



# Hummingbird

ULTRA REAL-SOUNDING VIRTUAL ACOUSTIC GUITAR

USER MANUAL

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# Introduction

## Prominy Hummingbird

Ultra Real-sounding Virtual Acoustic Guitar - The true sound of Gibson® 1963 Hummingbird  
- includes approx. 80GB\*, 89,000 samples

*(\* Hummingbird uses the Lossless Sample Compression format 'NCW' with real-time encoding. The data size after the installation is approx. 40 GB that equals 80 GB of .wav files.)*

*Hummingbird enables you to compose and create powerful and natural acoustic guitar tracks that imitate real acoustic guitar playing!*

### 1. Incredible real-time playability – Hummingbird SPI (Super Performance Instrument)

With Hummingbird SPI, you can play ultra realistic acoustic guitar performance in real-time. You can access various playing techniques instantly without stopping your performance and create convincing guitar tracks very quickly.

Single note

Emulated 2-strings dyad chords

*(minor 2nd, 2nd, minor 3rd, major 3rd, 4th, flat 5th, 5th, #5th, 6th, 7th, maj7th, octave)*

Sampled real chords

*(octave, major, minor, 7th, m7, maj7, add9, sus4, 9th, m7<sup>(9)</sup>, maj7<sup>(9)</sup>, dim7, aug, open / low chords, etc.)*

Emulated chords

*(major, minor, 7th, m7, maj7, add9, sus4, 7sus4, 9th, #9, m7<sup>(9)</sup>, maj7<sup>(9)</sup>, dim, dim7, m7<sup>5</sup>, aug, open / low chords, etc.)*

User chords

*(You can make any chords using User Chord Editor.)*

Realtime Hammer-on & Pull-off

Realtime Legato Slide

Vibrato

Trill

Picking Tremolo

Mute & picking noise

Gliss down

Natural Harmonics

Percussion

Fret noise, Pick stop noise, Bridge mute noise, Release noise, Position change noise

Special FX

etc.

## **2. Fretboard Monitor**

The SPI automatically selects a proper string / fret position depending on the situation. You can also change the string manually by key switches. The Fretboard Monitor visualizes the current fret position / playing technique you are playing.

## **3. Auto Stroke Detection**

With the SPI's Auto Stroke Detection feature, SPI automatically detects the current beat position and identify proper stroke direction (down or up). There are several stroke detection modes and you can also control stroke direction manually.

## **4. Realtime Legato Slide**

With Hummingbird's Realtime Legato Slide feature using 'real' legato samples, you are able to get perfectly real expressions of the human finger's legato slide that cannot be reproduced with a slide emulation by changing pitch.

## **5. Real sampled chords**

The extensive number of the 'real' chord samples makes your guitar tracks very convincing. (octave, major, minor, 7th, m7, maj7, add9, sus4, 9th, m7<sup>(9)</sup>, maj7<sup>(9)</sup>, dim7, aug, open / low chords, etc.) Hummingbird includes the huge number of 'real' recorded (in other words, 'pre-recorded' or 'pre-played') chord samples. You can instantly access the various types of guitar chords. Prominy's guitar libraries are the only ones that include such a huge number of the real chord samples.

## **6. Real emulated chords**

Though Hummingbird already includes a huge number of real chord samples, more chords (and more chord shape variations per each chord) are available with the emulated chords. Our unique recording / programming make it possible for you to get a realistic chord sound that is close to a real sampled chord sound, even if you are playing emulated chords.

*minor 2nd-dyad , maj2nd-dyad, minor 3rd-dyad, major 3rd-dyad, 4th-dyad, flat 5th-dyad, 5th-dyad, #5th-dyad, 6th-dyad, 7th-dyad, maj7th-dyad, octave-dyad, major, minor, 7th, m7, maj7, add9, sus4, 7sus4, 9th, #9, m7<sup>(9)</sup>, maj7<sup>(9)</sup>, dim, dim7, m7<sup>(b5)</sup>, aug, open / low chords, etc.*

## **7. User Chord**

User Chord Editor enables you to build your own chord shapes and make any chords you like. Each string is fully customizable and you can configure how the string is played using the User Chord Editor. (For example, normal sustain or mute or picking noise, always play open string regardless the fret position, strum the string or not, root string, etc.)

## **8. Customizable Strum Key**

As well as the User Chord Editor, you can configure how each string is played when you hit the Strum Keys and the Normal Key.

## **9. Arpeggio Key**

Arpeggio Key is a dedicated key for each string. When a chord instrument is selected, each note of the chord is automatically assigned to the Arpeggio Key for the string so you can play arpeggio with the keys.

\*This is not a so-called 'Arpeggiator'. This is a feature that enables you to play a certain note (string) of the chord individually.

## **10. True stereo recording**

The samples were recorded using three microphones; a pair of small diaphragm microphones for stereo recording, and one large diaphragm microphone for monaural recording. As a stereo option for the large diaphragm microphone, a Double-Tracking instrument is available (see below).

## **11. Double-Tracking**

In addition to the stereo recorded samples that capture a natural stereo sound, Double-Tracking instruments are available as another option to get a stereo sound. 'Double-Tracking' is a technique that is frequently used in recording guitar tracks. It gives the guitar track a nice, wide-spread stereo images and thickness. With Hummingbird SPI, you can reproduce it very easily just by loading the double-tracking instruments. No identical samples are played simultaneously in both channels. You don't need a stereo delay or tweaking your midi data to emulate the double-tracking.

## **12. Intelligent Instrument Key Switch with chord recognition**

You can instantly select an instrument (articulation) using the Instrument Select Key Switches. All the instruments can be assigned to any key switches and you can create your own key switch mapping. The key switches have a chord recognition feature that enables you to select a chord instrument by not only hitting a key that the chord is assigned, but also by hitting the chord notes in the key switch range. In other words, you don't need to memorize the key switches for the chord instruments. Just hold the chord notes in the key switch range, and you are ready to play the chord.

### **[The guitar used for recording]**

1963 Gibson Hummingbird (very rare maple back and sides, 25.5 inches long scale)

Strings: D'Addario Phosphor Bronze light .012 - .053

Pick: DUNLOP ULTEX 0.60

# **System Requirements**

Mac OS X 10.8, 10.9 or 10.10 (latest update), Intel Core 2 Duo

Windows 7 or Windows 8 (latest Service Pack, 32/64-bit), Intel Core 2 Duo or AMD Athlon™ 64 X2

4 GB RAM (6 GB recommended for large Instruments)

41 GB free disc space

Kontakt Player 5 included - No sampler required

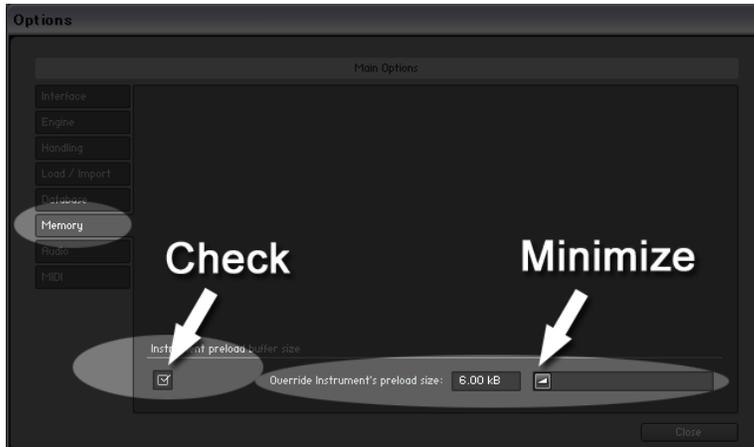
## **SUPPORTED INTERFACES**

Stand-alone, VST, Audio Units, ASIO, Core Audio, AAX Native (Pro Tools 10 or higher)

## [IMPORTANT] Preload buffer size configuration

**Please check your preload buffer size before loading the instrument.**

Hummingbird is a very big instrument that loads a huge number of samples. You need to configure the preload buffer size in Kontakt's option because the default pre-load buffer size is too large. If you have not changed the preload buffer setting yet, decrease the pre-load buffer size.



1. Click the Options button;

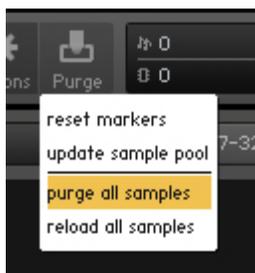


and select the 'Memory' tab.

2. Check the box and minimize (or set to 12kb); 'Override Instrument's preload size'.

The buffer size ('Override Instruments preload size') in the picture is 6kb, but if you load a big instrument, we recommend 12kb to play the samples smoothly. If the samples are not played smoothly with 12 kb, increase the buffer size as needed unless RAM runs out. It depends on the system, but in most cases 12 kb should work fine. By decreasing the preload buffer size, loading time becomes much shorter and you can save a big RAM space.

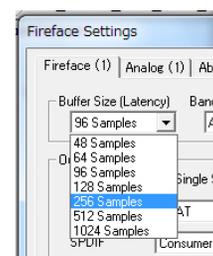
### Purge All Samples and 'on the fly streaming'



Another great way to save RAM is using the 'purge all samples' feature of Kontakt Player / Kontakt. After loading the multi / instruments, click on the 'Purge' icon and select 'purge all samples'. If your system is not so old, Kontakt Player should load previously unloaded samples on the fly when you play notes. If your RAM space is tight, it's worth trying.

### ***If you get a noise at the beginning of the note when you play a big instrument...***

A big multi that includes many instruments requires a certain amount of processing power. If you get a noise at the beginning of the note, *increase* the latency size of your audio interface (not 'decrease', unlike with the preload buffer size in Kontakt Option). For detail about changing the latency size, please refer to your audio interface manual.



A stylized, light gray silhouette of a hummingbird in flight, facing right, positioned behind the word "Hummingbird".

# **Hummingbird**

**Instrument**

# Instrument files (.nki)

## **Mono**

Hummingbird\_L (large diaphragm microphone)

Hummingbird\_S (small diaphragm microphone)

## **Stereo**

Hummingbird\_L\_doubletrack (large diaphragm microphone)

Hummingbird\_S\_doubletrack (small diaphragm microphone)

Hummingbird\_stereo (a pair of small diaphragm microphones)

## **lite**

The .nki files in the 'lite' folder are lite versions that require less RAM space than the full versions do.

They don't include the real chord samples and the hybrid mode cannot be selected. (emulated chords only)

# Interface

## Fretboard



## Instrument Select Key Switch



## Play Key (Hold Key & Stop Key)



## Strum setting



## User Chord



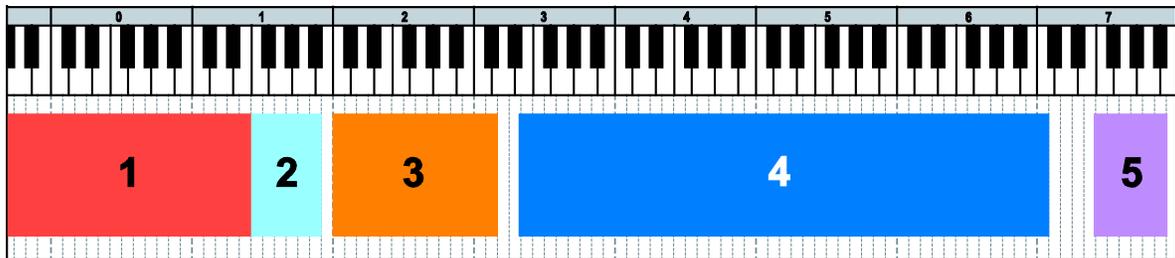
## Other settings



## Effects



# Key ranges



## 1: [Instrument select key switch](#) [C-2 - E1]

selects the instrument (articulation) to play.

## 2: [Play Key \(Hold Key & Stop Key\)](#) [F1 - A#1]

enables you to play gliss down, picking noise, fret noise, etc., also can be used as a 'repeat same note' key.

## 3: [Strum Key](#) & [Arpeggio Key](#)

**Strum Key** [C2, C#2, D2, D#2, F#2, G#2, A#2, C#3]: You can strum chords with the pre-configured Strum Keys.

**Arpeggio Key** [E2, F2, G2, A2, B2, C3]: When a chord instrument is selected, each note of the chord is automatically assigned to the Arpeggio Key for the string.

## 4: **Normal Key** [E3 - C7]

is the main range in which most of articulations such as chord strumming, solo (lead), legato slide, hammer-on, pull-off, etc. can be played.

## 5: [String / Chord shape select key switch](#) [F7 - A#7]

selects the string or chord shape.

# Instruments

single note		
single legato slide hammer-on&pull-off / trill no legato		
dyad chord		
minor2nd	5th-dyad	
major2nd	#5th-dyad	
minor3rd-dyad	6th-dyad	
major3rd-dyad	7th-dyad	
4th-dyad	maj7th-dyad	
flat5th-dyad	octave	
chord		
major	7 <sup>(b5)</sup> (flat5)	user chord 1
minor	m7 <sup>(b5)</sup>	user chord 2
7th	7 <sup>(#5)</sup> (7sharp5)	user chord 3
m7	6th	user chord 4
maj7	m6th	user chord 5
7 <sup>(9)</sup> (9th)	6 <sup>(9)</sup> (69th)	user chord 6
m7 <sup>(9)</sup> (m9)	m6 <sup>(9)</sup> (m69th)	user chord 7
maj7 <sup>(9)</sup> (maj9)	mMaj7	user chord 8
add9	7 <sup>(b9)</sup> (flat9)	user chord 9
sus4	7 <sup>(#9)</sup> (sharp9)	user chord 10
dim7	madd9	
aug	7sus4	
rush	dim	
FX		
natural harmonics FX1 - harmonics FX2 - percussions FX3 - slides FX4 - noise, etc.		

## Instrument select key switches

(default)

assigned	not assigned
<p><b>E1:</b> single note no legato  <b>D#1:</b> FX2 - percussion  <b>D1:</b> single note hammer-on&amp;pull-off  <b>C#1:</b> natural harmonics  <b>C1:</b> octave  <b>B0:</b> FX1 - harmonics  <b>A#0:</b> FX3 - slides  <b>A0:</b> FX4 - noise, etc.  <b>G#0:</b> user chord 1  <b>G0:</b> 7th  <b>F#0:</b> m7  <b>F0:</b> sus4  <b>E0:</b> major  <b>D#0:</b> minor  <b>D0:</b> add9  <b>C#0:</b> user chord 2  <b>C0:</b> single note legato Slide  <b>B-1:</b> maj7  <b>A#-1:</b> 9th  <b>A-1:</b> m9  <b>G#-1:</b> maj9  <b>G-1:</b> dim7  <b>F#-1:</b> aug  <b>F-1:</b> 'RUSH' chord  <b>E-1:</b> 7flat5  <b>D#-1:</b> m7flat5  <b>D-1:</b> 7sharp5  <b>C#-1:</b> 6th  <b>C-1:</b> m6  <b>B-2:</b> 69th  <b>A#-2:</b> m69th  <b>A-2:</b> mMaj7  <b>G#-2:</b> flat9  <b>G-2:</b> sharp9  <b>F#-2:</b> madd9  <b>F-2:</b> 7sus4  <b>E-2:</b> dim  <b>D-2:</b> user chord 5  <b>D#-2:</b> user chord 6  <b>C#-2:</b> user chord 7  <b>C-2:</b> user chord 8</p>	<p>minor 2nd-dyad  major 2nd-dyad  minor 3rd-dyad  major 3rd-dyad  4th-dyad  flat5th-dyad  5th-dyad  #5th-dyad  6th-dyad  7th-dyad  maj7th-dyad  user chord 9  user chord 10</p>

The diagram illustrates the mapping of 48 instruments to four key switch ranges (-2, -1, 0, 1) on a piano keyboard. The key ranges are defined by vertical dashed lines. The instruments listed on the right are:

- E1: single note no legato
- D#1: FX2 - percussion
- D1: single note hammer-on&pull-off
- C#1: natural harmonics
- C1: octave
- B0: FX1 - harmonics
- A#0: FX3 - slides
- A0: FX4 - noise, etc.
- G#0: user chord 1
- G0: 7th
- F#0: m7
- F0: sus4
- E0: major
- D#0: minor
- D0: add9
- C#0: user chord 2
- C0: single note legato Slide
- B-1: maj7
- A#-1: 9th
- A-1: m9
- G#-1: maj9
- G-1: dim7
- F#-1: aug
- F-1: 'RUSH' chord
- E-1: 7flat5
- D#-1: m7flat5
- D-1: 7sharp5
- C#-1: 6th
- C-1: m6
- B-2: 69th
- A#-2: m69th
- A-2: mMaj7
- G#-2: flat9
- G-2: sharp9
- F#-2: madd9
- F-2: 7sus4
- E-2: dim
- D-2: user chord 5
- D#-2: user chord 6
- C#-2: user chord 7
- C-2: user chord 8

### How to select instrument

Press one of the keys above. For example, if you would like to activate the single note legato slide, press the key; C0. ([Click here](#) to see playable key ranges of each instrument.)

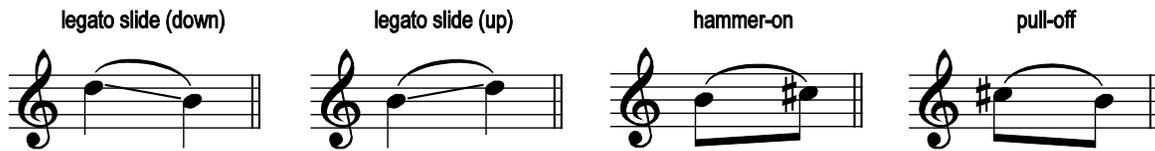
### How to select a chord instrument (chord recognition)

You can select a chord by pressing the [chord notes](#) within the instrument select key switch range (C-2 - E1). The root note needs to be the lowest. After selecting the chord, hit just the root note within the Normal Key range (E3 - C7) to play the chord.

### [Tips]

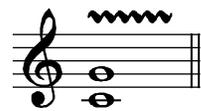
Did you notice that some of the instruments (dyad chords and some user chords) are not found in the list above? Don't worry; you can select chord instruments using the chord recognition feature. That's why the chords are assigned to the lower key switch ranges and some of the chords are not assigned to the key switches

## Realtime Legato Slide / Realtime Hammer-on& Pull-off



You can play legato slide by holding down one note while playing the next note to connect those notes within the Normal Key range. Realtime Hammer-on&Pull-off is available with single note instrument. Realtime Legato Slide feature is available with all the instruments including chord instruments except FX instruments and Percussions. (not available when the 'prefer open / low chord' is active)

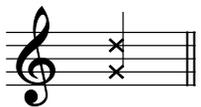
## Vibrato



Vibrato can be played using Aftertouch. If your keyboard doesn't have Aftertouch function but has an assignable slider or a knob, you can assign Aftertouch to the slider / knob.

You can also handle Aftertouch using your DAW. For detail about Aftertouch, please refer to your keyboard controller manual and DAW manual. Vibrato is available with the single note instruments and dyad chords.

## Picking noise



You can play picking noise using the [Play Key](#); G#1. When a chord instrument is active, the Play Key triggers a real pre-recorded chord strum noise.

## Mute



P.M.:-----|

Mute is available using Modulation wheel (CC#1) or velocity switch with all the instruments except FX instruments, Natural harmonics and Percussions. You can also play picking noise using Modulation wheel (CC#1).

### default setting:

[mute mode](#): mod wheel

mute MIDI CC# 1 threshold: 31

picking noise MIDI CC# 1 threshold: 126

Mute is played if the value of MIDI CC# 1 is higher than 31. Picking noise is played if the value of the MIDI CC# 1 is 127.

## Gliss down (using Hold Key)



### Hold Key: F#1

Gliss down samples can be played using the Hold Key; F#1. If you release the original note (played within the Normal Key range) while F#1 is held down, the original note is stopped and a gliss down sample is triggered. Gliss down is available with all the instruments except FX instruments and Percussions.

You can assign gliss down to a different Play Key. For detail, please refer to the ['Play Keys \(hold keys and stop keys\)'](#) section.

### Gliss down speed

3 types of gliss down speed (fast, mid, slow) are available. You can also select the gliss down speed in the [Play Keys](#) configuration page or MIDI CC# 4.

*\*Gliss down samples are not available on the 2nd fret or lower.*

MIDI CC# 4	gliss down speed
0 – 42	fast
43 – 85	mid
86 – 127	slow

## Fast / Slow stroke

You can switch fast / slow stroke using MIDI CC# 3 if a chord instrument is selected.

### MIDI CC# 3

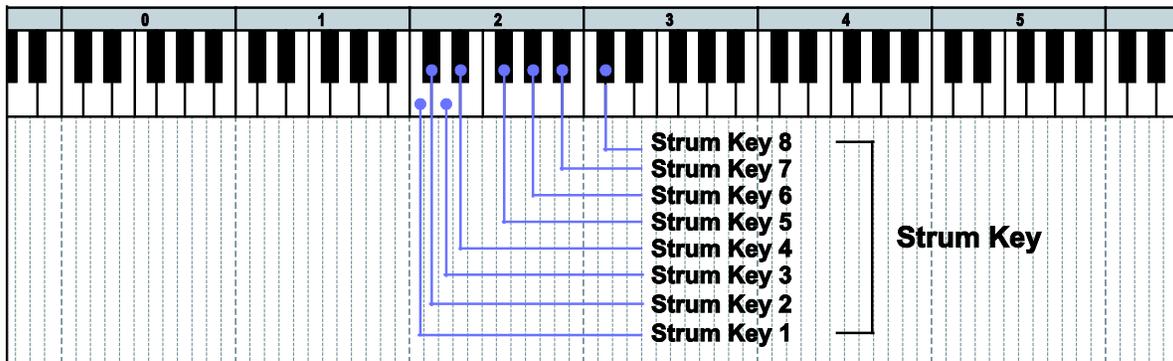
0 – 63: fast stroke

64 – 127: slow stroke

The each stroke speed can be controlled via MIDI CC# 22 & 23. (emulated chords only) For detail, please refer to the [stroke speed](#) section.

# Strum Key

The Strum Keys can be customized. For details, please refer to the ['Strum setting'](#) section.



## Strum Key 1 [C2]: full strum down stroke

Normal sustain down stroke samples (all strings) are triggered.

## Strum Key 2 [C#2]: full strum up stroke

Normal sustain up stroke samples (all strings) are triggered.

## Strum Key 3 [D2]: mute down stroke

Mute down stroke samples (string 4, 5, and 6) are triggered. String 1, 2, and 3 are stopped and not strummed.

## Strum Key 4 [D#2]: mute up stroke

Mute up stroke samples (string 4, 5, and 6) are triggered. String 1, 2, and 3 are stopped and not strummed.

## Strum Key 5 [F#2]: lower strings down stroke

Normal sustain down stroke samples (string 4, 5, and 6) are triggered. It neither stops nor strums string 1, 2, and 3.

## Strum Key 6 [G#2]: lower strings up stroke

Normal sustain up stroke samples (string 4, 5, and 6) are triggered. It neither stops nor strums string 1, 2, and 3.

## Strum Key 7 [A#2]: higher strings down stroke

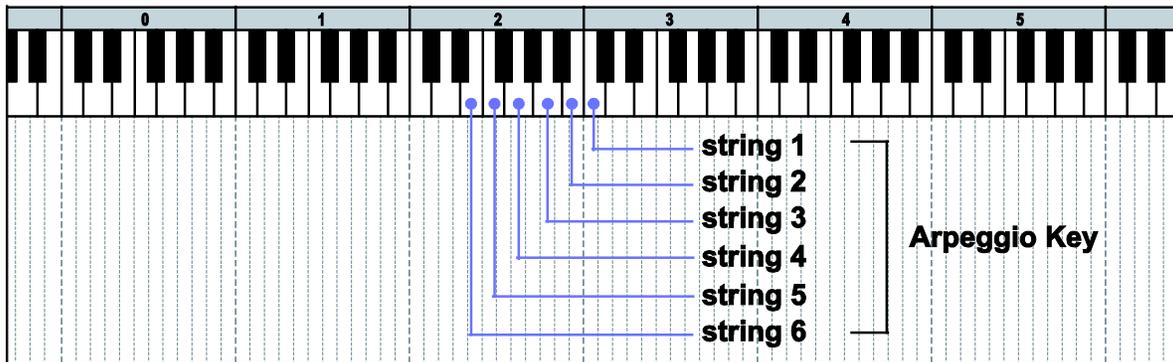
Normal sustain down stroke samples (string 1, 2, and 3) are triggered. It neither stops nor strums string 4, 5, and 6.

## Strum Key 8 [C#3]: higher strings up stroke

Normal sustain up stroke samples (string 1, 2, and 3) are triggered. It neither stops nor strums string 4, 5, and 6.

*If a single note instrument is active, the Strum Keys work as 'repeat same note' keys. (The [strum settings](#) are ignored.) The Strum Keys don't work with the FX instruments and Percussions (The note is released when the Strum Key is used and no samples are triggered.).*

## Arpeggio Key



Arpeggio Key is a dedicated key for each string. When a chord instrument is selected, each note of the chord is automatically assigned to the Arpeggio Key for the string so you can play arpeggio with the keys.

For example, if the chord; Em7 (root: string6) is played or selected, the following notes are assigned to the Arpeggio Keys;

C3 (string 1): E

B2 (string 2): B

A2 (string 3): G

G2 (string 4): D

F2 (string 5): B

E2 (string 6): E

If the chord is Aadd9 (root: string 5);

C3 (string 1): E

B2 (string 2): B

A2 (string 3): A

G2 (string 4): E

F2 (string 5): A

E2 (string 6): no sound

If the chord is octave-dyad (root: B on string 5);

C3 (string 1): no sound

B2 (string 2): no sound

A2 (string 3): B

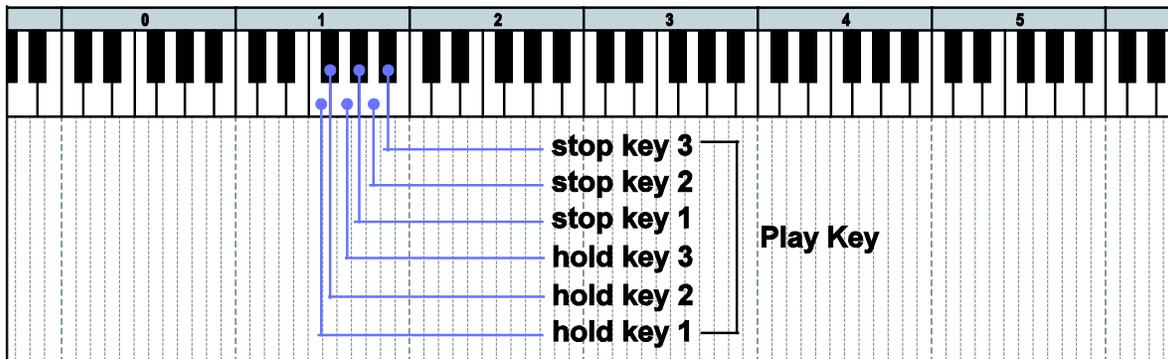
G2 (string 4): picking noise

F2 (string 5): B

E2 (string 6): no sound

*\*This feature is not a so-called 'Arpeggiator'. This is a feature that enables you to play a certain note (string) of the chord individually.*

## Play Key



### **Hold Key 1 [F1]: finger release noise and fret noise**

Pick stop noise and finger release noise are triggered when the note is released while the Hold Key; F1 is held down.

### **Hold Key 2\* [F#1]: gliss down**

Gliss down is triggered when the note is released while the Hold Key; F#1 is held down.

### **Hold Key 3 [G1]: fret noise & position change noise**

Fret noise and position change noise are triggered when the note is released while the Hold Key; G1 is held down.

### **Stop Key 1 [G#1]: picking noise**

Picking noise is triggered when the Stop Key; G#1 is pressed.

### **Stop Key 2 [A1]: muted brush noise**

Bridge mute noise is triggered when the Stop Key; A1 is pressed.

### **Stop Key 3 [A#1]: repeat same note**

The same note as the previous one is triggered when the Stop Key; A#1 is pressed.

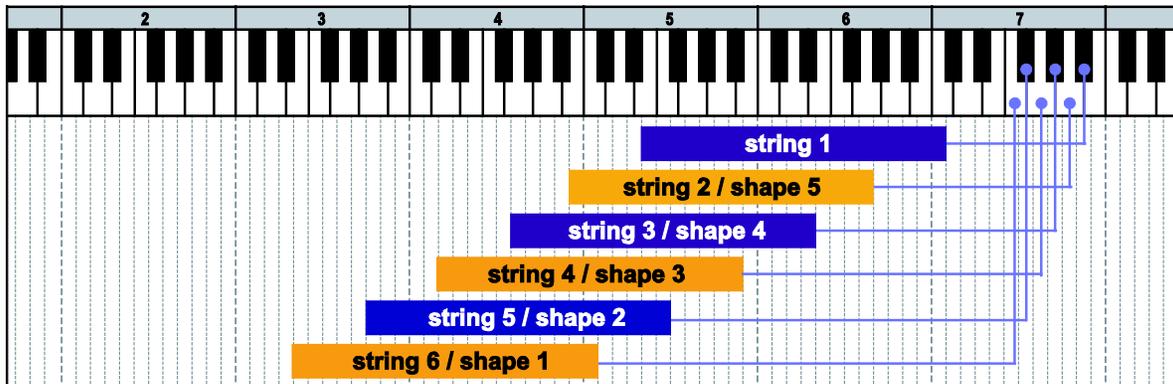
*\* not available with the FX instruments and Percussions (The note is released and no samples are triggered when the Play Key is used.)*

The Play Keys can be customized. For details, please refer to the '[Play Keys \(hold keys and stop keys\)](#)' section.

## String / chord shape select key switch

The SPI automatically selects a proper string / fret position depending on the situation, but you can change the string (or root string) for the next note manually by pressing the string select key switch. The string key switches work only to the next note. (The string select key switches are customizable. For detail, please refer to the '[String / chord shape select key switches](#)' section.) The string key switches also work as 'chord shape select key switches'. If you would like to use a different chord shape of the chord, you can select it using this feature. You can find what chord shape variations are available in the [Mapping & Key range](#).

### String / chord shape select key switch (default)



### MIDI note names and note numbers

key switch	MIDI note #	string / chord shape
A#7	118	String 1
A7	117	String 2 / chord shape 5
G#7	116	String 3 / chord shape 4
G7	115	String 4 / chord shape 3
F#7	114	String 5 / chord shape 2
F7	113	String 6 / chord shape 1

## Forced string select via MIDI CC

You can forcedly stay on the same string by using MIDI CC# 53.

### MIDI CC# 53:

0: forced string select OFF

1 - 21: string 6 / chord shape 1

22 - 43: string 5 / chord shape 2

44 - 65: string 4 / chord shape 3

66 - 87: string 3 / chord shape 4

88 - 99: string 2 / chord shape 5

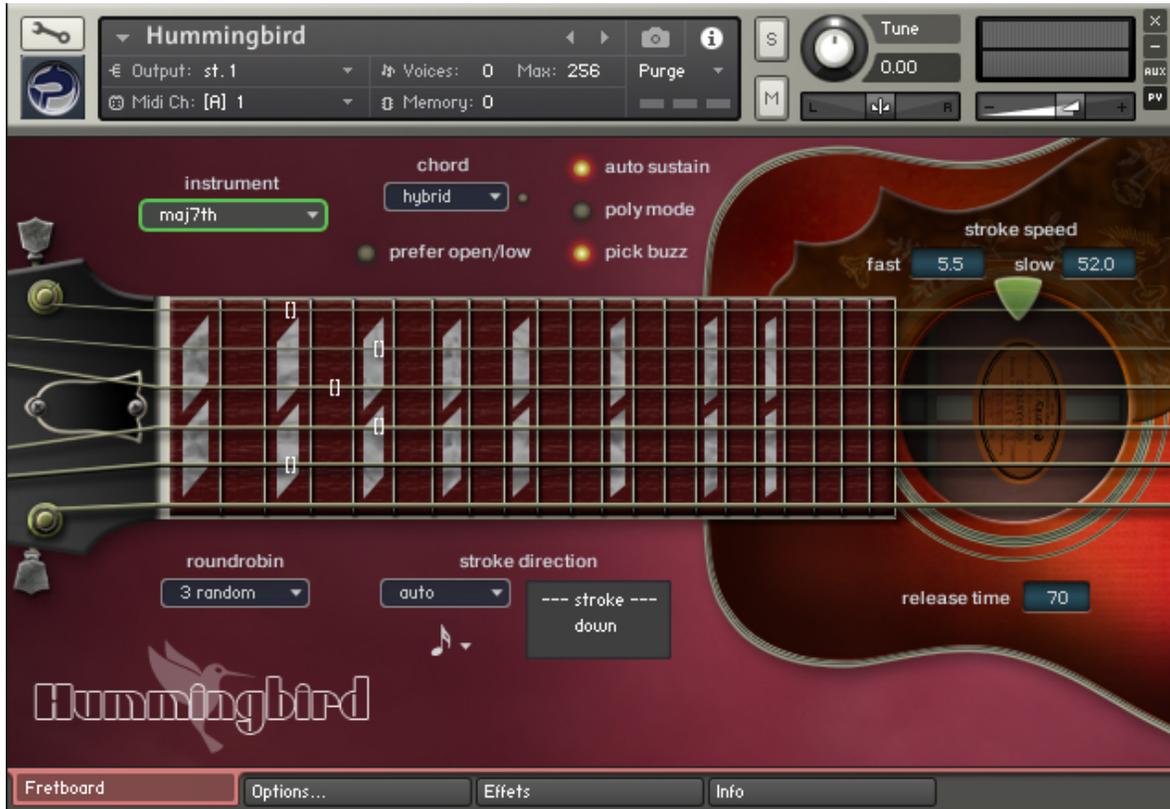
100 - 127: string 1

**[Tips]** Unlike 'Forced string select key switches', MIDI CC# 53 enables you to stay on the same string unless the note is out of the [range](#) of the string.



**Customizing Instruments**

# Fretboard



The Fretboard Monitor visualizes the current stroke direction / fret position / playing technique you are playing. The SPI automatically selects a proper string / chord shape (fret position) depending on the situation. You can also change the string / chord shape manually by String / Chord shape Select Key Switches or MIDI CC# 53.



Click the 'Fretboard' tab to show the fretboard monitor.

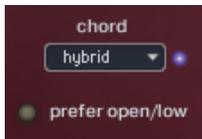
## Instrument



shows what instrument is currently selected. You can click this pull-down menu and select the instrument (articulation) you would like to play.

## Chord

(works only with chord instruments)



### Sampled chord mode

Hybrid - triggers real recorded chord samples if available, emulated chords are played if real recorded samples are not available. When a real recorded sample is triggered, the blue LED next to the pull down menu glows.

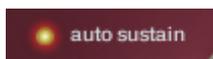
emulated - plays only emulated chords using single note samples, no real recorded chord samples are triggered.

The Sampled chord mode can also be selected via MIDI CC# 24.

### prefer open/low:

If the 'prefer open/low' is ON, open chord / low position are automatically selected regardless the situation. This feature can also be turned ON / OFF via MIDI CC# 21. (*Legato Slide is not available if this feature is ON.*)

## Auto sustain



With the Auto Sustain feature, you can avoid unwanted staccato that is caused by note-off when the same note (key) is repeated. After note-on, the note keeps playing until;

- the next note-on event
- Hold Key or Stop Key is triggered
- the sample is streamed to the end of it.

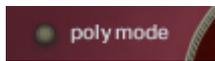
The previous note is cancelled automatically when a new note is triggered. That means your both hands are free until a new note is triggered. This feature gives you time to press a key switch or move a controller and you are able to be ready for next note without stopping your performance. That is why SPI enables you to control and switch the various articulations smoothly with a single MIDI channel in real time. If the auto sustain is OFF, the sample stops playing when the note is released. You can also turn ON / OFF the auto sustain through MIDI CC# 54.

