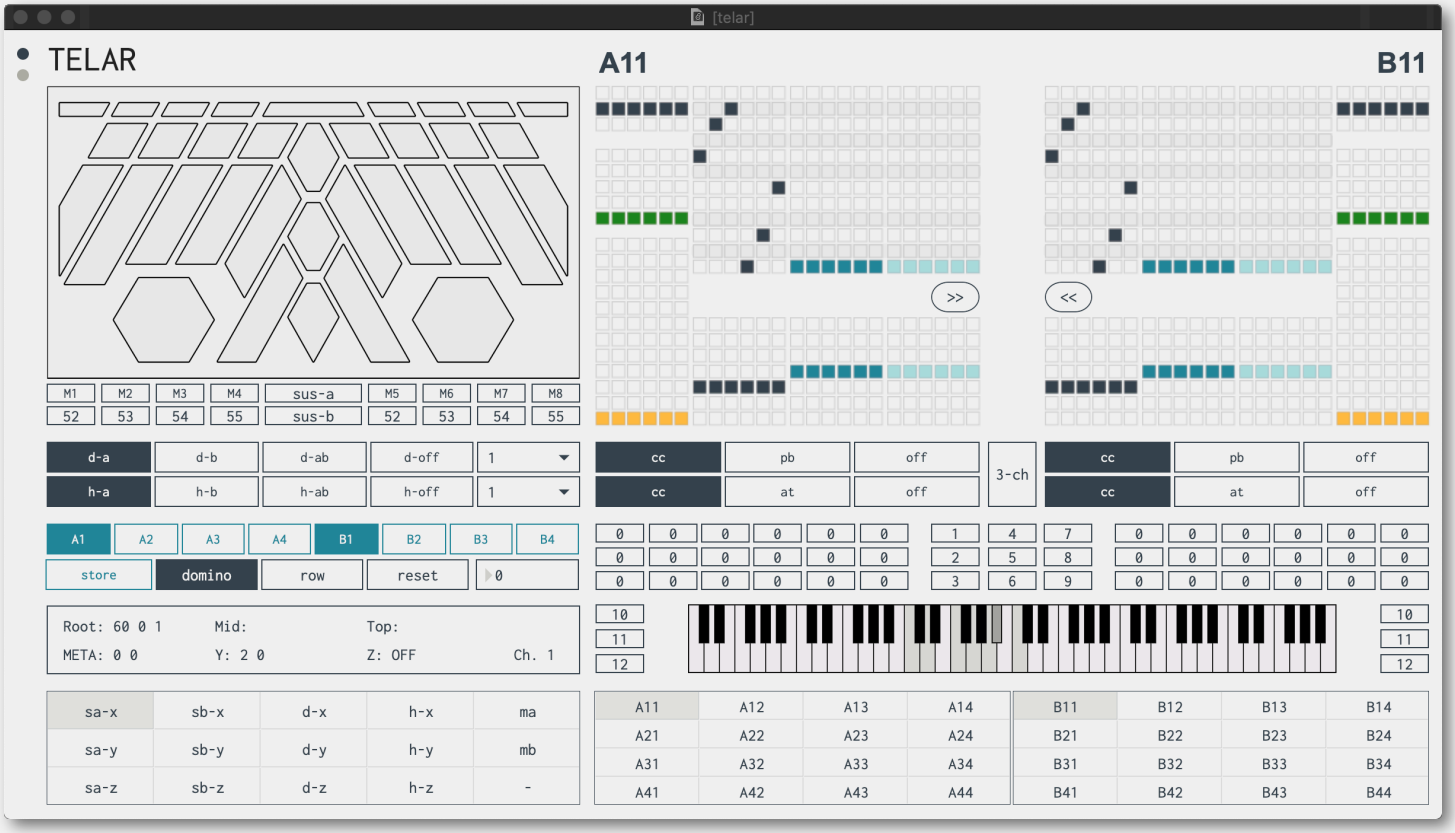
In general, the layout is considered as a **symmetrical setup**, so the left side (A) can work independently from the right side (B) – for the left and right hands respectively – so for example, the four program buttons on the left affect the left sliders, and so on).

