Using Impro-Visor

Robert M. Keller

Harvey Mudd College

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What is Impro-Visor?

- Impro-Visor is notation and playback software designed for jazz musicians.

- For more details, please see:http://www.cs.hmc.edu/~keller/jazz/improvisor/

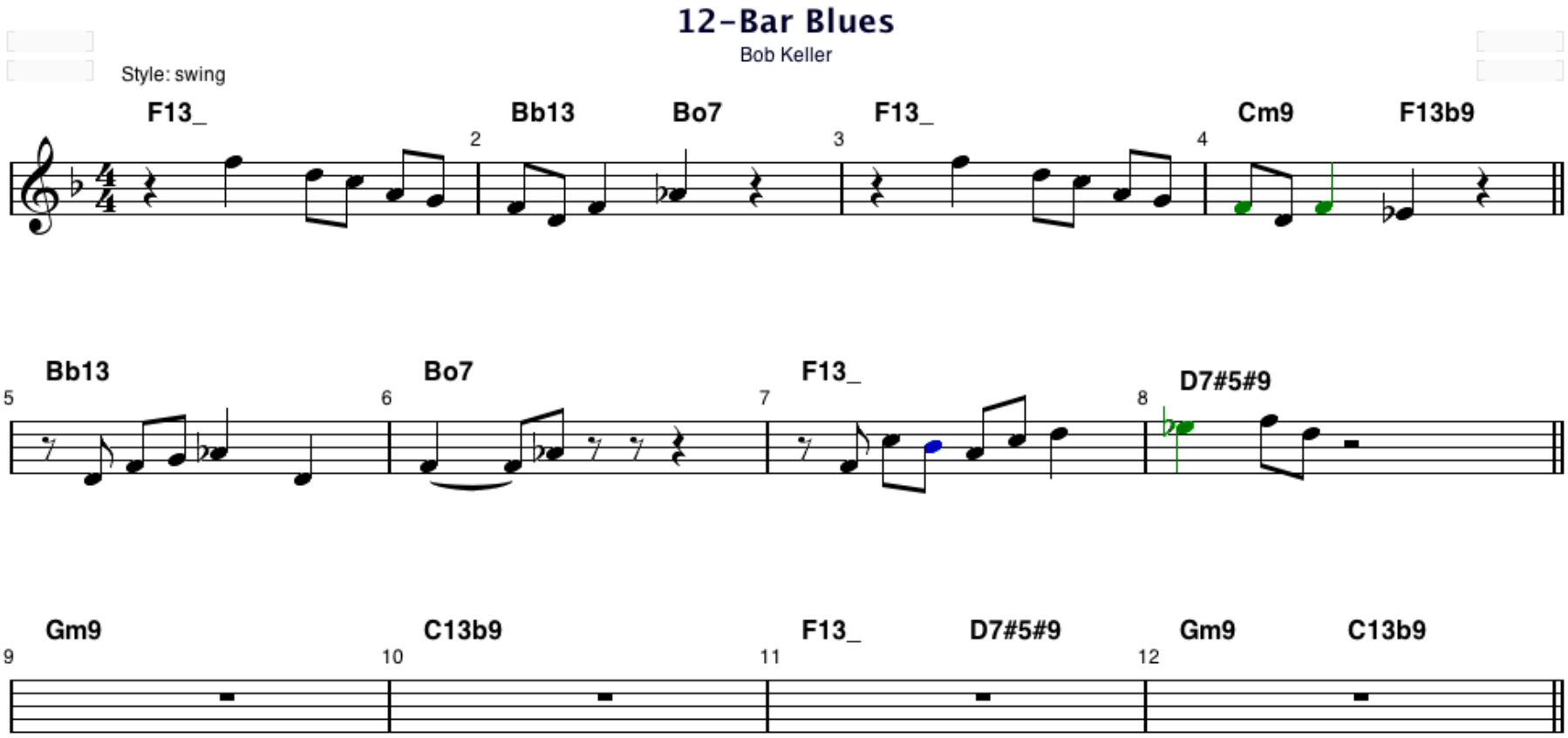
Disclaimer

- Although its educational usefulness has long been established, Impro-Visor does not claim to be completely general music notation program.

- For example, one can only display a **single melody line with chords** (i.e. a leadsheet). This is according to the original design for making it simple to use.

- New features are being added, so eventually this constraint may be relaxed, if it can be done consistently with the original goals.

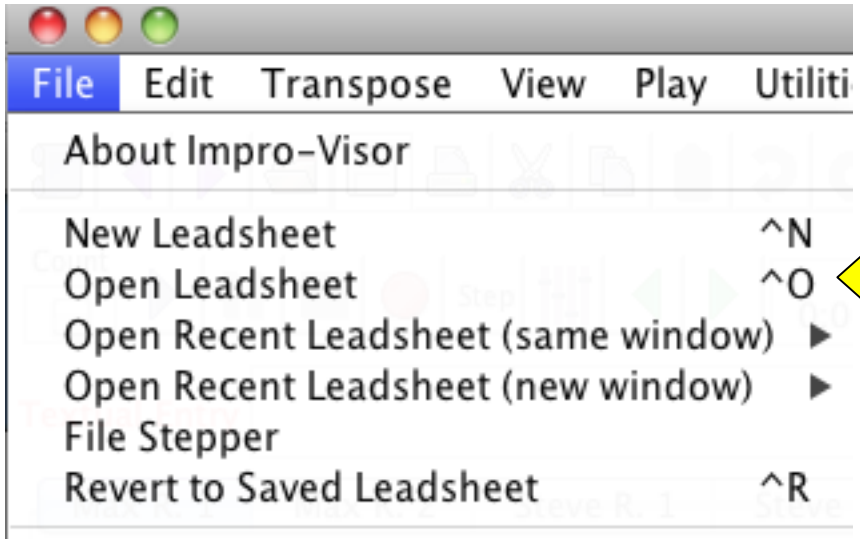
Example of an Impro-Visor Leadsheet



Opening Leadsheet Files

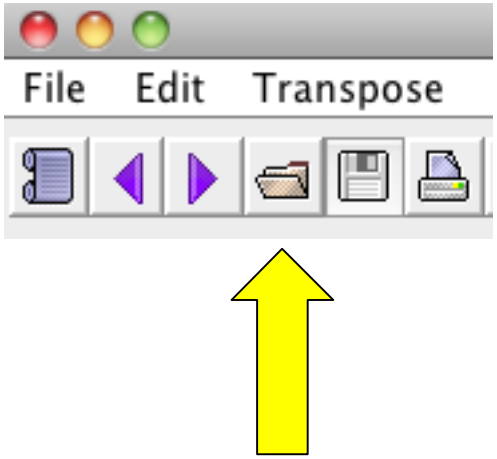
- 3 ways to open a file:
  - Using the shortcut ^O (Control-O)
  - From the File Menu
  - From the Icon Bar