### Tips - playing arpeggio using sustain pedal (temporary poly mode):

Besides using the Arpeggio Keys, you can also do arpeggio using sustain pedal (MIDI CC# 64) if a single note instrument is selected. While sustain pedal is ON, the poly mode is temporarily activated and you can play polyphonic and the samples continue playing even if the note is released because the sustain pedal is ON. When the new note is the same as one of the notes that is currently sustained by sustain pedal, the same old note is canceled automatically. (In short, no duplicate notes are played.) When the sustain pedal is released (=OFF), the temporary poly mode is turned OFF automatically.

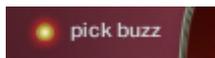
## Poly mode

(works only with single note instruments)



Poly mode enables you to play polyphonic. This feature is available only with single note instruments. You can also turn ON / OFF the poly mode through MIDI CC# 56.

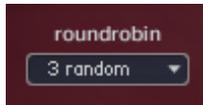
## Pick buzz



If pick buzz is ON, a slight pick buzz sound is added to the attack of the note, and the guitar sound becomes more realistic and natural. You can also turn ON / OFF the pick buzz through MIDI CC# 25.

## Roundrobin mode

(works only with single note instruments)

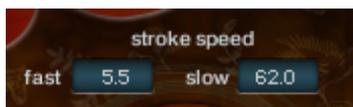


Four types of Roundrobin mode are available. It can be selected from the pull-down menu. You can also select the Roundrobin mode through MIDI CC# 42.

MIDI CC# 42	Roundrobin mode
0 – 31	OFF
32 – 63	2 roundrobin
64 – 95	3 random
96 - 127	4 random

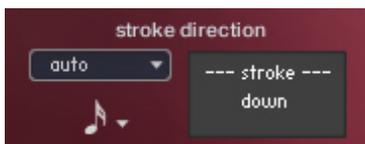
## Stroke speed

(works only with emulated chords)



The value shows a time lag between two strings in milliseconds. If fast stroke is active (MIDI CC# 3: 0 – 63), the value of the 'fast' is used and if slow stroke (MIDI CC# 3: 64 - 127) is active, the value of 'slow' is used. The stroke speed can be changed through MIDI CC# 22 (fast stroke) and MIDI CC# 23 (slow stroke).

## Stroke direction (Auto Stroke Direction)



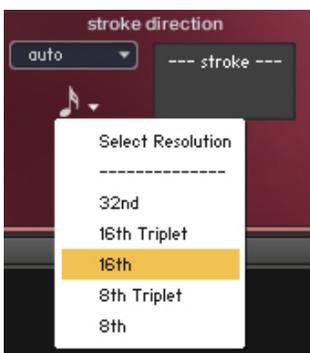
### Auto alternation modes



There are four stroke modes. You can also change the stroke mode using MIDI CC# 58.

<b>time recognition</b> (MIDI CC# 58: 0 - 31)	SPI automatically detects the current beat position and identify proper stroke direction (down or up).
<b>forced</b> (MIDI CC# 58: 32 - 63)	Down stroke and up stroke are played alternately regardless of the current beat position.
<b>down only</b> (MIDI CC# 58: 64 - 95)	Only down stroke is played regardless of the current beat position.
<b>up only</b> (MIDI CC# 58: 96 - 127)	Only up stroke is played regardless of the current beat position.

## Resolution



When the stroke more is 'auto', the resolution is shown. The stroke direction is determined according to the current beat position and the resolution. You can also change the resolution using MIDI CC# 57.

midi CC# 57	resolution
0 - 25	8th
26 - 50	8th Triplet
51 - 75	16th
76 - 100	16th Triplet
101 - 127	32nd

## Stroke information window



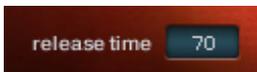
'down stroke' is detected, or 'down only' mode is active.



'up stroke' is detected, or 'up only' mode is active.

**[note]** Auto stroke detection mode does not work while the sequencer stops because no beat information is generated unless the sequencer is being played.

## Release time



When a new note is triggered, the previous note is automatically released. You can adjust the release time of the previous note so that the previous note is connected with the current note smoothly. The range; 50 – 80 is recommended. It depends on the instrument, tempo, and how the sound is processed (reverb, etc.) The release time can be controlled through MIDI CC# 62.

# Instrument select key switches



## Instrument Key Switch with chord recognition

You can instantly select an instrument (articulation) using the Instrument Select Key Switches. All the instruments can be assigned to any key switches and you can create your own key switch mapping. The key switches have a chord recognition feature that enables you to select a chord instrument by not only hitting a key that the chord is assigned, but also by hitting the chord notes (= '[Chord Recognition Intervals](#)') in the key switch range. In other words, you don't need to memorize the key switches for the chord instruments. Just hold the chord notes in the key switch range, and you are ready to play the chord.

We recommend you to assign single note instruments, FX instruments, and other instruments that you frequently use to higher keys in the key switch range because you can select chord instruments using the chord recognition feature.

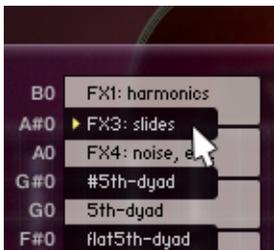
## How to check and change the instrument select key switch settings...



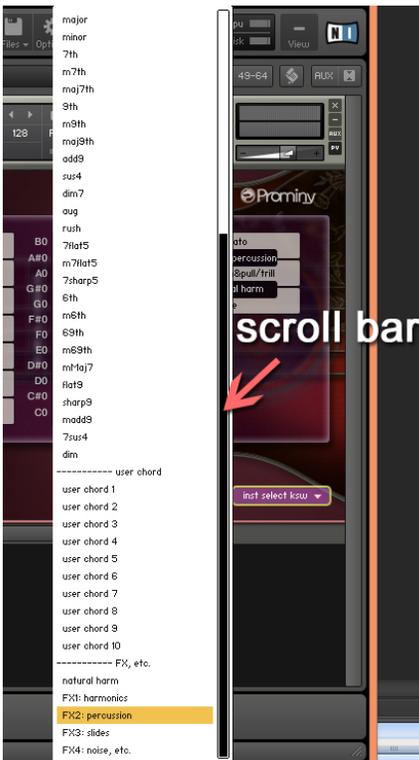
Click the 'options...' tab.



Click the pull-down menu on the lower right of the interface and select the 'inst select ksw'.



Click the key you would like to change...



and select the instrument you would like to assign to the key switch from the pull-down menu.

*\* There is a scroll bar on the right side of the menu. Scroll down if you would like to select a FX instrument.*



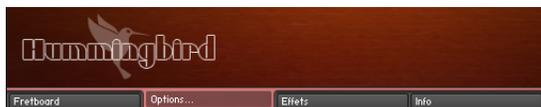
# Strum setting



## [Note]

The Strum setting works only with emulated chords. If one (or more) of the parameters of the strum key / normal key is edited and you play a chord instrument with the strum key / normal key, an emulated chord is forcedly played even if a sampled chord is available ([hybrid mode](#)). To play sampled chords, reset the strum key / normal key by clicking the reset button.

## How to check and change the strum settings...



Click the 'options...' tab.



Click the pull-down menu on the lower right of the interface and select the 'strum setting'.

## Target strum key



Select the target strum key (or normal key) to edit from the pull-down menu.

## Stroke direction (normal key)



If the 'normal key' is selected as a target strum key to edit, you can select the stroke direction from; 'auto', 'down, and 'up'. If the

'auto' is selected the resolution can be selected here. You can also edit the stroke direction setting of the normal key in the [Fretboard](#).

## Stroke direction (strum key 1 - 8)



If the 'strum key (1 - 8)' is selected as a target strum key to edit, you can select the stroke direction from ; 'normal', 'down, and

'up'. If the 'normal' is selected, the stroke direction setting of the normal key is used.

## String ON / OFF



You can choose which strings are strummed. If the button of the string is OFF, the string is not strummed and the sound of the string is stopped if it is sounding.

*This setting is ignored if a single note instrument is selected.*

## Vel. Rate (%)



You can change the velocity rate of each string. For example, if the note-on velocity is 100 and the velocity rate of the string is 90 %, the string is strummed with the velocity 90. If the note-on velocity is 127 and the velocity rate of the string is 100 %, the string is strummed with the velocity 127.

*This setting is ignored if a single note instrument is selected.*

## Type



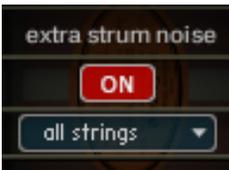
You can configure how the string is played.

### 'do nothing'

Unlike the string ON / OFF button, the 'do nothing' does not stop the sound of the string. It neither strums nor stops. This can be used if you would like to strum some of the strings without re-strumming the other strings. If you select the 'do nothing', the string ON / OFF button needs to be ON. Otherwise, the sound of the string is stopped.

*This setting is ignored if a single note instrument is selected.*

## Extra strum noise



### ON / OFF

If the Extra Strum Noise is ON, a strum noise sound is added to the emulated chord.

### Strum noise type

There are three types of the extra strum noises;

all strings: strum noise that the string 1, 2, 3, 4, 5, and 6 are strummed

lower strings: strum noise that the string 4, 5, and 6 are strummed.

upper strings: strum noise that the string 1, 2, and 3 are strummed.

The volume of extra strum noise can be controlled via MIDI CC# 82.

*This feature works only with emulated chords, not available with sampled chords / single note instruments.*

## Reset



This button resets the setting of the strum key / normal key.

## How to configure the Strum setting via MIDI CC#

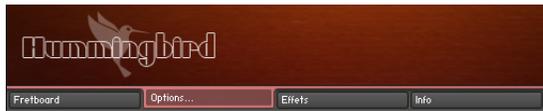
You can also configure the Strum setting through the MIDI CC# 28, 74, 75, 76, 77, 78, 80, and 81. For example; if you would like to turn OFF the string 1 of strum key 5, send the value 5 (= target strum key number) though MIDI CC# 74 and send the value 1 (= string number) though MIDI CC# 28, and then send the value 0 (0 - 63: OFF) through MIDI CC# 76.

<b>MIDI CC# 74</b>	<b>target strum key to edit</b> 0: normal key (E3 - C7) 1: strum key 1 (C2) 2: strum key 2 (C#2) 3: strum key 3 (D2) 4: strum key 4 (D#2) 5: strum key 5 (F#2) 6: strum key 6 (G#2) 7: strum key 7 (A#2) 8: strum key 8 (C#3)
<b>MIDI CC# 28</b>	<b>target string to edit</b> 0 : all strings 1: string 1 2: string 2 3: string 3 4: string 4 5: string 5 6: string 6
<b>MIDI CC# 75</b>	<b>strum key: stroke direction</b> 0 – 42: auto (time recognition) 43 – 85: down 86 – 127: up
<b>MIDI CC# 76</b>	<b>strum key: string ON / OFF</b> 0 - 63: OFF / 64 - 127: ON
<b>MIDI CC# 77</b>	<b>strum key: string velocity rate</b> 1 (min) - 100 (max)
<b>MIDI CC# 78</b>	<b>strum key: string strum type</b> 0 - 31: do nothing 32 – 63: normal sustain 64 – 95: mute 96 – 127: picking noise
<b>MIDI CC# 80</b>	<b>extra strum noise ON / OFF</b> 0 – 63: OFF / 64 – 127: ON
<b>MIDI CC# 81</b>	<b>extra strum noise type</b> 0 – 42: all strings 43 – 85: lower strings 86 – 127: upper strings

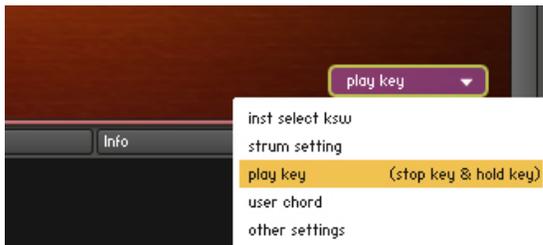
# Play Keys (hold keys and stop keys)



## How to check and configure the Play Key settings...



Click the 'options...' tab.



Click the pull-down menu on the lower right of the interface and select the 'play key'.



### Hold keys

When the original note is released while the hold key is held down, the original note is stopped and the selected samples are triggered. In the case of the picture above, if you release the original note while F#1 is held down, the original note is stopped and the gliss down is triggered. If you release the original note while F1 is held down, the pick stop noise and the finger release noise are triggered. If you release the original note while G1 is held down, no samples are triggered.

### Stop keys

The original note is stopped and the selected samples are triggered when the stop key is pressed. In the case of the picture above, the picking noise is triggered when G#1 is pressed. No samples are triggered when A1 is pressed. The same note as the previous one is repeated when A#1 is pressed.

\* *'repeat same note' and 'gliss down' cannot be selected with the other ones.*

**[Tips]** You can also assign the 'repeat same note' function to a Hold key. When the original note is released while the hold key that is used as a repeat key is held down, the original note is stopped and the same note samples are played. That allows you to play notes very fast, and is good for simulating tremolo playing technique.

## Configure Play Keys through MIDI CC

The buttons for each hold key / stop key can be turned on /off through MIDI CC# 114, 115, and 116.

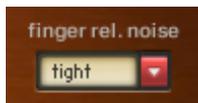
You can select the Play Key that you would like to configure through MIDI CC# 114.

Play Key	MIDI CC # 114
hold key 1	1
hold key 2	2
hold key 3	3
stop key 1	4
stop key 2	5
stop key 3	6

After selecting the target Play Key via MIDI CC# 114, select the target button via MIDI CC# 115, and the button can be turned on / off with the MIDI CC# 116.

button	MIDI CC# 115	MIDI CC# 116
picking noise	1	0 – 63: OFF 64 – 127: ON
pick stop noise	2	
finger rel. noise	3	
repeat same note	4	
gliss down	5	
bridge mute noise	6	
fret noise	7	
position change noise	8	
muted brush noise	9	
palm body hit	10	
finger body hit	11	
string mute buzz	12	

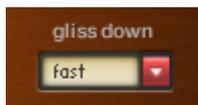
## Finger release noise



The finger release noise type can be selected here. You can also select it via MIDI CC# 41.

midi CC# 41	Finger release noise type
0 - 63	tight
64 - 127	loose

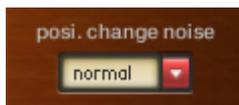
## Gliss down



You can play gliss down using [Play Keys](#). 3 types of gliss down speed (fast, mid, slow) are available. You can also select the gliss down speed through MIDI CC# 4.

MIDI CC# 4	Gliss down speed
0 – 42	fast
43 – 85	mid
86 – 127	slow

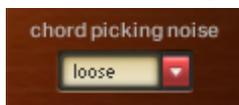
## Position change noise



Two types of position change noise are available. You can also select it via MIDI CC# 20.

midi CC# 20	Position change noise type
0 - 63	normal
64 - 127	loud

## Chord picking (strum) noise



Two types of chord picking noise are available. You can also select it via MIDI CC# 19.

midi CC# 19	Chord picking noise type
0 - 63	tight
64 - 127	loose

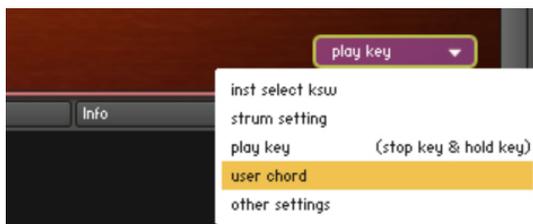
# User chord



## How to check and configure the user chord settings...

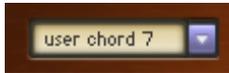


Click the 'options...' tab.



Click the pull-down menu on the lower right of the interface and select the 'user chord'.

## Target user chord



selects the target user chord to edit.

## Rename



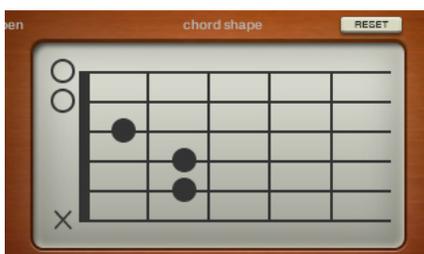
Click this button and rename the chord, and click the button again (or press the enter key of your keyboard) to apply the change.

## Always open



By turning ON the button, the string becomes 'open-string' (= 0 fret) regardless the position of the chord.

## Chord shape



You can create your own chord shapes here.

## Type



selects how the string is played.

## Root



selects the root string of the chord.

### Preview



You can preview the user chord.  
(Stop / Play / Stroke direction / Stroke speed)

### Reset

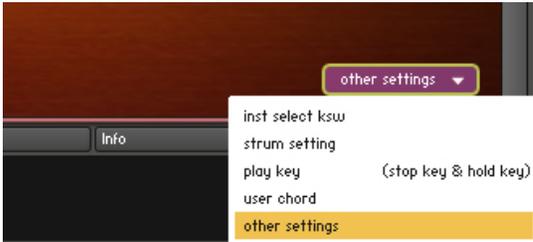


resets the setting of the user chord.

## Other settings



Click the 'options...' tab.



Click the pull-down menu on the menu and select the 'other settings' from the pull-down menu on the lower right of the interface.

## Mute / Picking noise (CC# 1 or velocity switch)

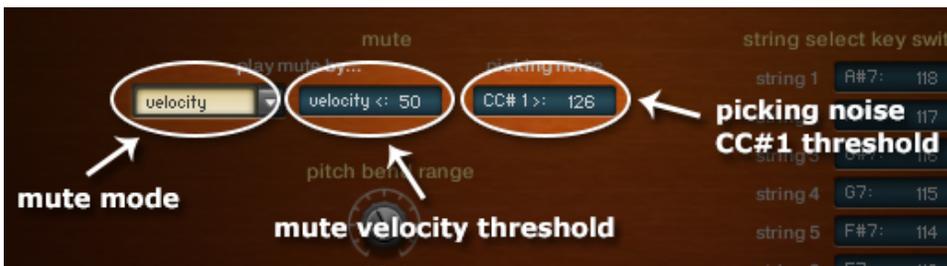
### Mute mode: mod wheel (MIDI CC# 1)

With this mode, mute and picking noise can be played using modulation wheel (MIDI CC# 1). Mute samples are triggered if the value of MIDI CC# 1 is larger than the MIDI CC# 1 threshold level. Picking noise samples are triggered if the value of MIDI CC# 1 is larger than the picking noise threshold level.



### Mute mode: velocity

With this mode, mute and picking noise can be played using velocity switch. Mute samples are triggered if the note velocity is lower than the mute velocity threshold level. Picking noise samples are triggered if the note velocity is lower than the mute velocity threshold level and the value of MIDI CC# 1 is larger than the picking noise threshold level.



Mute mode (mod wheel / velocity switch), and the threshold levels can be changed through the following MIDI CC numbers.

<b>MIDI CC# 48</b>	<b>mute mode</b> 0 - 63: modulation wheel (MIDI CC# 1) / 64 - 127: velocity
<b>MIDI CC# 49</b>	<b>picking noise MIDI CC#1 (mod wheel) threshold level</b>
<b>MIDI CC# 50</b>	<b>mute MIDI CC#1 (mod wheel) threshold level</b>
<b>MIDI CC# 51</b>	<b>mute velocity threshold level</b>

You can also play picking noise using [Hold key or Stop Key](#)

### Pitch bend range

default: 2 semi tones, max. 12 semi tones



Pitch bend range also can be changed through MIDI CC# 29.

### String / chord shape select key switches



default:

String 1: A#7 (MIDI note number: 118)

String 2 (or string 2 root or chord shape 5): A7 (MIDI note number: 117)

String 3 (or string 3 root or chord shape 4): G#7 (MIDI note number: 116)

String 4 (or string 4 root or chord shape 3): G7 (MIDI note number: 115)

String 5 (or string 5 root or chord shape 2): F#7 (MIDI note number: 114)

String 6 (or string 6 root or chord shape 1): F7 (MIDI note number: 113)

You can also change the string / chord shape select key switches via MIDI CC# 52. Send the MIDI note number you would like to use for the lowest key switch (= key switch for string 6) through MIDI CC# 52, and six consecutive MIDI note numbers are assigned to the strings automatically.

# Effects



Click the 'Effects' tab to show the effect settings.

## EQUALIZER

**LOW CUT:** Attenuates frequencies below the cutoff at a rate of -24 dB/octave.

**LOW GAIN:** Adjusts the amount of boost or cut at the LOW FRQ.

**LOW FRQ:** Adjusts the center frequency of the low frequency band at which the boost or cut will occur.

**LOW MID GAIN:** Adjusts the amount of boost or cut at the LOW MID FRQ.

**LOW MID FRQ:** Adjusts the center frequency of the low-mid frequency band at which the boost or cut will occur.

**LOW MID Q:** Controls the Quality (or Q) of the low-mid frequency band. For most EQs, the higher the quality, the narrower the frequency band, but with this EQ the control is reversed to match the hardware it emulates and becomes a bandwidth control.

**HIGH MID GAIN:** Adjusts the amount of boost or cut at the HIGH MID FRQ.

**HIGH MID FRQ:** Adjusts the center frequency of the high-mid frequency band at which the boost or cut will occur

**HIGH MID Q:** Controls the Quality (or Q) of the high-mid frequency band. For most EQs, the higher the quality, the narrower the frequency band, but with this EQ the control is reversed to match the hardware it emulates and becomes a bandwidth control.

**HIGH GAIN:** Adjusts the amount of boost or cut at the HF Frequency.

**HIGH FRQ:** Adjusts the center frequency of the high frequency band at which the boost or cut will occur.

## COMPRESSOR

Compressors are dynamic tools which automatically reduce the level of loud passages in a signal, thereby affecting the signal's dynamic range. They are invaluable tools for a lot of common tasks — for instance, they can be used for reducing level peaks, thereby allowing the overall signal volume to be turned up without making it clip, or in other words, increasing the average volume of a signal. By careful adjustment of the attack and release times, they can also modify signal transients. However, there is a point of diminishing returns; too much compression can result in a rather strained and weak sound.

**Threshold:** Sets a level threshold above which the Compressor starts working. Only levels that rise above this threshold will be reduced by the compression; signals that stay below it will be left unprocessed.

**Ratio:** Controls the amount of compression, expressed as a ratio of “input level change” against “output level change”. A Ratio of 1:1 means that no compression will be happening. A Ratio of 2:1 means that a level increase of 2 dB at the input will raise the output level by only 1 dB (keep in mind, though, that this applies only for input levels above the threshold). A 4:1 Ratio results in more aggressive compression, with a 4 dB level increase at the input causing a 1 dB increase at the output. Typical ratios for natural compression of instruments are between 2:1 and 4:1.

**Attack:** Adjusts the time the Compressor will take to reach the full Ratio value after an input signal exceeds the Threshold level. If you're using compression mainly for transparent dynamic reduction, values between 5 and 10 ms are a good starting point. Longer attack times can be useful for emphasizing transients and adding “punch” to a signal.

**Release:** Adjusts the time the compressor will take to fall back to non-compression after the input signal falls below the threshold. Typical values range from 50 to 250 ms.

**Output:** Controls the module's output level. This knob acts as a make-up gain control, which allows you to bring the output signal up to the same peak level as the input signal after compression. After you've found a compression setting, it's good practice to adjust the input and output signals so they have comparable levels, and then compare them via the Bypass button. This way, you can make sure your adjustment really made the signal sound better (and not just louder).

**TONE ADJUST:** Adjusts the tone of the sound after the compression.

## CHORUS

The Chorus module "thickens" the audio signal by splitting it up and detuning one version in relation to the original. Separate LFOs with an adjustable phase relationship detune each stereo channel independently for creating wide-panorama effects.

**Stereo Modeller:** This module allows you to control the width of your signal's stereo base, change the panning, and create a pseudo-stereo signal from mono sources. At the far left position, stereo signals will be summed to mono. Positive values will result in an artificial widening of stereo sources that has a tendency to apparently expand beyond the speakers, but watch out — just like the Pseudo Stereo feature, this tends to cause mono incompatibilities in your mix. (not recommended for the stereo / double-tracking instruments)

**Depth:** Adjusts the range of modulated detuning. Higher values give a more pronounced chorusing effect.

**Speed:** Adjusts the LFO speed.

**Phase:** Imparts an LFO phase difference between the left and the right stereo channel. This can considerably increase the width of the output signal's stereo base.

**Dry / Wet:** Adjusts the respective levels of the original and processed signals. Note that the typical chorus effect is created by the combination of both signals, so setting these to the same levels results in the most pronounced effect.

## REVERB

This module simulates the natural reverberation that occurs when a sound source is placed in an acoustic environment, thus adding a feeling of spaciousness to the sound.

**Pre-Delay:** Introduces a short delay between the direct signal and the reverb trail build-up. This corresponds to the natural reverberation behavior of large rooms, where a short time elapses before the first reflection of a sound wave returns from a wall.

**Size:** Adjusts the size of the simulated room. This affects the duration of the reverb trail.

**Colour:** This control allows you to adjust the construction material of the simulated room and, consequently, the color of the reverb trail. Low values simulate softer surfaces like wood, while high values simulate the reflection behavior of hard surfaces like concrete.

**Damping:** Sets the amount of simulated absorption that takes place in rooms due to furnishings, people, or acoustic treatments affecting the reflection behavior.

**Stereo:** Higher values increase the stereo base width of the output signal. Lower values simulate a closer distance to the sound source.

**Dry / Wet:** Adjusts the respective levels of the original and processed signals. In common scenarios, the reverb signal is mixed in at a lower level than the direct signal.

### Bypass all effects



If this button is ON, all the effects are bypassed.

### Save / Load



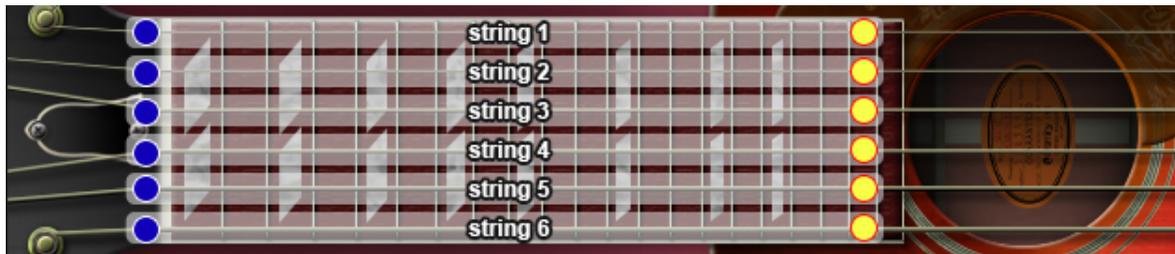
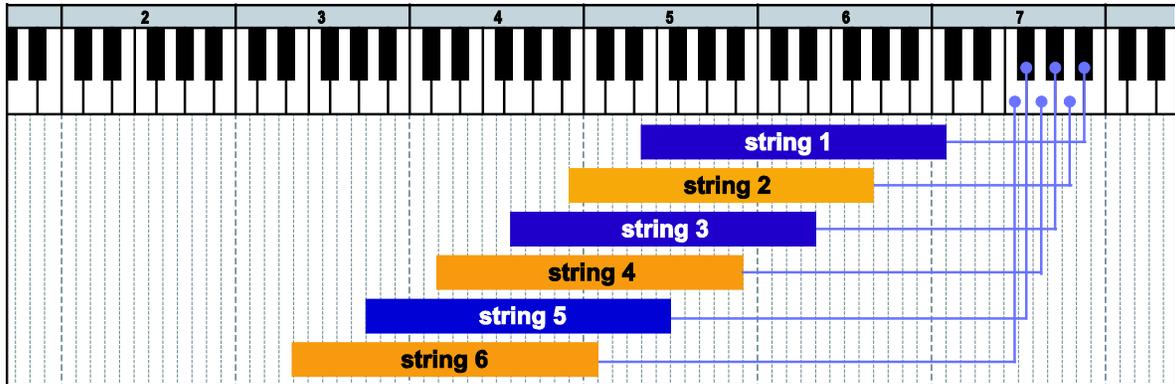
The effect settings can be saved / loaded as a file (.nka).

A stylized grey silhouette of a hummingbird in flight, facing right, positioned behind the word "Hummingbird".

# **Hummingbird**

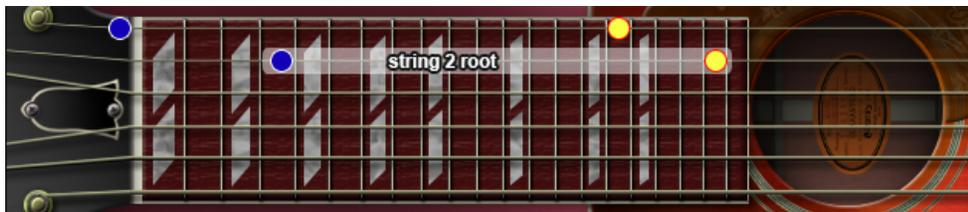
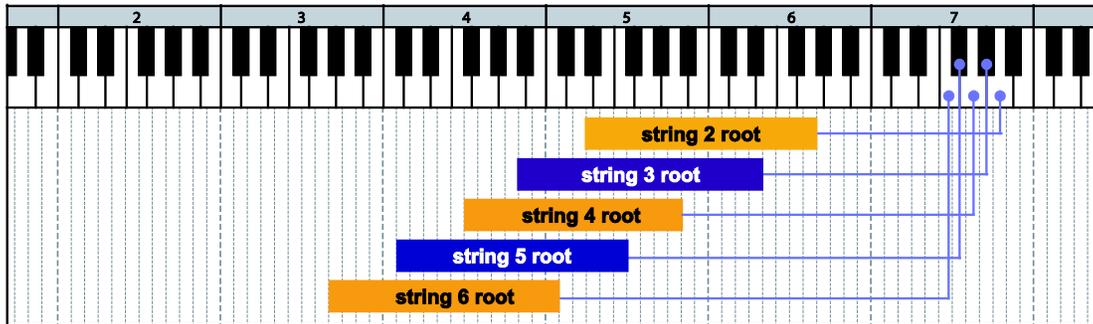
**Mapping & key range**

# single note



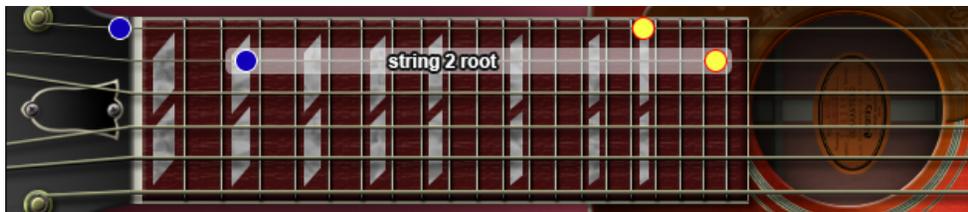
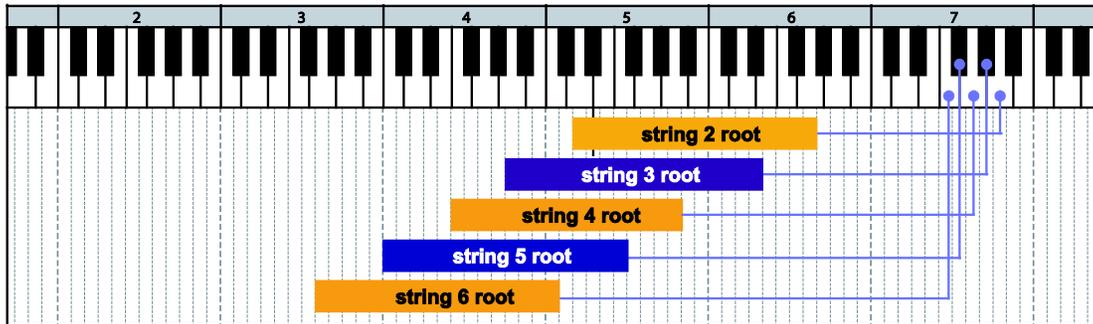
● = lowest position ● = highest position

# minor 2nd-dyad chord



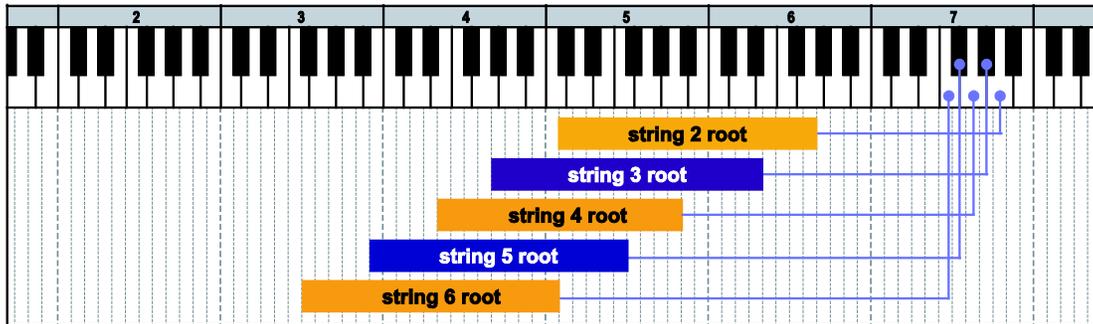
● = lowest position   ● = highest position

# major 2nd-dyad chord



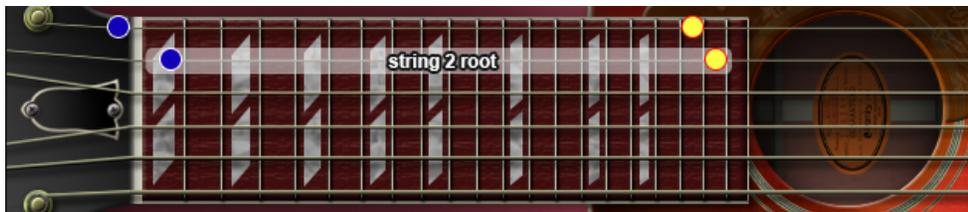
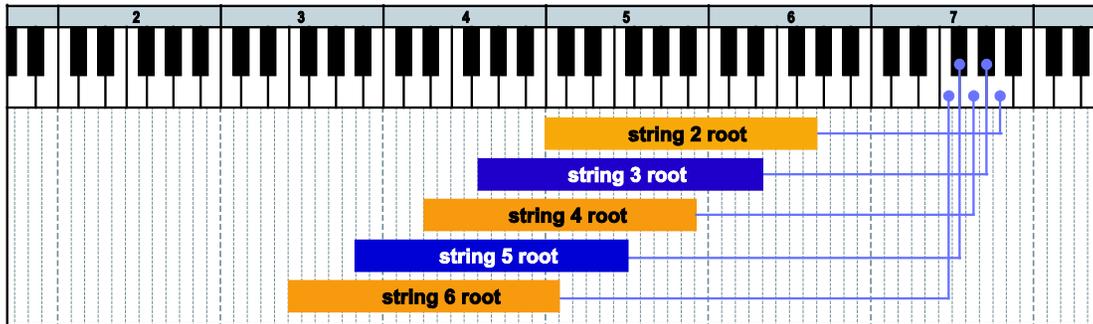
● = lowest position ● = highest position