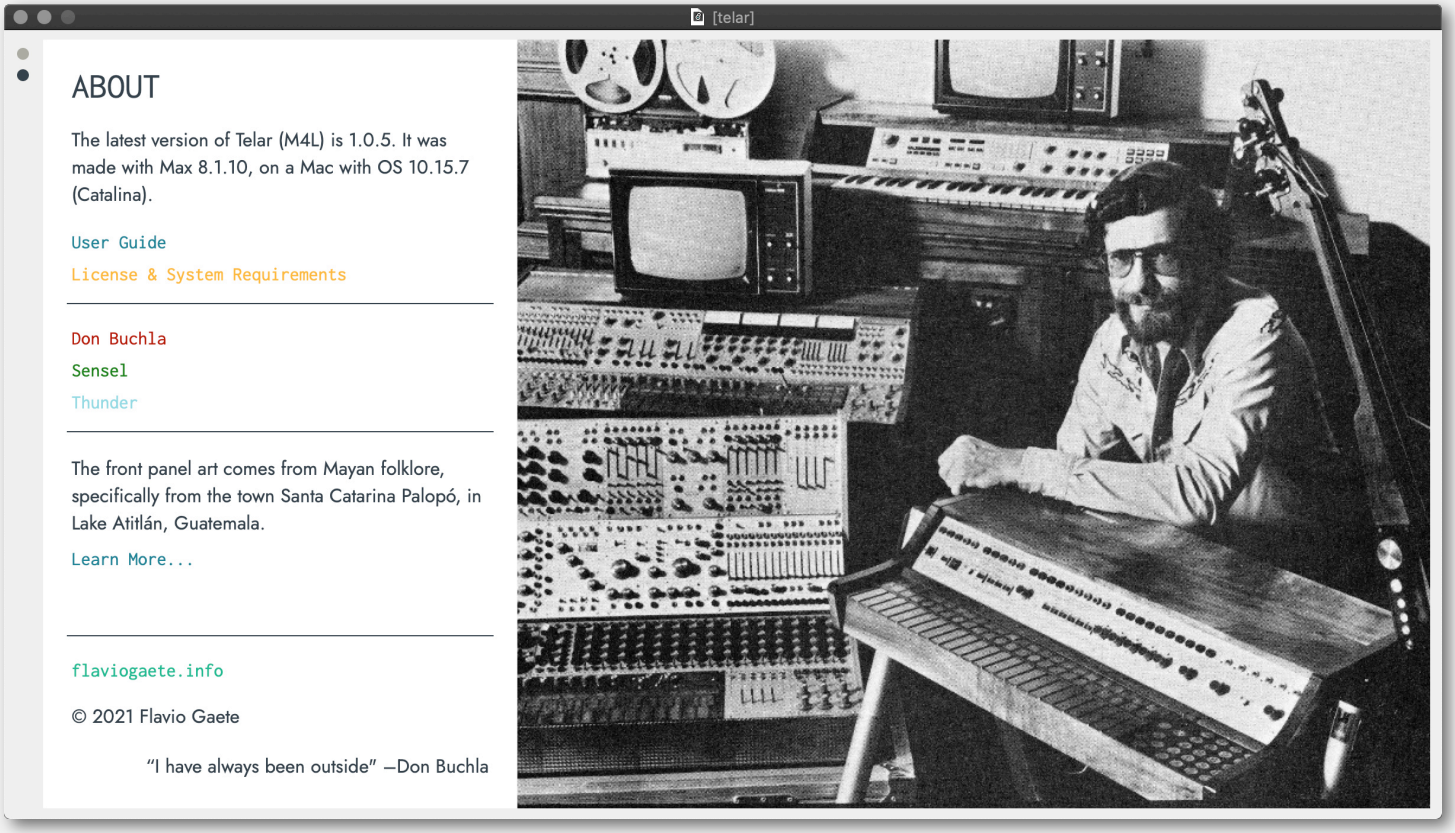


Control Type	Data Sent	Description	Special Functions
META BUTTONS: MA1-MA4 SUS MB1-MB4	MIDI CC (as buttons)	Meant for 'extra' musical operations, e.g. to record a MIDI clip, bypass an effect, etc. The middle button is the Sustain Pedal.	• **SUS + MA1 = Side A Sustain ON/OFF.** • **SUS + MA2 = Side B Sustain ON/OFF.**
PROGRAM BUTTONS: PA1 - PA4 PB1 - PB4	Internal to Telar	Each side features an independent preset system w/ 4 banks of 4 presets each (16 for each side), labeled A11-A14, A21-A24...B41 - B44.	**Examples:** **PA1 + PB1 = B11** **PB2 + PA4 = A24**
BUTTON-SLIDERS: SA1 - SA6 SB1 - SB6	MIDI Notes MIDI CC (XYZ) Pitch Bend (X) After Touch (Z)	Each slider can play a MIDI note and a combination of 3 controls for XYZ. Additionally, there are special modes where each slider can play octaves of the same note, or chords (up to a triad).	• **When PB is enabled, X sends Pitch Bend.** • **When AT is enabled, Z sends After Touch.**
DIAMONDS: D1 - D3	MIDI CC (XYZ)	Meant to send global MIDI CC control.	-
HEXAGONS: HA, HB	MIDI CC (XYZ)	Meant to send global MIDI CC control.	-

THE EDITOR PANEL

The main editor is divided in two parts, the **Editor** proper, which is what you see as soon as you open the editor, and the **About** page (click on the radio buttons on the top-left corner of the device), where you have a number of web links that give you additional related information (e.g. a link to this manual, articles about Don Buchla, the Thunder, etc.)

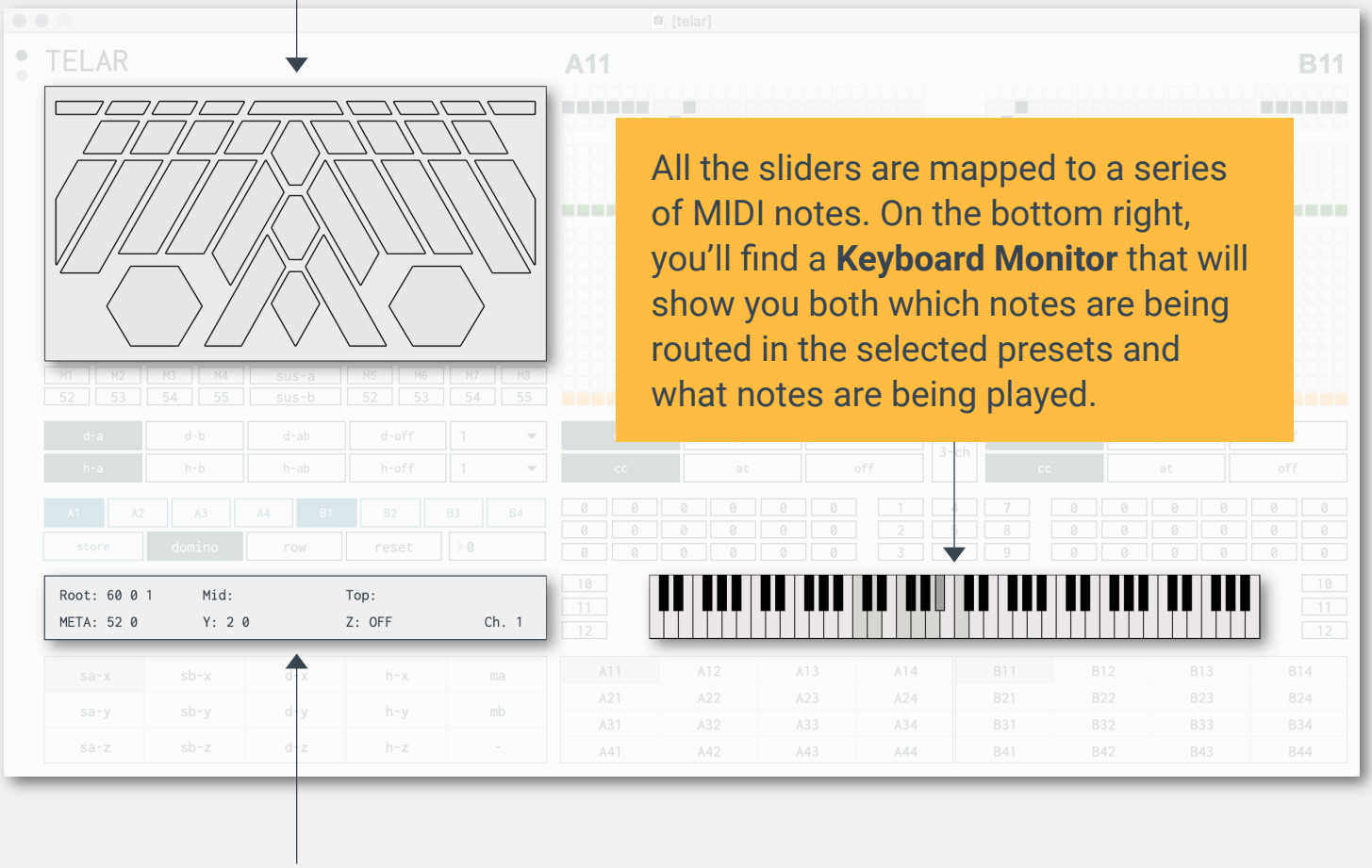




The **Editor** is made up of various sections, which are covered below...

Monitoring Panels

On the top left corner you'll find a miniature version of the Thunder that will display incoming data from the Sensel Morph (make sure to have sent the appropriate **Telar Sensel Map** to the Morph using the Sensel app; this map will be included with the rest of your download).



Towards the bottom of the editor panel, on the left side, you'll find a **MIDI Monitor Panel** that will show you the MIDI data going *out* of Telar.

On the top row you'll read note information for each layer of a (potential) chord (root, middle note, top note), the first number is the note number, the second velocity and the third that note's MIDI channel.