Opening Leadsheet File from the File Menu



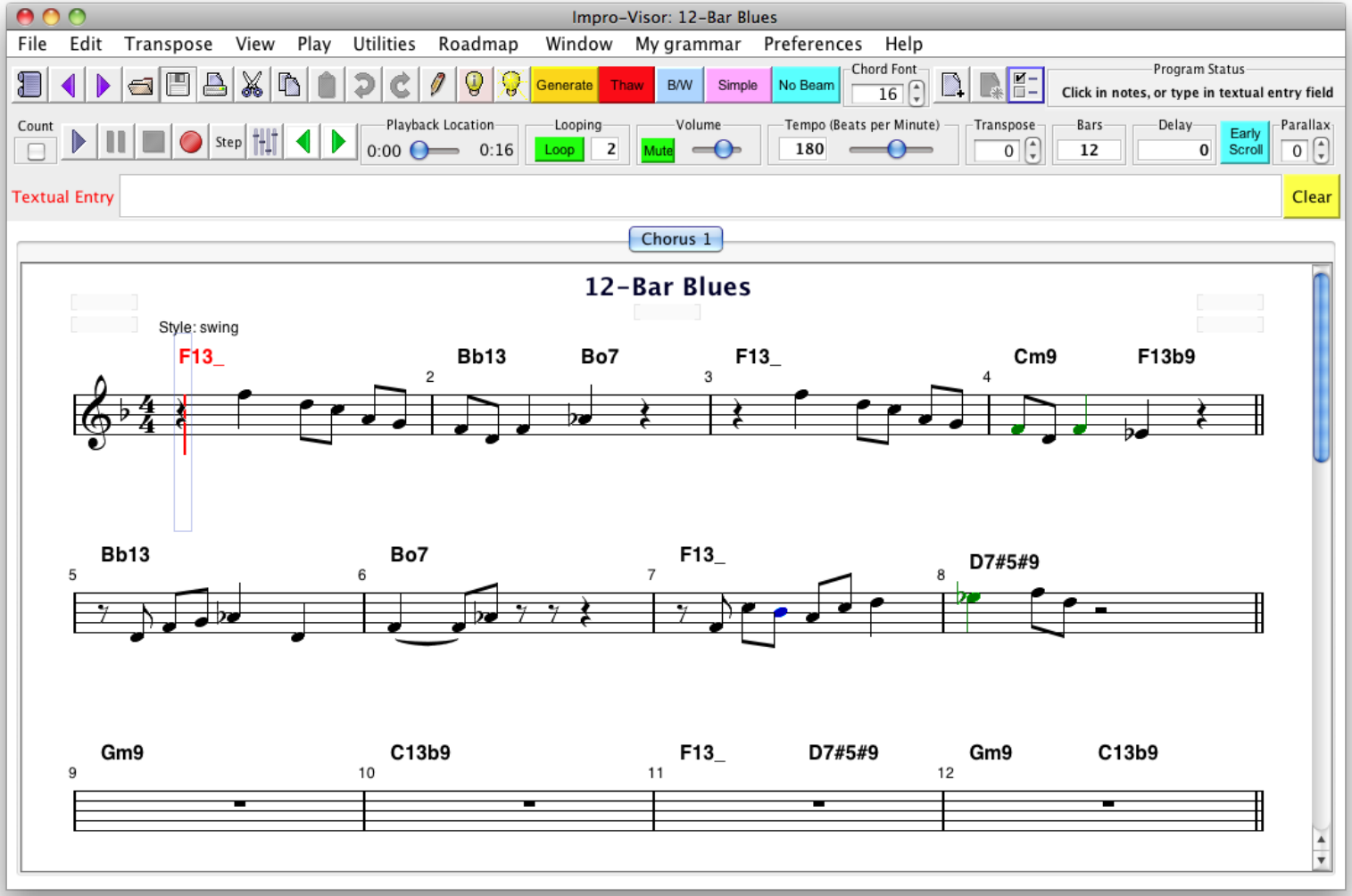
Click Here

Opening Leadsheet File from the Icon Bar



Click Here,
then refer to the previous page

Open _tutorial.ls



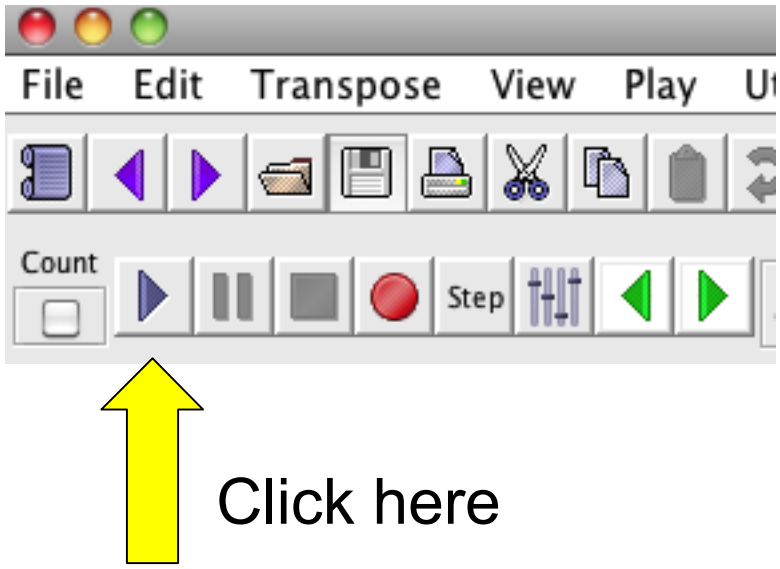
Browsing Leadsheets

- The leadsheets in a single directory can be browsed step-wise by using the **purple** arrow buttons.

- The order is alphabetic, as used in the underlying file system.

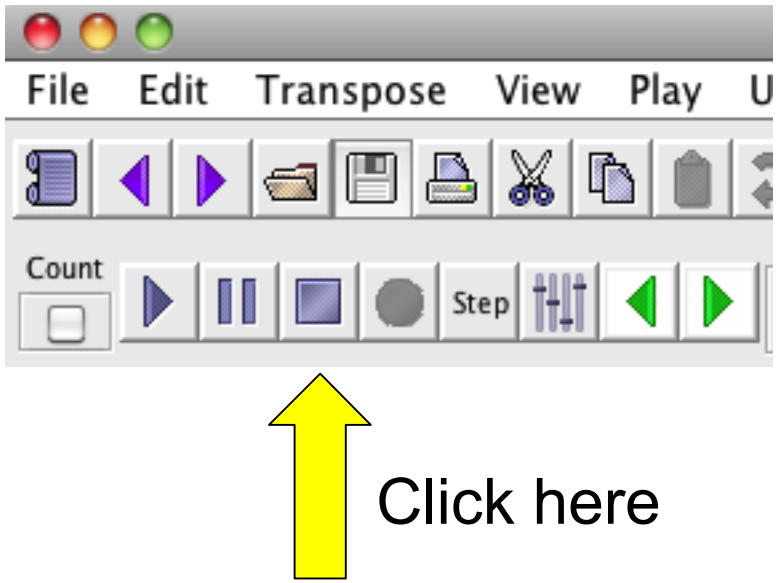
Play the Leadsheet

- 3 ways to play the entire leadsheet:
  - Press I key
  - Press shift-return
  - Click the lower left triangle icon



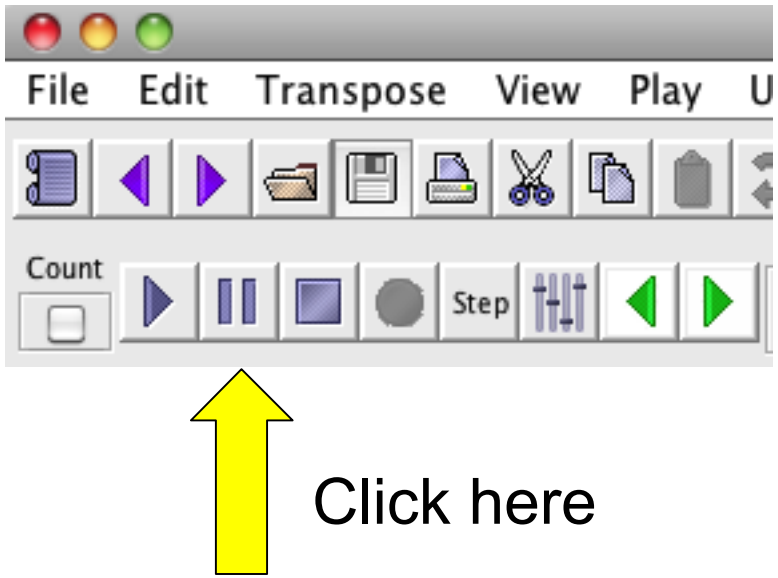
Stop Playback

- 2 ways to stop playback:
  - Press the K key
  - Click the square icon



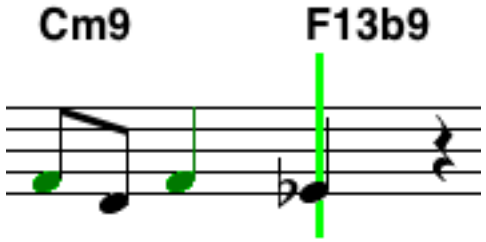
Pause or Resume Playback

- 2 ways to pause or resume playback:
  - Press the L key
  - Click the parallel bars icon icon

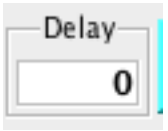


Tracking Line

- A green vertical tracking line shows the position in the playback, unless you turn off this feature.



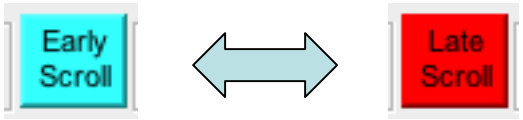
- The tracking line can be calibrated with the **delay** setting



Auto-Scrolling

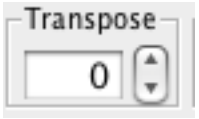
- The leadsheet window will scroll automatically when tracking gets to the bottom.

- To make it scroll a little earlier, toggle the Early Scroll button.



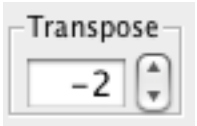
Transposed Playback

- For transposing instruments, such as Bb or Eb instruments, a transpose setting is provided.



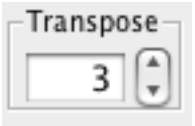
- To use it, the number of **half-steps** (positive or negative) should be set, and the chords transposed in the opposite direction, if chords are being read by the transposing instrument player.

Transposing Settings for Bb

- For Bb instruments, set the playback transpose to -2. 

- Transpose the chords and melody notation **up** two steps:
  - Select all (control-A).
  - Press control-E twice.

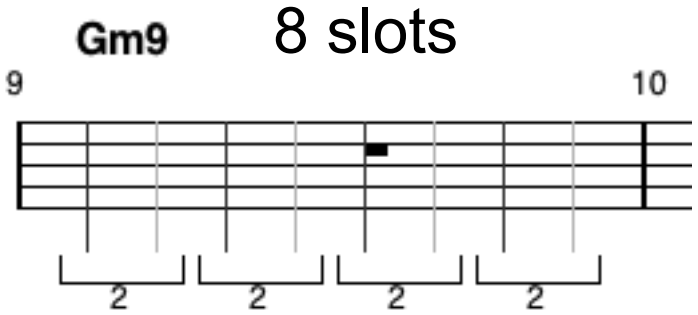
Transposing Settings for Eb

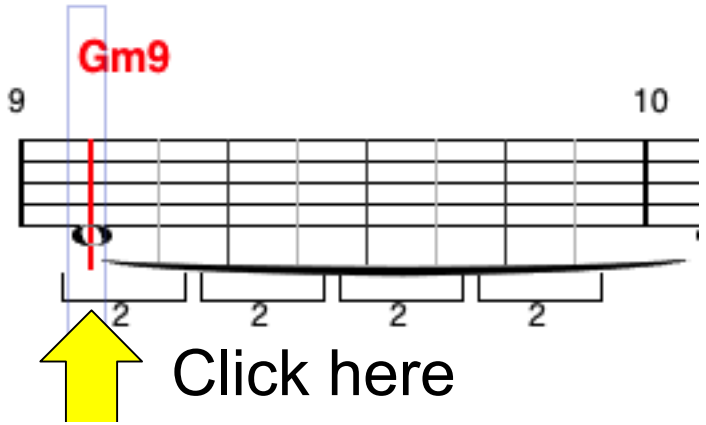
- For Eb instruments, set the playback transpose to 3. 