# minor 3rd-dyad chord



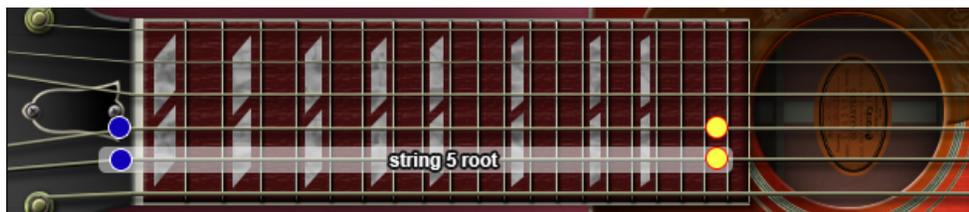
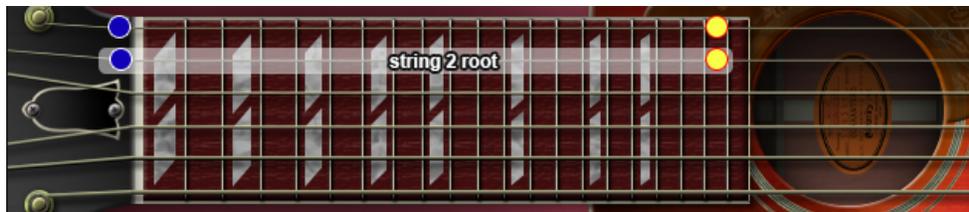
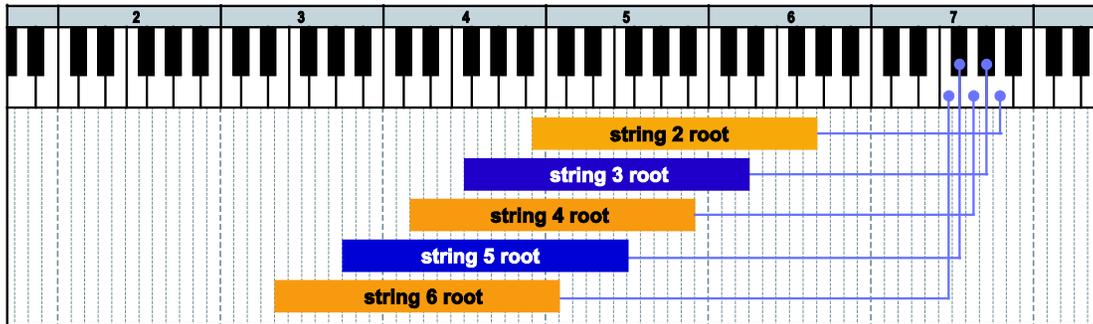
● = lowest position ● = highest position

# major 3rd-dyad chord



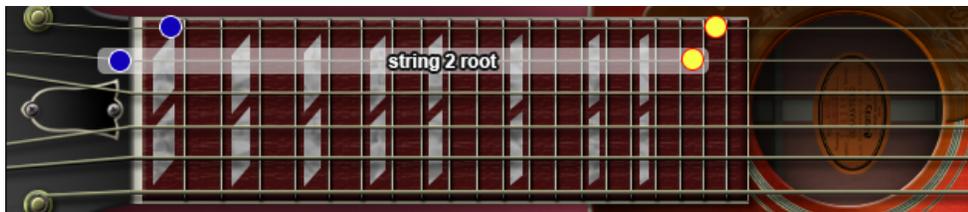
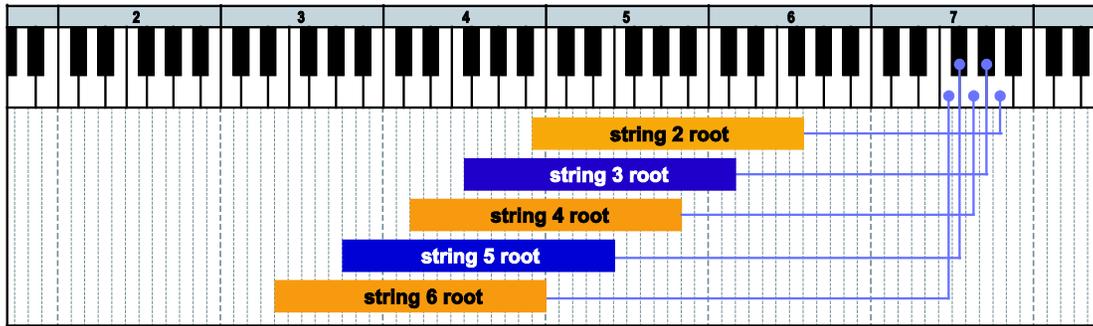
● = lowest position ● = highest position

# 4th-dyad chord



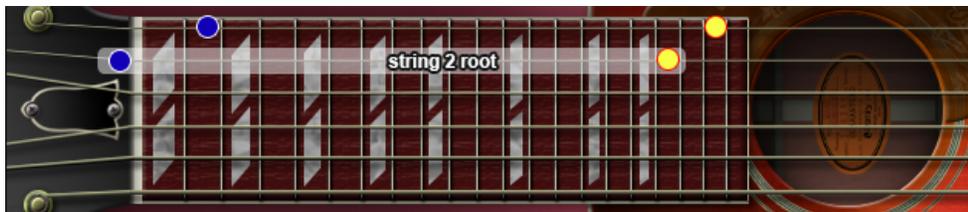
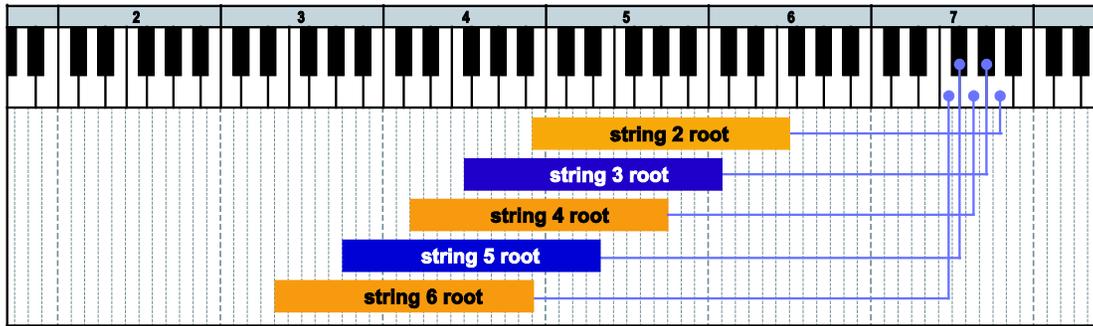
● = lowest position ● = highest position

# flat 5th-dyad chord



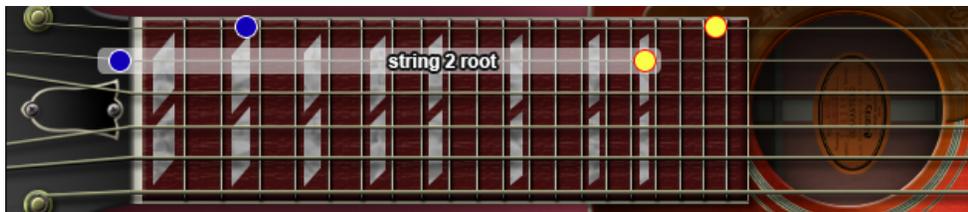
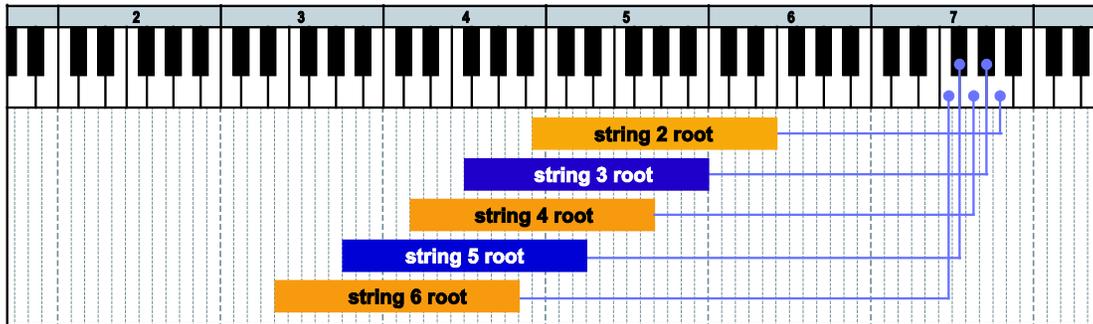
● = lowest position ● = highest position

# 5th-dyad chord



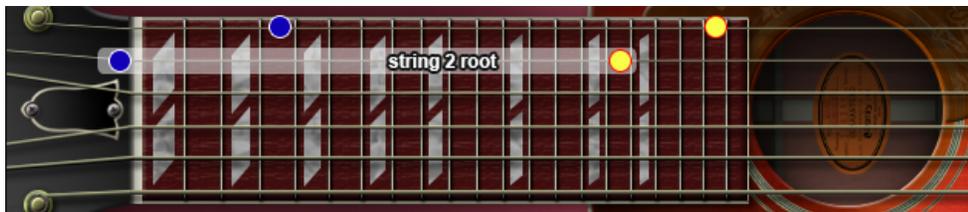
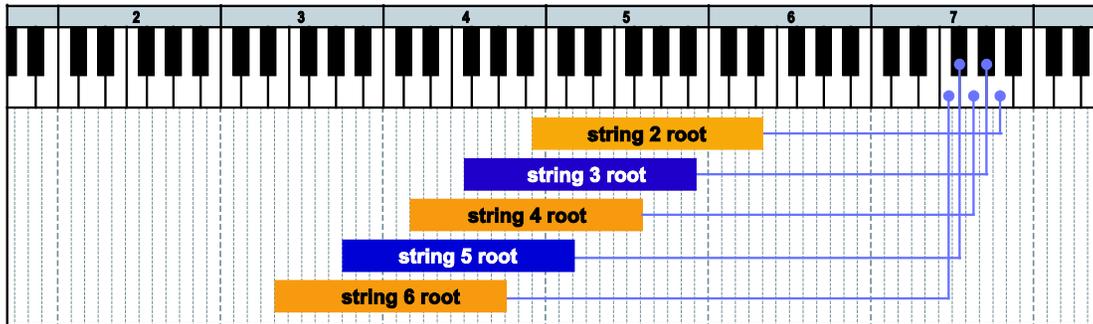
● = lowest position ● = highest position

# #5th-dyad chord



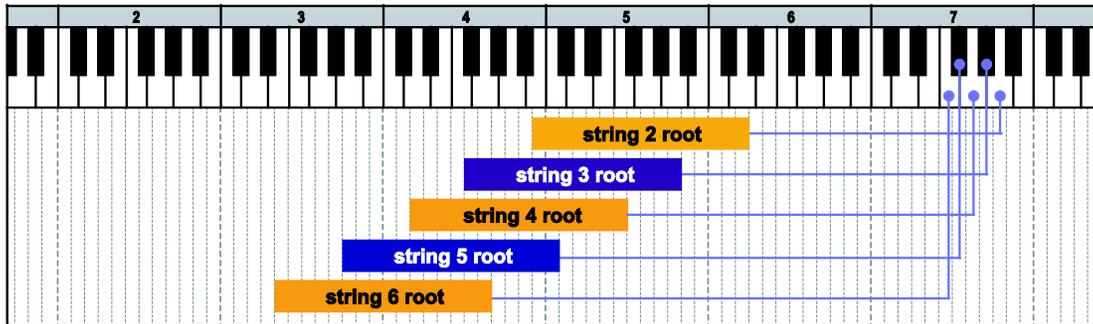
● = lowest position ● = highest position

# 6th-dyad chord



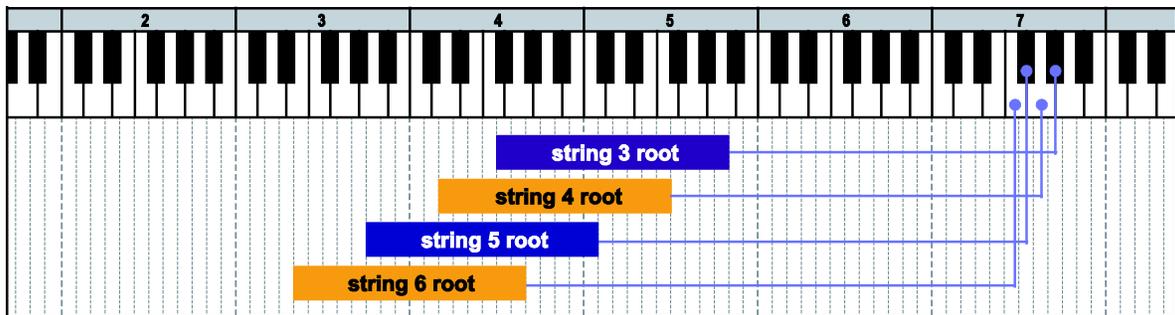
● = lowest position ● = highest position

# 7th-dyad chord



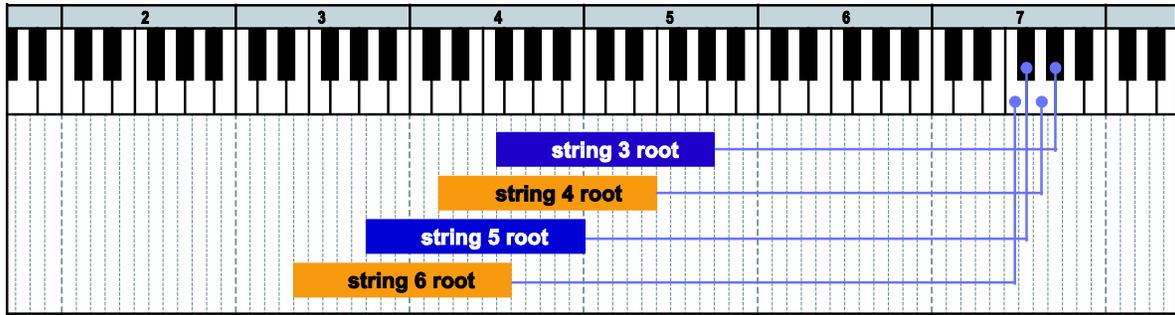
● = lowest position   ● = highest position

# major 7th-dyad chord



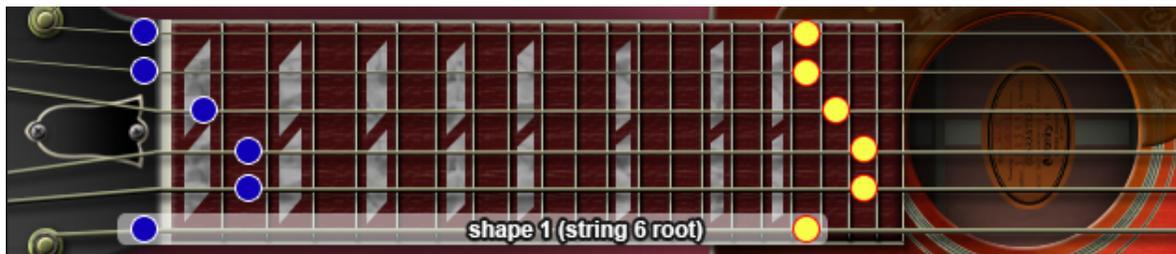
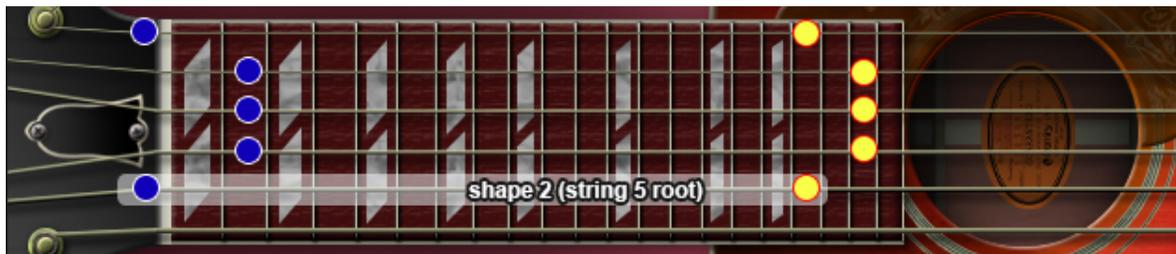
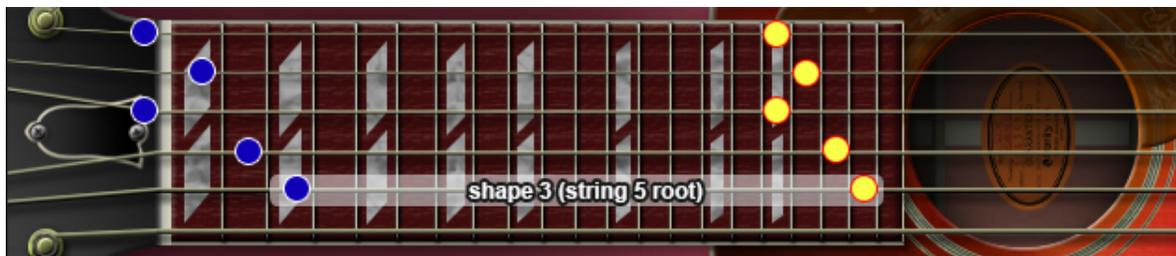
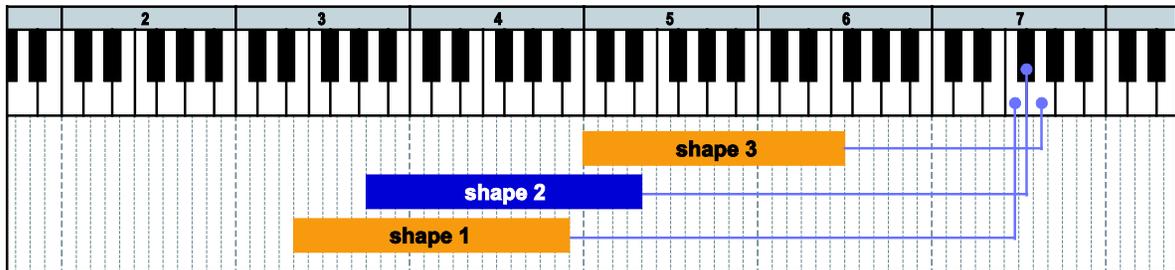
● = lowest position ● = highest position

# octave



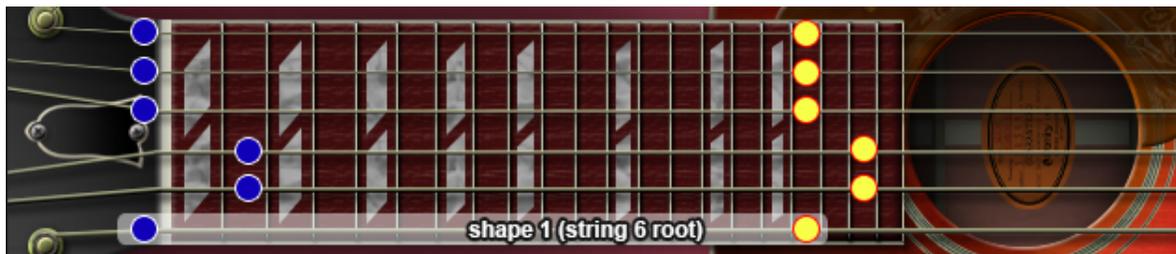
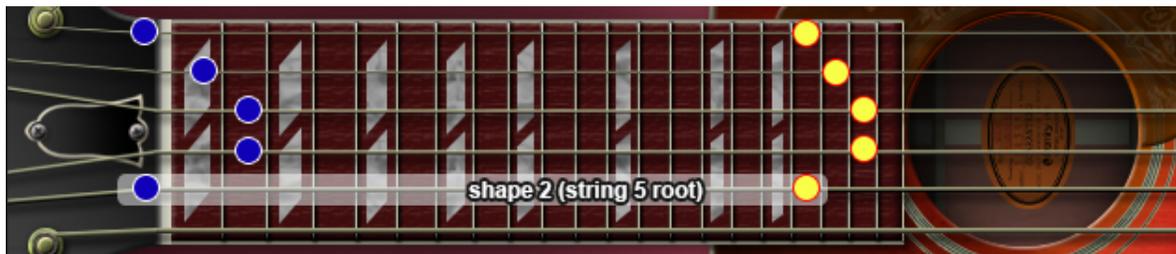
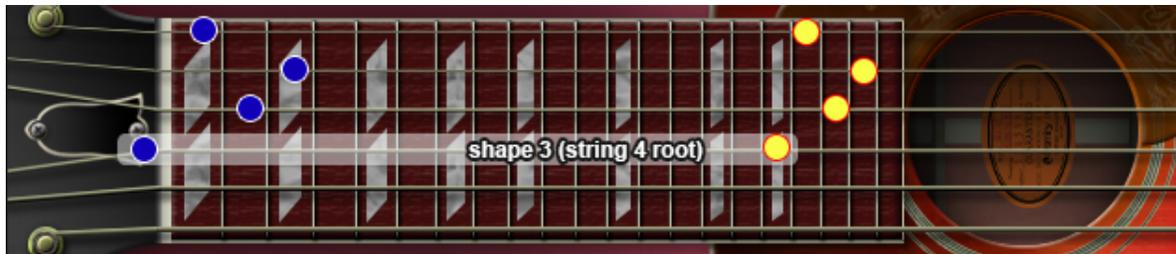
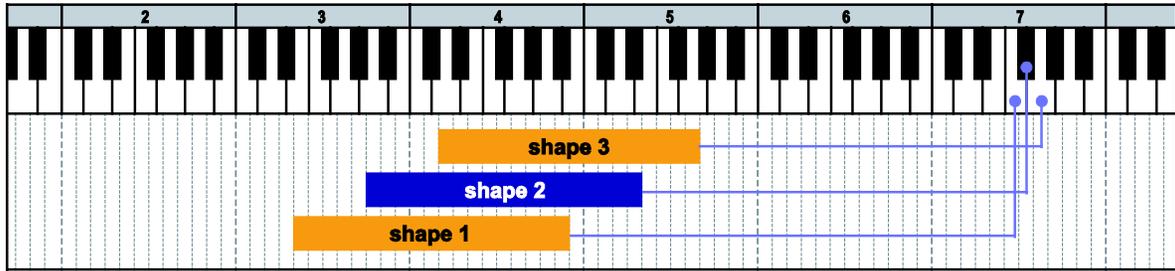
● = lowest position ● = highest position

# major



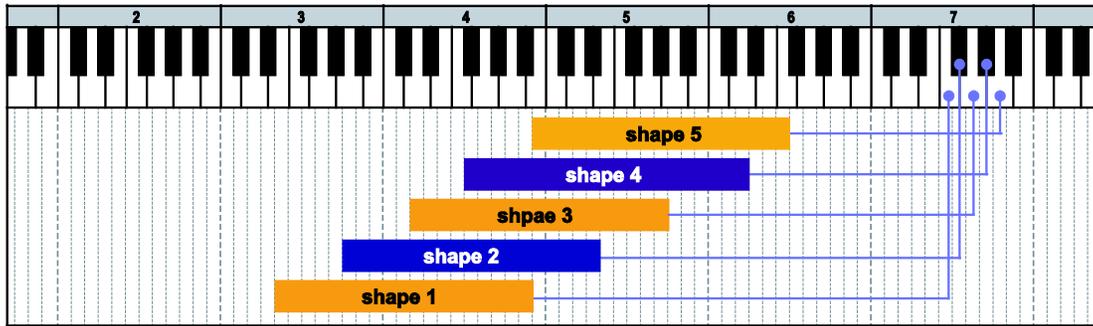
● = lowest position ● = highest position

# minor



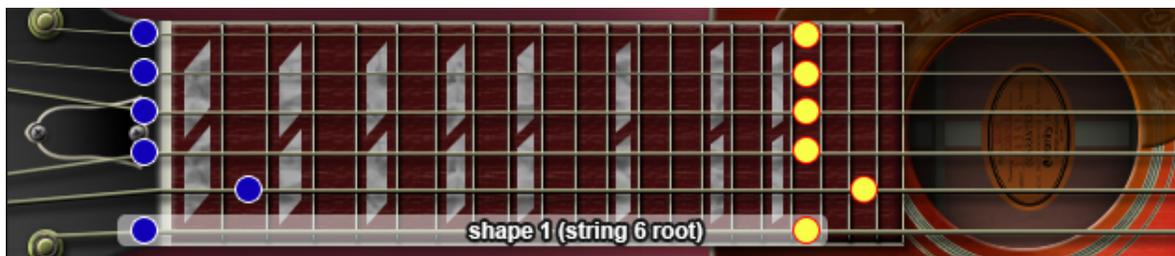
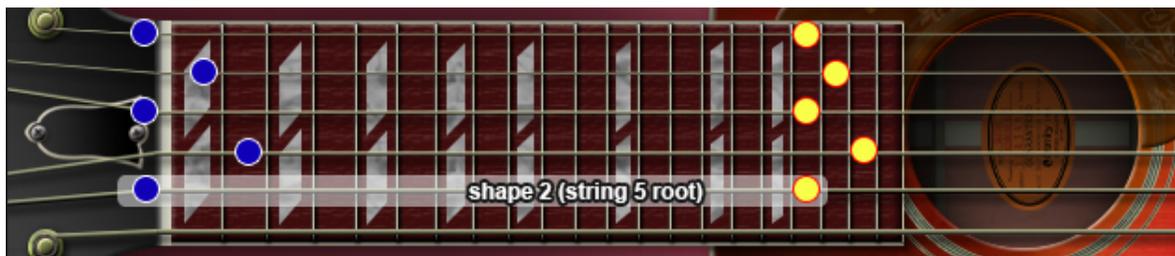
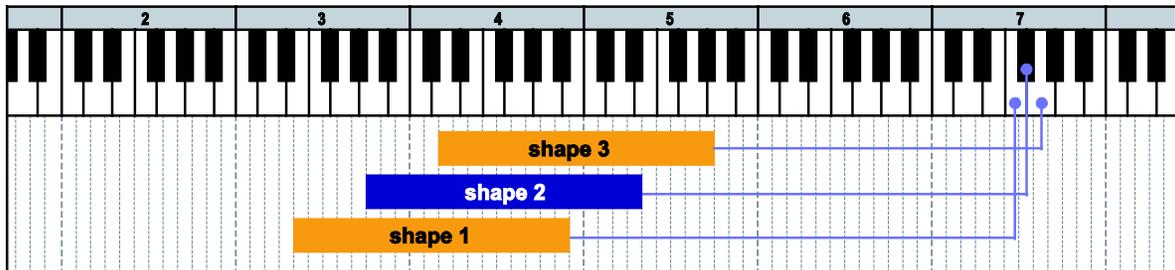
● = lowest position ● = highest position

# 7th



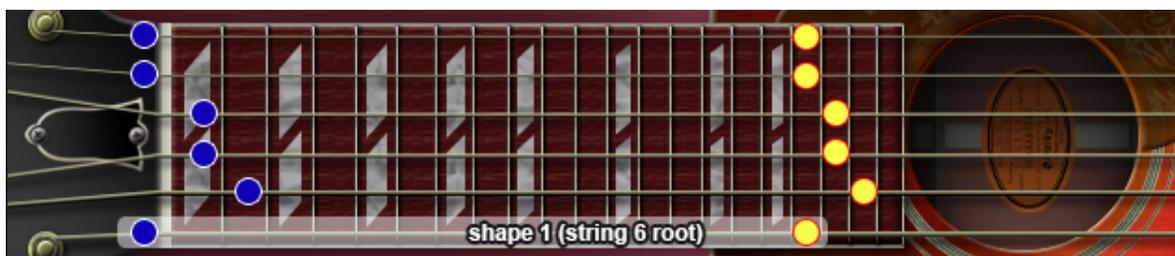
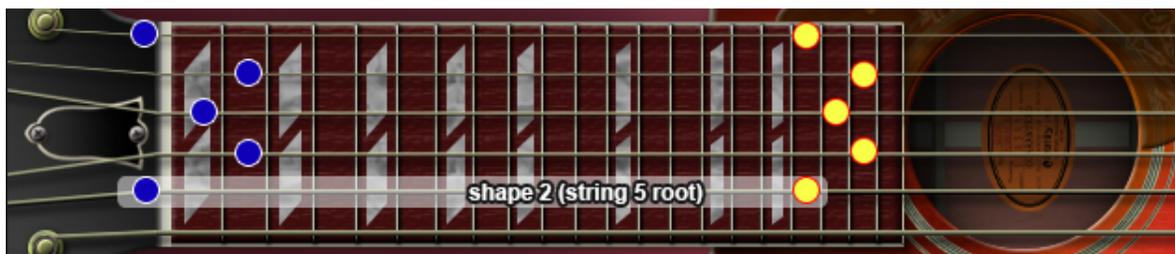
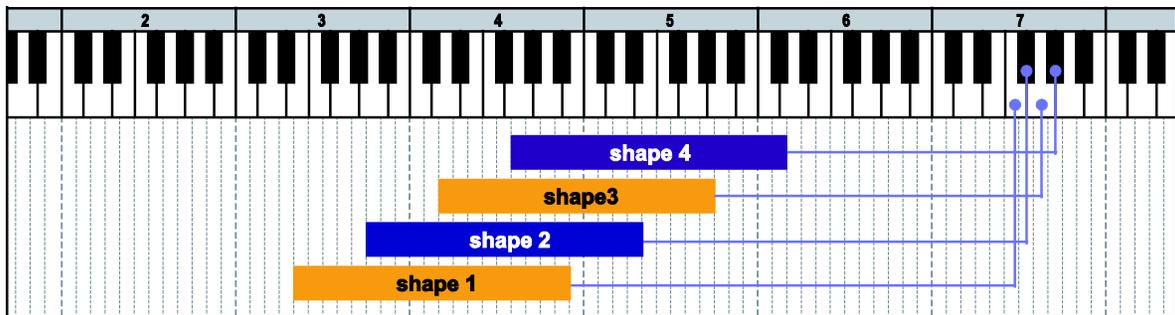
● = lowest position ● = highest position

m7



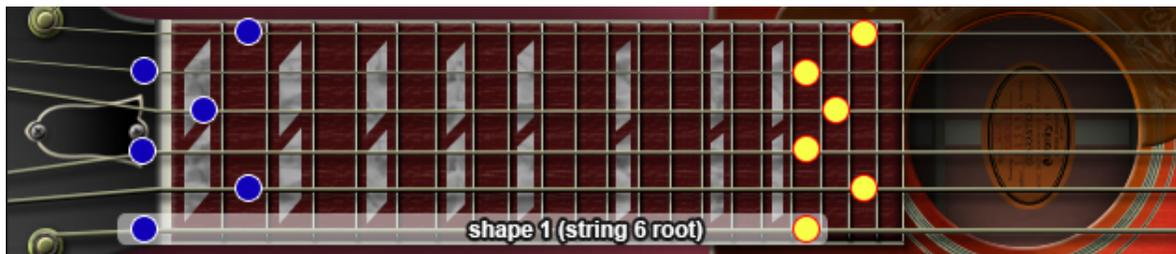
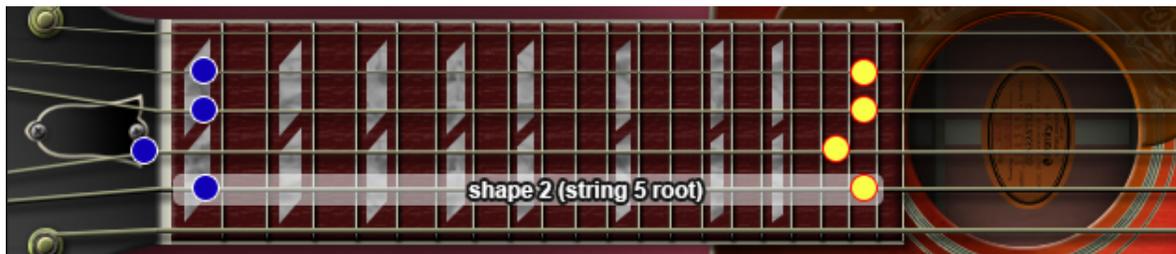
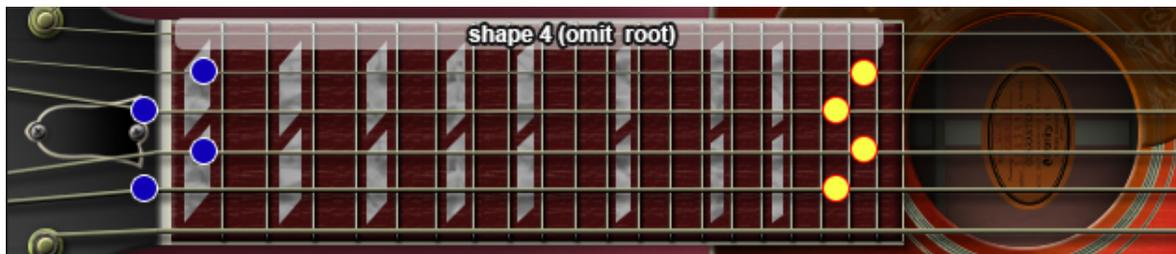
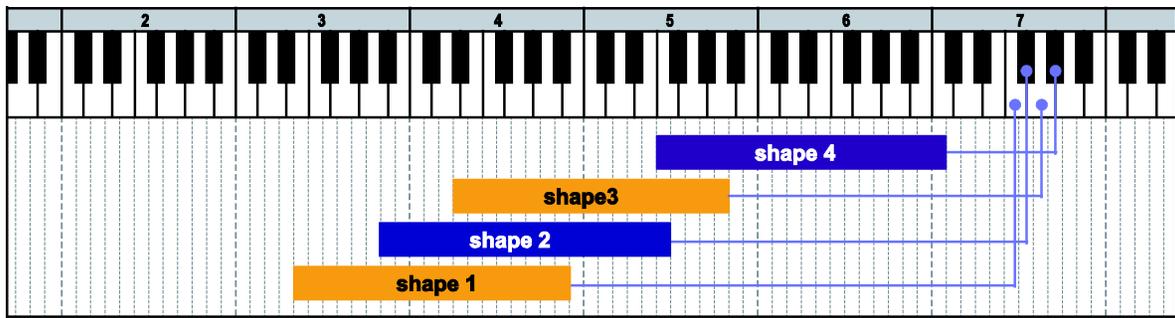
● = lowest position ● = highest position

# maj7



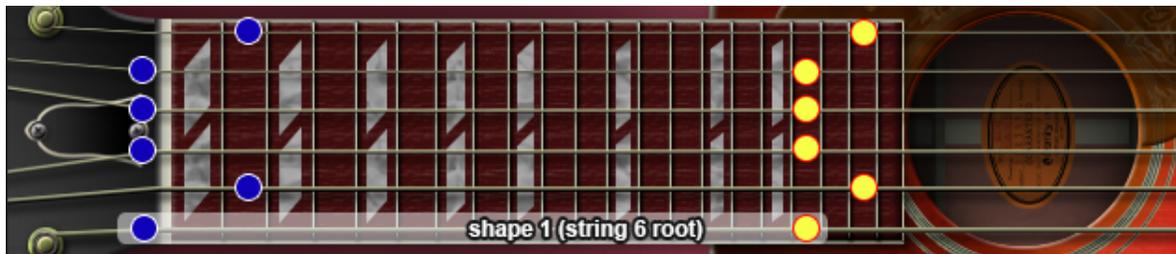
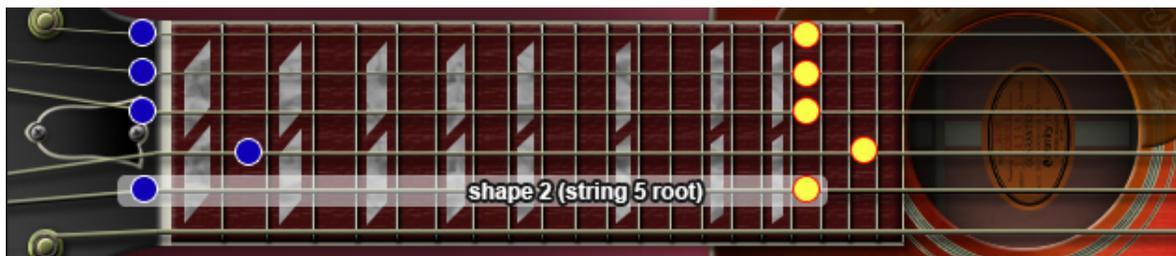
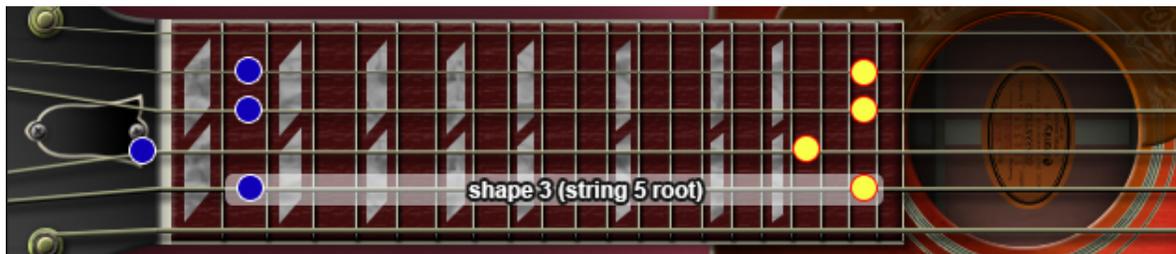
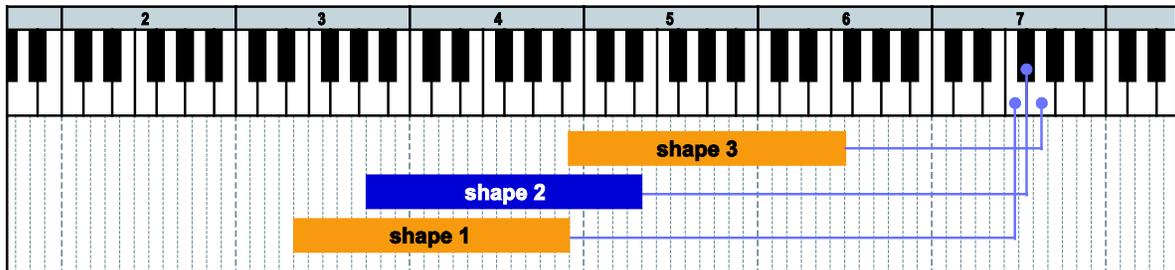
● = lowest position ● = highest position