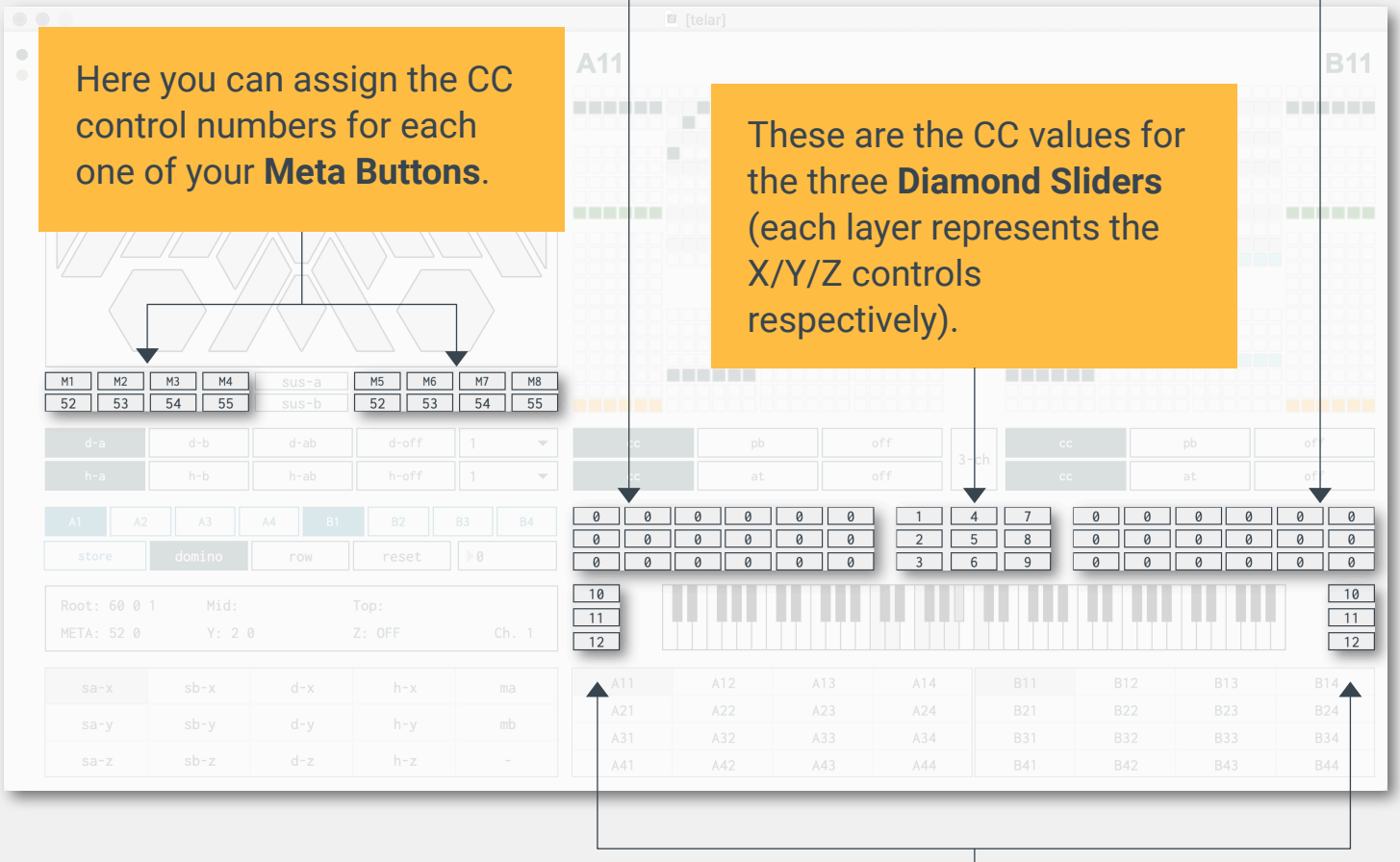
On the bottom row you'll read CC information for the latest slider that you play, on the X, Y & Z controls respectively; the fourth item is the slider's MIDI channel.

CC Value Assignments

As discussed before, Telar's layout is split into a number of layers, of which, the following can send CC data:

- Meta Buttons
- Sliders
- Diamonds
- Hexagons

These two sets of CC value assignments correspond to **Sliders A & B**. There are six sliders for each hand, each with the ability to send X/Y/Z controls

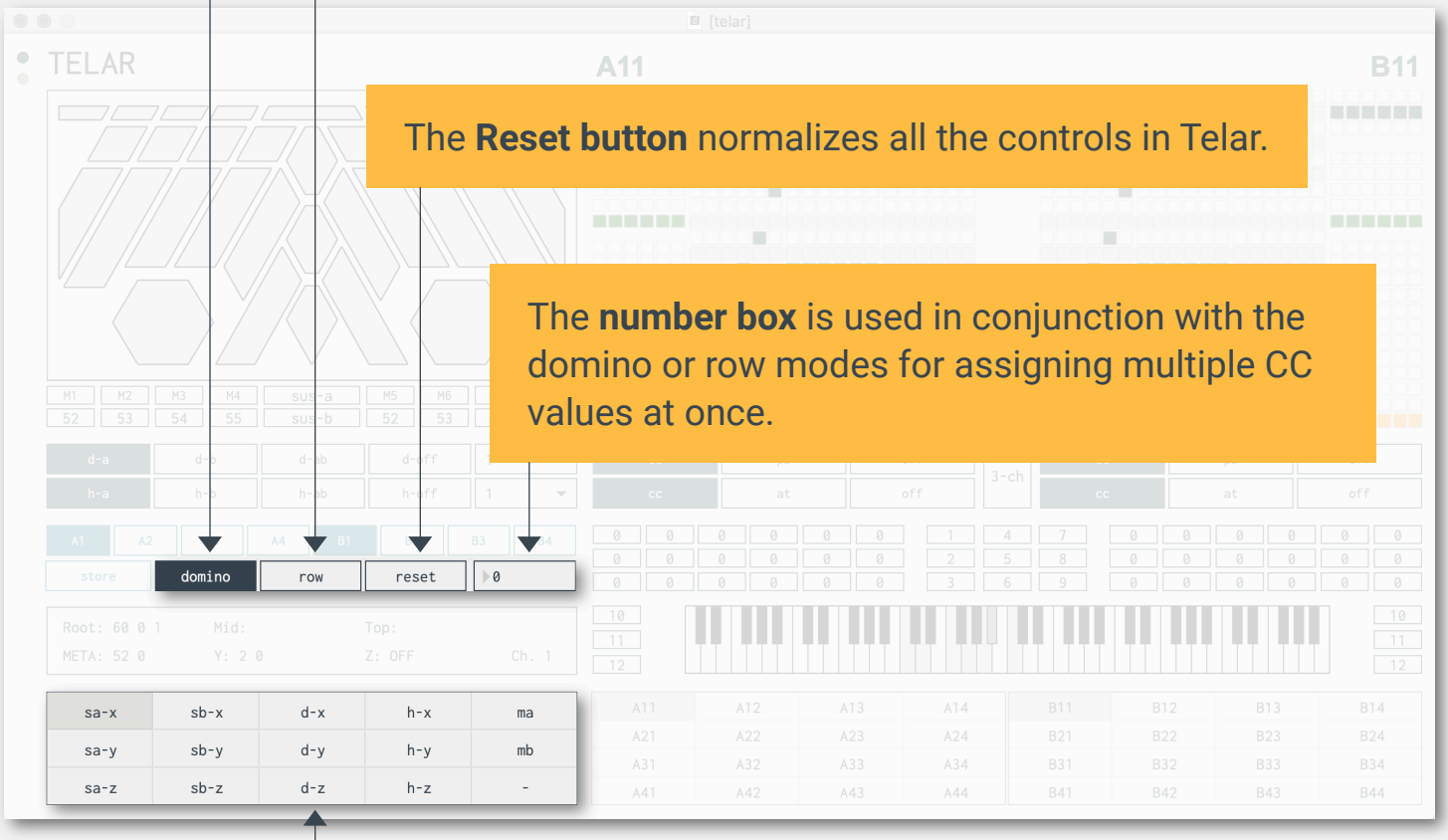


These two sets of CC value assignments correspond to **Hexagons A & B**. Each hexagon has the ability to send X/Y/Z controls.