- Transpose the chords and melody notation **down** three steps:
  - Select all (control-A).
  - Press control-D three times.
- Optionally, transpose the melody up an octave: Press T.

Entering Notes by Clicking

- Move the mouse around and notice that **slots** (vertical bars) appear in the measure.
- Click on a slot to get a note.
- Don’t worry about note duration yet.





Determining Pitch

- The **vertical position** of the mouse when clicking determines the note's pitch.
- If you don't get it exactly right, don't worry. Just **click the new position to adjust**.
- You will only end up with one note, the way Impro-Visor is designed to behave.

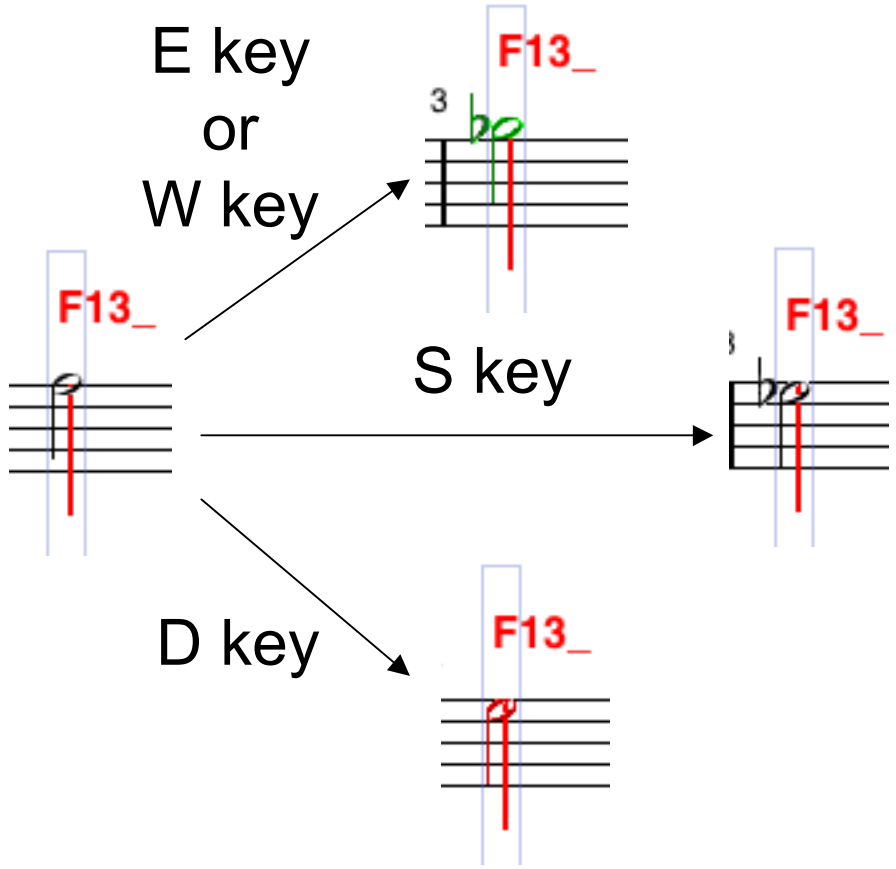
Adjusting Pitch with Keys

- Once a note is clicked in, it can be adjusted, as follows:
  - D key moves the note down a half-step.
  - E key moves the note up a half-step.
  - S key moves the note down harmonically, i.e. fitting with the chord.
  - W key moves the note up harmonically.

Adjusting Pitch with Keys

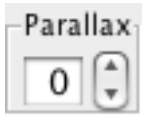
E and W do the same in this example because gb is a color tone for F13.

This won't always be the case.



Parallax Adjustment

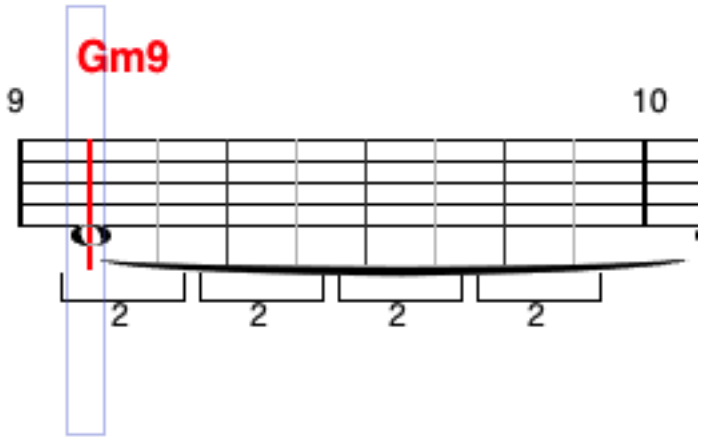
- If you perpetually click the wrong position, your screen may be tilted at an angle.
- The Parallax adjustment moves the virtual click position up or down to compensate for the angle.

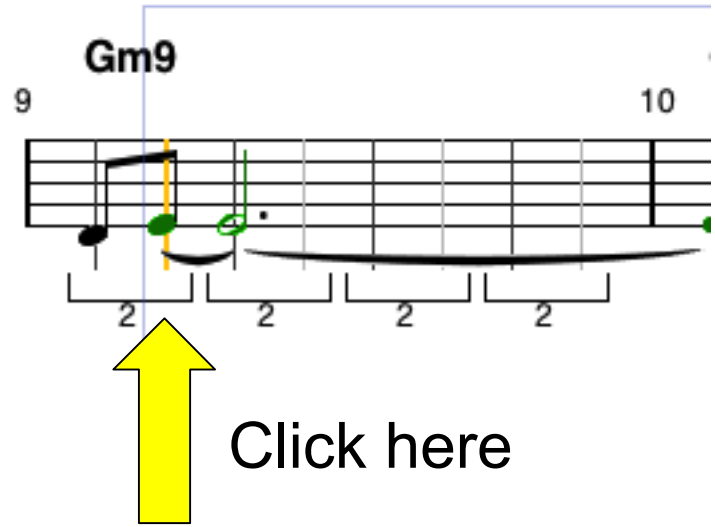


- Some experimentation may be required.

Adding Another Note

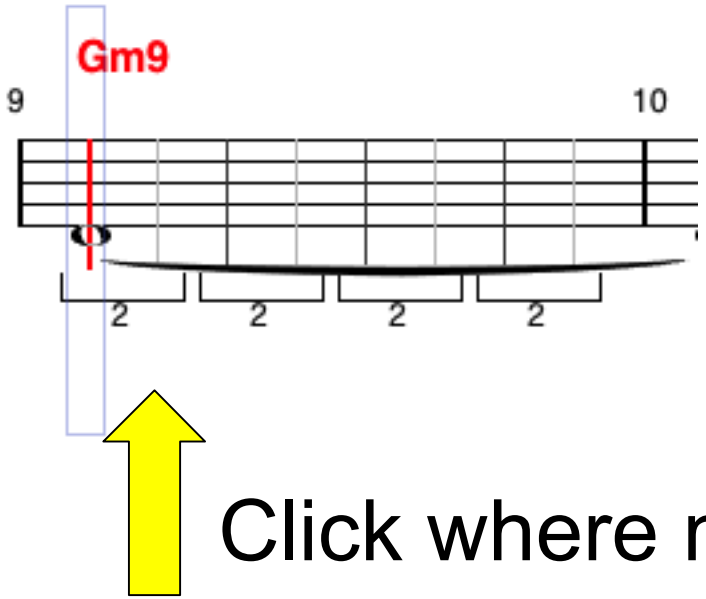
- Clicking in the range of an existing note cuts that note off and starts a new one.



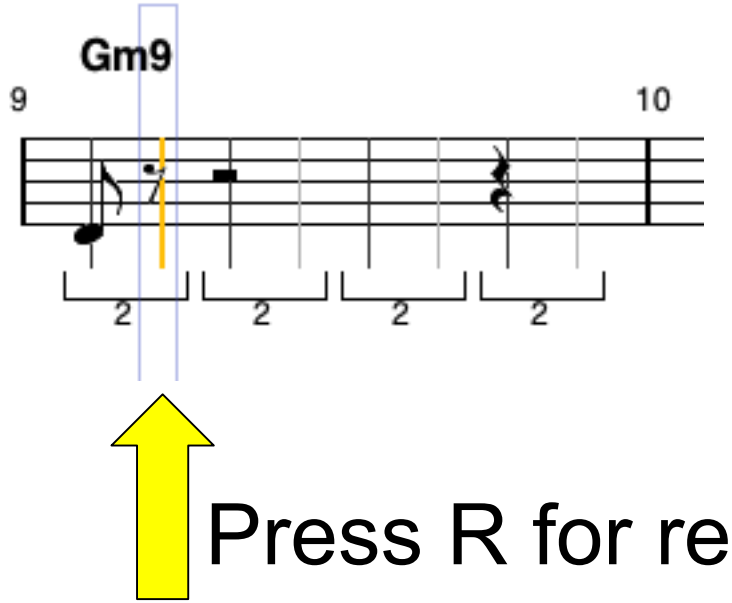


Shortening a Note's Duration

- Click in the range of an existing note, then press the R key.