# 9th



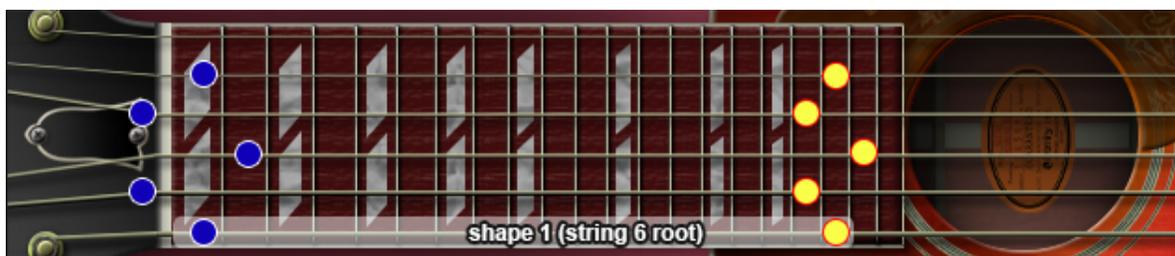
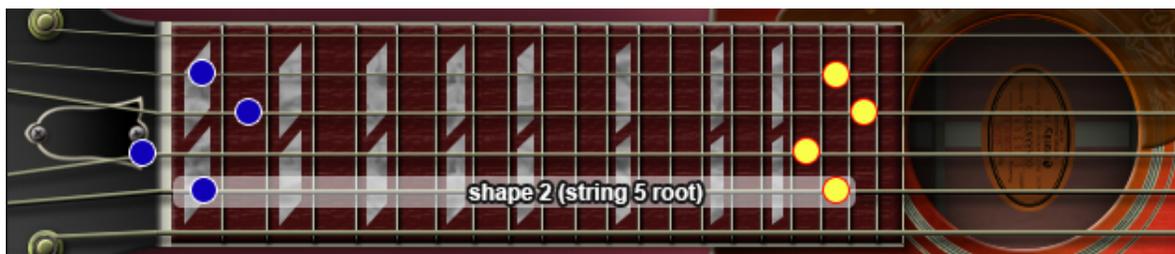
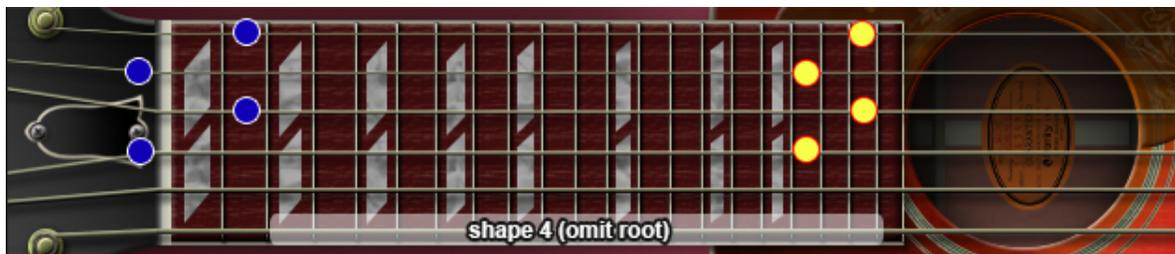
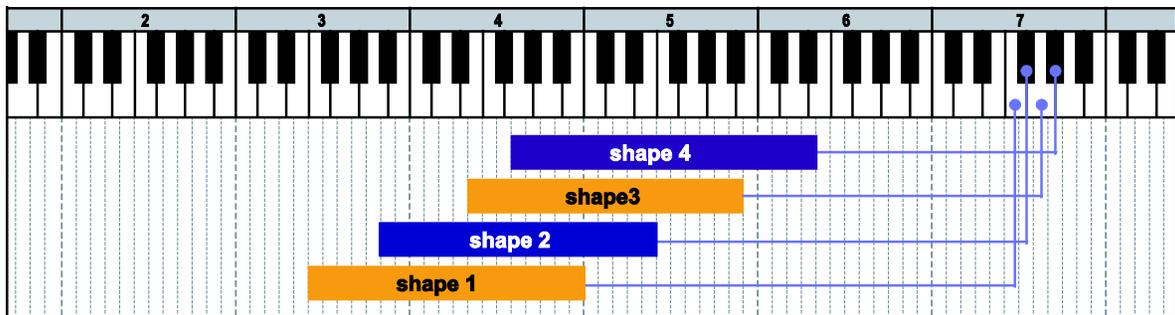
● = lowest position ● = highest position

m9



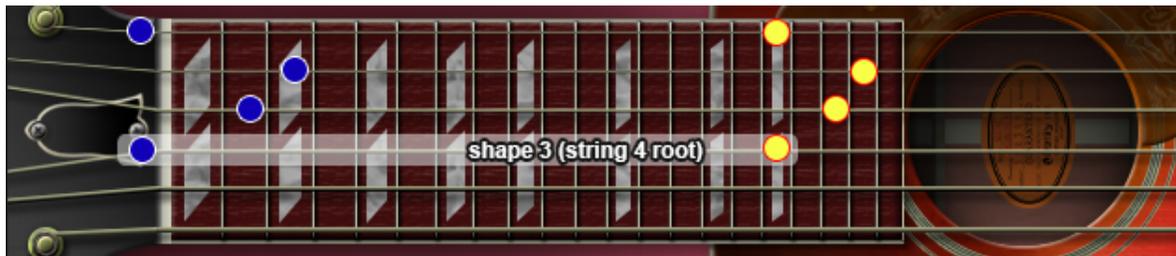
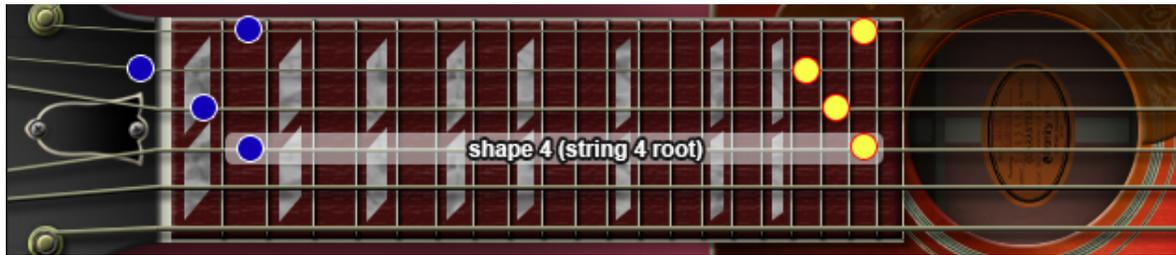
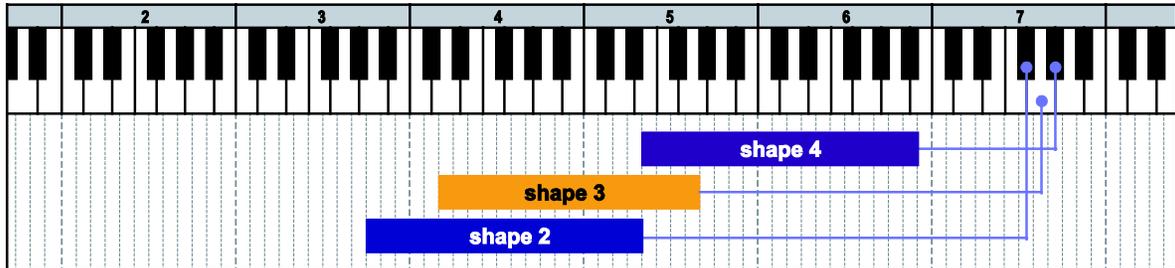
● = lowest position ● = highest position

# maj9



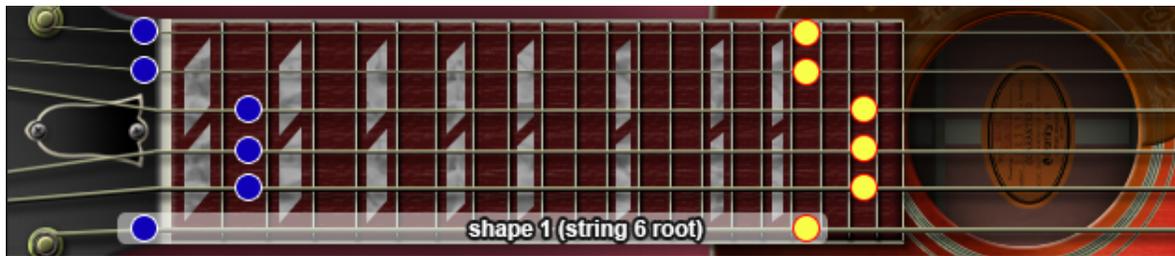
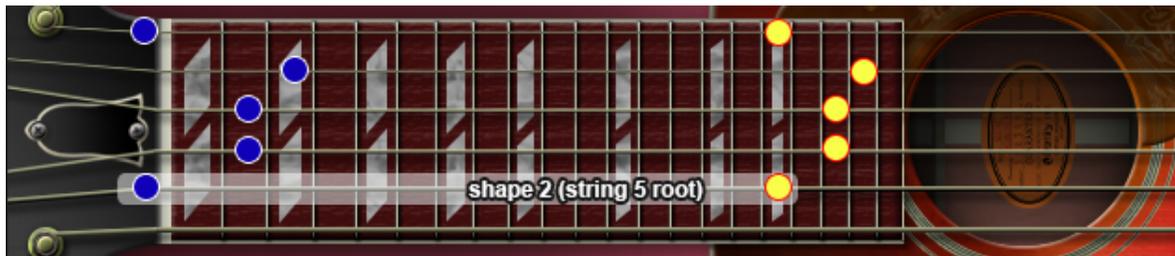
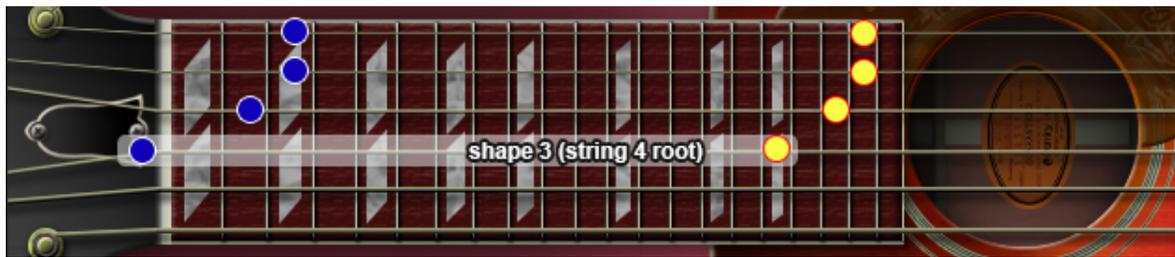
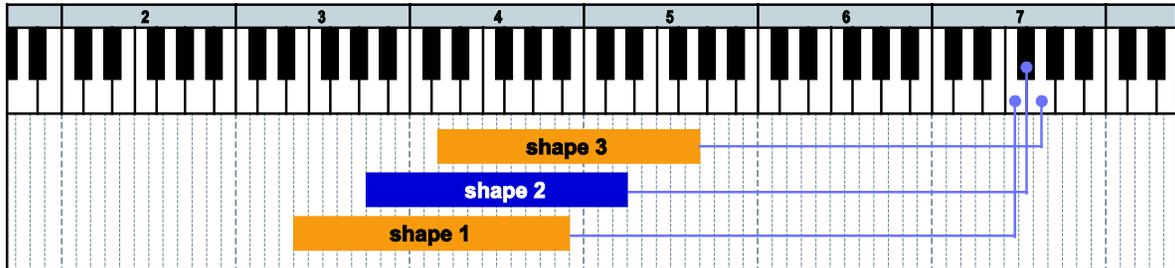
● = lowest position ● = highest position

add9



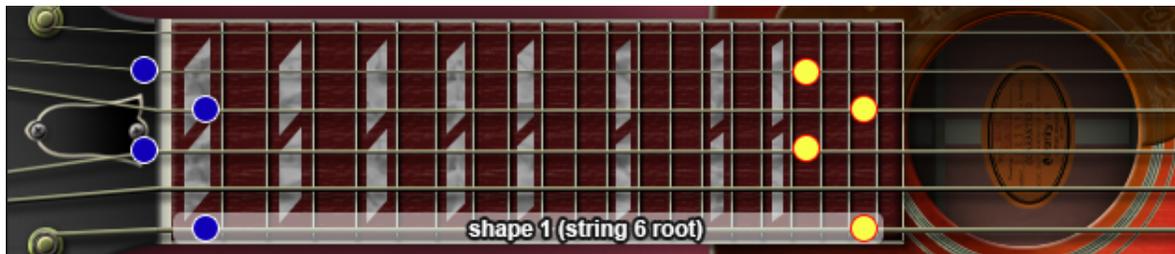
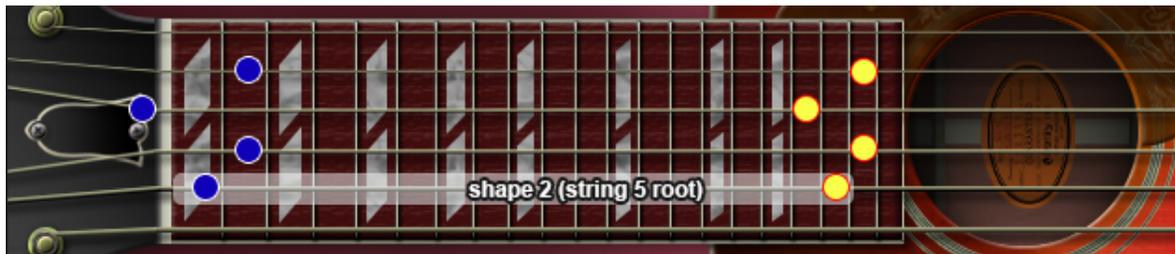
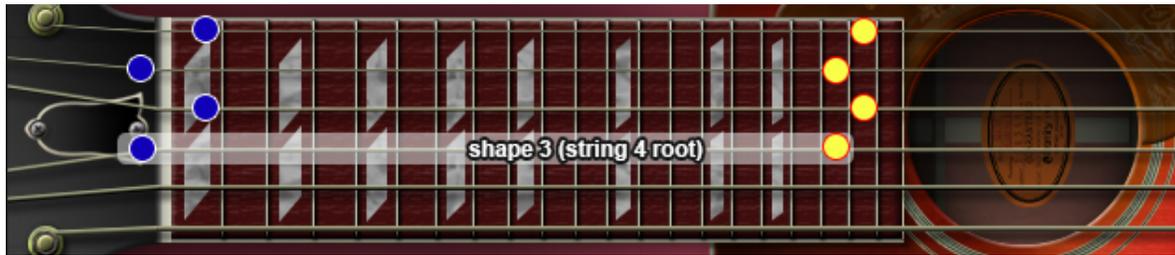
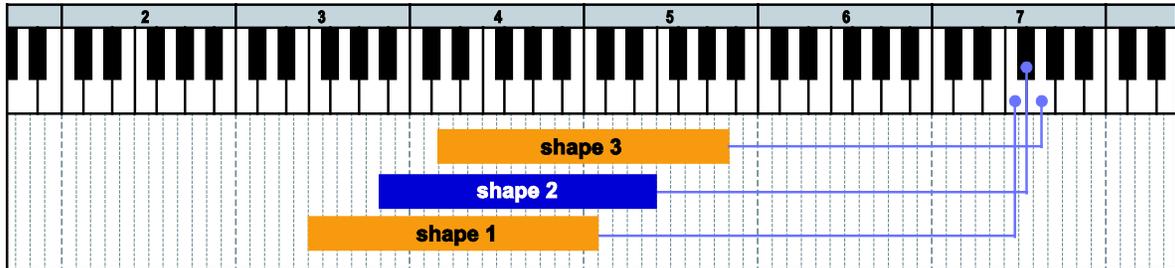
● = lowest position ● = highest position

# sus4



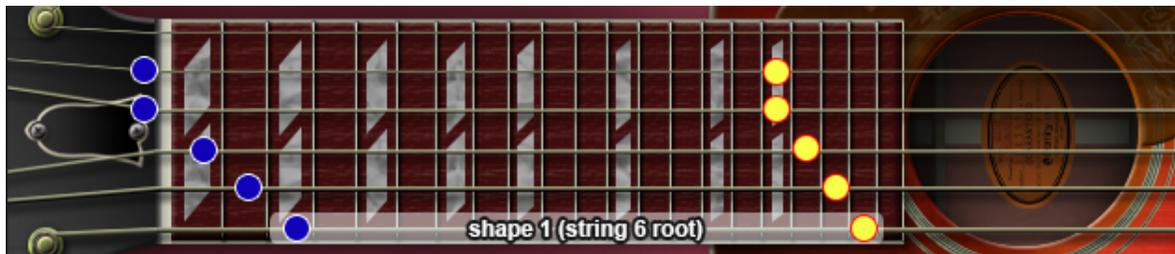
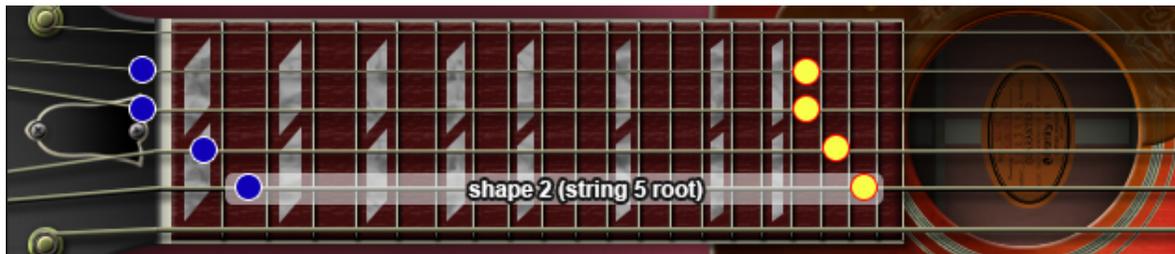
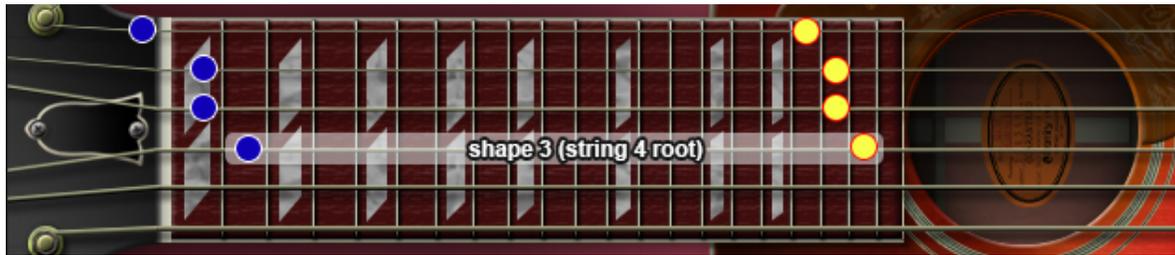
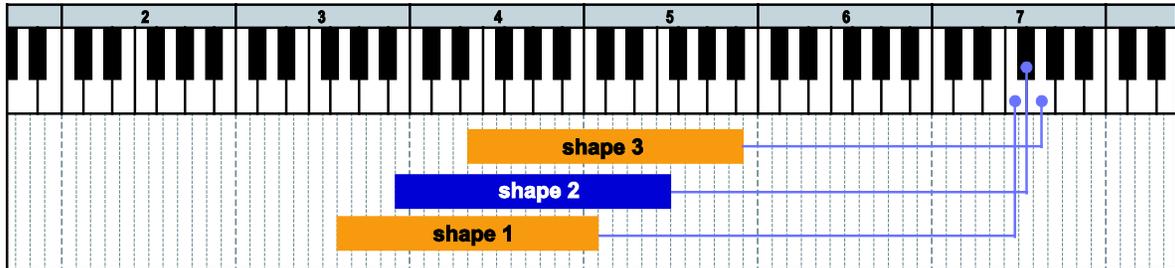
● = lowest position ● = highest position

# dim7



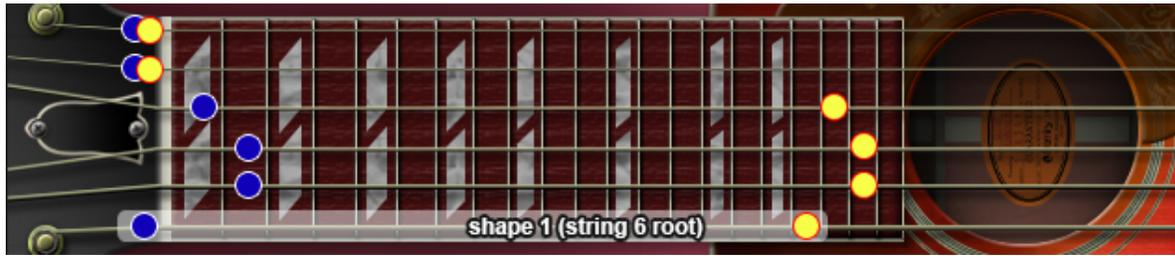
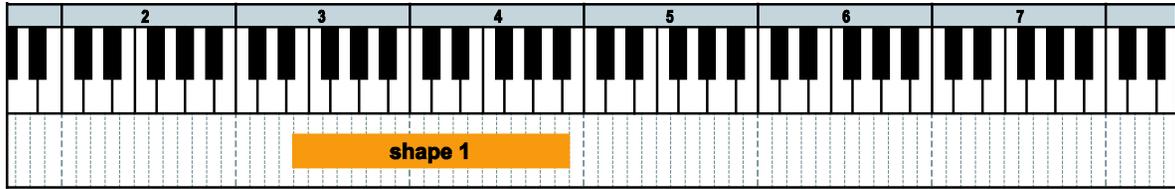
● = lowest position ● = highest position

aug



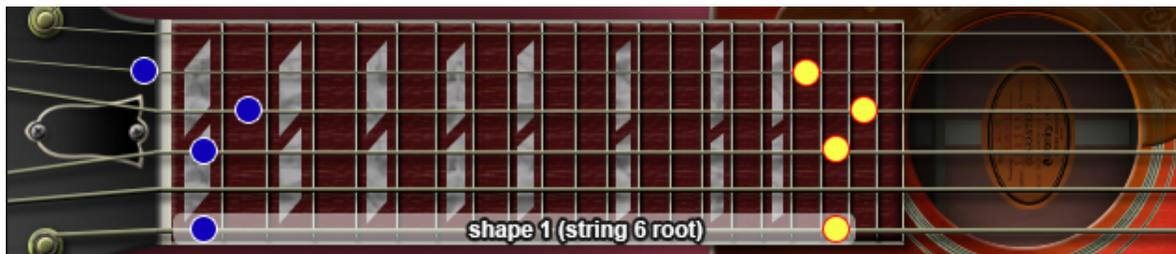
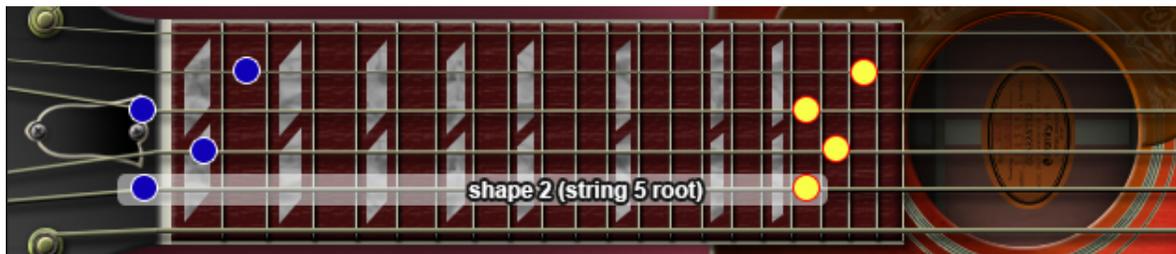
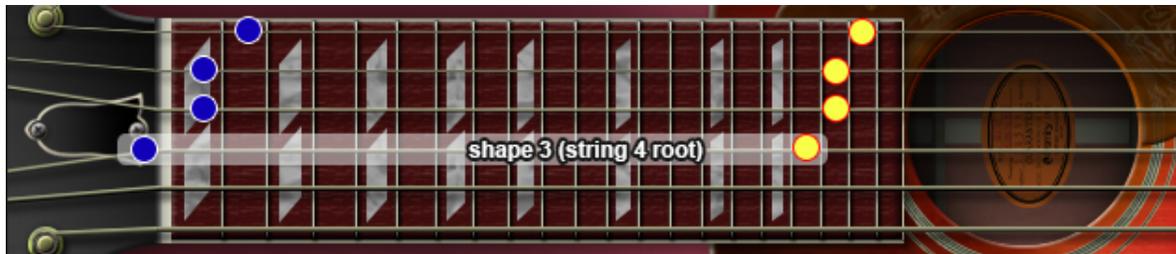
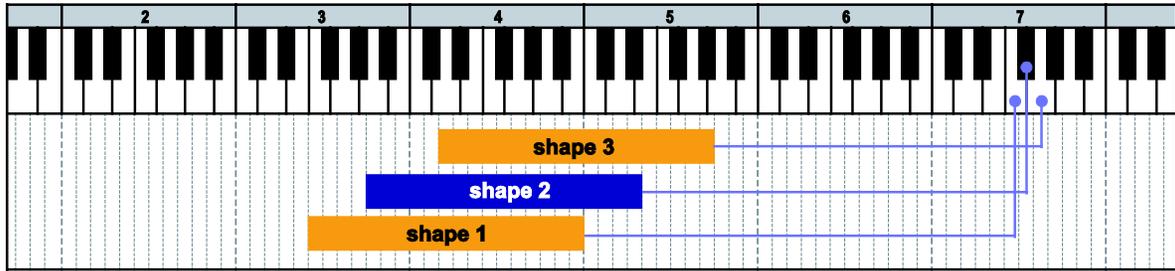
● = lowest position ● = highest position

# 'RUSH' chords



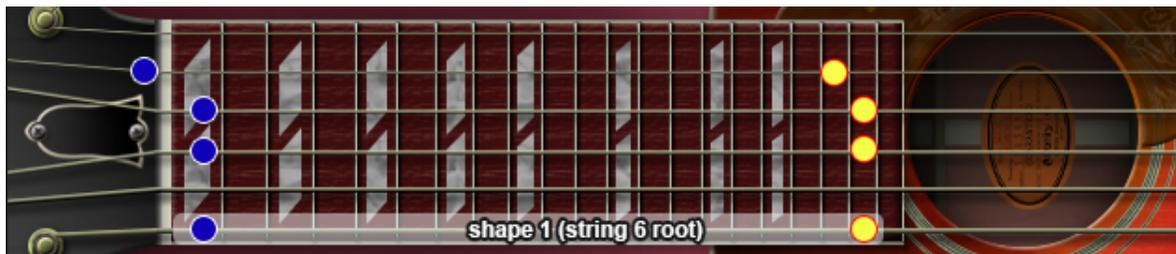
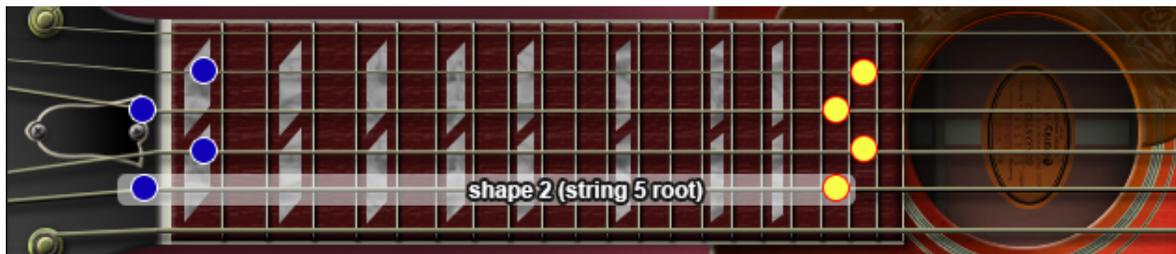
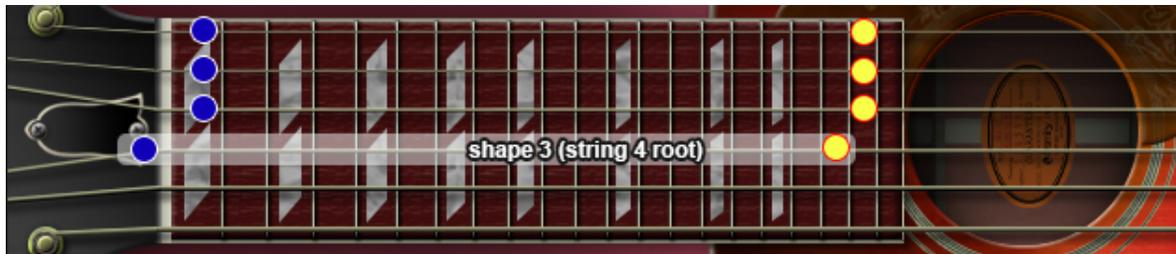
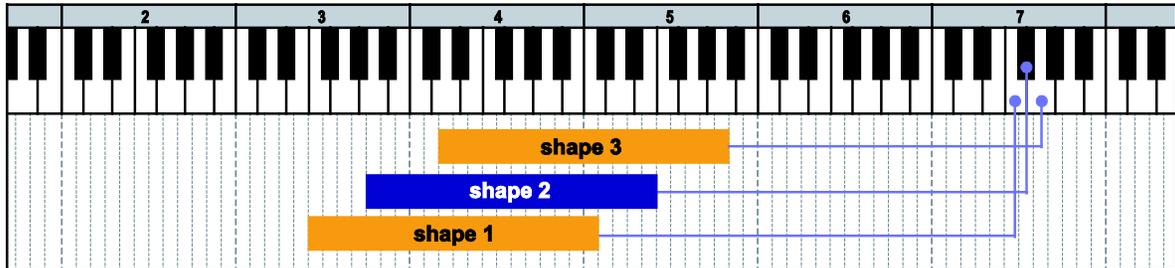
● = lowest position ● = highest position

7<sup>(b5)</sup>



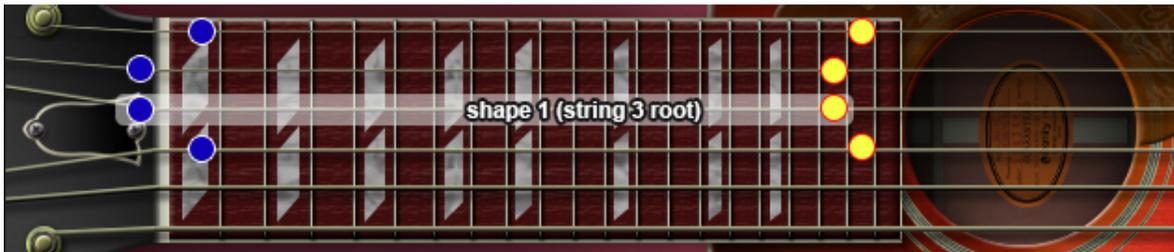
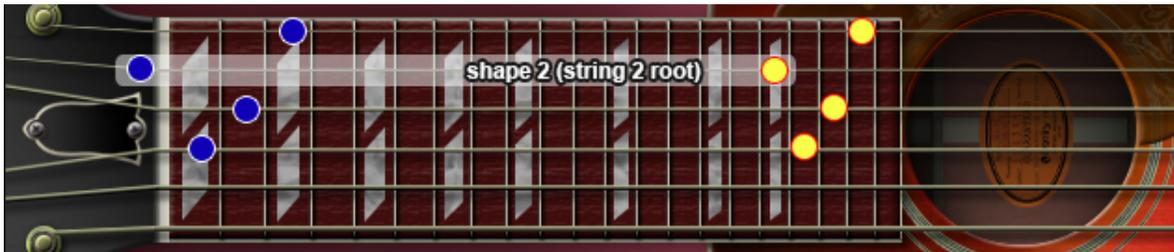
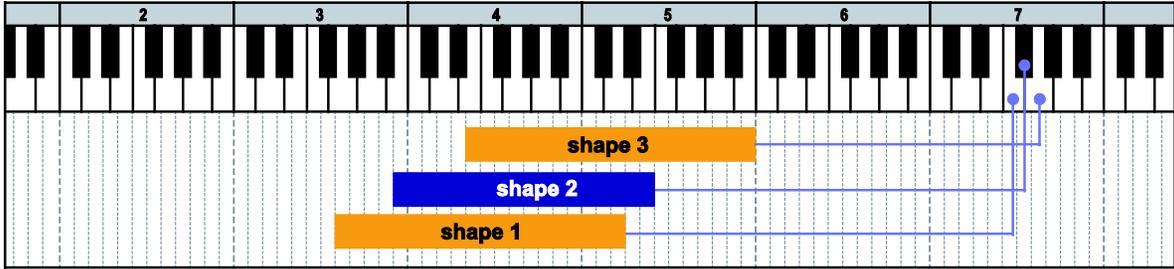
● = lowest position ● = highest position

# m7<sup>(b5)</sup>



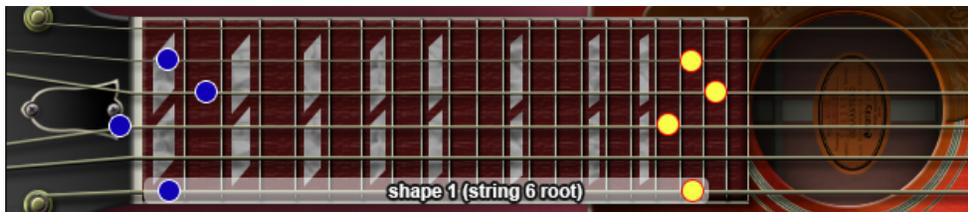
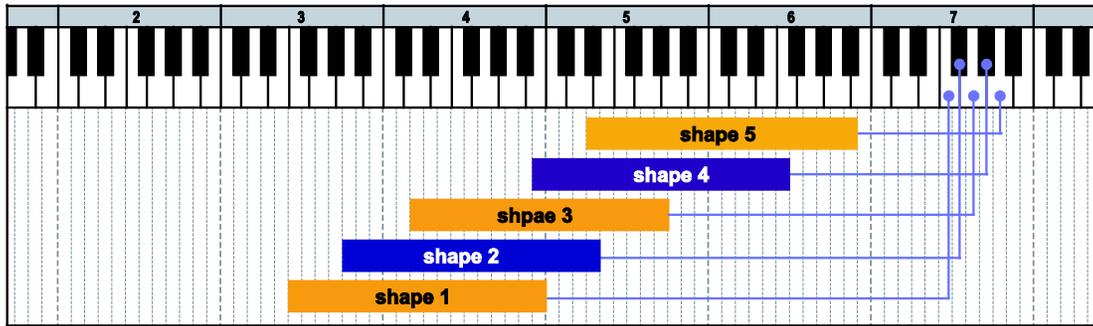
● = lowest position ● = highest position

