

X Touch Patch Switcher

Overview

For use as a “**master keyboard patch selection tool**”, the Behringer “X Touch Compact” desktop controller device with the help of the appropriate Reaper JSFX scripts described here, provides these features:

- Two “groups” of patch select Buttons, usually to be assigned each to a dedicated keyboard.
- 16 Buttons in either group, each selecting a patch and showing the selection state by the embedded LED(s).
- Two “layers” selectable with each of the 2*16 Patches.
- 17 parameters visible in realtime, live-tweakable, and managed for each patch:
 - 9 Faders
 - 8 Rotaries
- 9 Buttons to select a transpose setting: -8 ... +8 semitones. One of these also controls the “octave doubling”.
- 8 Rotaries to be used independently of the patches
- A single “X Touch Layer” (A ↔ B) is used, so that the other X Touch Layer is available for other (not patch depending) purpose (like controlling a mixer device).

Technical software integration details:

- The JSFX software stores up to $2*16*2*17 = 1088$ controller (CC) values for the up to $2*16*2 = 64$ patches.
- Midi Data sent to the Reaper system:
 - A single CC # as “patch select” usually received by “SWS LiveConfigs”. To allow for two different “Configs” in LiveConfigs, Group 1 and Group 2 can be sent on different channels.
 - CC val 0..15: Group 1 Layer 1 (Patches 1..16)
 - CC val 16..31: Group 2 Layer 1 (Patches 1..16)
 - CC val 32..47: Group 1 Layer 2 (Patches 1..16)
 - CC val 48..63: Group 2 Layer 2 (Patches 1..16)
 - CCs sent on a dedicated channel to the audio engine plugins after selecting a new patch or when manually tweaking a parameter by moving the appropriate Rotary or Fader (standard configuration):
 - CC # 16..23 (binary 15..22): Rotary 1..8
 - CC # 24..32 (binary 23..31): Fader 1..9
 - CCs sent on a dedicated channel to “common” plugins considered independent of the patches:
 - CC # 18..25 (binary 17..24): Rotary 9..16
 - CC # 26 (binary 25): expression Pedal
 - CC # 27 (binary 26): foot switch
 - The transpose-value (-8 ... +8) is saved to the global variable “_global.xc_transpose” to be used by other JSFX plugins.
 - The octave doubling state is saved as a special value to the global variable “_global.xc_transpose” to be used by other JSFX plugins.

User-Interface

The patch select actions are:

- Push on Rotary 1..8
 - select Patch 1..8 for Group 1 (CC val: layer 1: 0..7, layer 2: 32..39)
- Push Button 1..8 in 1st row
 - select Patch 9..16 for Group 1 (CC val: layer 1: 8..15, layer 2: 40..47)
- Push Button 1..8 in 2nd row
 - select Patch 1..8 for Group 2 (CC val: layer 1: 16..23, layer 2: 48..55)
- Push Button 1..8 in 3rd row
 - select Patch 9..16 for Group 2 (CC val: layer 1: 24..31, layer 2: 56..63)

Depending on the selected layer, the appropriate Rotary LED ring or Button LED will turn to be lit or flashing.

After doing a selection, Rotary 1..8 LED rings and Fader 1..9 position will show the parameters last active with the newly selected patch. If in group 1 a patch 1..8 is selected, the value of the appropriate Rotary can't be displayed. To see it, turn the Rotary or push on Rotary 13.

If the last selected patch is in group 1 (and hence the parameters of the patch “lit” in group 1 are displayed on the Rotaries and the Faders, the LED rings of the “upper” Rotaries 9 and 10 are lit. Appropriately, if the last selected patch is in group 2 (and hence the parameters of the patch “lit” in group 2 are displayed on the Rotaries and the Faders, the LED rings of the “lower” Rotaries 11 and 12 are lit.

When pressing a patch-select- Rotary or Button that already is lit or flashing, the parameters of that patch will be displayed by the LED rings of the Rotaries and the Faders, switching the displayed group appropriately, while no actual patch switch is performed.

Tweaking the patch parameters:

Turning Rotary 1..8 or moving the Faders 1..9 modifies the parameters of the selected patch in the group denoted by the LED rings of the Rotaries 9..12. When turning a Rotary, it's LED ring will show the current value. After a short time, the LED ring returns to denote a patch select, if appropriate. These parameter changes are sent to the appropriate sound engine plugins, and are stored in the JSFX system, so that they can be re-displayed whenever the patch is selected.