In addition to being able to assign a CC value to each particular control in Telar, there are various shortcuts for assigning either consecutive values to all the controls, or to assign the same value to a particular row.

In order to assign each individual control to a consecutive CC value in one go, you need to select the **Domino Button** and type in a number on the right. Then, all the values will be assigned consecutively (counting from the number you typed in – if this 'domino effect' goes over the highest MIDI value of 127, it will cycle through and continue with CC1 and onwards). The domino assignments happen in the following order: Sliders A, Sliders B, Diamonds, Hexagons, Meta Buttons.

If you'd like to assign the same value to a row of sliders (for example, if you wanted to use Thunder as a 'MIDI mixer' and have all the Y controls of the SA & SB sliders set to CC7), you can: 1) click on the **Row Button** (to activate 'row mode'), 2) click on the **Row Matrix** below, on a particular row set you're interested in (e.g. **sa-x**), and 3) type the desired CC value on the number box (to the right of the Reset Button). Then, all the X values for sliders SA1 - SA6 will be set to that number.



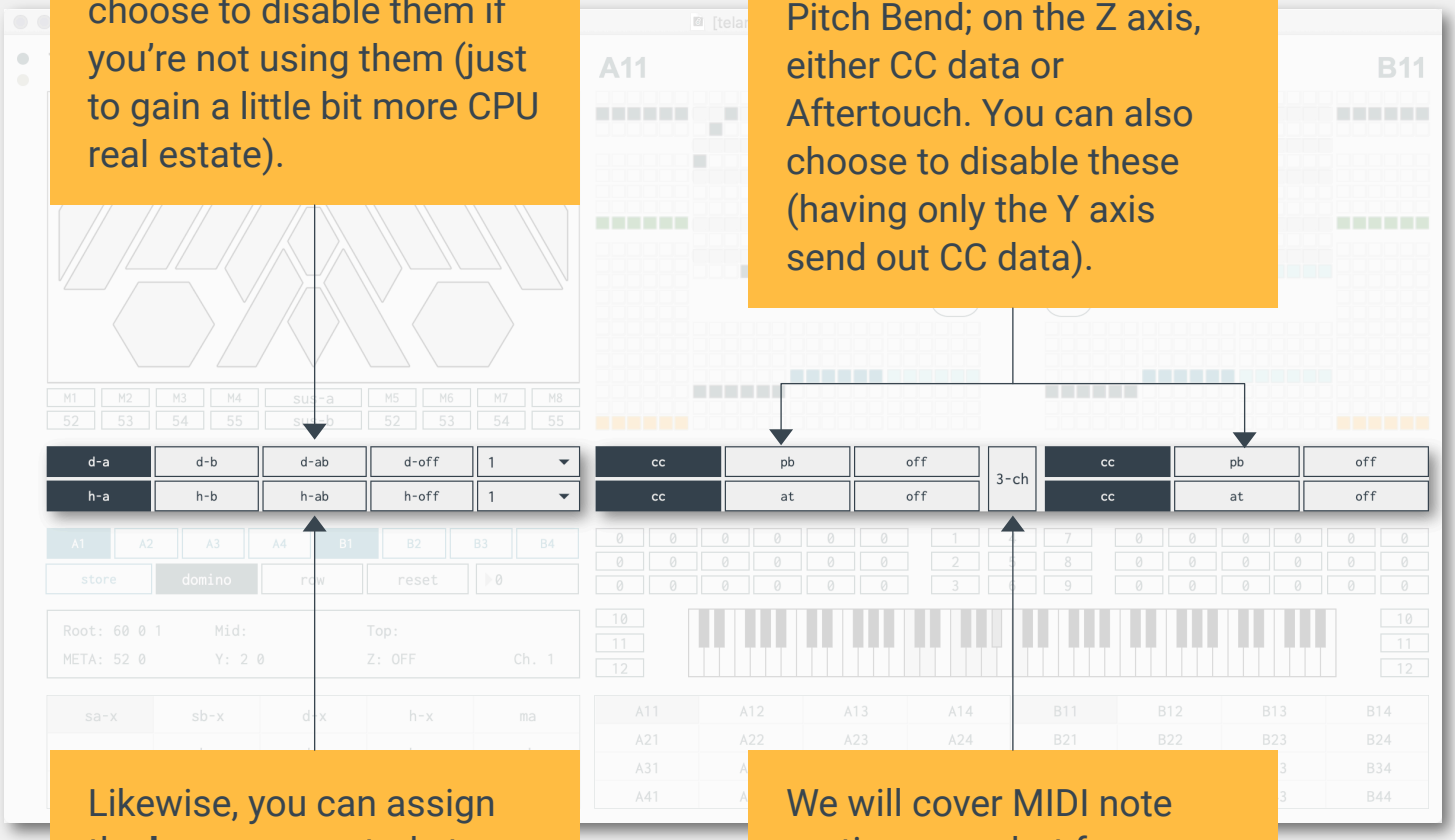
The **Row Matrix** at the bottom left corner of the Editor lets you select row sets for the various controls, e.g. you can adjust the values of just the X axis on the A Sliders.

Global CC Controls & CC Modes

Some of the CC data sent out of Telar have alternative ways of operating. These ‘special modes’ are outlined below, but before we take a look at these, it’s important to emphasize that, in general, Telar splits the Thunder layout in two halves (left & right), so the sliders on the left side of the controller can work independently of the sliders on the right, etc.

You can have the **diamonds** send out CC data out of **side A**, or **side B**, or both. Or you can choose to disable them if you’re not using them (just to gain a little bit more CPU real estate).

The **performance sliders** (A & B) can send, on the X axis, either CC data or Pitch Bend; on the Z axis, either CC data or Aftertouch. You can also choose to disable these (having only the Y axis send out CC data).