7 (#5)



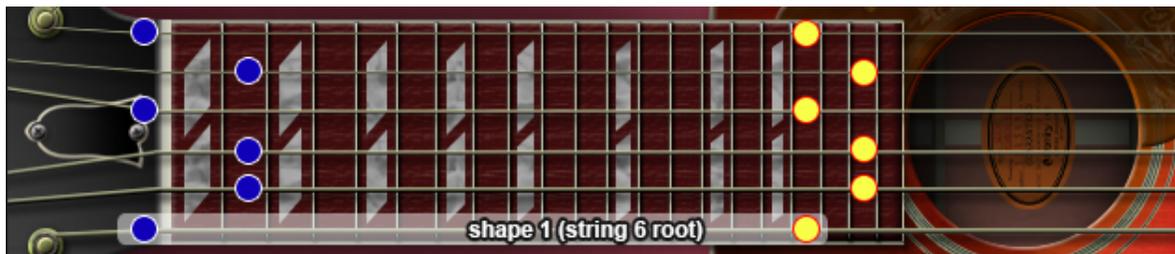
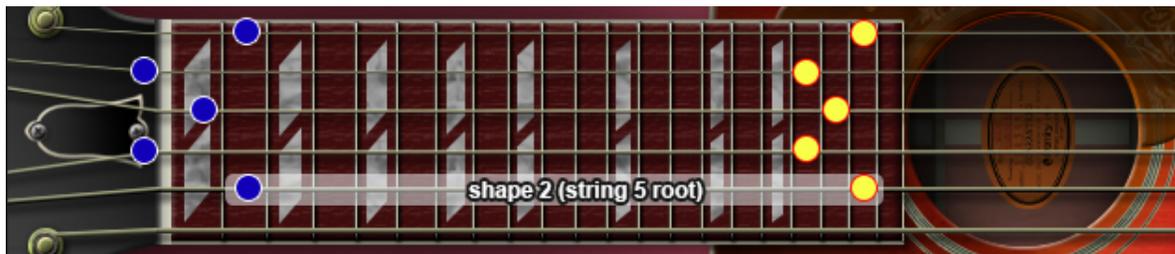
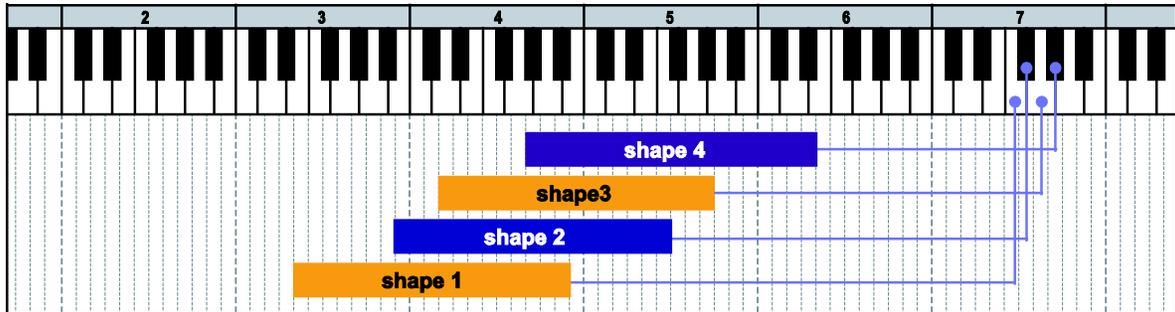
● = lowest position ● = highest position

# 6th



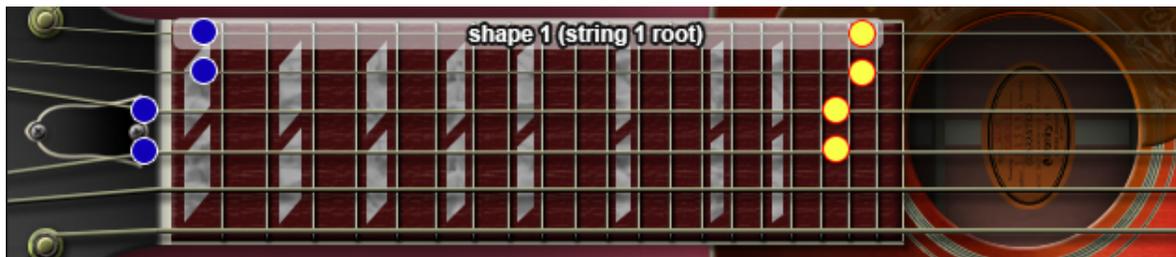
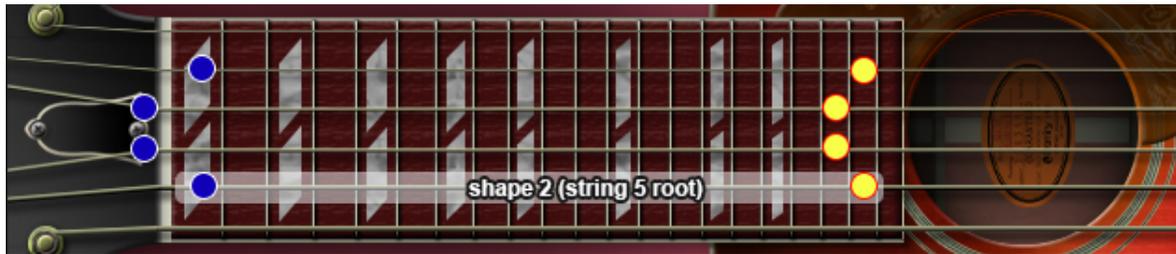
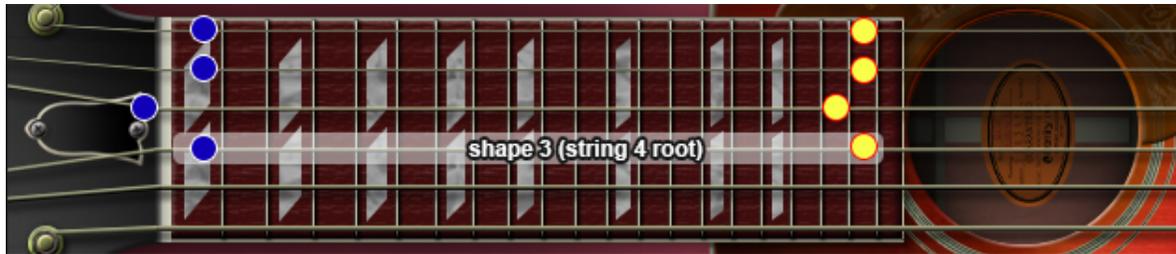
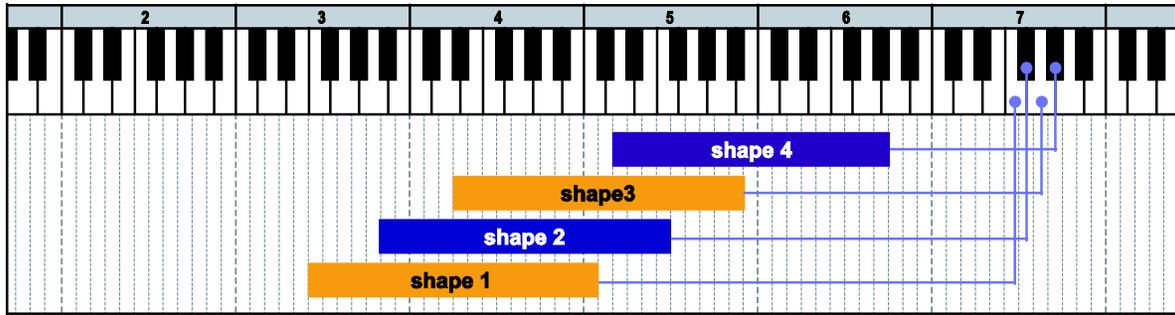
● = lowest position ● = highest position

m6



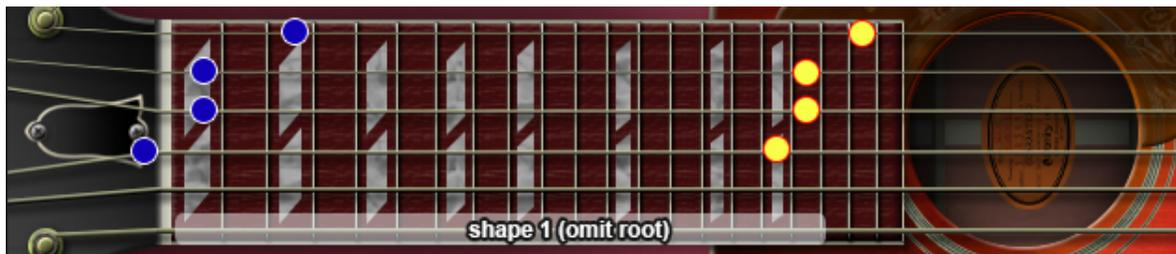
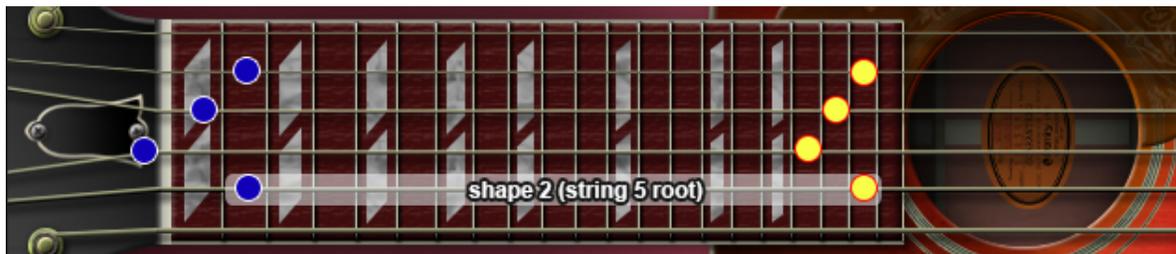
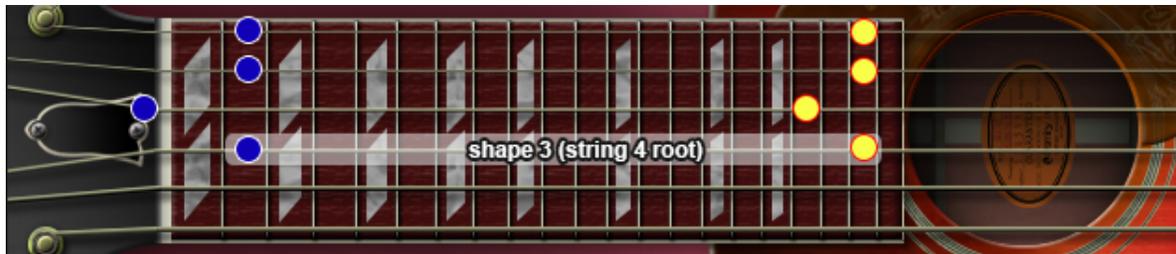
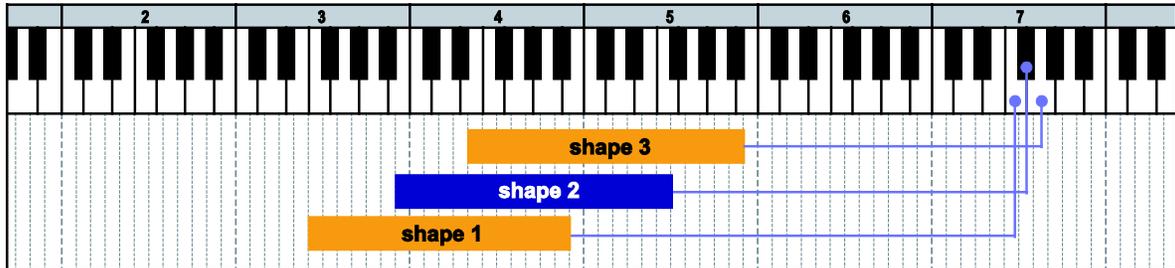
● = lowest position ● = highest position

6<sup>(9)</sup>



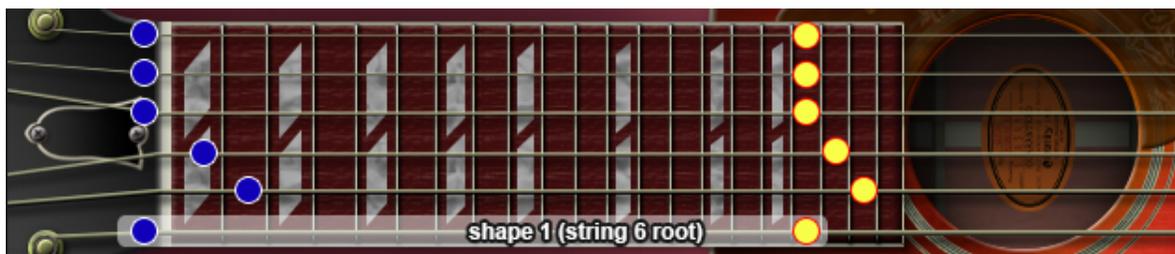
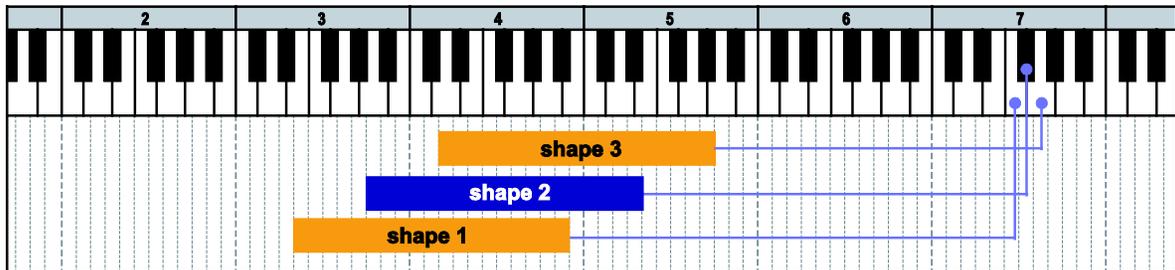
● = lowest position ● = highest position

# m6<sup>(9)</sup>



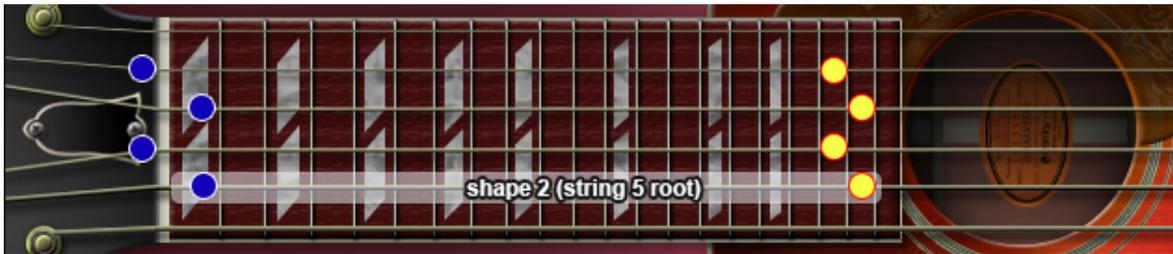
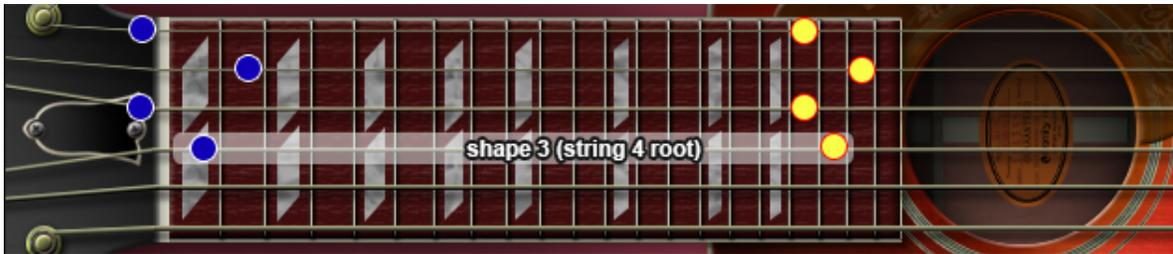
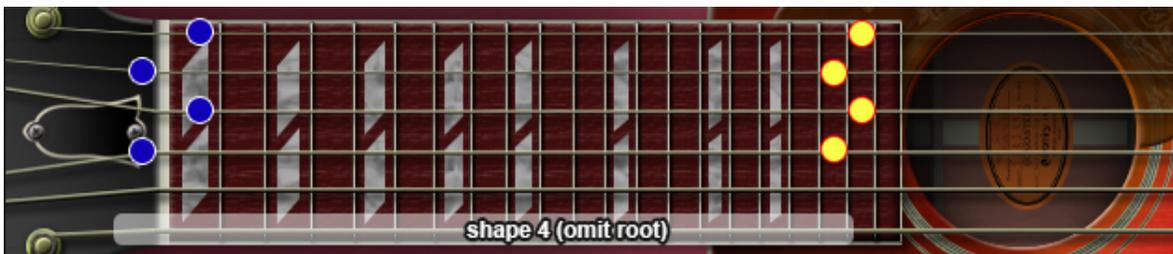
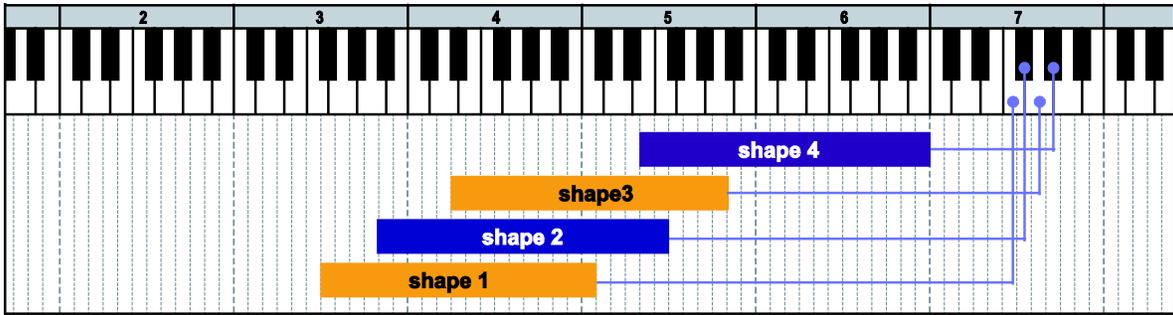
● = lowest position ● = highest position

# mMaj7



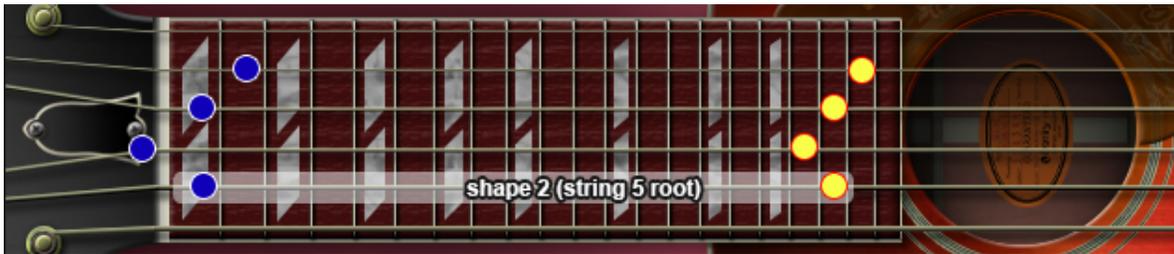
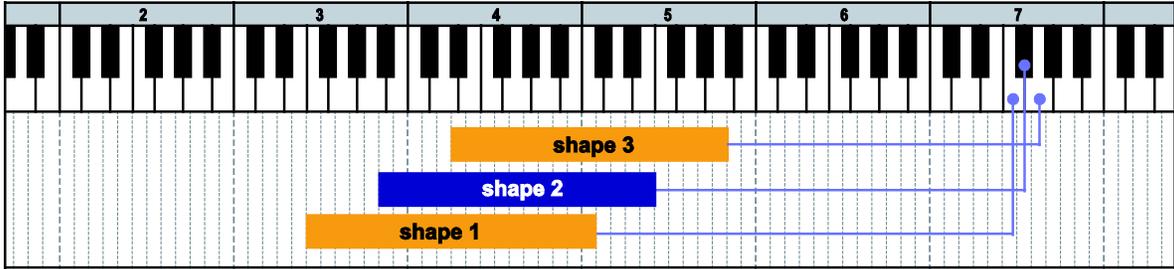
● = lowest position ● = highest position

7<sup>(b9)</sup>



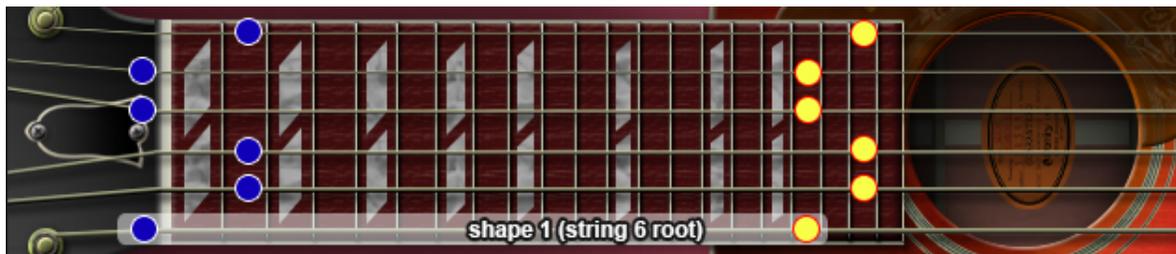
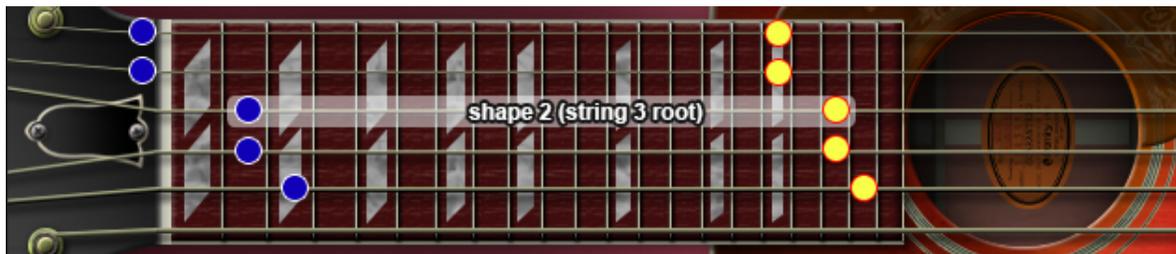
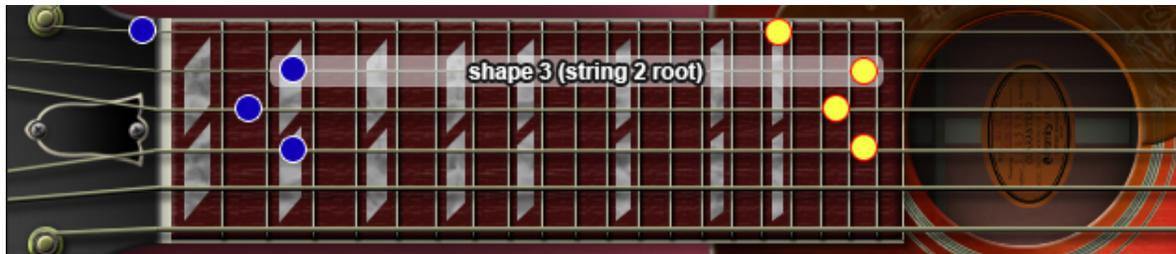
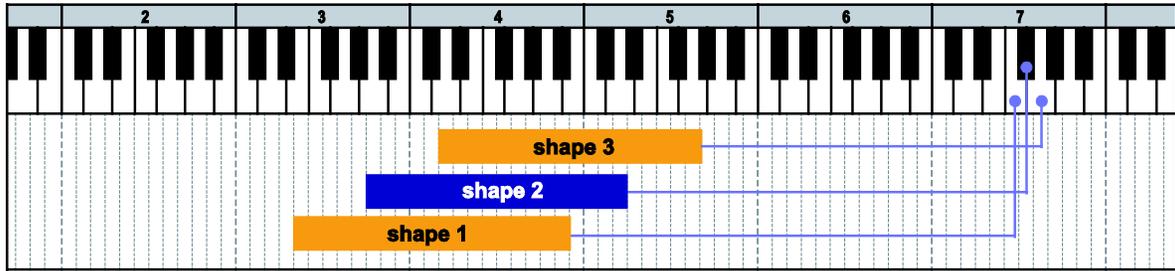
● = lowest position ● = highest position

# 7 (#9)



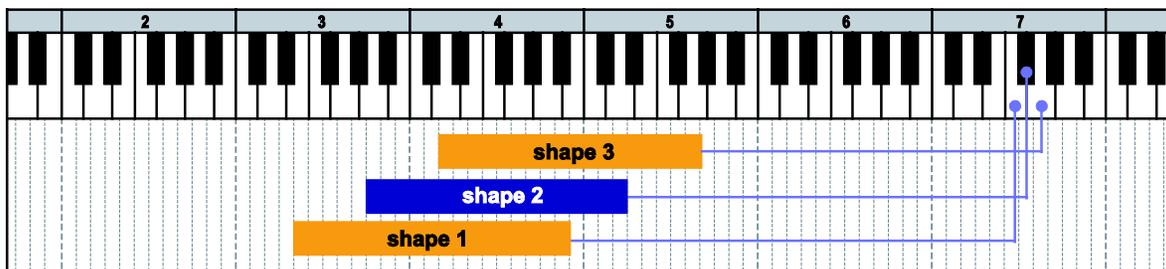
● = lowest position ● = highest position

# madd9



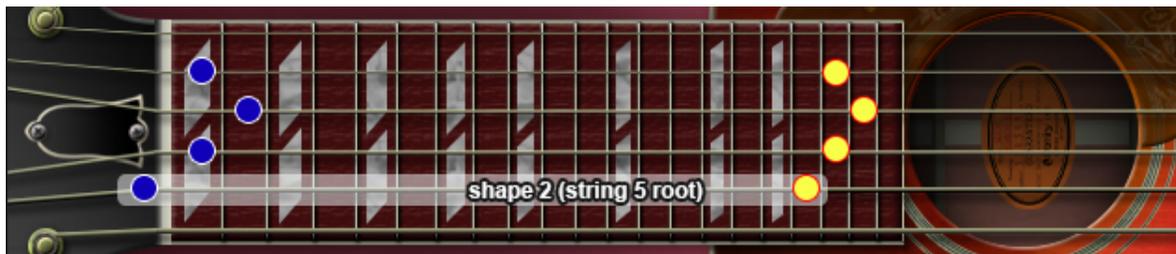
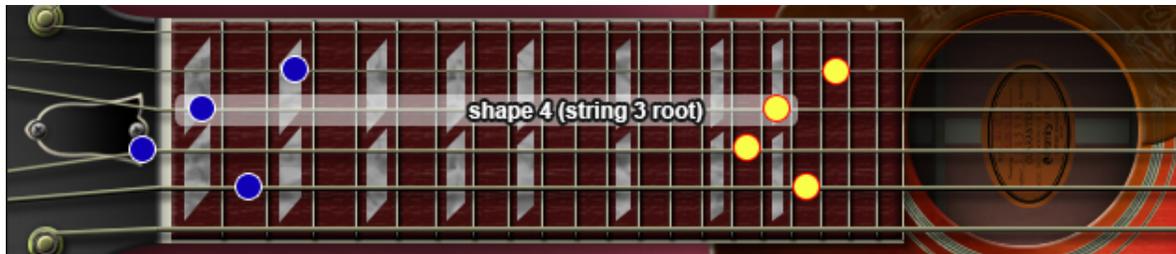
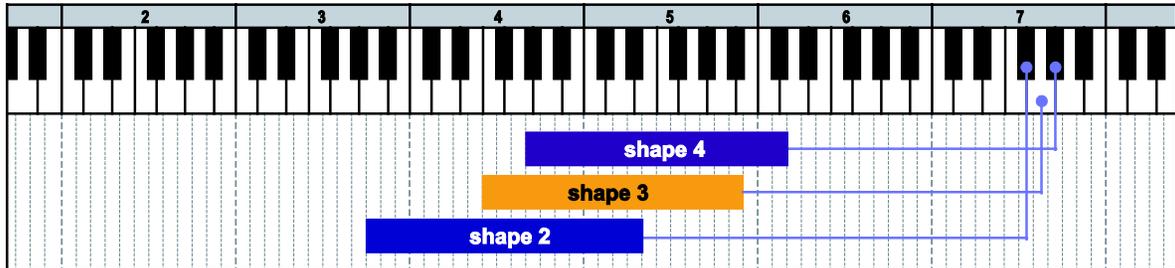
● = lowest position ● = highest position

# 7sus4



● = lowest position ● = highest position

dim



● = lowest position ● = highest position

# natural harmonics

3rd fret   5th fret   7th fret   9th fret   12th fret   19th fret   sound hall

(string number) 6 5 4 3 2 1 6 5 4 3 2 1 6 5 4 3 2 1 6 5 4 3 2 1 6 5 4 3 2 1 6 5 4 3 2 1 6 5 4 3 2 1

# FX

FX1: harmonics

FX2: percussion

FX3: slides

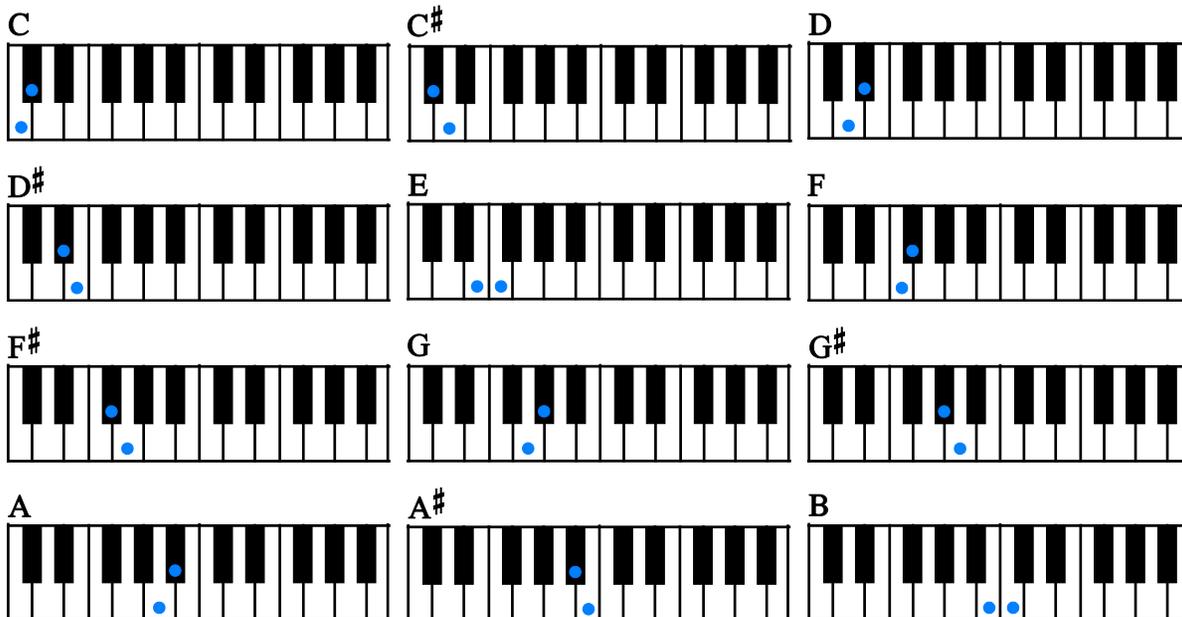
FX4: noises, etc.