Click where note should stop

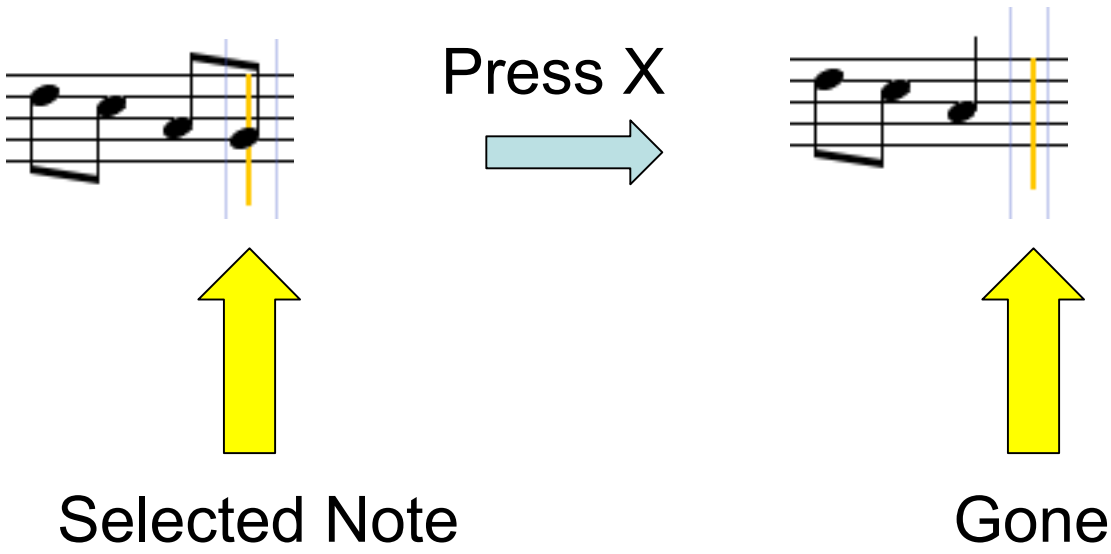


Press R for rest

Removing a Note

- To remove the selected note, press the **X key**.
- The duration of the note will be added into the previous note or rest.
- Other notes will not move, by design.

Removing a Note

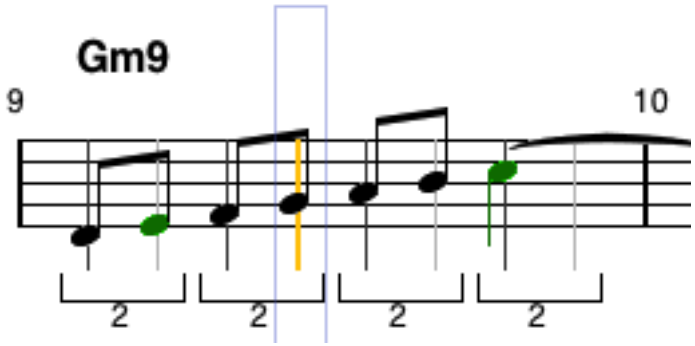


To Remove Notes and Close the Gap

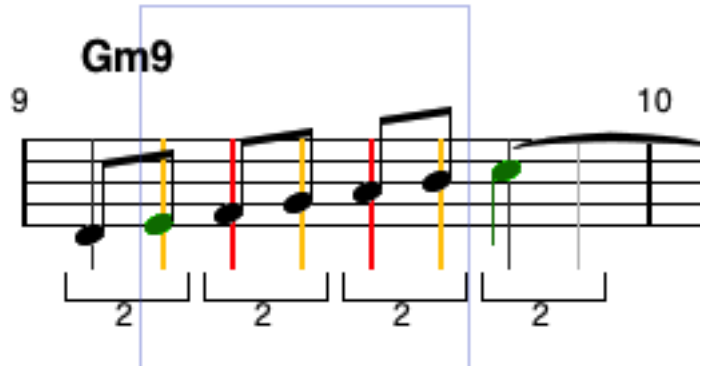
- There is no special operation for this.
- It is best accomplished by dragging or cutting and pasting following notes over the notes to be removed.
- This will be covered presently.

Selection Concept

- By a *selection*, we mean one slot or a region between two slots



Single-slot selection (blue outline)



Multiple-slot selection (blue outline)

IMPORTANT Selection Moves

- The next three pages show you non-standard moves for making selections that you will need to know to edit efficiently.

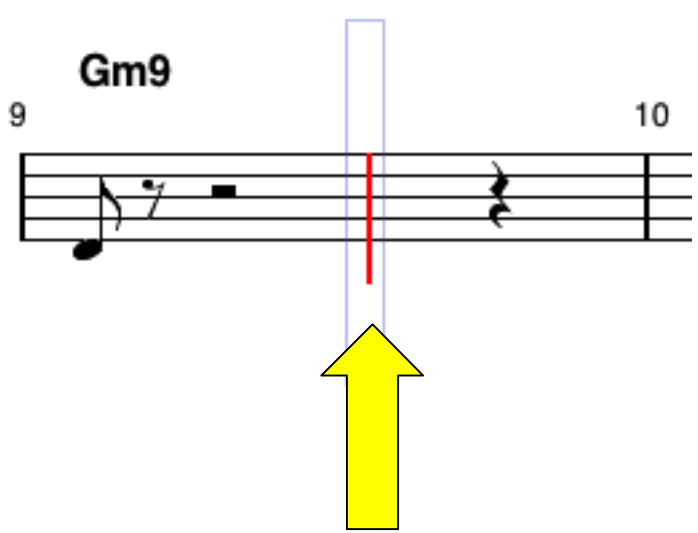
- They are used a lot, so spend a little time learning them.

- They are **designed** to make editing fast.

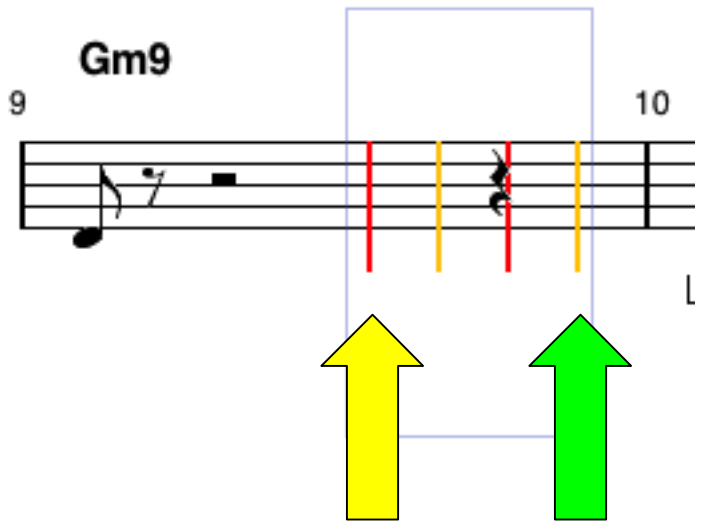
- This is the most complicated bit in Impro-Visor, so bear with me. All the rest will be easier.

Extending a Selection

- **If there already is a selection**, shift-clicking a new slot **outside** the selection will extend that selection.



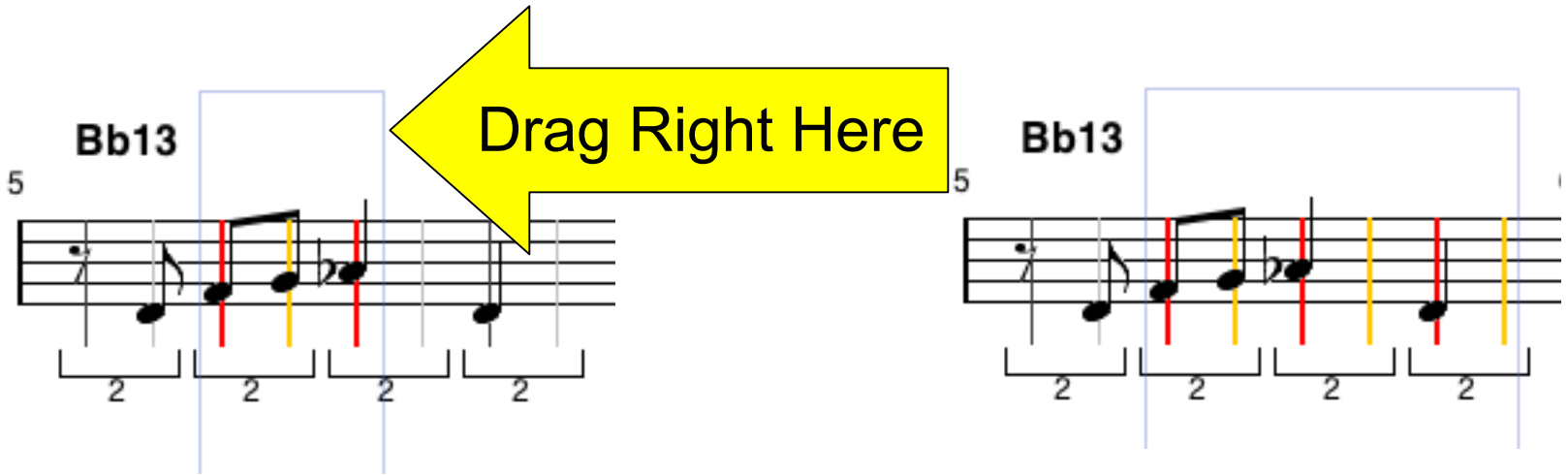
Previous selection



Shift-click **outside** extends

Changing Selection by Dragging

- You can also change the selection by “grabbing” an edge and dragging to the desired position.