Tweaking the patch independent parameters

Turning Rotary 9..16 changes global parameters. These parameter changes are sent to the appropriate sound engine plugins, and are stored in the JSFX system, so that they can be re-displayed when Reaper starts (if the project had been saved). If the LED-ring of a parameter is used for other purpose, when turning a Rotary, it's LED ring will show the current value. After a short time, the LED ring returns to the default display.

Using the patch layers

The Buttons **Loop**, ■, ●, and ► are used to preselect the layer of the patches to be selected with the next patch activate action:

Loop	→	layer 1 for group 1
■	→	layer 1 for group 2
●	→	layer 2 for group 1
►	→	layer 2 for group 2

- Pressing **Loop** preselects layer 1 for group 1, and the Button **Loop** LED will be lit, while the Button ■ and ● LEDs will dim. The parameters of the current patch in group 1 are displayed.
- Pressing ■ preselects layer 1 for group 2, and the Button ■ LED will be lit, while the Button **Loop** and ● and ► LEDs will dim. The parameters of the current patch in group 2 are displayed.
- Pressing ● preselects layer 2 for group 1, and the Button **Loop** LED will be lit, while the ● LED will flash and ■ LED will dim. The parameters of the current patch in group 1 are displayed.
- Pressing ► preselects layer 2 for group 2, and the Button ■ LED will be lit, while the ► LED will flash and the **Loop** LED will dim. The parameters of the current patch in group 2 are displayed.

When a patch is selected with layer 2 preselected, the patches Rotary LED ring or Button LED will be flashing, while a patch selected as Layer 1 will be just lit constantly.

When selecting a patch by pushing on Rotary 1..8 or one of the patch select Buttons while holding down one of the layer select Buttons **Loop**, ■, ●, or ►, the appropriate layer will be used for that patch. But the state of the layer select Buttons ● and ► will not change. This provides a shortcut for calling up a patch in different layer than used most of the time.

Restoring the default parameters of a patch

When pressing the ►► button, the parameters of the currently displayed patch (group 1 or 2, either layer) are restored to the default values they got when starting the project.

Advanced functions

Several “push on rotary” actions can be used to perform special actions:

Select a group to be displayed by the Rotaries and Faders without changing the selected patch or the layer preselection:

- Pushing on Rotary 9 displays the selected patch in group 1.
- Pushing on Rotary 11 displays the selected patch in group 2.

Toggle the layer of the selected patch in a group:

- Pushing on Rotary 10 toggles the layer of the selected patch in group 1. The parameters of the newly selected patch will be displayed with the Rotaries and Faders.
- Pushing on Rotary 12 toggles the layer of the selected patch in group 2. The parameters of the newly selected patch will be displayed with the Rotaries and Faders.

Display the value of the Rotaries:

- Pushing on Rotary 13 displays the values of all Rotaries for several seconds.
- When turning any of the Rotaries, it's LED ring will show the appropriate parameter value for a short time.

Transposition

The left nine Buttons in lowest row are intended to be used to define a global transposition for the Notes of all keyboards.

Hitting one of the Buttons labeled **1**, **2**, **3**, **4**, **5**, **6**, **7**, and **8** will set the transposition to **+1**, **+2**, **+3**, **+4**, **+5**, **+6**, **+7**, and **+8** semitones accordingly. The appropriate button is lit while transposition is active.

Holding one of the Buttons labeled **1**, **2**, **3**, **4**, **5**, **6**, **7**, and **8** for more than 0.2 seconds will set the transposition to **-1**, **-2**, **-3**, **-4**, **-5**, **-6**, **-7**, and **-8** semitones accordingly. The appropriate button is flashing while transposition is active.

The **ninth** Button resets the transposition to **zero** semitones. None of the nine buttons will be lit in this state.

The transpose feature sets the global variable “_global.xc_transpose”. Appropriate plugins in the sound generating tracks can be used to modify the midi stream as appropriate for the hosted plugins, either by modifying the Note-On / Note-Off events or sending out transposition defining messages whenever necessary.

Octave doubling

Pressing the **ninth** Button for more than 0.2 seconds activates the “octave doubling” feature. Appropriate plugins in the tracks can be used to read the global “_global.xc_transpose” variable and act appropriate on same e. g. by adding a sub-octave to the sound.