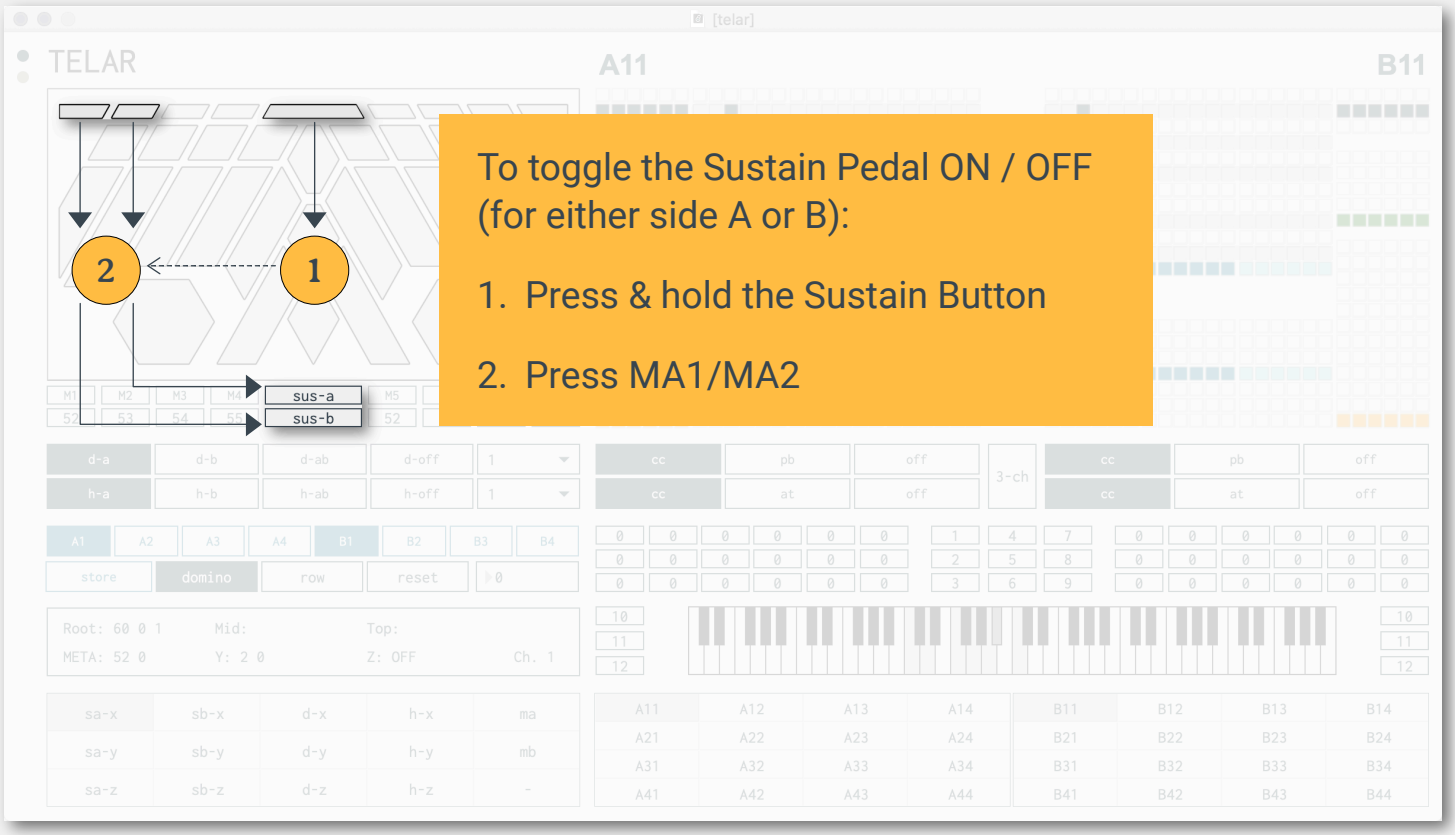


Likewise, you can assign the **hexagon** controls to either side, or both sides, or you can turn them off. Additionally, you can choose what MIDI channel they send their data through.

We will cover MIDI note routing soon, but for now: there’s a mode where each slider can send, beyond a single note, a triad. In that case, you can have each note of the chord be sent out of a consecutive MIDI channel (vs. having all three notes on the same channel).

Sustain Pedals

The middle Meta Button works like a **Sustain Pedal**, in conjunction with Meta Buttons MA1 & MA2 (each side of the Thunder has independent sustain control).

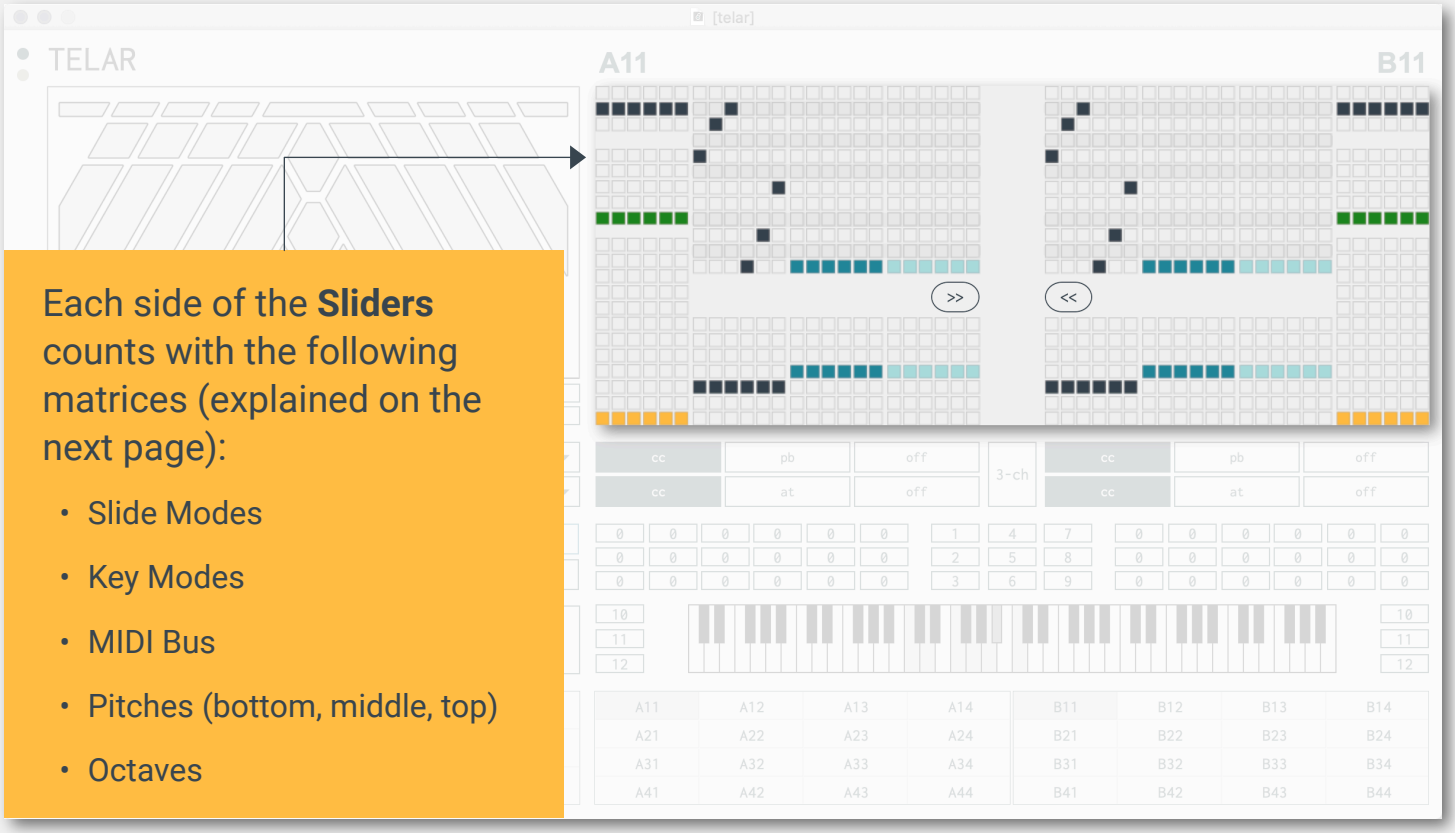


To toggle the Sustain Pedal ON / OFF (for either side A or B):

1. Press & hold the Sustain Button
2. Press MA1/MA2

MIDI Note Routing

On the right side of the editor panel, you will see a number of matrices, laid out symmetrically (for the left and right Sliders, respectively).