## **Chord Recognition Intervals**

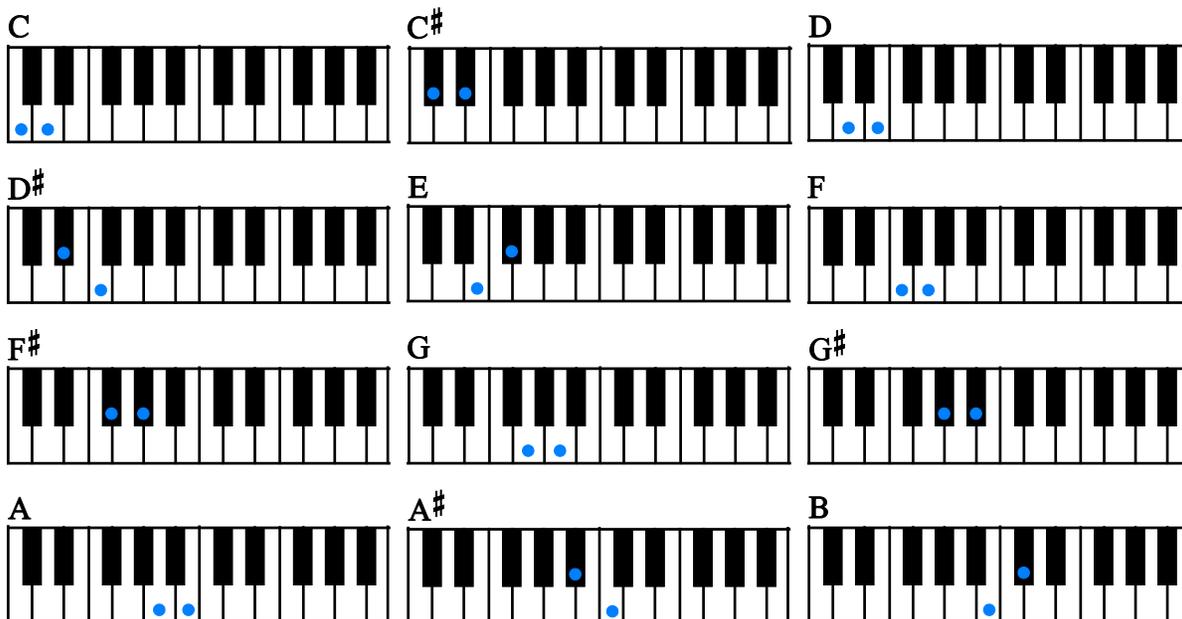
## minor 2nd-dyad chord

root + minor2nd



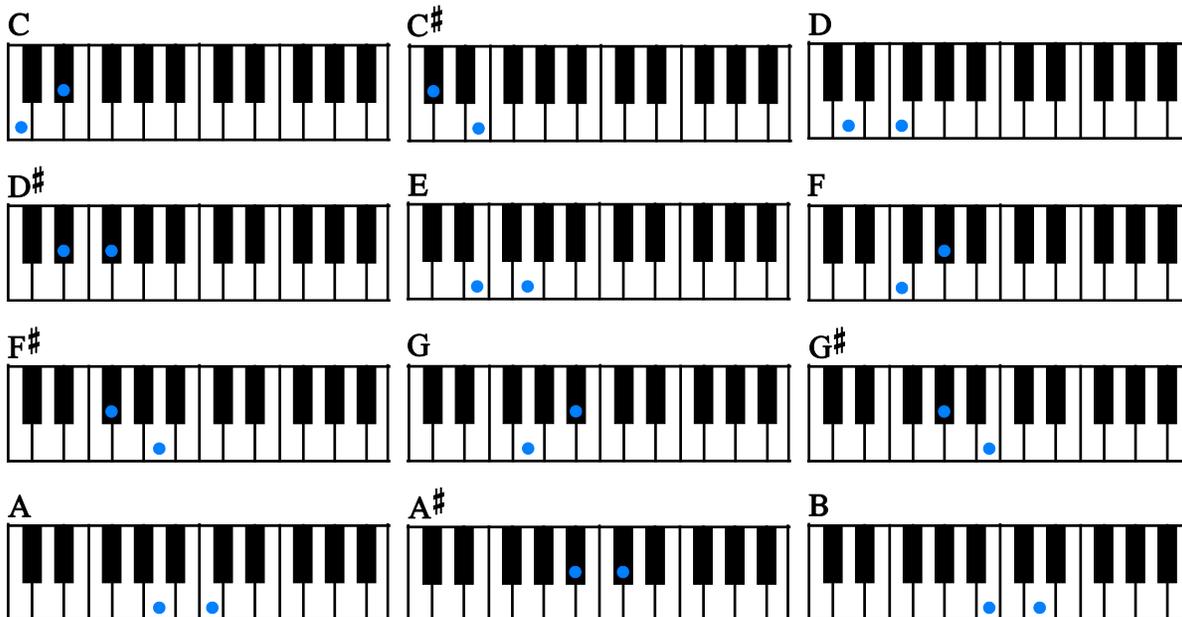
## major 2nd-dyad chord

root + major2nd



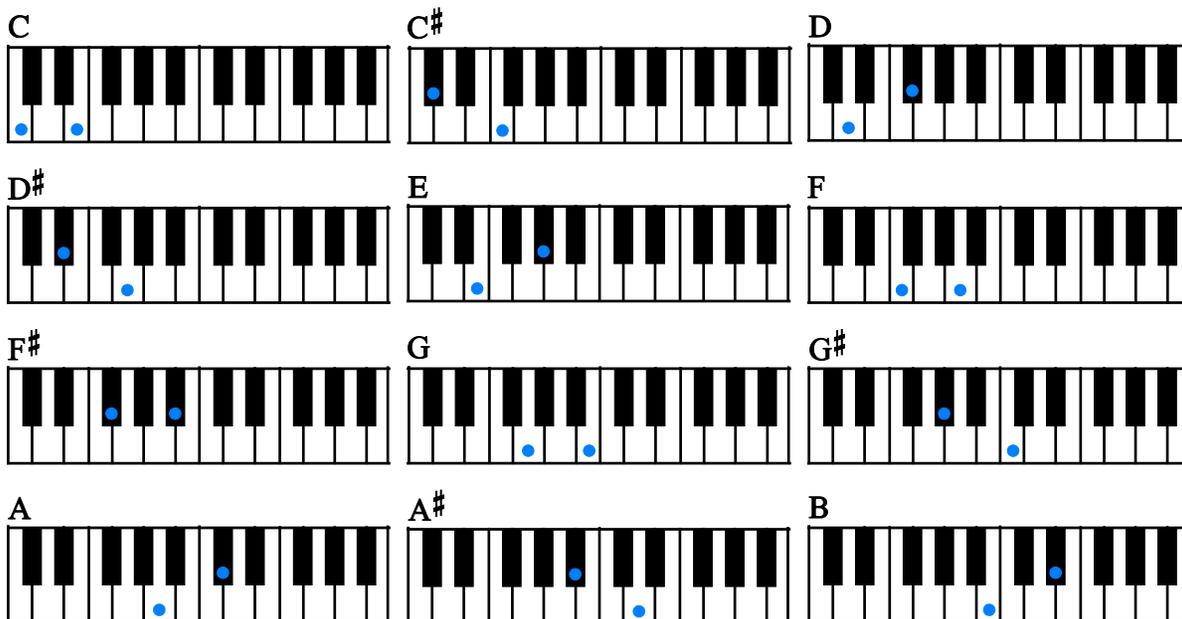
## minor 3rd-dyad chord

root + minor3rd



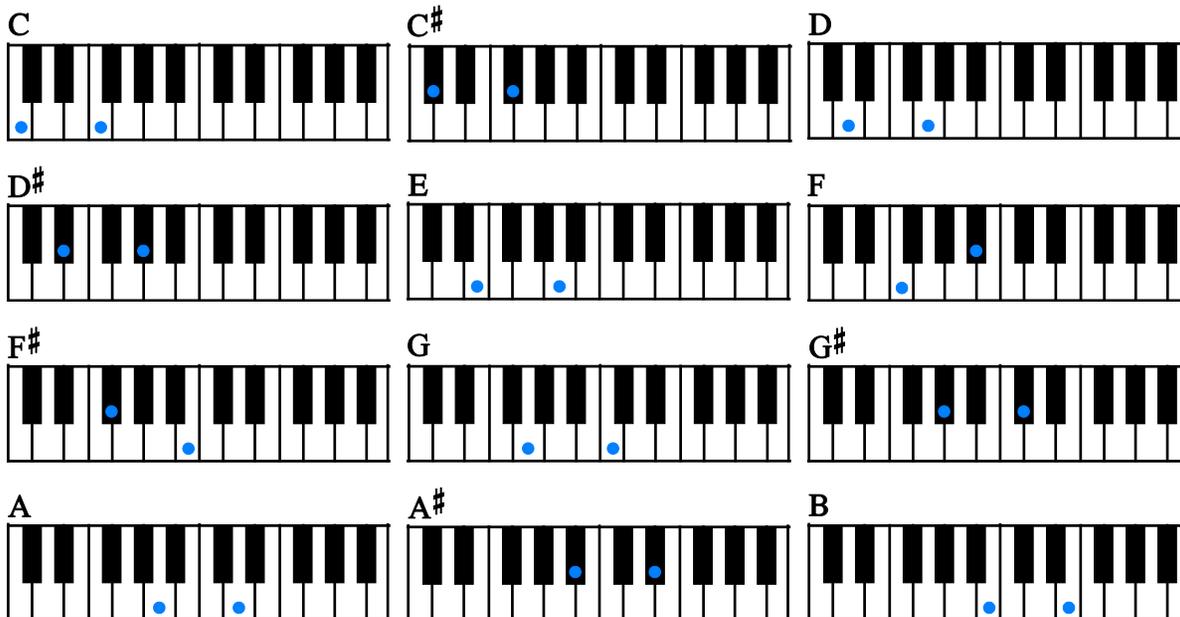
## major 3rd-dyad chord

root + major3rd



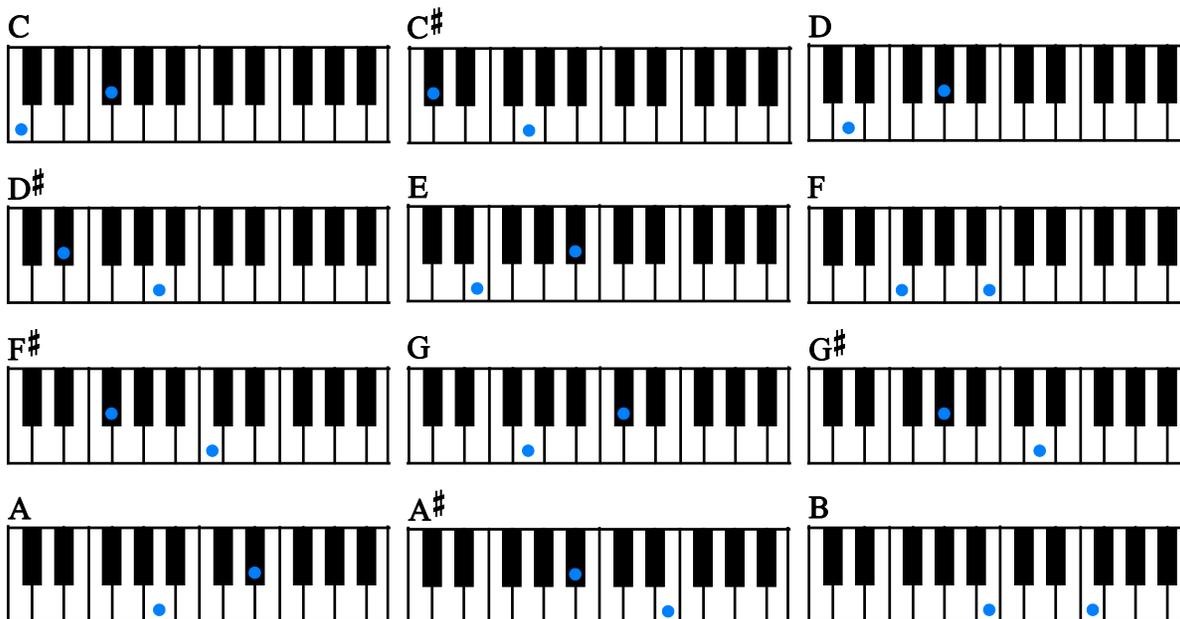
## 4th-dyad chord

root + 4th



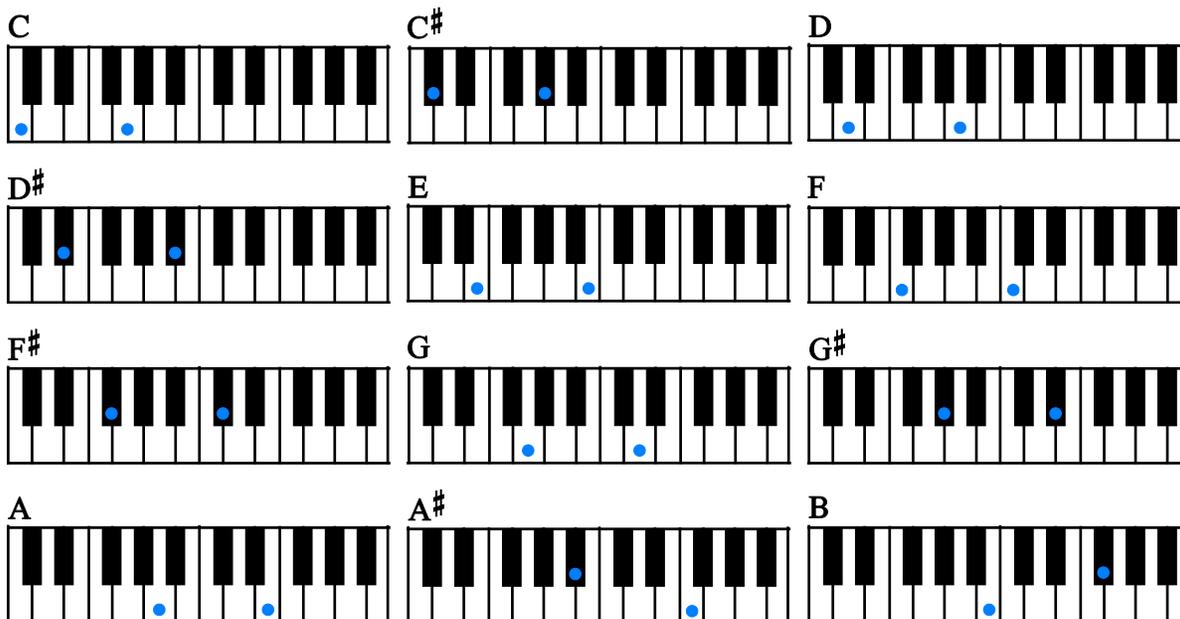
## flat 5th-dyad chord

root + flat5th



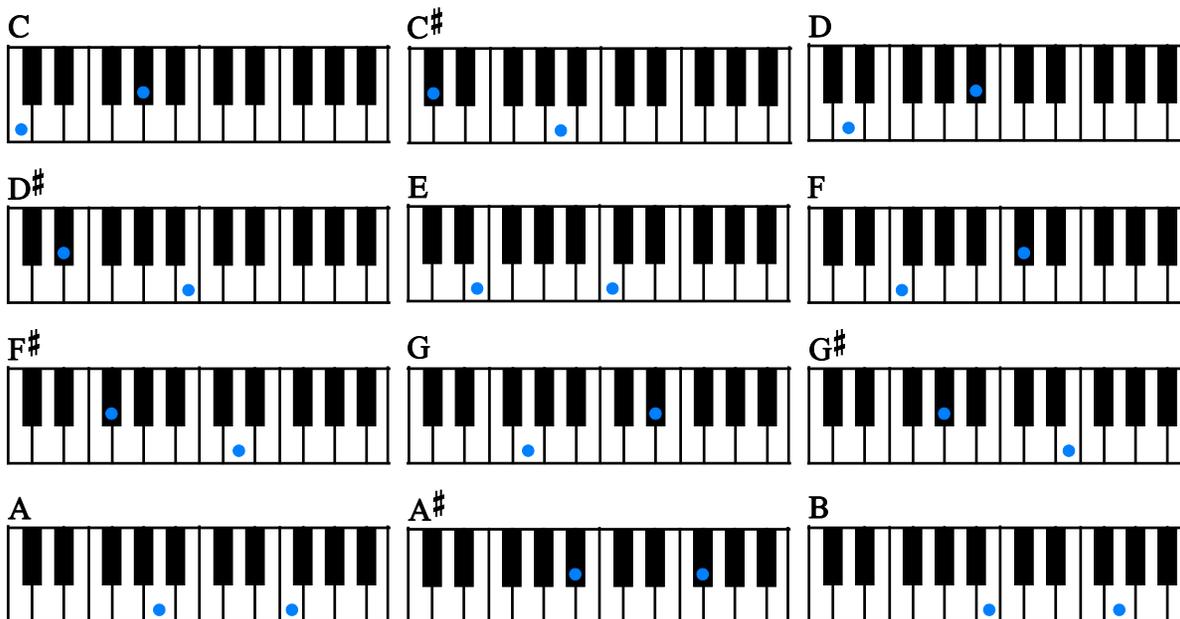
## 5th-dyad chord

root + 5th



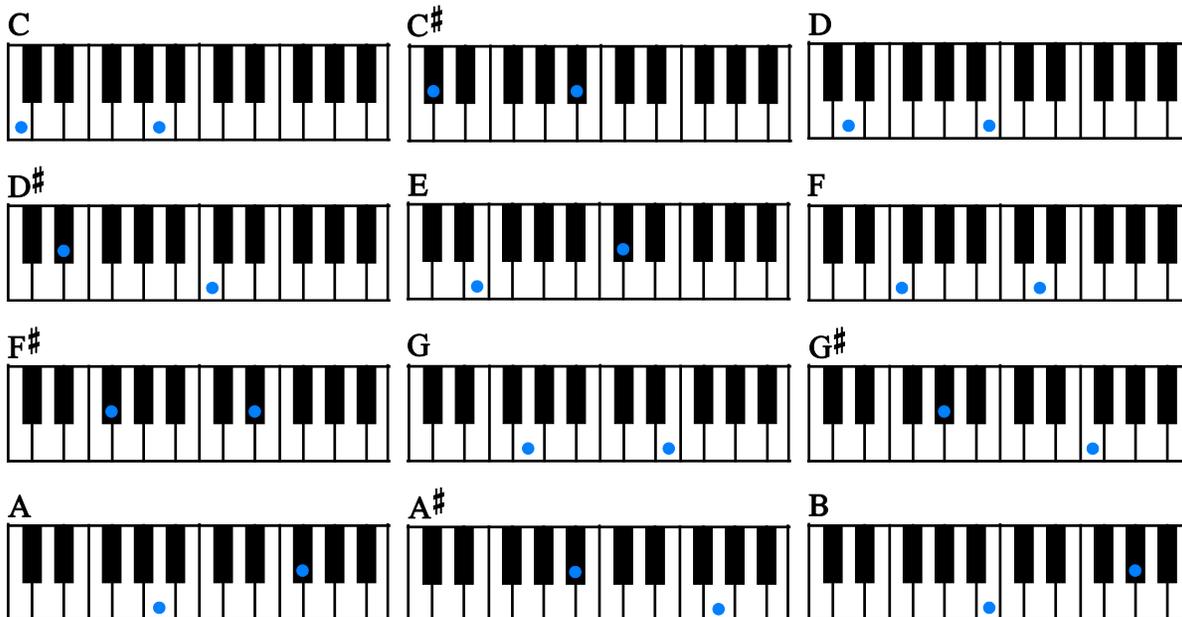
## #5th-dyad chord

root + #5th



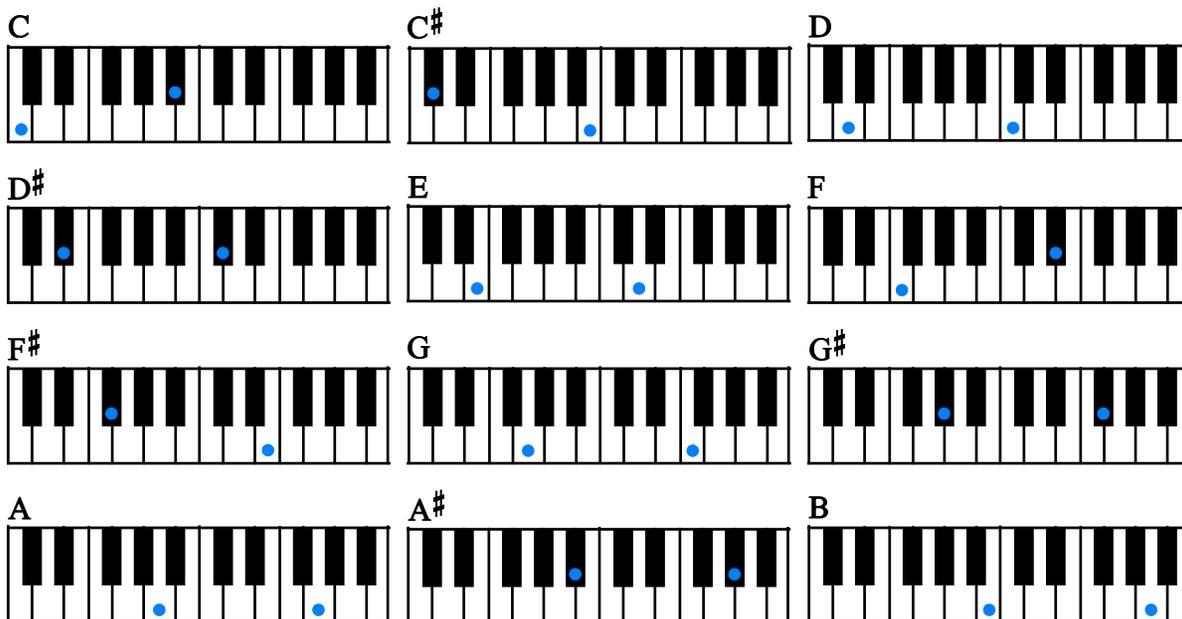
## 6th-dyad chord

root + 6th



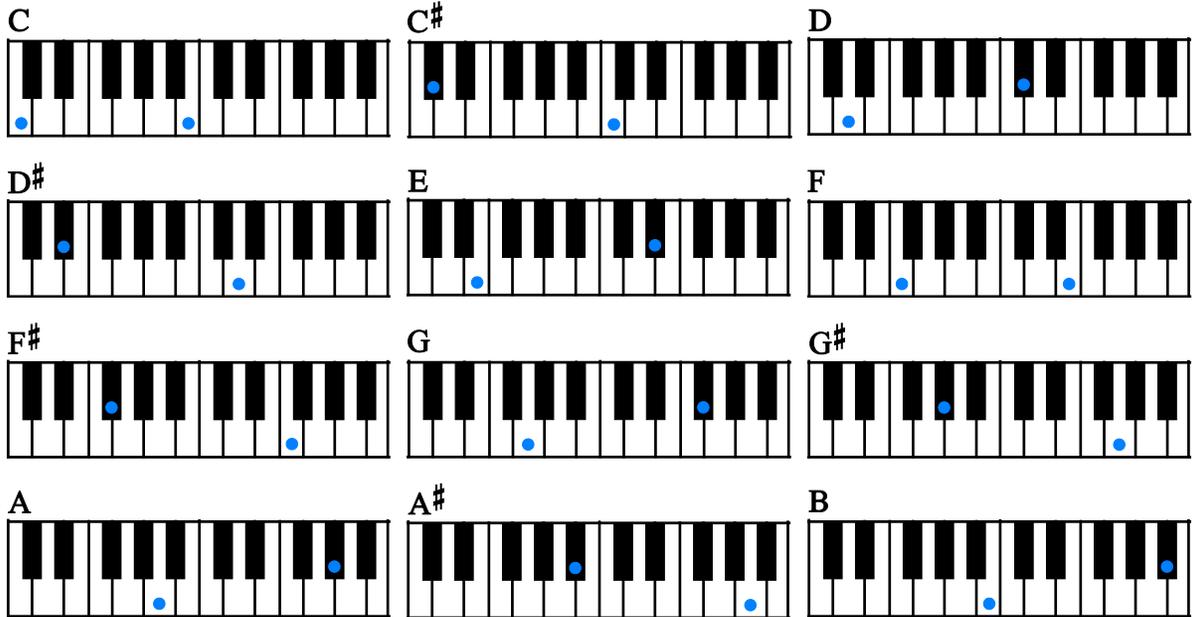
## 7th-dyad chord

root + 7th



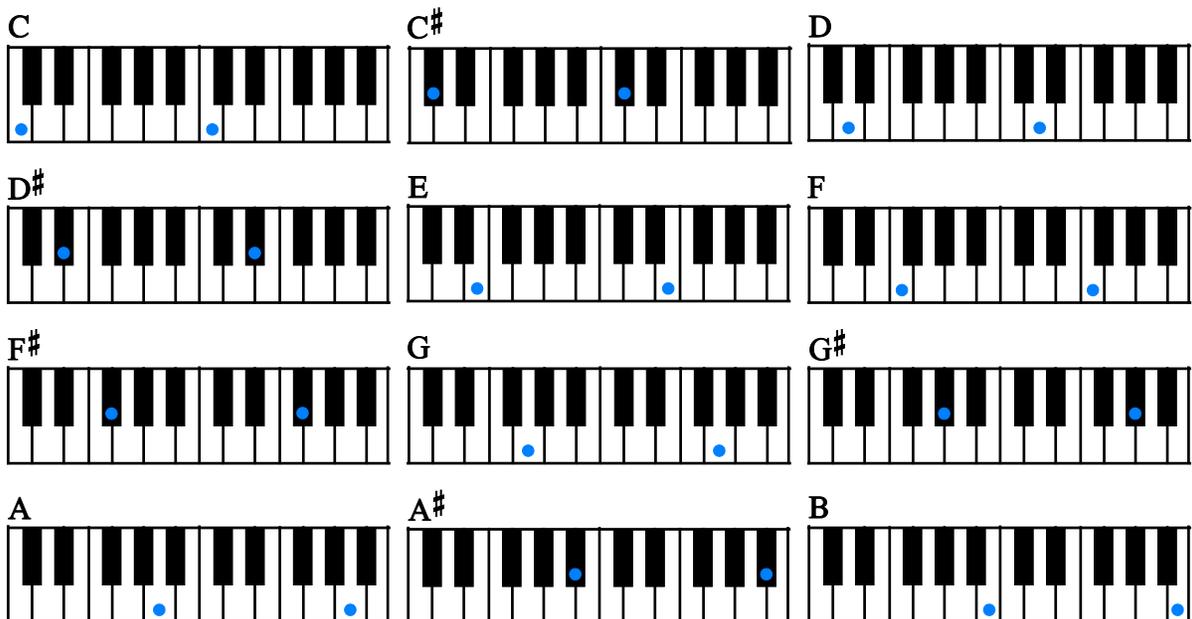
# major 7th-dyad chord

root + major7th



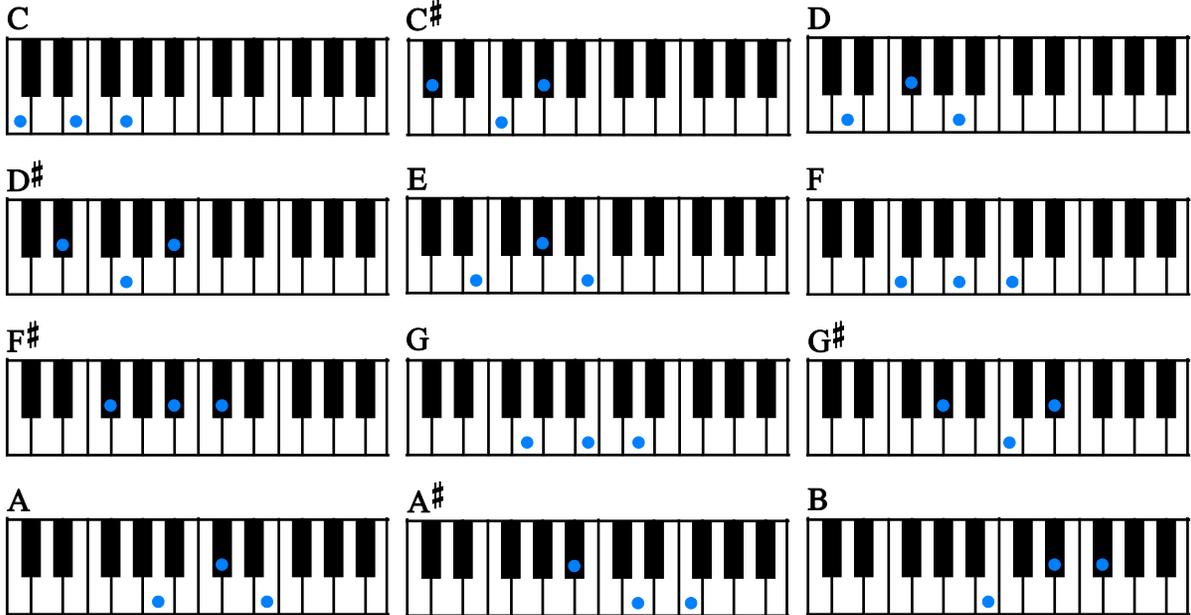
# octave

root + octave



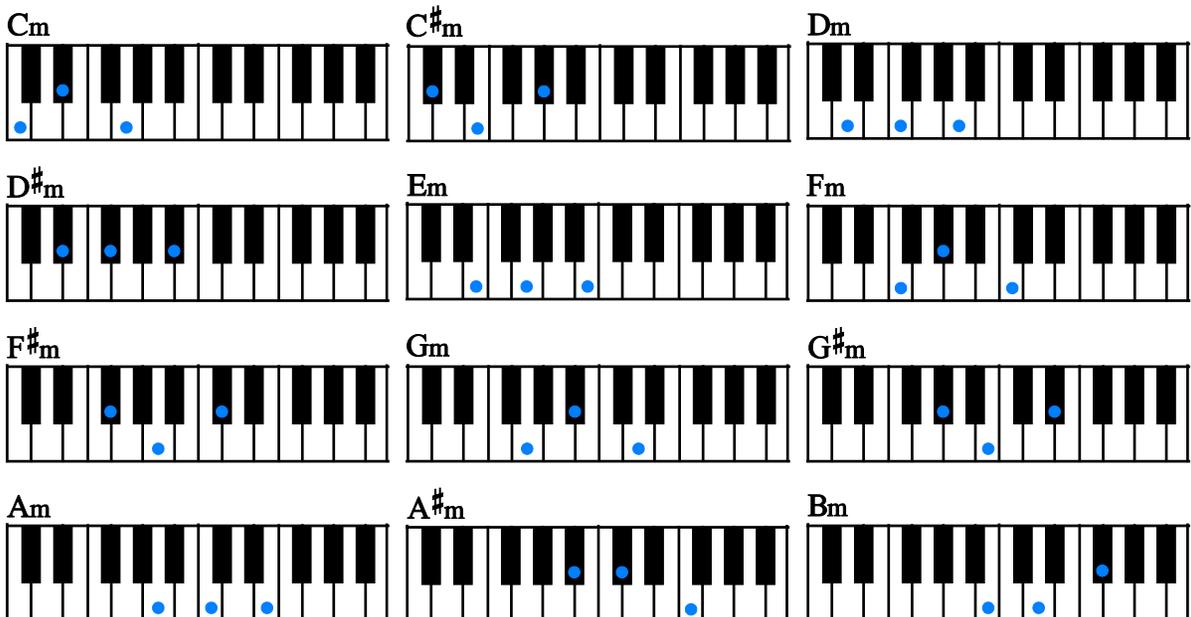
# major

root + major3rd + 5th



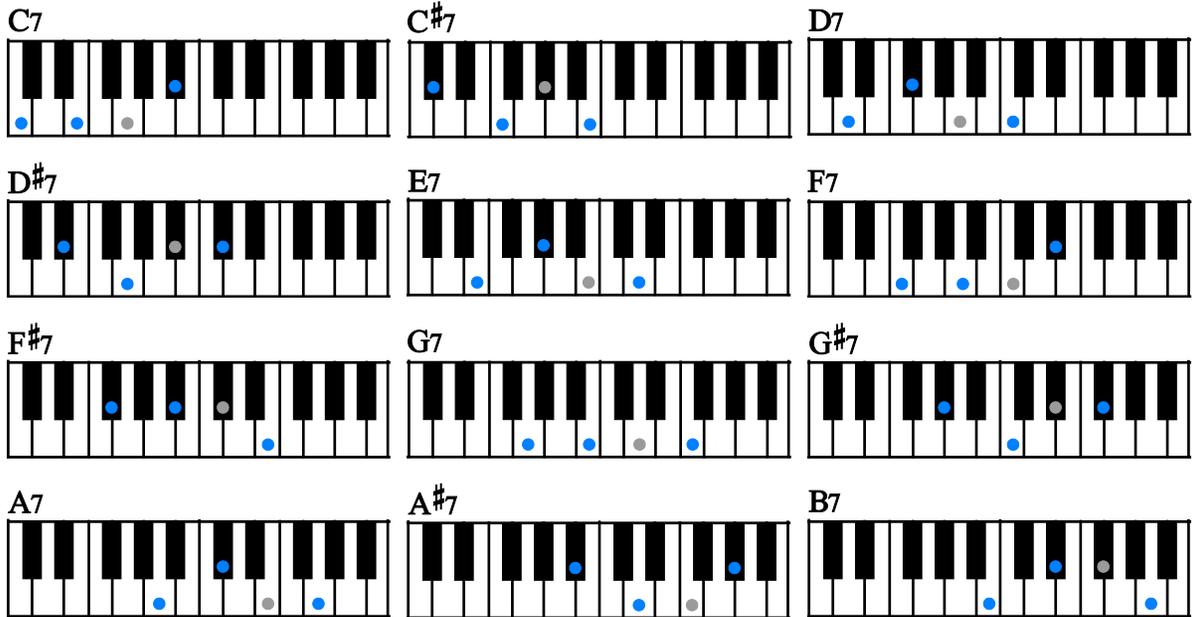
# minor

root + minor3rd + 5th



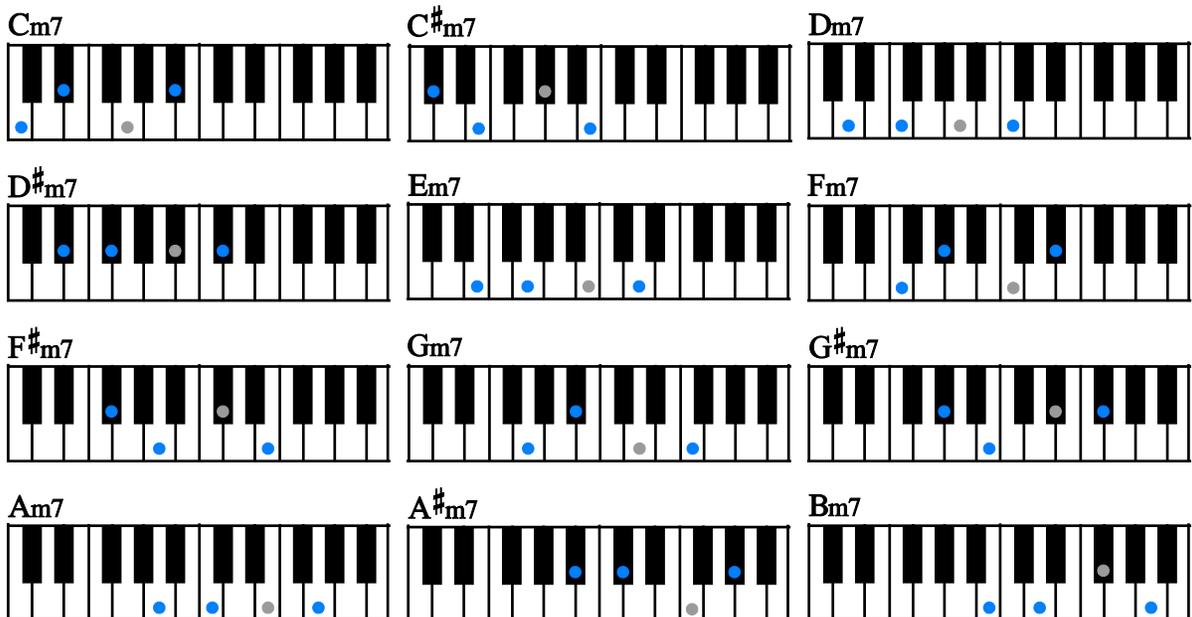
# 7th

root + major3rd + 7th (5th can be omitted.)



# m7

root + minor3rd + 7th (5th can be omitted.)



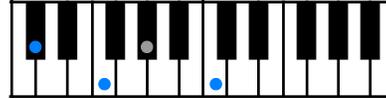
# maj7

root + major3rd + major7th (5th can be omitted.)

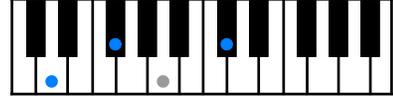
Cmaj7



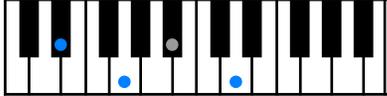
C#maj7



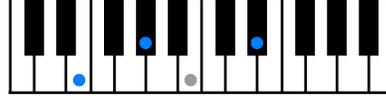
Dmaj7



D#maj7



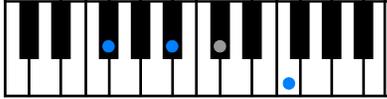
E:maj7



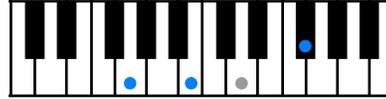
F:maj7



F#maj7



G:maj7



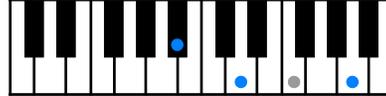
G#maj7



A:maj7



A#maj7



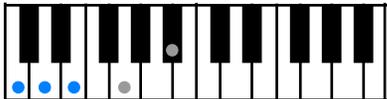
B:maj7



# 9th

root + 9th(2nd) + major3rd (5th and 7th can be omitted.)