Hitting the **ninth** Button deactivates octave doubling.

It's not possible to use octave doubling and Transposition at the same time.

Installation

The software for the master keyboard patch selection tool consists of three different plugins. The main plugin **“X Touch Button to CC”** is supposed to receive the Midi stream from the X Touch device. Its Midi output is sent to a sequence of up to 64 **“X Touch CC save”** plugins. Finally an **“X Touch Button to CC end”** plugin combines the data and sends out Midi events on different channels that can be routed back to the X Touch controller, to the patch selecting software (such as LiveConfigs), and to the plugins that are supposed to receive parameter changes.

Plugin Settings and Display

X Touch Button to CC:

- XTouch Channel
normal send and receive channel for the X Touche device
- XTouch Global Channel
“Global” channel of the X Touch for sending special commands to X Touch
- Patch Select Channel 1
channel to send out CCs for patch selection for group 1
- Patch Select Channel 2
channel to send out CCs for patch selection for group 2
- Parameter Set Channel 1
channel to send out CCs for parameter modification for group 1
- Parameter Set Channel 2
channel to send out CCs for parameter modification for group 2
- nonPatch Channel
channel to send out CCs for “global” parameter modification when turning Rotary 8..16
- enumerate Parameter Storage Plugins
Select “automatic” for automatic assigning patch numbers to the “X Touch CC save” plugins at start up.
- CC to set Patch
CC to be used for communication with the “X Touch CC save” plugins (usually no change necessary)
- Active Patch 1
read-only display of the patch number currently active in group 1.
- Active Patch 2
read-only display of the patch number currently active in group 2.
- Transpose
read-only display of the active transpose setting (manual modification here triggers a start up sequence).
- Rotary 9 (CC18) etc.
Current setting of the “global” parameters (Rotary 9..16)
- CC # add (set 15)
offset of the CC # sent to the audio engine with respect to the CC # sent by the X Touch device, when changing a Fader or Rotary setting. Set this Fader to “15” to match the parameter description in the X Touch CC save GUI display.
- Patch switch -> CC setup delay

delay (in seconds) between sending out a patch select and the parameter changes for that patch.

- Fader Touch
"discard": no CC is sent out when a Fader is touched.
"forward": the CC message generated by X Touch when a Fader is touched is passed through.

X Touch CC save:

- I am Patch
The patch number this plugin will store the managed parameter values for:
1 ... 16 = group 1, layer 1
17 ... 32 = group 2, layer 1
33 ... 48 = group 1, layer 2
49 ... 64 = group 2, layer 2
- Fader 1 (CC1 -> CC 16) etc.
current value of the managed parameter described by Controller description, X Touch CC # and CC # sent to the audio engine

X Touch Button to CC end:

No parameters to be set

Routing

The Midi stream from the X Touch should be sent to a dedicated track. In the FX queue of this track the first relevant plugin should be "**X Touch Button to CC**", followed by up to 64 instances of "**X Touch CC save**" and finally "**X Touch Button to CC end**".

This track sends out a Midi stream on several channels that can be configured in **X Touch Button to CC**.

- The channels denoted by "XTouch Channel" and "XTouch Global Channel" should be routed back to the X Control device.
- The channels "Patch Select Channel 1" and "Patch Select Channel 2" should go to the patch selecting entity (usually "SWS LiveConfigs")
- The channels "Parameter Set Channel 1" and "Parameter Set Channel 2" should be sent to the appropriate audio engine tracks.
- The channel "nonPatch Channel" should be sent to the tracks that handle global (not patch depending) sound processing.

It is not recommended to route other Midi signals but those created by the X Touch device through the chain of these plugins. Hence, when using the Midi In socket of the X Touch device, you should split the Midi streams before according to the Midi channels.

While up to 64 different patches can be managed and for each patch an instance of **X Touch CC save** is necessary, it is possible to reduce the count if not all patches are intended to be used. In this case "enumerate Parameter Storage Plugins" can be set to "manual" and all "I am Patch" settings need to be prepared before the software can be used.

Setting up the X Touch controller device

This software uses the the default configuration of Layer A of the X Touch device. The other Layer can be used fo other purpose if appropriate, if (like with the default configuration) a different set of CCs and Note numbers is used.

The normal and the “global” channel of the X Touch device need to match the settings described above.