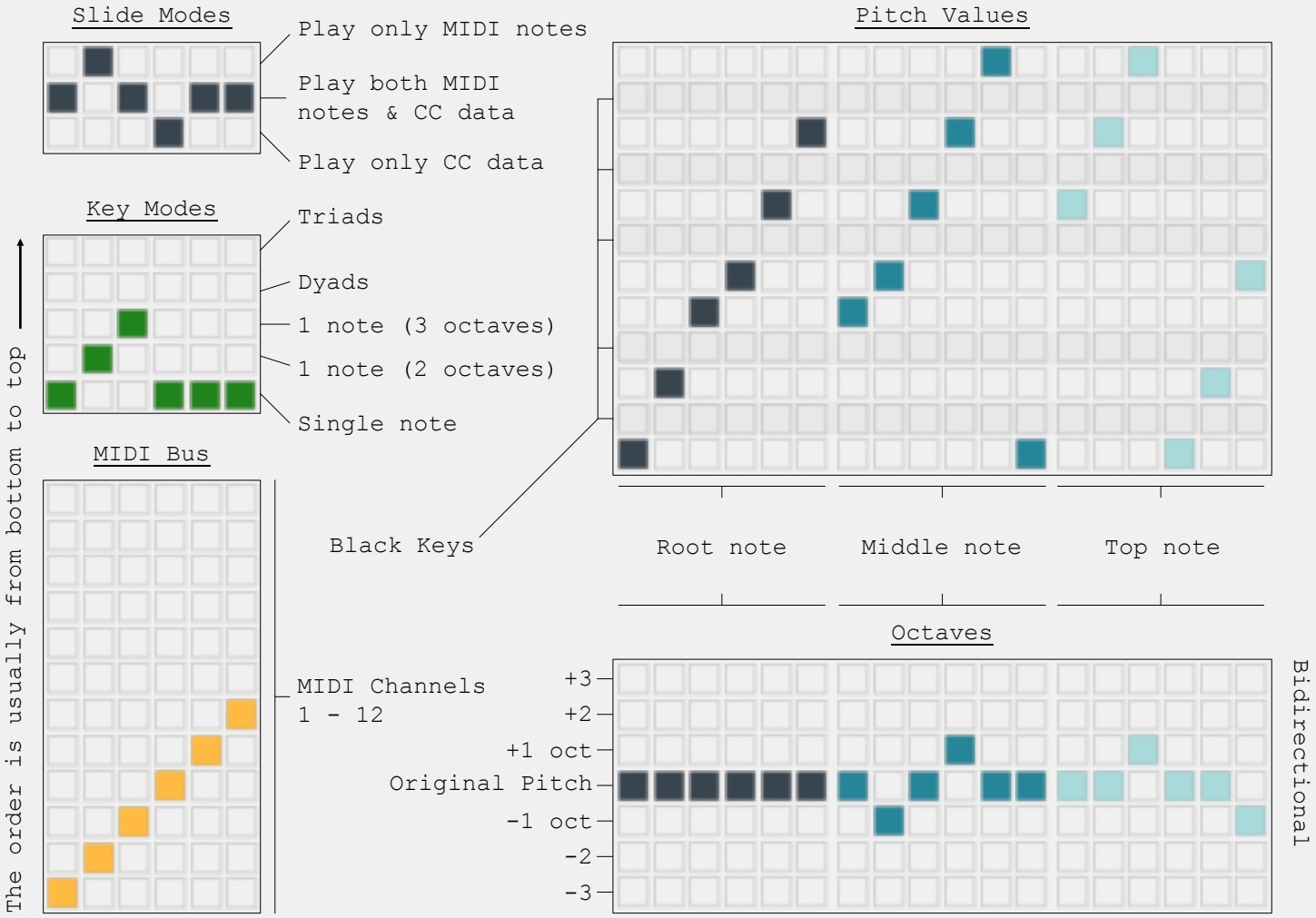
Each side of the **Sliders** counts with the following matrices (explained on the next page):

- Slide Modes
- Key Modes
- MIDI Bus
- Pitches (bottom, middle, top)
- Octaves

The Note Matrices

Note: the values of the matrices are laid out as follows:

- Horizontally, from left to right: sliders 1 through 6.
- Vertically, **from bottom to top**: modes 1 through *n*; busses 1 through 12 (which correspond to MIDI Ch. 2 through 13 – Ch. 1 is reserved for global sends), pitches in ascending order from C to B; the octave matrix is an exception: **the middle row** is the center octave, spreading up and down in a range of three octaves in each direction.



1. Slide Modes:

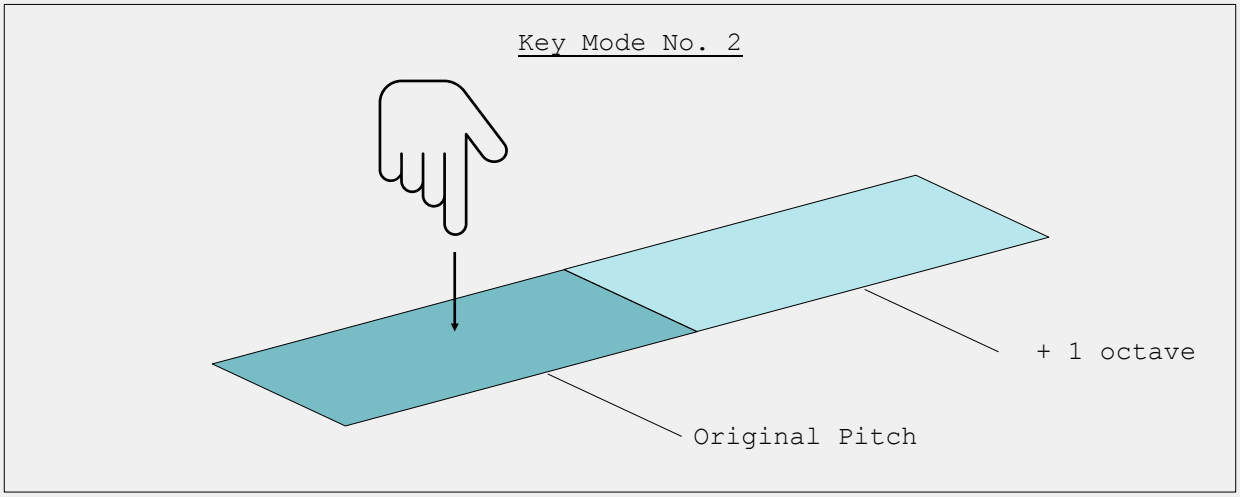
The first matrix on the top left (and top right, in dark blue) let's you enable/disable the different types of data, as follows:

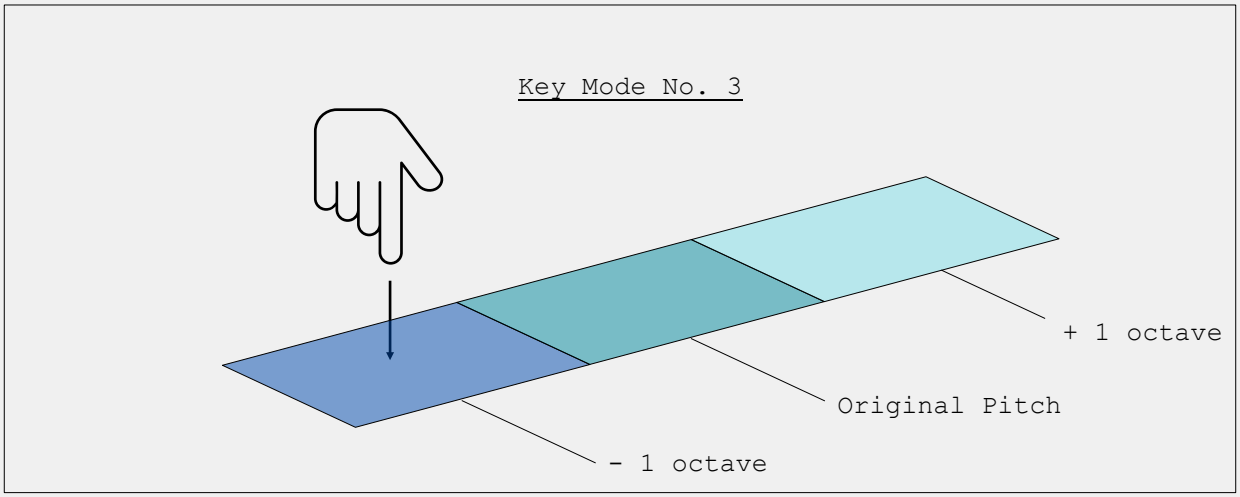
- The bottom row will send **only CC data**.
- The middle row will send **both MIDI notes and CC data**.
- The top row means the sliders will send **only MIDI note data**.

2. Key Modes:

The next matrix below (in green) changes the behaviour of the slider itself:

• Row 1 (bottom) sends out a single note.
• Row 2 splits the slider in two: the bottom half plays the original pitch, the top half plays an octave above.
• Row 3 splits the slider in three: the middle portion plays the original pitch, the top and bottom play an octave above and below respectively.
• Row 4 plays a dyad (it utilizes the first and second pitch matrices).
• Row 5 plays a triad (all three pitch matrices are utilized).





3. MIDI Busses

The matrix at the bottom left & right (in yellow) assigns a discrete MIDI channel for each note being played. The bottom row routes to MIDI channel 1, the last, top row to channel 12.

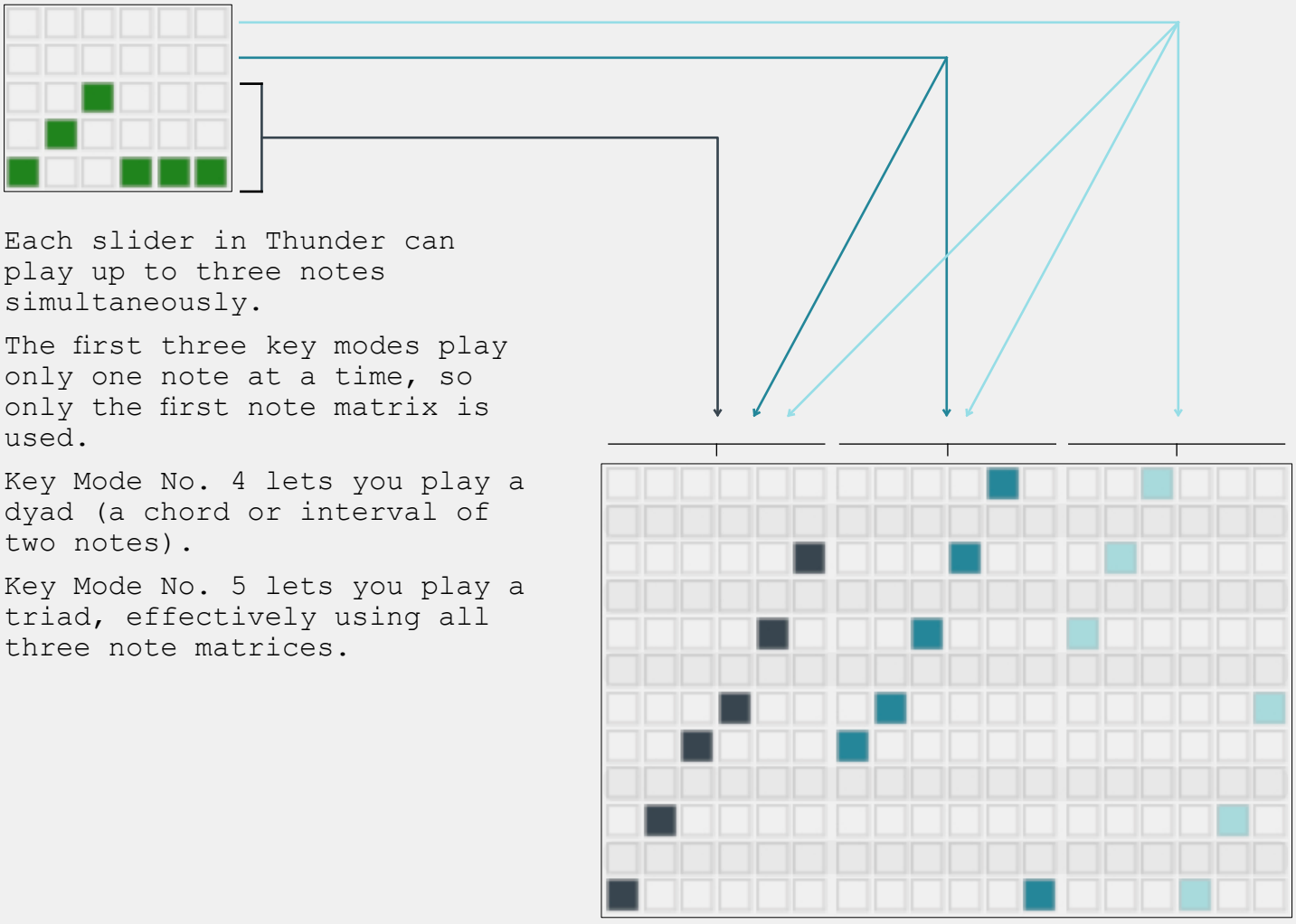
Note: When the **3-Ch Button** is turned on, and a slider is set to play a chord, the notes in the chord will be spread to subsequent MIDI channels. Otherwise, all the notes in the chord will come out of the same channel.

4. Pitches

There are three pitch matrices (in different shades of blue), in case the sliders are set to play either dyads or triads, they assign a note value to each slider (laid out chromatically in a vertical, ascending order).

5. Octaves

Likewise, there are three octave matrices, which modify the pitch values set in the matrices above. Any slider can play any note within a 6 octave range, the middle octave being C3 - B3.



Each slider in Thunder can play up to three notes simultaneously.

The first three key modes play only one note at a time, so only the first note matrix is used.

Key Mode No. 4 lets you play a dyad (a chord or interval of two notes).