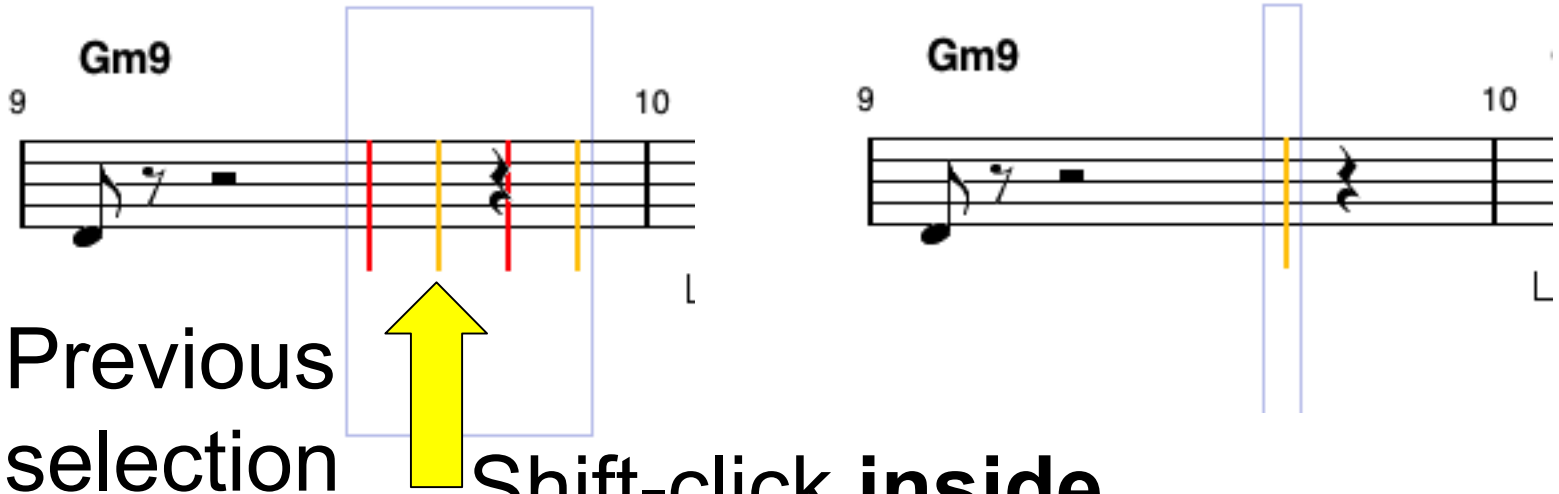


Original selection

Modified selection

Selecting a New Slot, inside current selection

- **If there already is a selection**, shift-clicking a new slot **inside** the selection will select just that slot.



Selecting a New Slot, **outside** current selection

- **If there already is a selection**, to select a new slot **outside**,
  shift click that slot **twice**.

- The first click will extend the selection.

- The second click will select just that slot.

- All we are doing is combining the previous two moves.

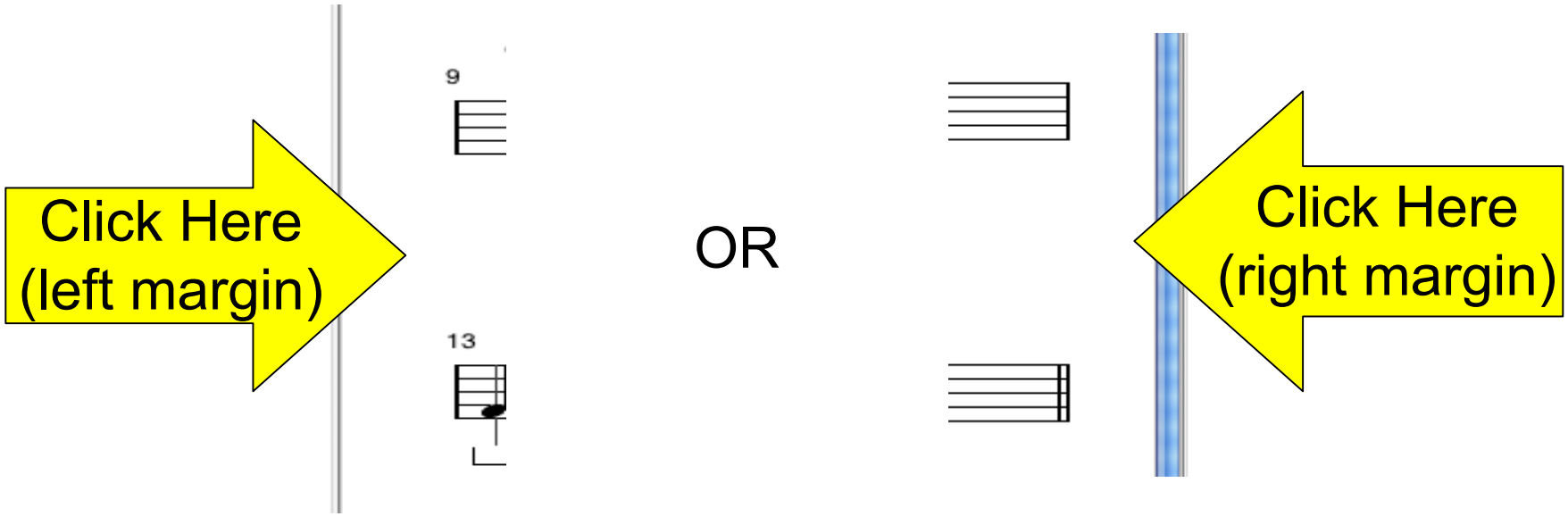
Selecting an Entire Chorus

- One page of a leadsheet is called a **chorus** (jazz terminology).

- Use ^A (Control-A) to select everything in the chorus.

Two Ways to Unselect Everything

- Press the Escape (esc) key
- Click in one of the blank margins of the leadsheet

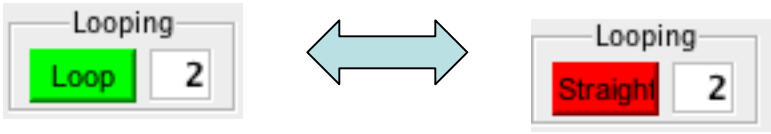


Playing the Selection

- To play the current selection, press Enter.

- To play the current selection and continue on to the end of the chorus, press Shift-Enter.

Looping Playback

- Press the Loop button to cause any playing to be repeated. Off: 

:On
- The default is 2 times through.
- Setting the number to 0 loops indefinitely.
- Press the K key to stop playback.

Count-In for Playback

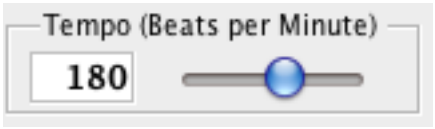
- A 2-bar count-in, consisting of drum rim shots, is available.

- Click the box as shown.

Setting Tempo

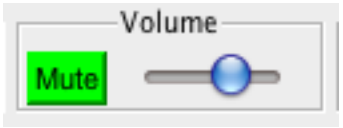
- The tempo can be set approximately by a slider, or exactly by typing the beats per minute (BPM).

- The range is from 30 to 300 BPM.



Setting Volume

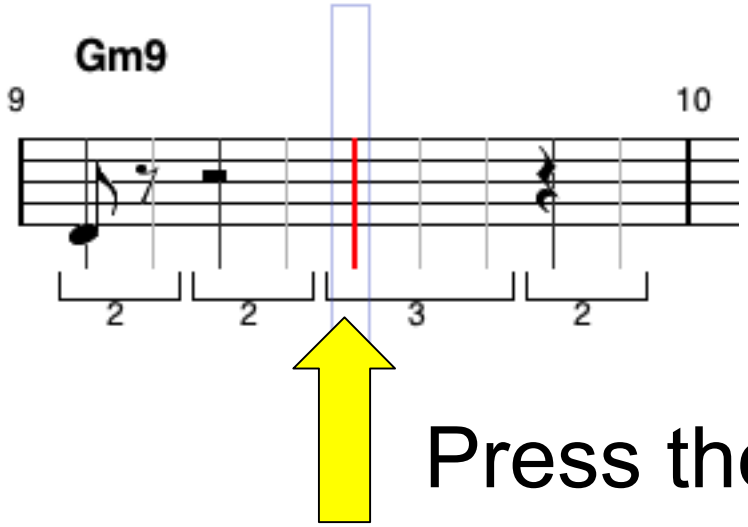
- There is a master volume setting and mixer settings for each instrument.
- All sound, as well as individual instruments, can be muted.