C7(9)



C#7(9)



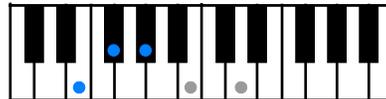
D7(9)



D#7(9)



E7(9)



F7(9)



F#7(9)



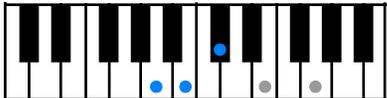
G7(9)



G#7(9)



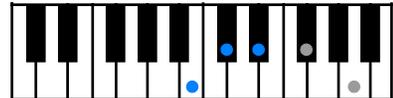
A7(9)



A#7(9)

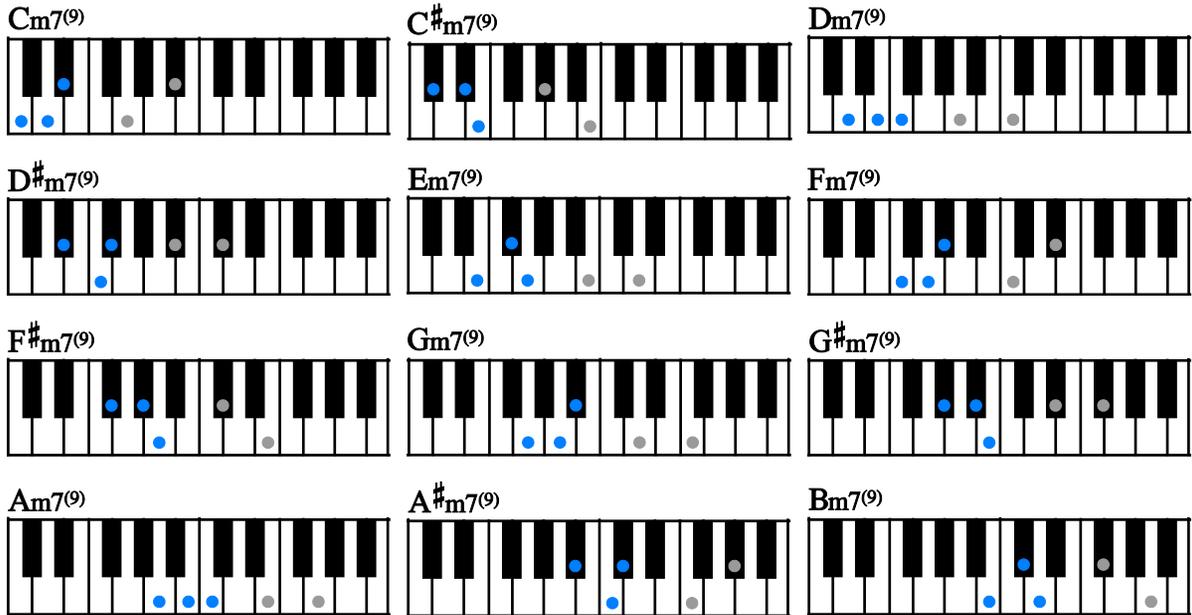


B7(9)



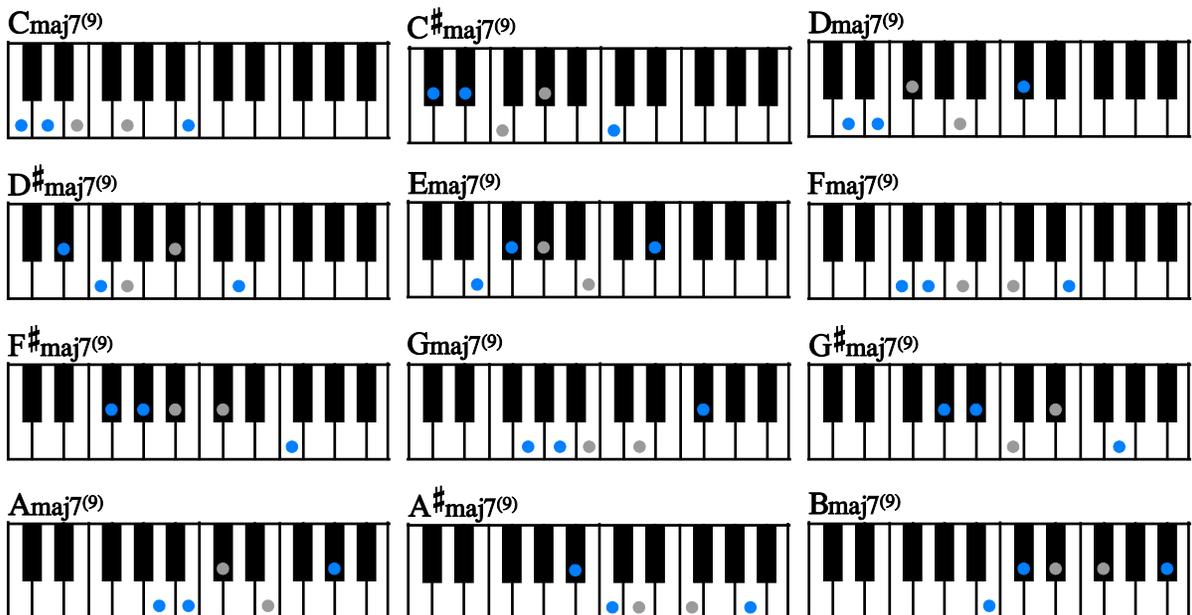
# m9

root + 9th(2nd) + minor3rd (5th and 7th can be omitted.)



# maj9

root + 9th(2nd) + major7th (3rd and 7th can be omitted.)



# add9

root + 9th(2nd) + 5th

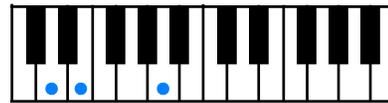
Cadd9



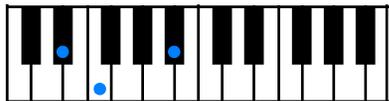
C#add9



Dadd9



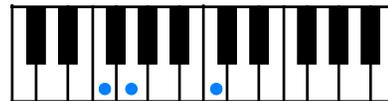
D#add9



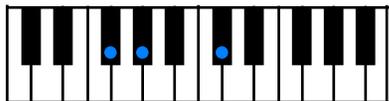
Eadd9



Fadd9



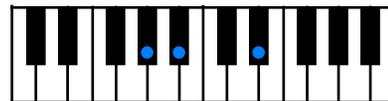
F#add9



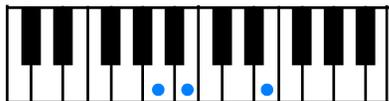
Gadd9



G#add9



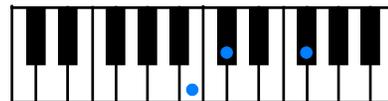
Aadd9



A#add9



Badd9



# sus4

root + 4th + 5th

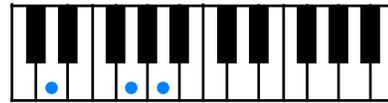
Csus4



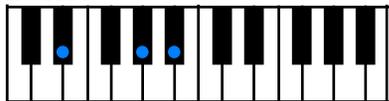
C#sus4



Dsus4



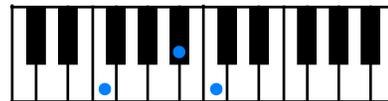
D#sus4



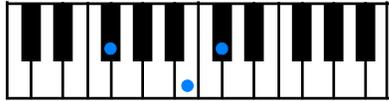
Esus4



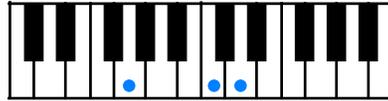
Fsus4



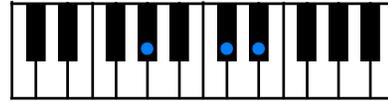
F#sus4



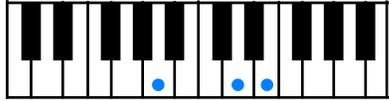
Gsus4



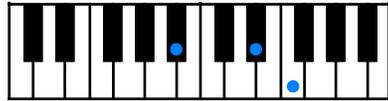
G#sus4



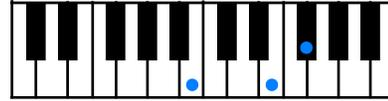
Asus4



A#sus4



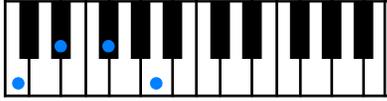
Bsus4



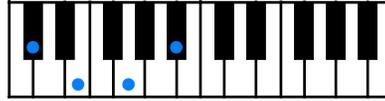
# dim7

root + minor3rd + dim5 + dim7

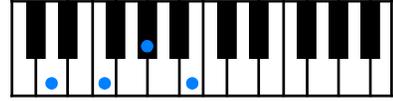
Cdim7



C#dim7



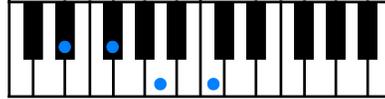
Ddim7



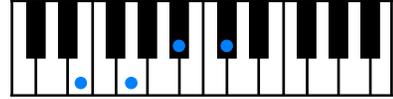
D#sus4



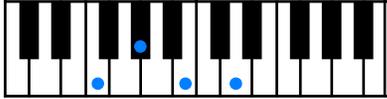
D#dim7



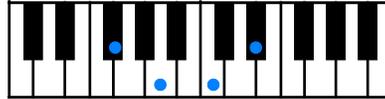
Edim7



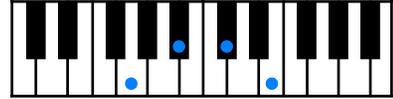
Fdim7



F#dim7



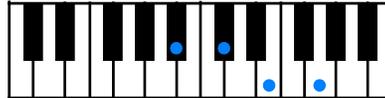
Gdim7



Adim7



A#dim7



Bdim7



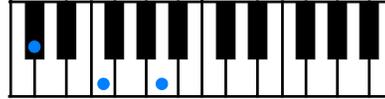
# aug

root + major3rd + aug5

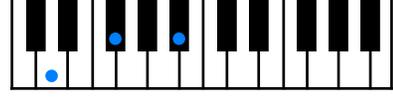
Caug



C#aug



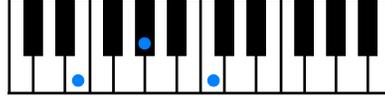
Daug



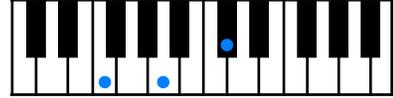
D#aug



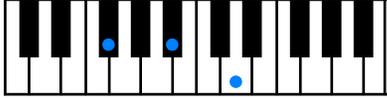
Eaug



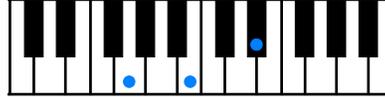
Faug



F#aug



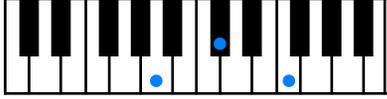
Gaug



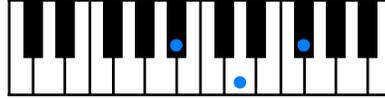
G#aug



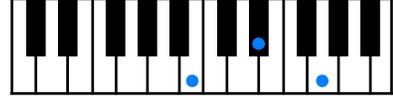
Aaug



A#aug



Baug



# 'RUSH' chords

root + minor2nd + minor3rd + major3rd (does not represent actual chord notes of the chord)

RUSH chord (root = C)



RUSH chord (root = C#)



RUSH chord (root = D)



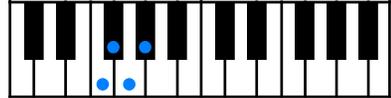
RUSH chord (root = D#)



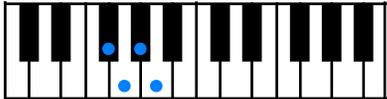
RUSH chord (root = E)



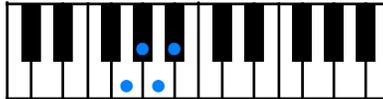
RUSH chord (root = F)



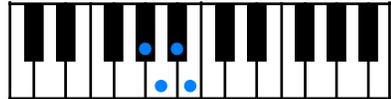
RUSH chord (root = F#)



RUSH chord (root = G)



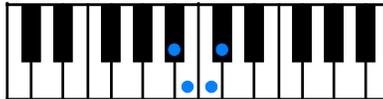
RUSH chord (root = G#)



RUSH chord (root = A)



RUSH chord (root = A#)



RUSH chord (root = B)



# 7<sup>(b5)</sup>

root + major3rd + flat5th (7th can be omitted.)

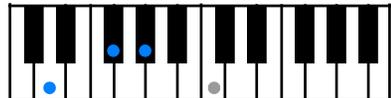
C7<sup>bs</sup>



C#7<sup>bs</sup>



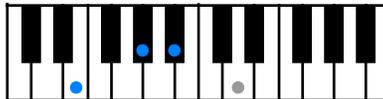
D7<sup>bs</sup>



D#7<sup>bs</sup>



E7<sup>bs</sup>



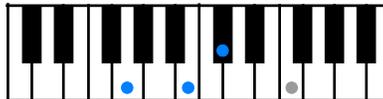
F7<sup>bs</sup>



F#7<sup>bs</sup>



G7<sup>bs</sup>



G#7<sup>bs</sup>



A7<sup>bs</sup>



A#7<sup>bs</sup>

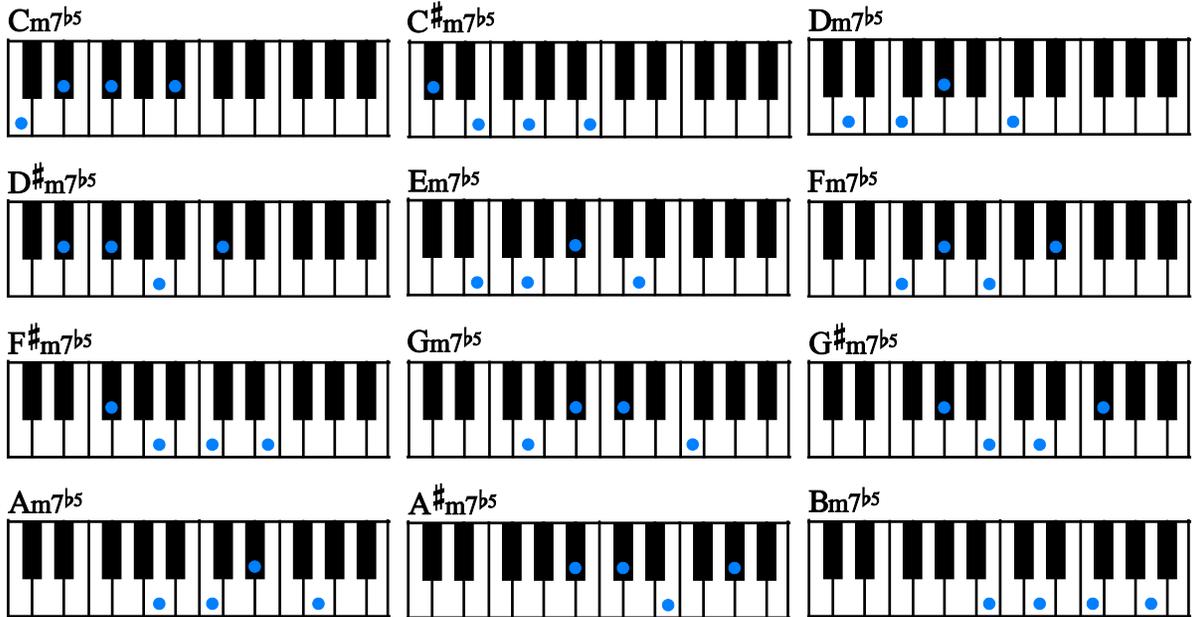


B7<sup>bs</sup>



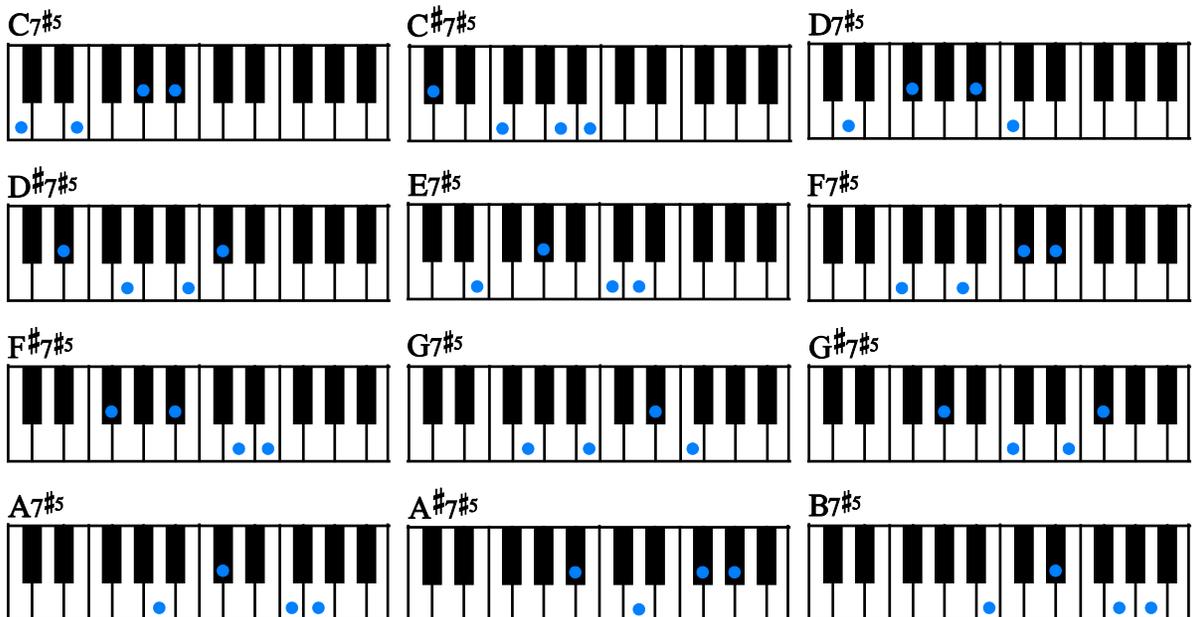
# m7<sup>(b5)</sup>

root + minor3rd + flat5th + 7th



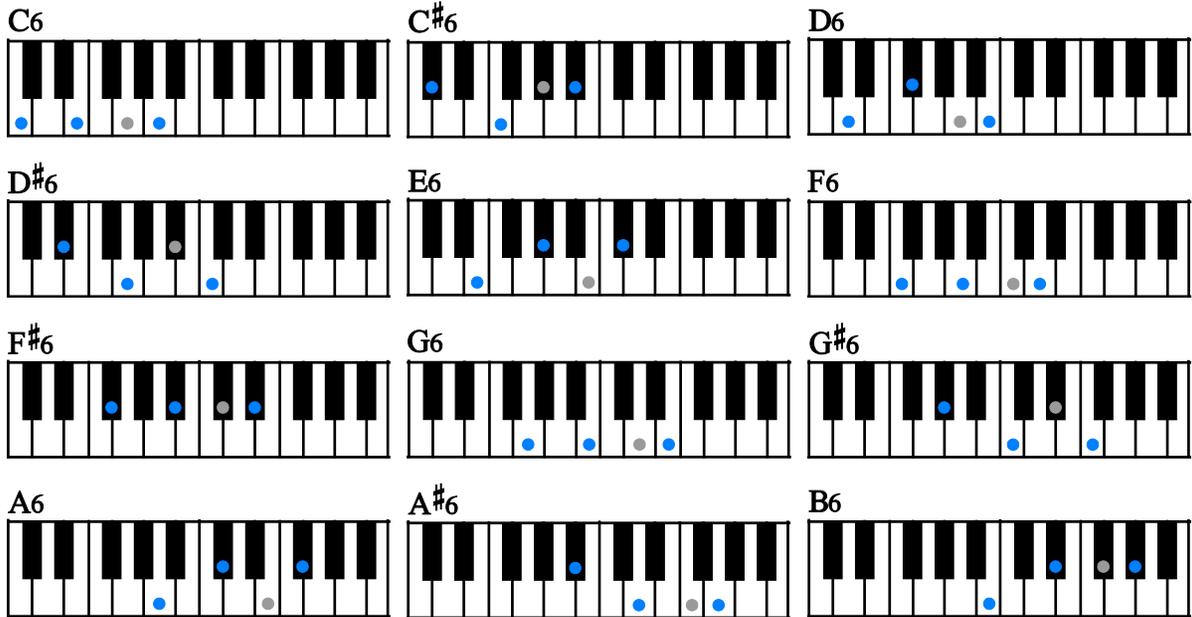
# 7<sup>(#5)</sup>

root + major3rd + #5th + 7th



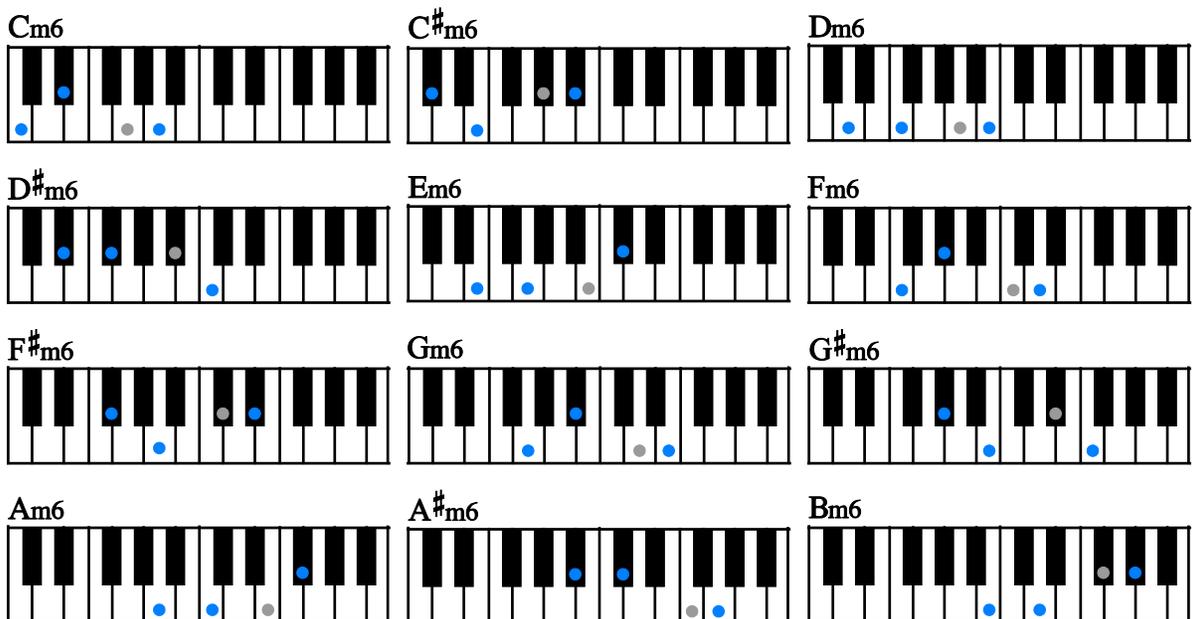
# 6th

root + major3rd + 6th (5th can be omitted.)



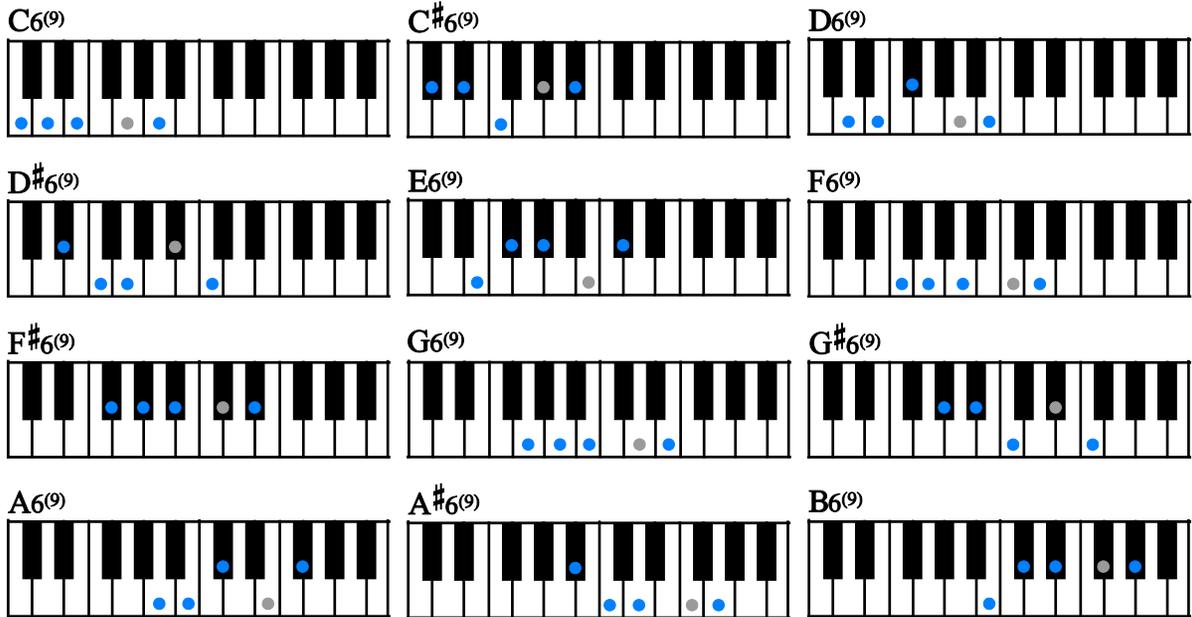
# m6

root + minor3rd + 6th (5th can be omitted.)



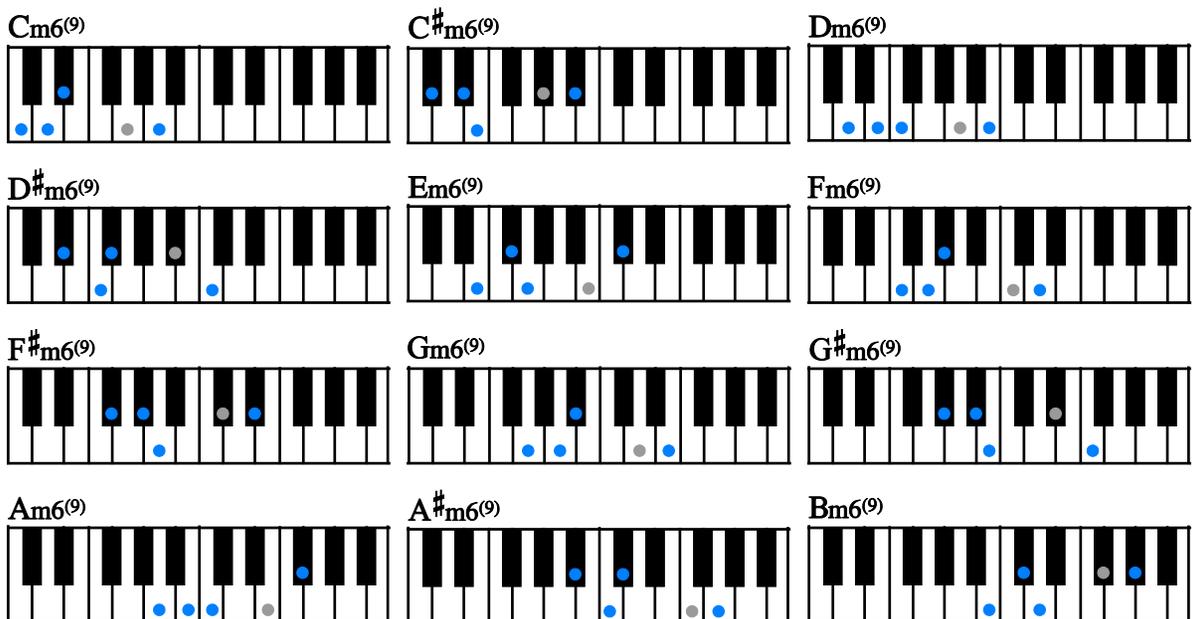
# 6<sup>(9)</sup>

root + 9th(2nd) + major3rd + 6th (5th can be omitted.)



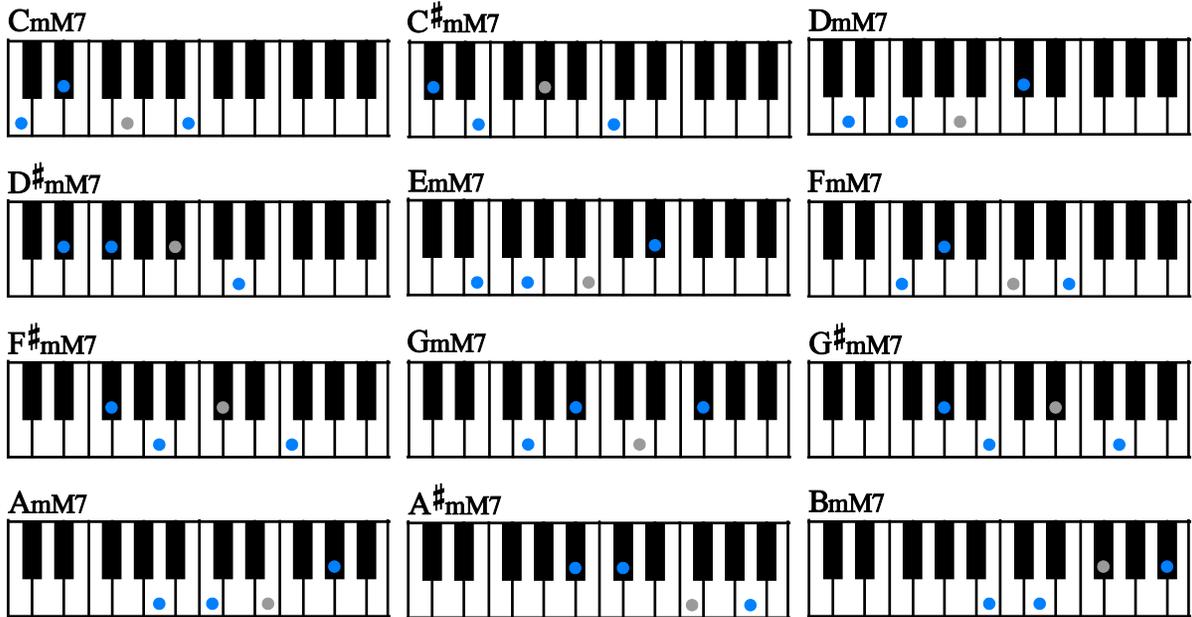
# m6<sup>(9)</sup>

root + 9th(2nd) + minor3rd + 6th (5th can be omitted.)



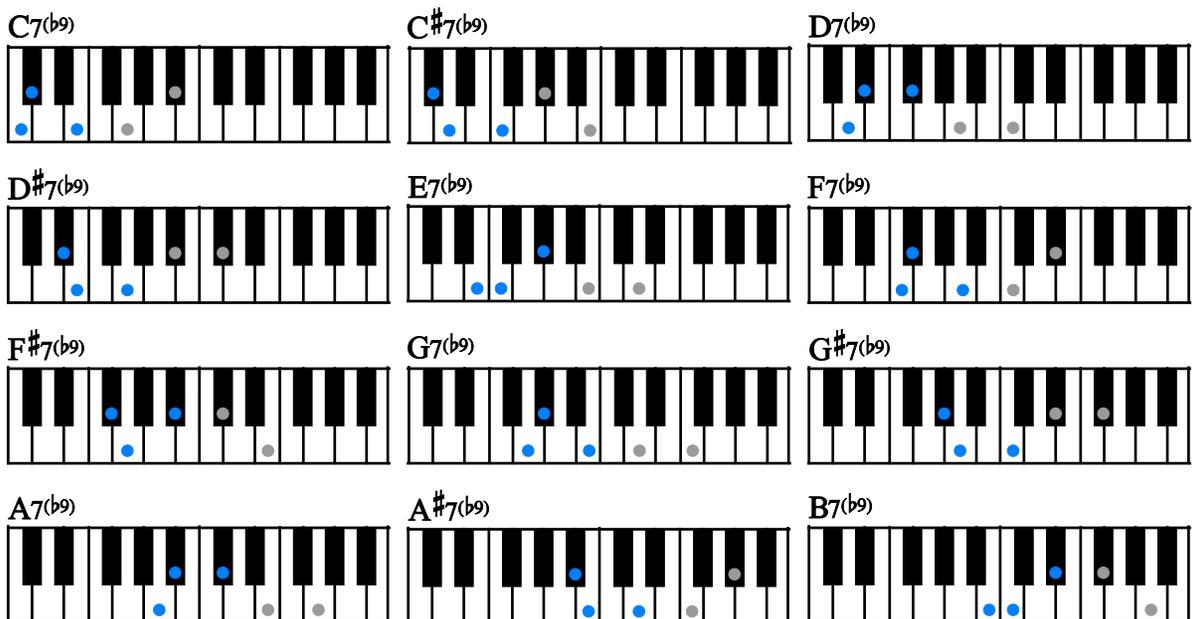
# mMaj7

root + minor3rd + major7th (5th can be omitted.)



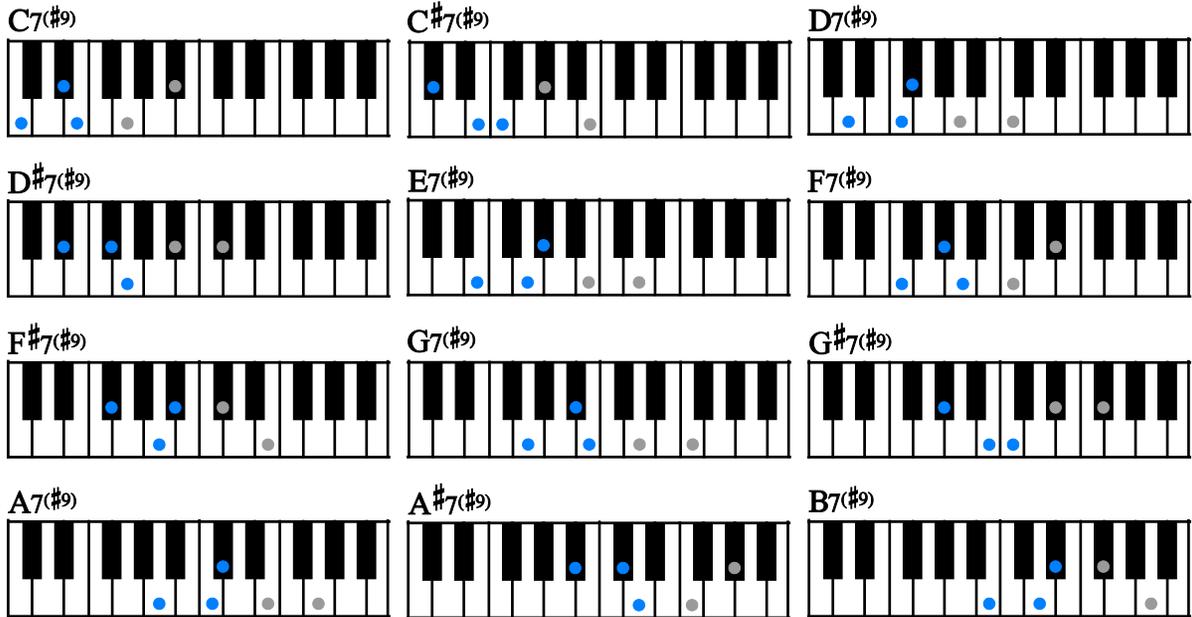
# 7<sup>(b9)</sup>

root + flat9(minor2nd) + major3rd (5th and 7th can be omitted.)



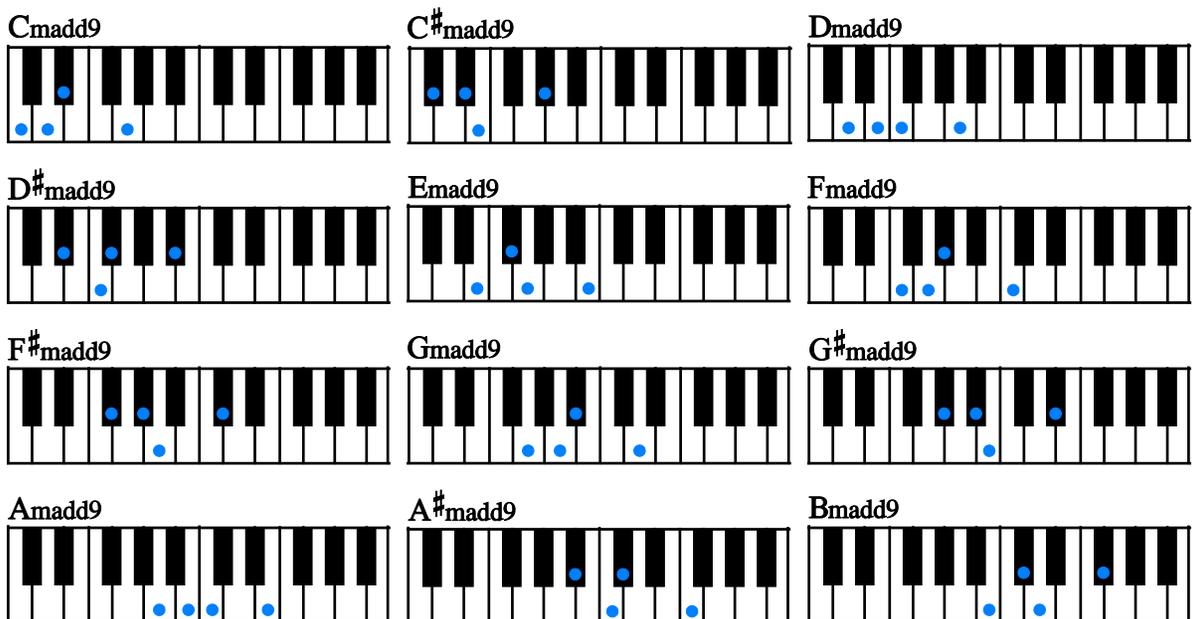
# 7(#9)

root + #9th(#2nd) + major3rd (5th and 7th can be omitted.)