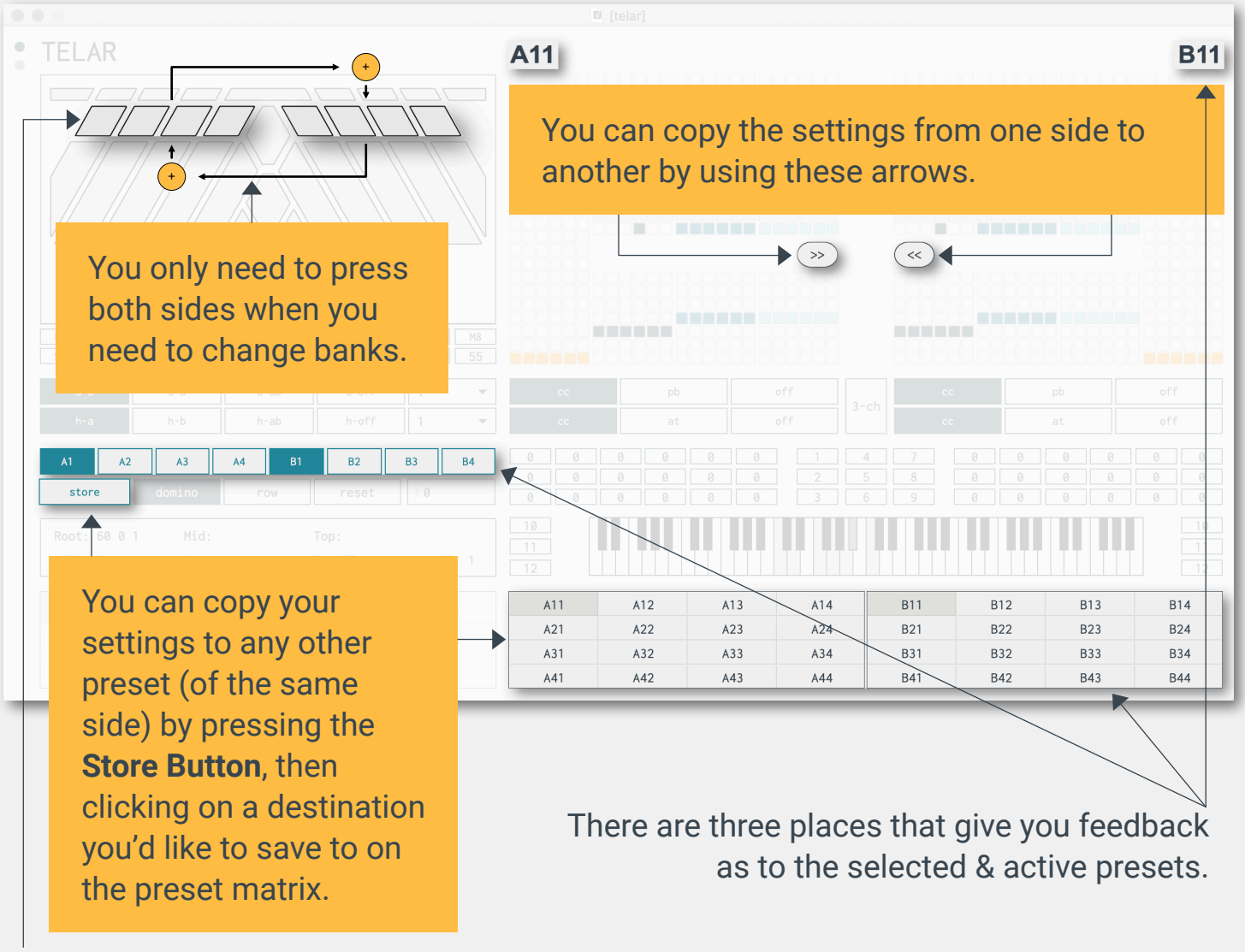
Key Mode No. 5 lets you play a triad, effectively using all three note matrices.

The Preset System

All of the MIDI notes and CC control value assignments that are given to each slider on Thunder can be saved as a preset for quick recall. Each side of Thunder has its own independent preset system and features a set of 4 banks x 4 presets (a total of 32 presets, 16 on each side).

Diamonds and hexagons, plus other common settings (e.g. whether the ‘X’ controls are sending CC data vs. pitch bend, etc.) are saved with the A presets.

All the configurations are saved automatically on whatever preset you happen to have selected at the moment, and you can copy your configurations to any other preset or pass the values from one side to another.



You can use the program buttons symbiotically to select any of the 32 available presets:
- To select any ‘A’ preset: first hold any button from PB1 - PB4 to select a bank, then press any button from PA1 - PA4 (e.g., holding PB3 and then pressing PA2 will select preset A32).
- To select any ‘B’ preset, do exactly the reverse (hold a ‘PA’ button to select a bank, then press any ‘PB’ button).

SENSEL MAP & MIDI IMPLEMENTATION CHART

The following pages will provide the MIDI mapping configuration used for the Thunder Overlay, should you for any reason lose the Sensel map that came with your download (or if you'd like to experiment with another Sensel overlay or MIDI controller). Please refer to the **Overview** in this manual to follow the nomenclature used for each control.

Control	MA1	MA2	MA3	MA4	SUS	MB1	MB2	MB3	MB4
Control Type	MIDI CC Button								
Button Type	Momentary								
MIDI Ch.	1								
CC No.	1	2	3	4	5	6	7	8	9
Aftertouch	OFF								
Threshold	0								
LED	OFF								

Control	PA1	PA2	PA3	PA4	PB1	PB2	PB3	PB4
Control Type	MIDI CC Button							
Button Type	Momentary							
MIDI Ch.	1							
CC No.	10	11	12	13	14	15	16	17
Aftertouch	OFF							
Threshold	0							
LED	OFF							

Control	SA1	SA2	SA3	SA4	SA5	SA6
Control Type	MIDI XYZ Pad					
MIDI Note	C3	C#3	D3	D#3	E3	F3
Note No.	60	61	62	63	64	65
CC No. X	18	21	24	27	30	33
CC No. Y	19	22	25	28	31	34
CC No. Z	20	23	26	29	32	35
MIDI Ch.	1					
Threshold	0					
Absolute X	Yes					
Absolute Y	Yes					
LED	OFF					
14-bit CC	OFF					
Recenter CC	OFF					

Control	SB1	SB2	SB3	SB4	SB5	SB6
Control Type	MIDI XYZ Pad					
MIDI Note	F#3	G3	G#3	A3	A#3	B3
Note No.	66	67	68	69	70	71
CC No. X	36	39	42	45	48	51
CC No. Y	37	40	43	46	49	52
CC No. Z	38	41	44	47	50	53
MIDI Ch.	1					
Threshold	0					
Absolute X	Yes					
Absolute Y	Yes					
LED	OFF					
14-bit CC	OFF					
Recenter CC	OFF					

Control	D1	D2	D3	HA	HB
Control Type	MIDI XYZ Pad				
MIDI Note	C4	C#4	D4	D#4	E4
Note No.	72	73	74	75	76
CC No. X	54	57	60	63	66
CC No. Y	55	58	61	64	67
CC No. Z	56	59	62	65	68
MIDI Ch.	1				
Threshold	0				
Absolute X	Yes				
Absolute Y	Yes				
LED	OFF				
14-bit CC	OFF				
Recenter CC	OFF				

GENERAL INFO

Don Buchla & the **Thunder**:

https://buchla.com/history/

https://en.wikipedia.org/wiki/Buchla_Thunder

Sensel Morph:

https://morph.sensel.com/

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