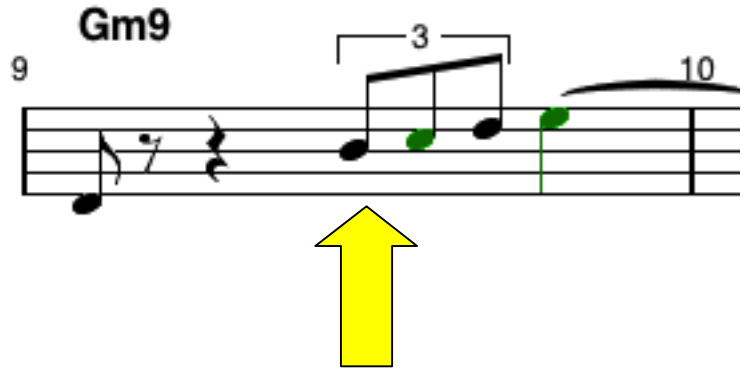
Click to open mixer

Entering Triplets

- The default setting for slots is 2 notes per beat.
- To set for eighth-note triplets, select a slot on the beat and press the 3 key.



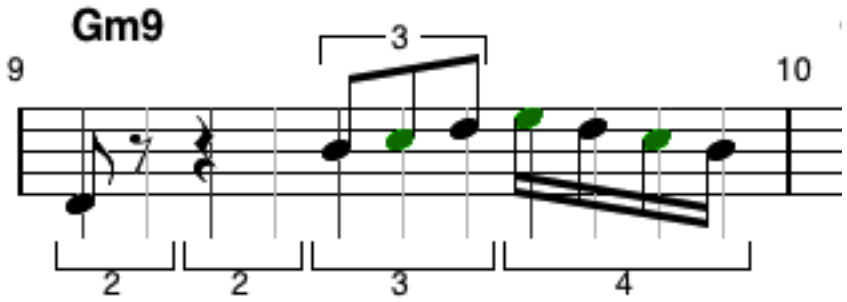
Press the 3 key



Click in triplets

Enter Sixteenth Notes

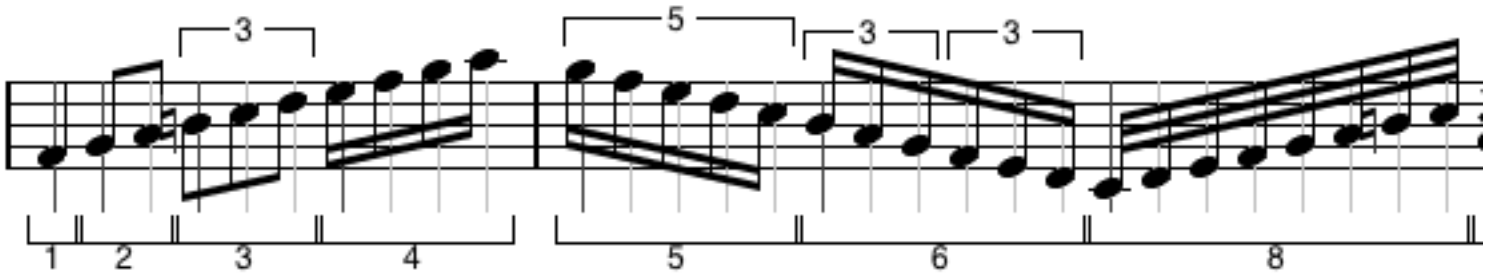
- This is similar to triplets, but press the 4 key, for four subdivisions of the beat.



Enter 5-tuplets, etc.

- The following subdivisions of the beat are supported for key press:
  - 1 No subdivision
  - 2 Eighth-notes
  - 3 Eighth-note triplets
  - 4 Sixteenth-notes
  - 5 Eighth-note 5-tuplets
  - 6 Sixteenth-note triplets
  - 8 Thirty-second-notes
- In addition, one can enter up to thirty-second note triplets textually.

Enter 5-tuplets, etc.

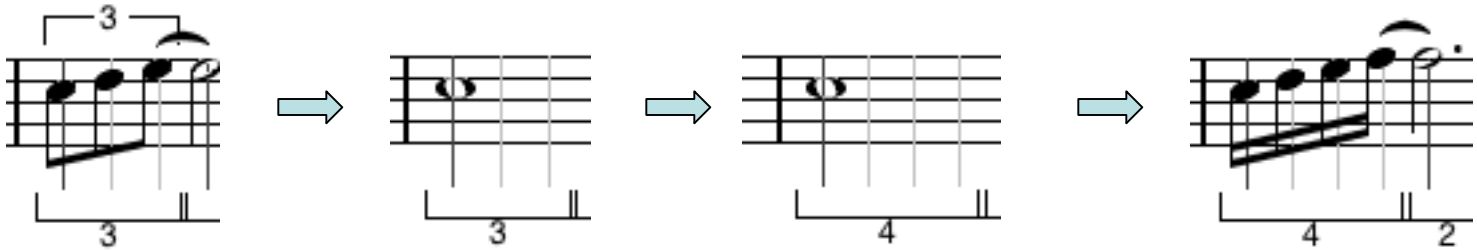


Brackets above notes are part of the notation.

Brackets below show beat sub-divisions. They will go away when the mouse is moved away.

Changing from triplets back, etc.

- If you have triplets, but want sixteenth notes, say, you have to first get rid of enough notes to make the beat divisible by 4, because 3 and 4 are incompatible.

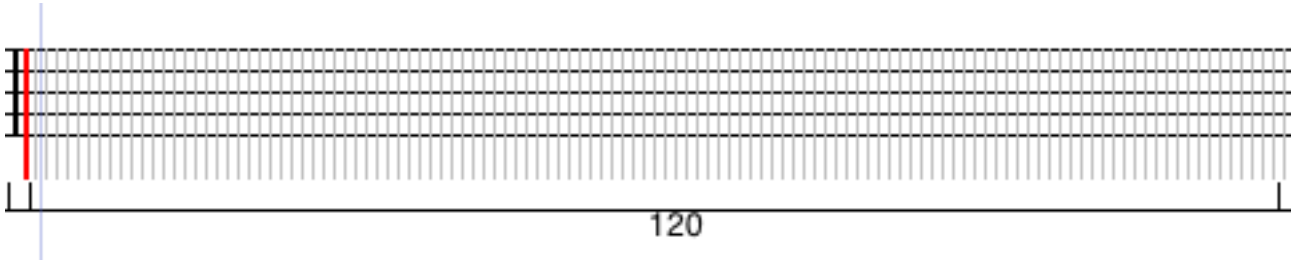


Details on Slots

(not needed by typical user)

- There are 120 slots per beat, but at any one time, only some of them show, depending on the beat subdivision.
- A quarter note is 120 slots, eighth note 60 slots, sixteenth note 15 slots, thirty-second-note triplet 12 slots, etc.
- Smaller durations are possible, but we don’t show flags for all of them.

Reference: Slots for Various Notes (not needed by typical user)



Duration	Slots	Notes Per Beat	Minimum Slots Per Beat Needed
Half Note	240	1/2	1
Half Note Triplet	160	2/3	3
Quarter Note	120	1	1
Quarter Note Triplet	80	4/3	3
Eighth Note	60	2	2
Eighth Note Triplet	40	8/3	3
Sixteenth Note	30	4	4
Sixteenth Note Triplet	20	16/3	6
Thirty-Second Note	15	8	8
Thirty-Second Note Triplet	10	32/3	12
Sixty-Fourth Note Triplet	5	64/3	24