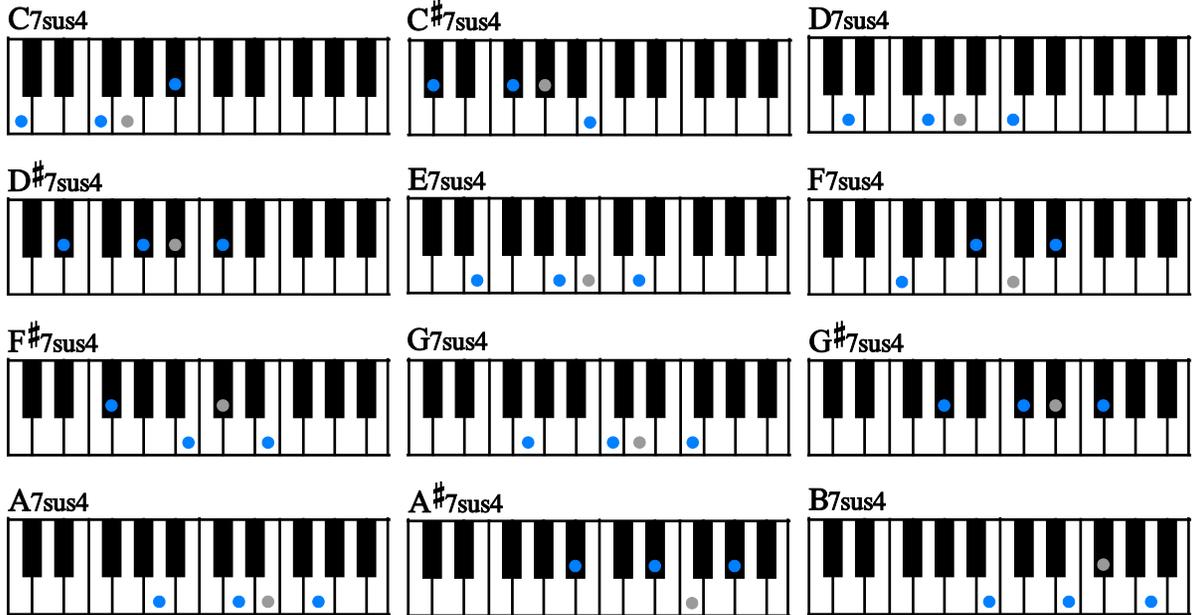
# madd9

root + 9th(2nd) + minor3rd + 5th



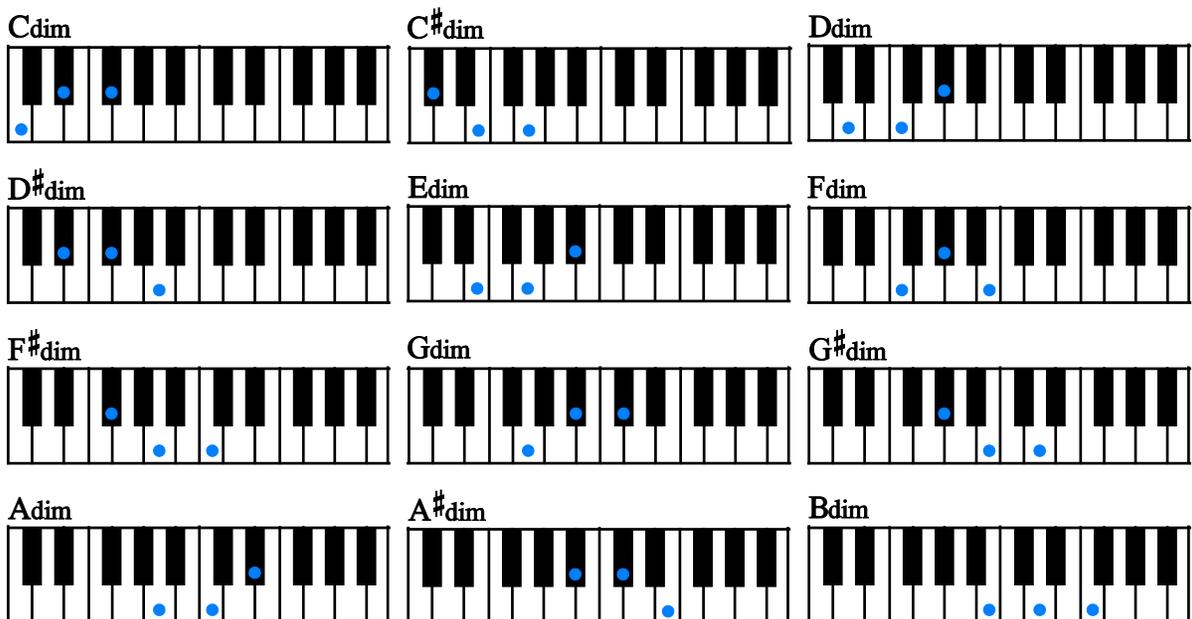
# 7sus4

root + 4th + 7th (5th can be omitted.)



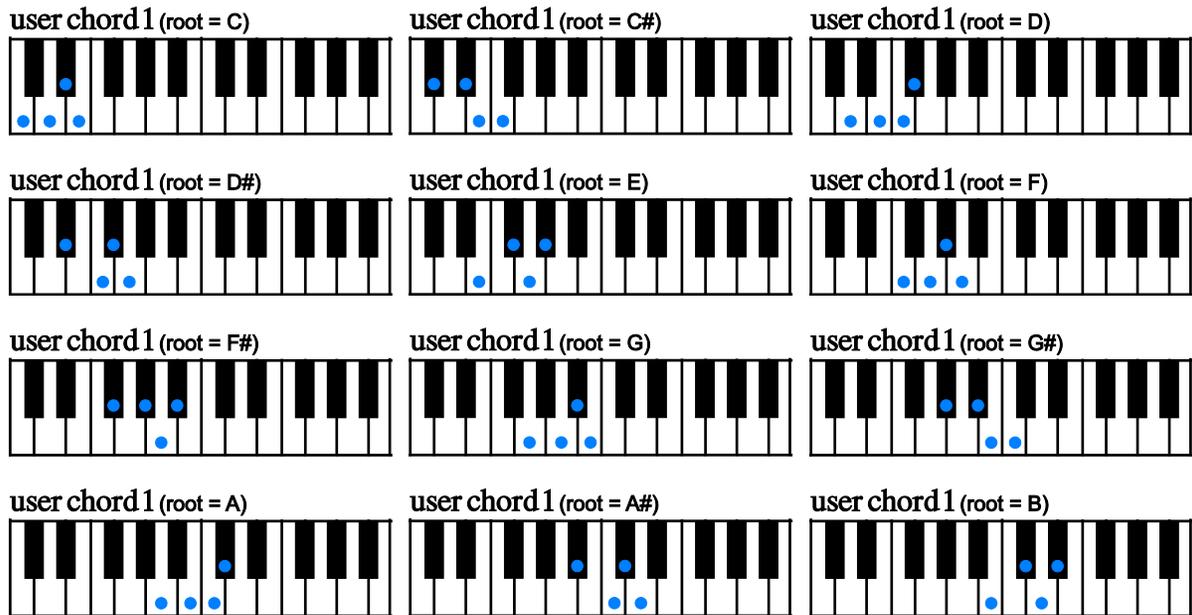
# dim

root + minor3rd + dim5



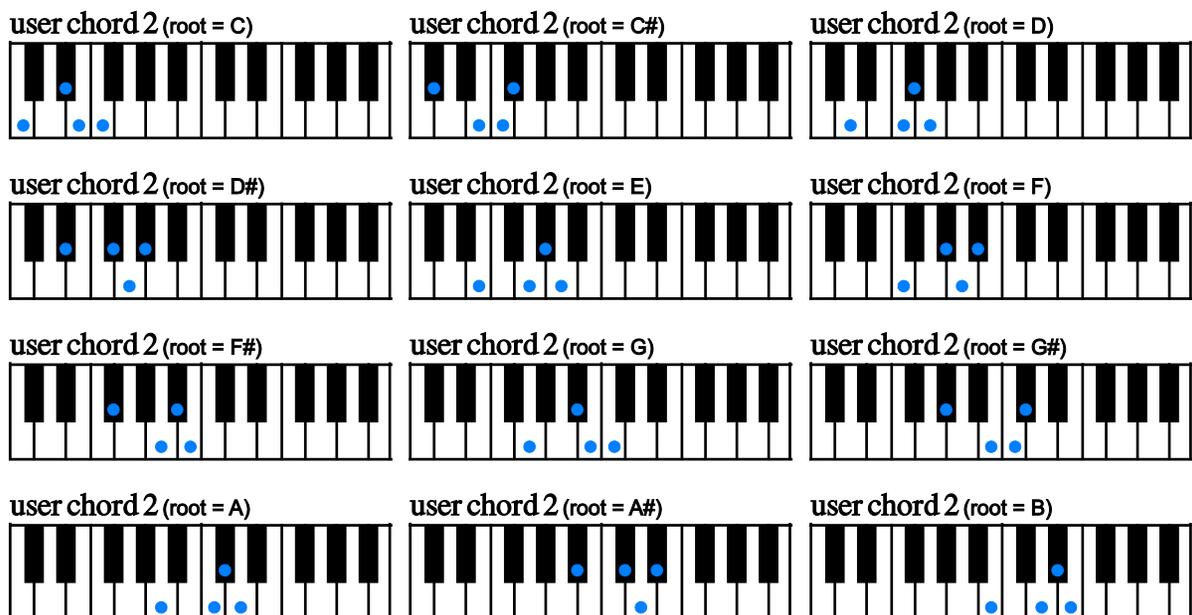
## user chord 1

root + 9th(2nd) + minor3rd + major3rd (does not represent actual chord notes of the chord)



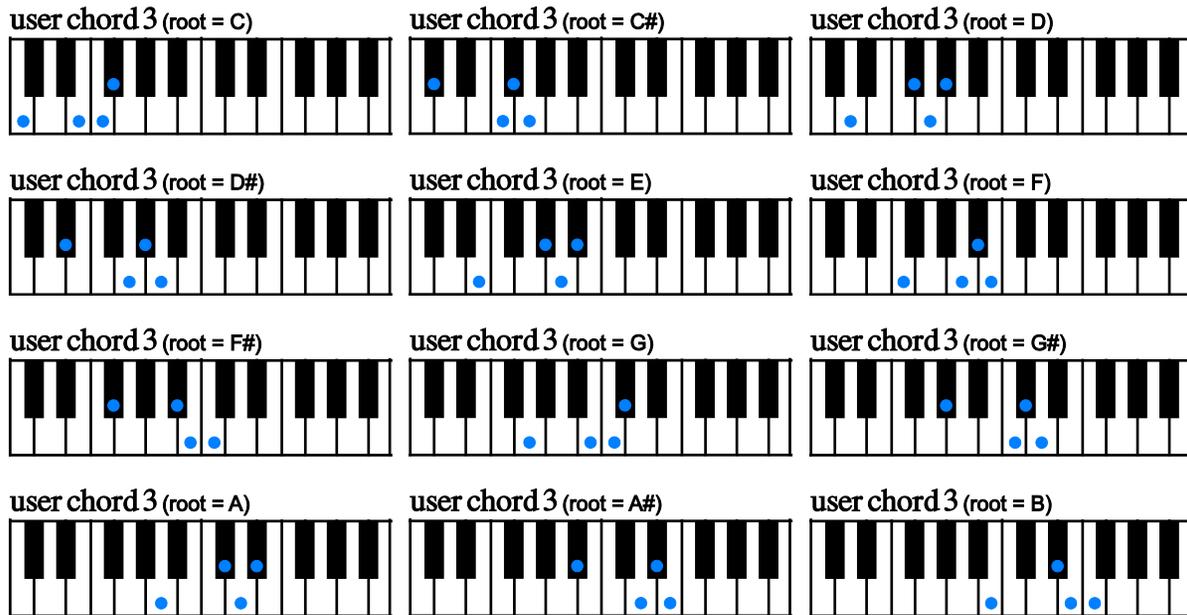
## user chord 2

root + minor3rd + major3rd + 4th (does not represent actual chord notes of the chord)



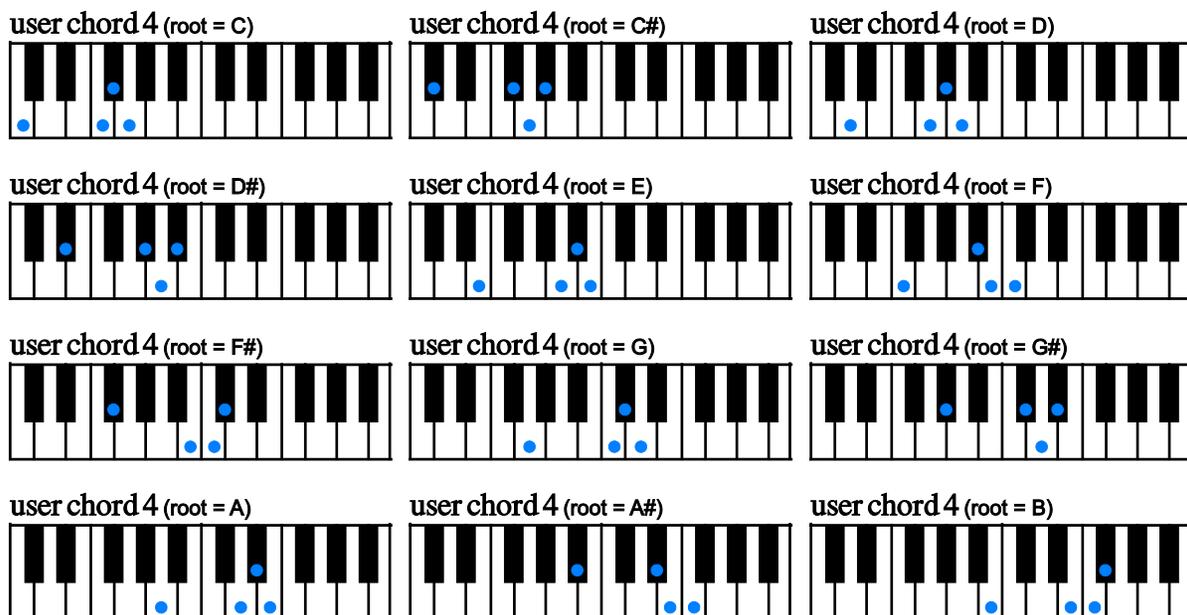
## user chord 3

root + major3rd + 4th + flat5 (does not represent actual chord notes of the chord)



## user chord 4

root + 4th + flat5 + 5th (does not represent actual chord notes of the chord)



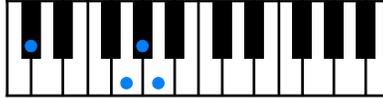
## user chord 5

root + flat5 + 5th + #5th (does not represent actual chord notes of the chord)

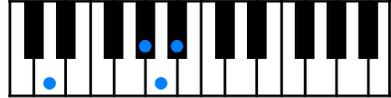
user chord 5 (root = C)



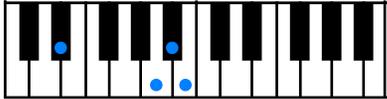
user chord 5 (root = C#)



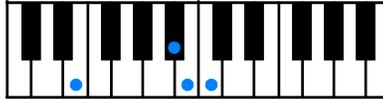
user chord 5 (root = D)



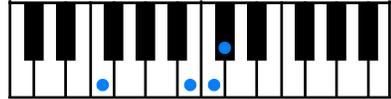
user chord 5 (root = D#)



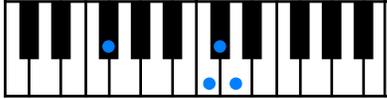
user chord 5 (root = E)



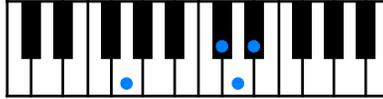
user chord 5 (root = F)



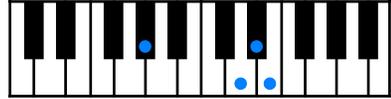
user chord 5 (root = F#)



user chord 5 (root = G)



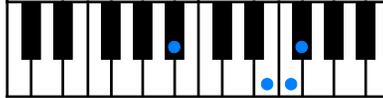
user chord 5 (root = G#)



user chord 5 (root = A)



user chord 5 (root = A#)



user chord 5 (root = B)



## user chord 6

root + flat9(minor2nd) + 9th(2nd) + m3rd + maj3rd (does not represent actual chord notes of the chord)

user chord 6 (root = C)



user chord 6 (root = C#)



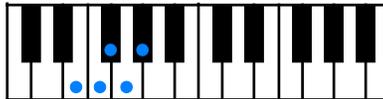
user chord 6 (root = D)



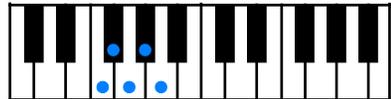
user chord 6 (root = D#)



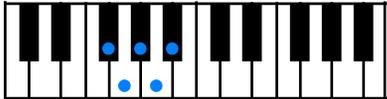
user chord 6 (root = E)



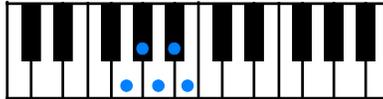
user chord 6 (root = F)



user chord 6 (root = F#)



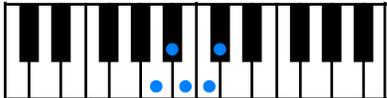
user chord 6 (root = G)



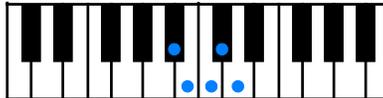
user chord 6 (root = G#)



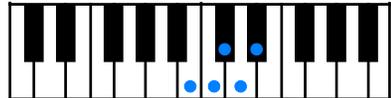
user chord 6 (root = A)



user chord 6 (root = A#)



user chord 6 (root = B)



## user chord 7

root + 9th(2nd) + minor3rd + major3rd + 4th (does not represent actual chord notes of the chord)

user chord 7 (root = C)



user chord 7 (root = C#)



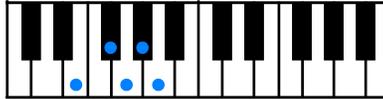
user chord 7 (root = D)



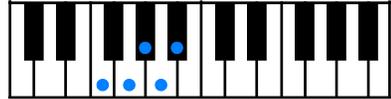
user chord 7 (root = D#)



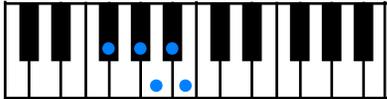
user chord 7 (root = E)



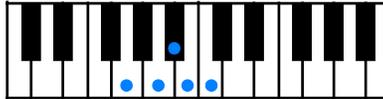
user chord 7 (root = F)



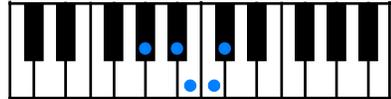
user chord 7 (root = F#)



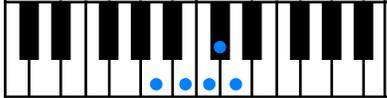
user chord 7 (root = G)



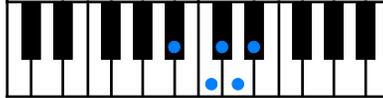
user chord 7 (root = G#)



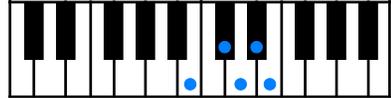
user chord 7 (root = A)



user chord 7 (root = A#)



user chord 7 (root = B)



## user chord 8

root + minor3rd + major3rd + 4th + flat5 (does not represent actual chord notes of the chord)

user chord 8 (root = C)



user chord 8 (root = C#)



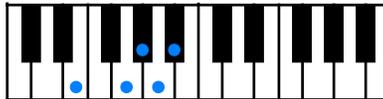
user chord 8 (root = D)



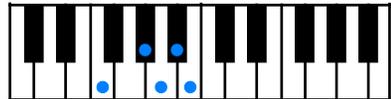
user chord 8 (root = D#)



user chord 8 (root = E)



user chord 8 (root = F)



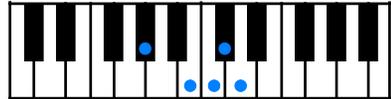
user chord 8 (root = F#)



user chord 8 (root = G)



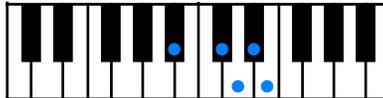
user chord 8 (root = G#)



user chord 8 (root = A)



user chord 8 (root = A#)



user chord 8 (root = B)



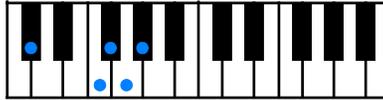
## user chord 9

root + major3rd + 4th + flat5 + 5th (does not represent actual chord notes of the chord)

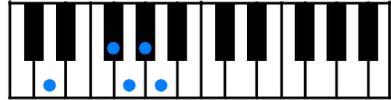
user chord 9 (root = C)



user chord 9 (root = C#)



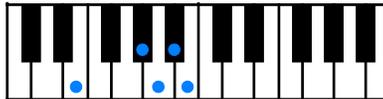
user chord 9 (root = D)



user chord 9 (root = D#)



user chord 9 (root = E)



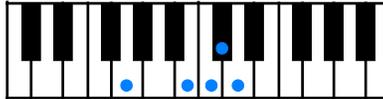
user chord 9 (root = F)



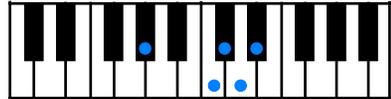
user chord 9 (root = F#)



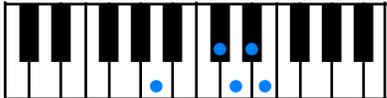
user chord 9 (root = G)



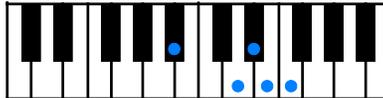
user chord 9 (root = G#)



user chord 9 (root = A)



user chord 9 (root = A#)



user chord 9 (root = B)



## user chord 10

root + 4th + flat5 + 5th + #5 (does not represent actual chord notes of the chord)

user chord 10 (root = C)



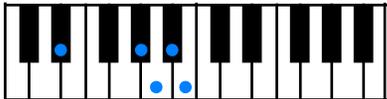
user chord 10 (root = C#)



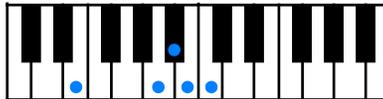
user chord 10 (root = D)



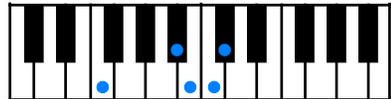
user chord 10 (root = D#)



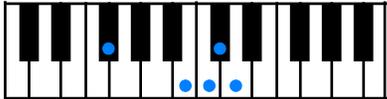
user chord 10 (root = E)



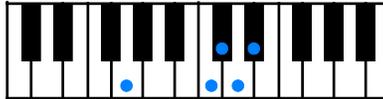
user chord 10 (root = F)



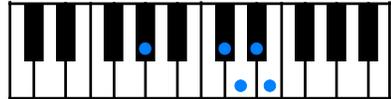
user chord 10 (root = F#)



user chord 10 (root = G)



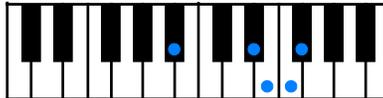
user chord 10 (root = G#)



user chord 10 (root = A)



user chord 10 (root = A#)



user chord 10 (root = B)





## **MIDI Controller Chart**

# Hummingbird MIDI controllers

<b>MIDI CC# 1</b>	<b>mute / picking noise</b> (active only when the mute mode is 'mod wheel')																																																																														
<b>MIDI CC# 3</b>	<b>chord stroke speed (fast or slow)</b> 0 – 63: fast stroke 64 – 127: slow stroke *Each stroke speed can be changed via MIDI CC# 22 (fast) and 23 (slow).																																																																														
<b>MIDI CC# 4</b>	<b>gliss down speed</b> 0 – 42: fast 43 – 85: mid 86 – 127: slow																																																																														
<b>MIDI CC# 19</b>	<b>chord picking noise mode</b> 0 – 63: tight 64 – 127: loose																																																																														
<b>MIDI CC# 20</b>	<b>position change noise mode</b> 0 – 63: normal 64 – 127: loud																																																																														
<b>MIDI CC# 21</b>	<b>prefer open / low chord</b> 0 - 63: OFF 64 - 127: ON																																																																														
<b>MIDI CC# 22</b>	<b>strum speed 1 (2 - 30 ms) fast</b>																																																																														
<b>MIDI CC# 23</b>	<b>strum speed 2 (30 - 199.9 ms) slow</b>																																																																														
<b>MIDI CC# 24</b>	<b>sampled chord mode</b> 0 – 63: hybrid (play sampled chord if available) 64 – 127: emulated (play only emulated chord)																																																																														
<b>MIDI CC# 25</b>	<b>pick buzz ON / OFF</b> 0 - 63: OFF 64 - 127: ON																																																																														
<b>MIDI CC# 28</b>	<b>target string to edit</b> * Use with MIDI CC# 29 (pitch bend range) or MIDI CC# 77, 78, and 79 (strumkey setting) 0 : all strings 1: string 1 2: string 2 3: string 3 4: string 4 5: string 5 6: string 6																																																																														
<b>MIDI CC# 29</b>	<b>pitch bend range</b>																																																																														
<b>MIDI CC# 31</b>	<b>direct select instrument via MIDI CC</b> * Use with MIDI CC# 45 <table border="0"> <tr> <td>(single note)</td> <td>(chord)</td> <td>(chord)</td> </tr> <tr> <td>1: single legato slide</td> <td>1: major</td> <td>51: user chord 1</td> </tr> <tr> <td>2: hammer-on&amp;pull-off / trill</td> <td>2: minor</td> <td>52: user chord 2</td> </tr> <tr> <td>3: no legato</td> <td>3: 7th</td> <td>53: user chord 3</td> </tr> <tr> <td></td> <td>4: m7th</td> <td>54: user chord 4</td> </tr> <tr> <td>(dyad chord)</td> <td>5: maj7th</td> <td>55: user chord 5</td> </tr> <tr> <td>1: minor2nd</td> <td>6: 9th</td> <td>56: user chord 6</td> </tr> <tr> <td>2: major2nd</td> <td>7: m9th</td> <td>57: user chord 7</td> </tr> <tr> <td>3: minor3rd-dyad</td> <td>8: maj9</td> <td>58: user chord 8</td> </tr> <tr> <td>4: major3rd-dyad</td> <td>9: add9</td> <td>59: user chord 9</td> </tr> <tr> <td>5: 4th-dyad</td> <td>10: sus4</td> <td>60: user chord 10</td> </tr> <tr> <td>6: flat5th-dyad</td> <td>11: dim7</td> <td></td> </tr> <tr> <td>7: 5th-dyad</td> <td>12: aug</td> <td>(FX)</td> </tr> <tr> <td>8: #5th-dyad</td> <td>13: rush 14: 7flat5</td> <td>3: natural harmonics</td> </tr> <tr> <td>9: 6th-dyad</td> <td>15: m7flat5</td> <td>4: FX1 - harmonics</td> </tr> <tr> <td>10: 7th-dyad</td> <td>16: 7sharp5</td> <td>5: FX2 - percussion</td> </tr> <tr> <td>11: maj7th-dyad</td> <td>17: 6th</td> <td>6: FX3 - slides</td> </tr> <tr> <td>12: octave</td> <td>18: m6th</td> <td>7: FX4 - noise, etc.</td> </tr> <tr> <td></td> <td>19: 69th</td> <td></td> </tr> <tr> <td></td> <td>20: m69th</td> <td></td> </tr> <tr> <td></td> <td>21: mMaj7</td> <td></td> </tr> <tr> <td></td> <td>22: flat9</td> <td></td> </tr> <tr> <td></td> <td>23: sharp9</td> <td></td> </tr> <tr> <td></td> <td>24: madd9</td> <td></td> </tr> <tr> <td></td> <td>25: 7sus4</td> <td></td> </tr> <tr> <td></td> <td>26: dim</td> <td></td> </tr> </table>	(single note)	(chord)	(chord)	1: single legato slide	1: major	51: user chord 1	2: hammer-on&pull-off / trill	2: minor	52: user chord 2	3: no legato	3: 7th	53: user chord 3		4: m7th	54: user chord 4	(dyad chord)	5: maj7th	55: user chord 5	1: minor2nd	6: 9th	56: user chord 6	2: major2nd	7: m9th	57: user chord 7	3: minor3rd-dyad	8: maj9	58: user chord 8	4: major3rd-dyad	9: add9	59: user chord 9	5: 4th-dyad	10: sus4	60: user chord 10	6: flat5th-dyad	11: dim7		7: 5th-dyad	12: aug	(FX)	8: #5th-dyad	13: rush 14: 7flat5	3: natural harmonics	9: 6th-dyad	15: m7flat5	4: FX1 - harmonics	10: 7th-dyad	16: 7sharp5	5: FX2 - percussion	11: maj7th-dyad	17: 6th	6: FX3 - slides	12: octave	18: m6th	7: FX4 - noise, etc.		19: 69th			20: m69th			21: mMaj7			22: flat9			23: sharp9			24: madd9			25: 7sus4			26: dim	
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<b>MIDI CC# 41</b>	<b>finger release noise mode (Play Key)</b> 0 - 63: tight 64 - 127: loose
<b>MIDI CC# 42</b>	<b>roundrobin mode</b> (works only with single note instruments) 0 – 31: OFF 32 – 63: 2 roundrobin 64 – 95: 3 random 96 - 127: 4 random
<b>MIDI CC# 44</b>	<b>target instrument select key switch</b> (MIDI CC value = MIDI note number) * Use with MIDI CC# 45 & 46 0: C-2      12: C-1      24: C0      36: C1 1: C#-2     13: C#-1     25: C#0     37: C#1 2: D-2      14: D-1      26: D0      38: D1 3: D#-2     15: D#-1     27: D#0     39: D#1 4: E-2      16: E-1      28: E0      40: E1 5: F-2      17: F-1      29: F0 6: F#-2     18: F#-1     30: F#0 7: G-2      19: G-1      31: G0 8: G#-2     20: G#-1     32: G#0 9: A-2      21: A-1      33: A0 10: A#-2    22: A#-1     34: A#0 11: B-2     23: B-1      35: B0
<b>MIDI CC# 45</b>	<b>Instrument type</b> * Use with MIDI CC# 44 or 46 0: single note 1: dyad chord 2: chord 3: FX
<b>MIDI CC# 43</b>	<b>legato slide &amp; gliss sample volume</b> (0: max, 127:min)
<b>MIDI CC# 46</b>	<b>instrument number</b> * Use with MIDI CC# 45  <b>If MIDI CC# 45 = 0 (single note) ;</b> 1: single legato slide 2: hammer-on&pull-off / trill 3: no legato  <b>If MIDI CC# 45 = 1 (dyad chord);</b> 1: minor2nd 2: major2nd 3: minor3rd-dyad 4: major3rd-dyad 5: 4th-dyad 6: flat5th-dyad 7: 5th-dyad 8: #5th-dyad 9: 6th-dyad 10: 7th-dyad 11: maj7th-dyad 12: octave  <b>If MIDI CC# 45 = 2 (chord);</b> 1: major 2: minor 3: 7th 4: m7th 5: maj7th 6: 9th7: m9th 8: maj9 9: add9 10: sus4 11: dim7 12: aug 13: rush 14: flat5 15: mflat 16: sharp5 17: 6th 18: m6th 19: 69th 20: m69th 21: mMaj7 22: flat9 23: sharp9 24: madd9 25: 7sus4 26: dim  <b>If MIDI CC# 45 = 2 (chord);</b> 51: user chord 1 52: user chord 2 53: user chord 3 54: user chord 4 55: user chord 5 56: user chord 6 57: user chord 7 58: user chord 8 59: user chord 9 60: user chord 10  <b>If MIDI CC# 45 = 3 (FX, etc.);</b> 3: natural harmonics 4: FX1 - harmonics 5: FX2 - percussions 6: FX3 - slides 7: FX4 – noise, etc.
<b>MIDI CC# 48</b>	<b>mute mode</b> 0 - 63: modulation wheel (MIDI CC# 1) 64 - 127: velocity
<b>MIDI CC# 49</b>	<b>picking noise MIDI CC#1 (mod wheel) threshold level</b>
<b>MIDI CC# 50</b>	<b>mute MIDI CC#1 (mod wheel) threshold level</b>
<b>MIDI CC# 51</b>	<b>mute velocity threshold level</b>

<b>MIDI CC# 52</b>	<b>string / chord shape select key switch</b> (MIDI note number for the lowest string select key switch)
<b>MIDI CC# 54</b>	<b>auto sustain ON / OFF</b> 0 - 63: ON 64 - 127: OFF
<b>MIDI CC# 55</b>	<b>high velocity threshold level</b>
<b>MIDI CC# 56</b>	<b>poly mode ON / OFF</b> 0 - 63: ON 64 - 127: OFF
<b>MIDI CC# 57</b>	<b>auto alternation (auto stroke detection) resolution</b> 0 - 25: 8th 26 - 50: 8th triplet 51 - 75: 16th 76 - 100: 16th triplet 101 - 127: 32nd
<b>MIDI CC# 58</b>	<b>auto alternation (auto stroke detection) mode</b> 0 - 31: auto 32 - 63: forced 64 - 95: down only 96 - 127: up only
<b>MIDI CC# 62</b>	<b>release time</b>
<b>MIDI CC# 74</b>	<b>target strum key to edit</b> 0: normal keys (E3 - C7) 1: strum key 1 (C2) 2: strum key 2 (C#2) 3: strum key 3 (D2) 4: strum key 4 (D#2) 5: strum key 5 (F#2) 6: strum key 6 (G#2) 7: strum key 7 (A#2) 8: strum key 8 (C#3)
<b>MIDI CC# 75</b>	<b>strum key: stroke direction</b> (* Use with MIDI CC# 74) 0 - 42: auto (time recognition) 43 - 85: down 86 - 127: up
<b>MIDI CC# 76</b>	<b>strum key: string ON / OFF</b> (* Use with MIDI CC# 74 & 28) 0 - 63: OFF 64 - 127: ON
<b>MIDI CC# 77</b>	<b>strum key: string velocity rate</b> (* Use with MIDI CC# 74 & 28) 1 (min) - 100 (max)
<b>MIDI CC# 78</b>	<b>strum key: string strum type</b> (* Use with MIDI CC# 74 & 28) 0 - 31: do nothing 32 - 63: normal sustain 64 - 95: mute 96 - 127: picking noise
<b>MIDI CC# 80</b>	<b>extra strum noise ON / OFF</b> (* Use with MIDI CC# 74) 0 - 63: OFF 64 - 127: ON
<b>MIDI CC# 81</b>	<b>extra strum noise type</b> (* Use with MIDI CC# 74) 0 - 63: lower strings 64 - 127: upper strings
<b>MIDI CC# 82</b>	<b>extra strum noise volume</b> (0: max / 127: min)

<b>MIDI CC# 114</b>	<b>target play key to edit</b> 1: hold key 1 2: hold key 2 3: hold key 3 4: stop key 1 5: stop key 2 6: stop key 3
<b>MIDI CC# 115</b>	<b>target play key button to turn ON / OFF</b> 1: picking noise 2: pick stop noise 3: finger release noise 4: repeat same note 5: gliss down 6: bridge mute noise 7: fret noise 8: position change noise 9: muted brush noise 10: palm body hit 11: finger body hit 12: string mute buzz
<b>MIDI CC# 116</b>	<b>ON / OFF the play key button</b> * Use with MIDI CC# 114 & 115 0 – 63: OFF 64 – 127: ON

# Credits

## Produced and Programmed by

Akihito Okawa

## Demo Music

Akihito Okawa, Hozo Okazaki

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## **Hummingbird User's Manual**

Written by AKIHITO OKAWA

Ver.1.0

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