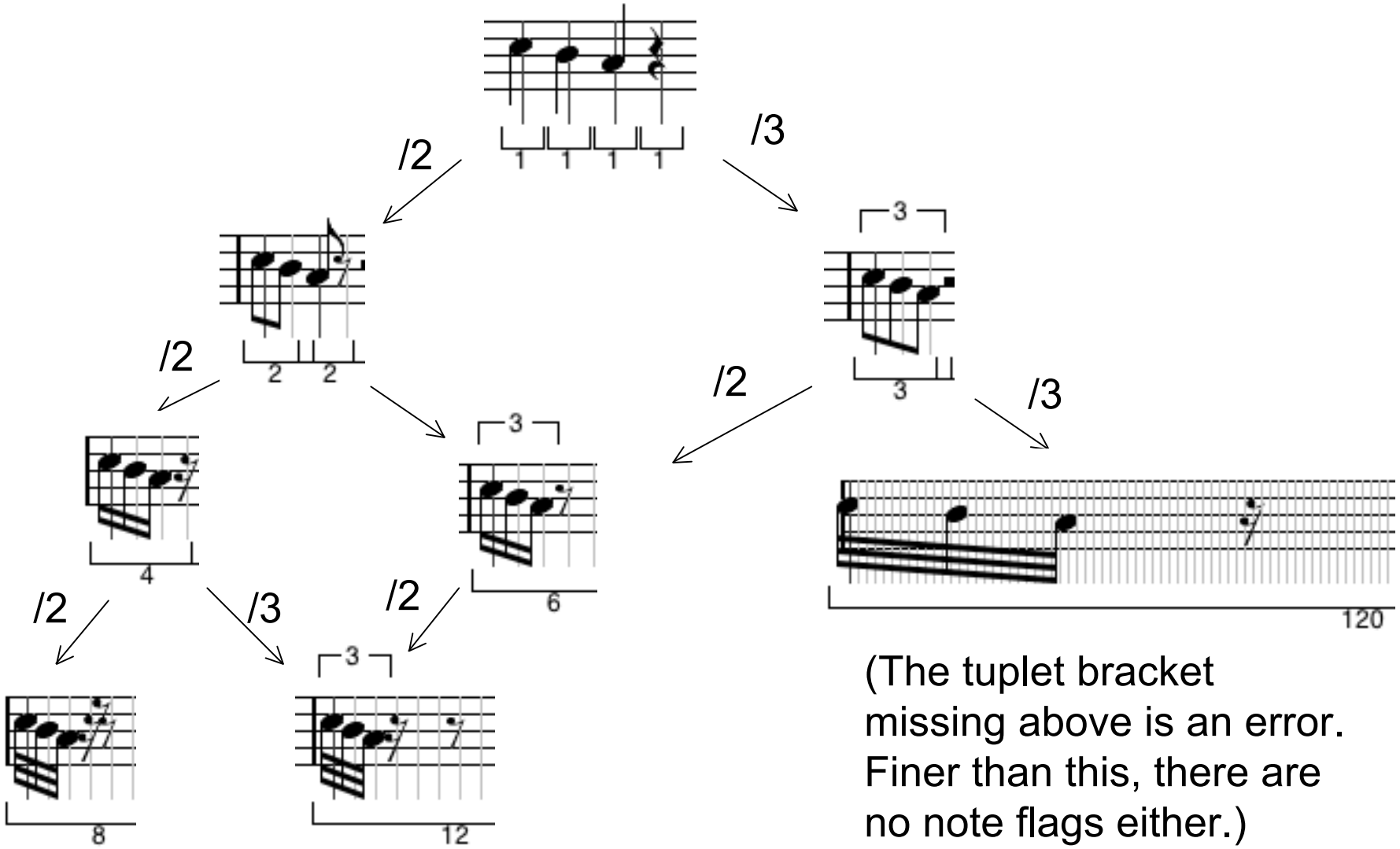
Contract and Expand

- A convenient way to deal with small durations, and to correct other mistakes, is to use contract and expand.

- There are four operations on the current selection:
  - Contract by 2
  - Contract by 3
  - Expand by 2
  - Expand by 3

Contract Operation Illustrated

Moving left contracts by 2, moving right contracts by 3



(The tuplet bracket missing above is an error. Finer than this, there are no note flags either.)

Note Entry by MIDI Keyboard

- There are two ways to enter notes by MIDI keyboard:
  - Step entry
  - Real-time entry

- The MIDI input should be selected through the MIDI Preferences frame.

Step Entry

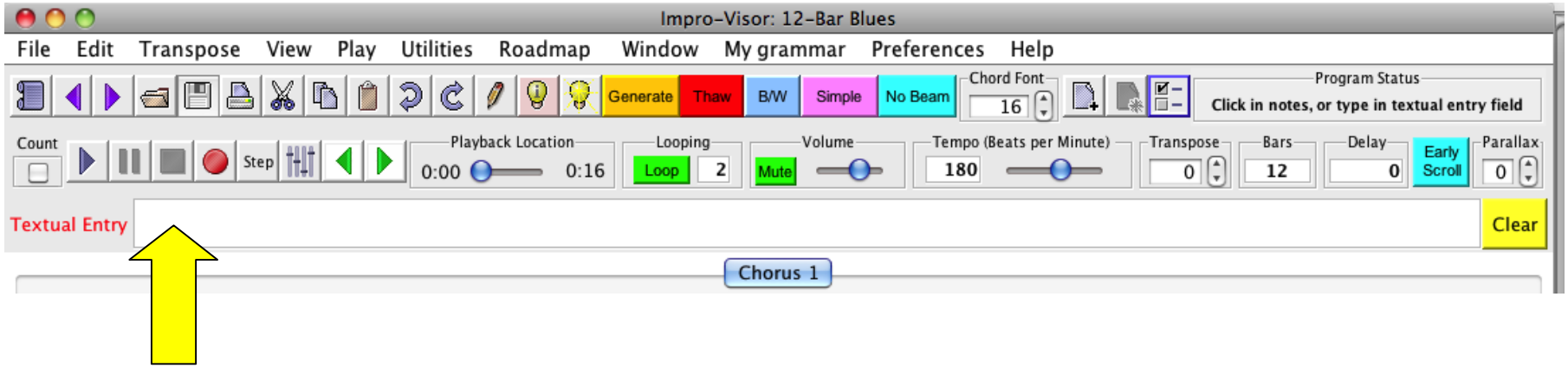
- To enter by step from a MIDI keyboard, the slot spacing should be set first, as each note will advance to the next slot.
- For uniformly-spaced notes, this can be a rather fast way.
- To enter in this way, press the Step button.

Real-Time Entry

- Real-time entry from a MIDI keyboard is not fully developed. The main issue is one of quantizing the notes to align with expected slots, as human error will be pronounced in the result.
- If this method is used, the tempo is ideally somewhat slow.
- The keyboard should be first calibrated for latency using the tool in the MIDI Preferences.
- Press the red circle icon to record from the MIDI source.

Textual Entry of Notes

- Instead of point-and-click, notes can be entered in the textual entry field.



Enter notes here

Textual notation for notes

- Type the pitch class, followed by duration.
- Pitch classes: a, b, c, d, e, f, g

  follow those by # for sharp, b for flat

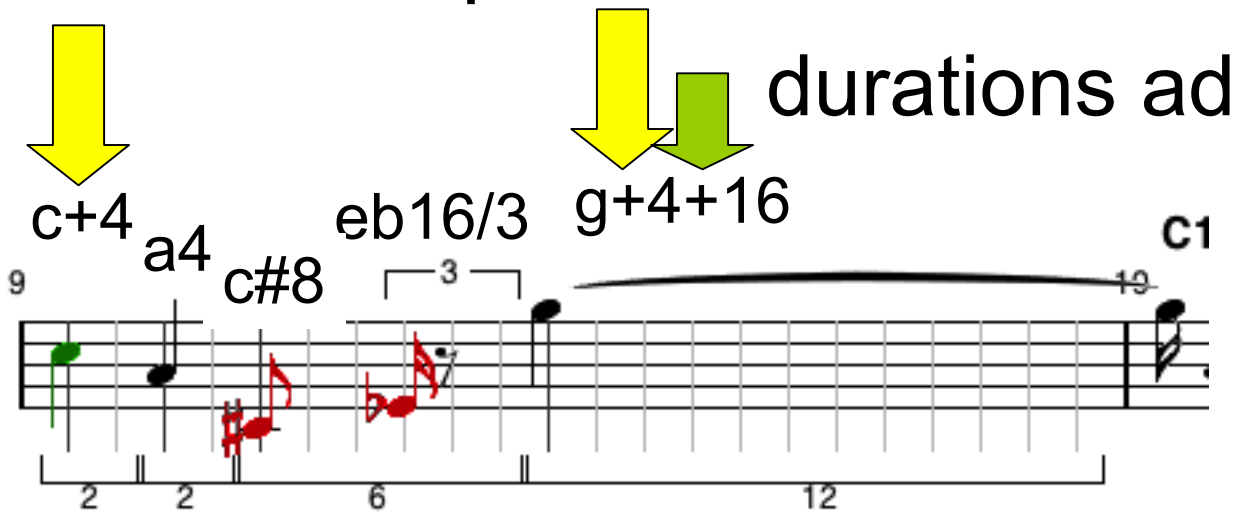
  follow by +'s for up an octave, -'s for down
- Durations: 1, 2, 4, 8, 16, 2/3, 4/3, 8/3, 16/3, 32/3
- Durations can be added together using +
- Examples: a4, c#8, eb16/3, c+4, g+4+16

Example Textual Note Entry

- Enter: c+4 a4 c#8 eb16/3 g+4+16

up an octave up an octave

durations added



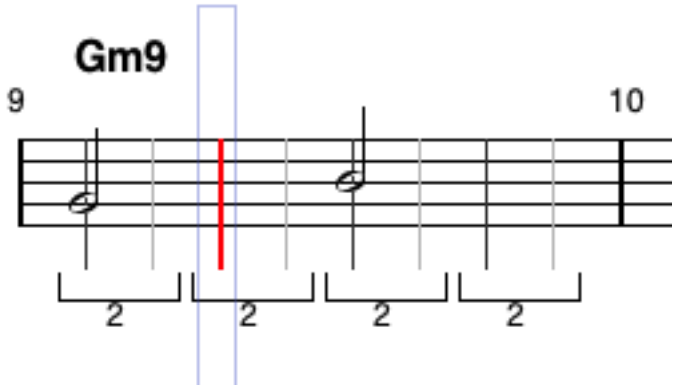
Slots per beat

Entering Rests Textually

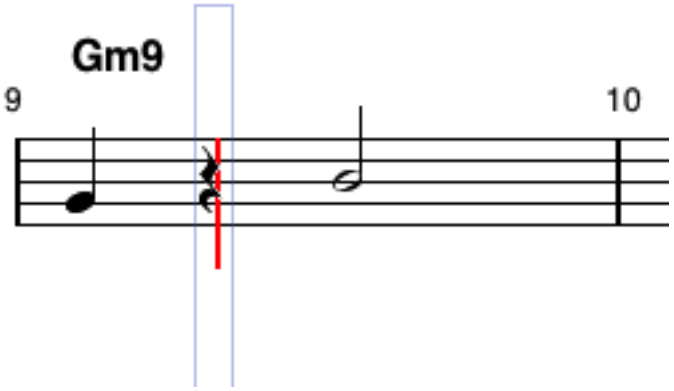
- Rests are treated like notes.
- They are represented by an r, followed by a duration.
- Examples: r4, r8, r16/3

Shortening Notes

- Select the slot after where the note sholuld end.
- Press R key for rest.

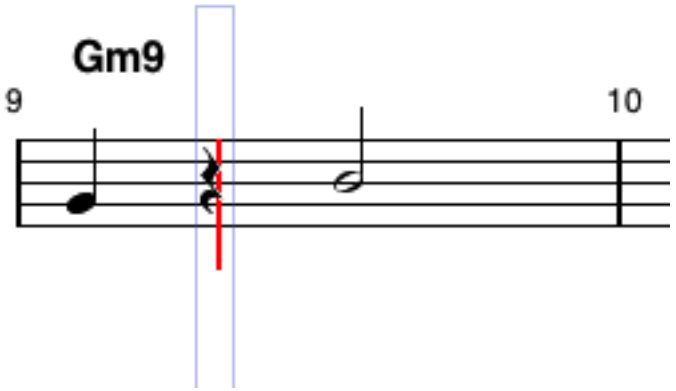


Press r

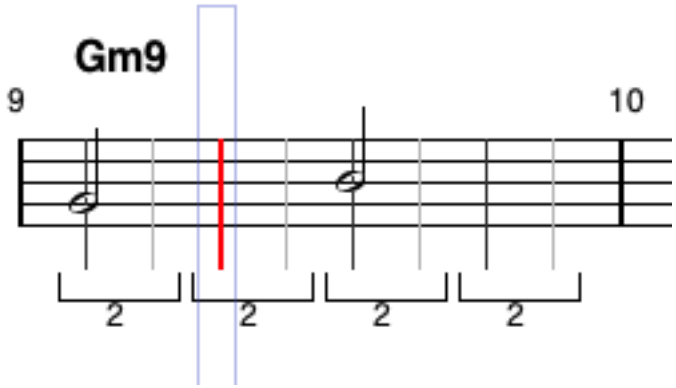


Lengthening Notes

- A rest is like a note. It’s removal extends the note before.
- Select the slot after where the note ends.
- Press x to remove rest.

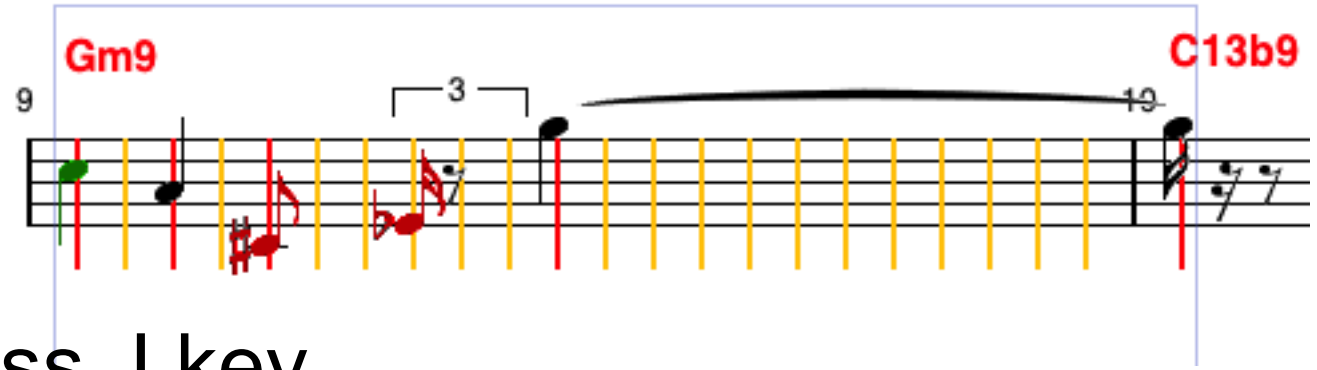


Press x



Getting the Textual Representation

- The textual representation for notes in a selection can be obtained by pressing the J key.



Press J key

Textual Entry c+4 a4 c#8 eb16/3 r8/3 g+4+16

Correcting Mistakes

- If the note you entered isn't what you wanted, you can easily fix it.
  - The Z key **undoes** the previous action.
  - The Z key can be used any number of times to undo several previous actions.
  - You can also change a note just by clicking over it. This will not add a new note.

Redoing the Undo

- If after using undo you decide you wanted the step after all, you can use the Y key to get back to where you were.

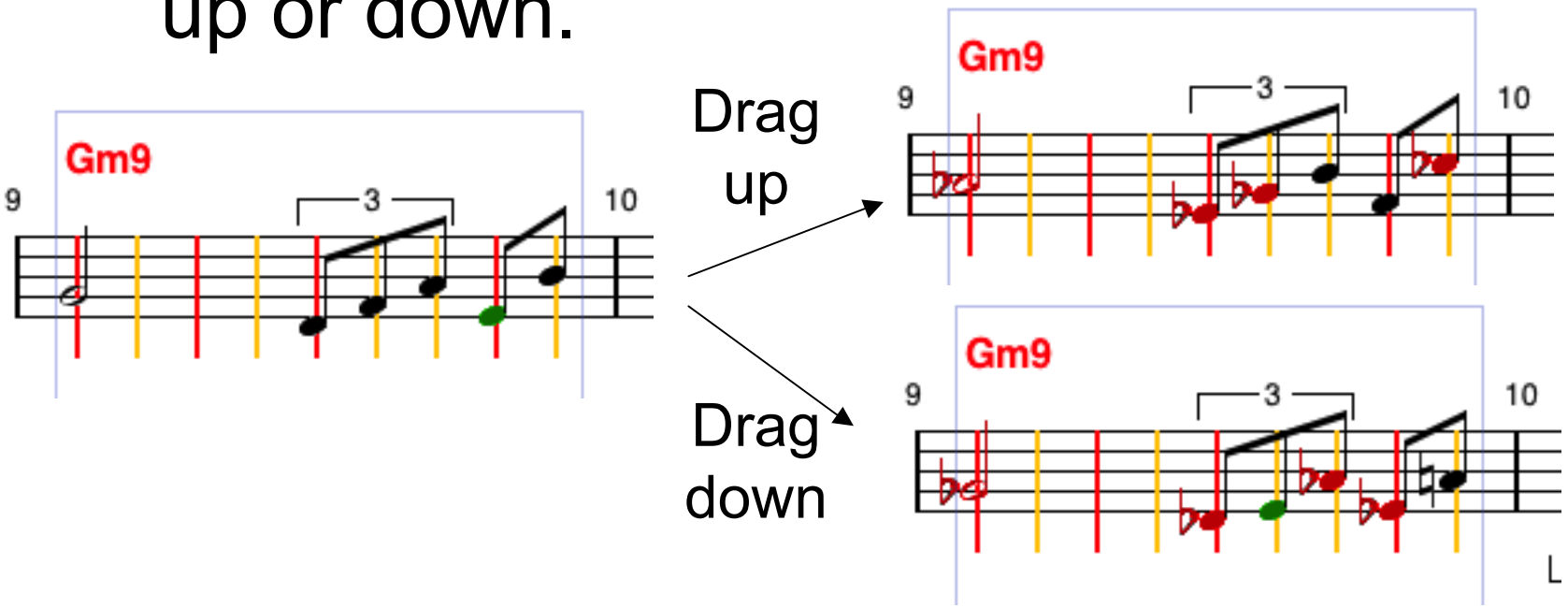
- In some cases, two y's might be required.

Icons for Undo/Redo

- These icons can be clicked as an alternative, for undo and redo, respectively.

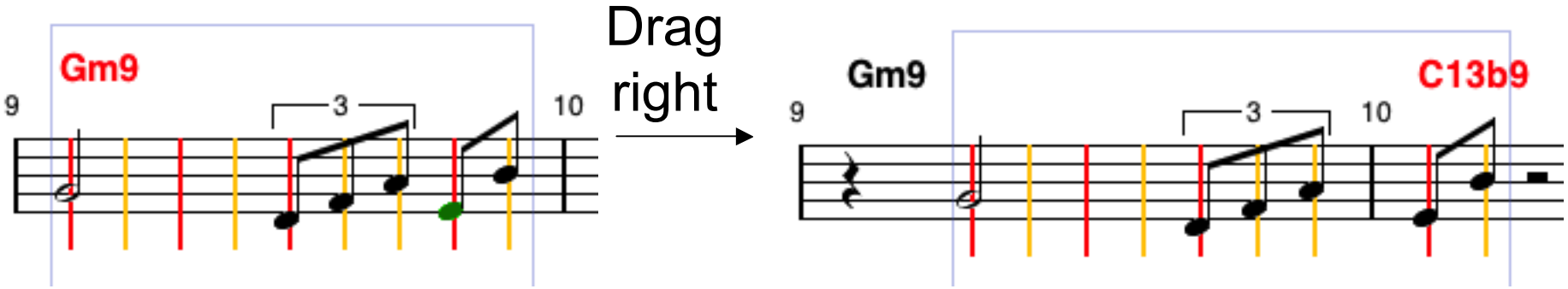
More Ways to Correct

- You can move (transpose) the note or a group of notes up or down.
- Grab a note in the selection and move up or down.



Moving Notes Short Distances

- A group of notes can be dragged horizontally as well as vertically.
- Go slowly, as this may change spacing.

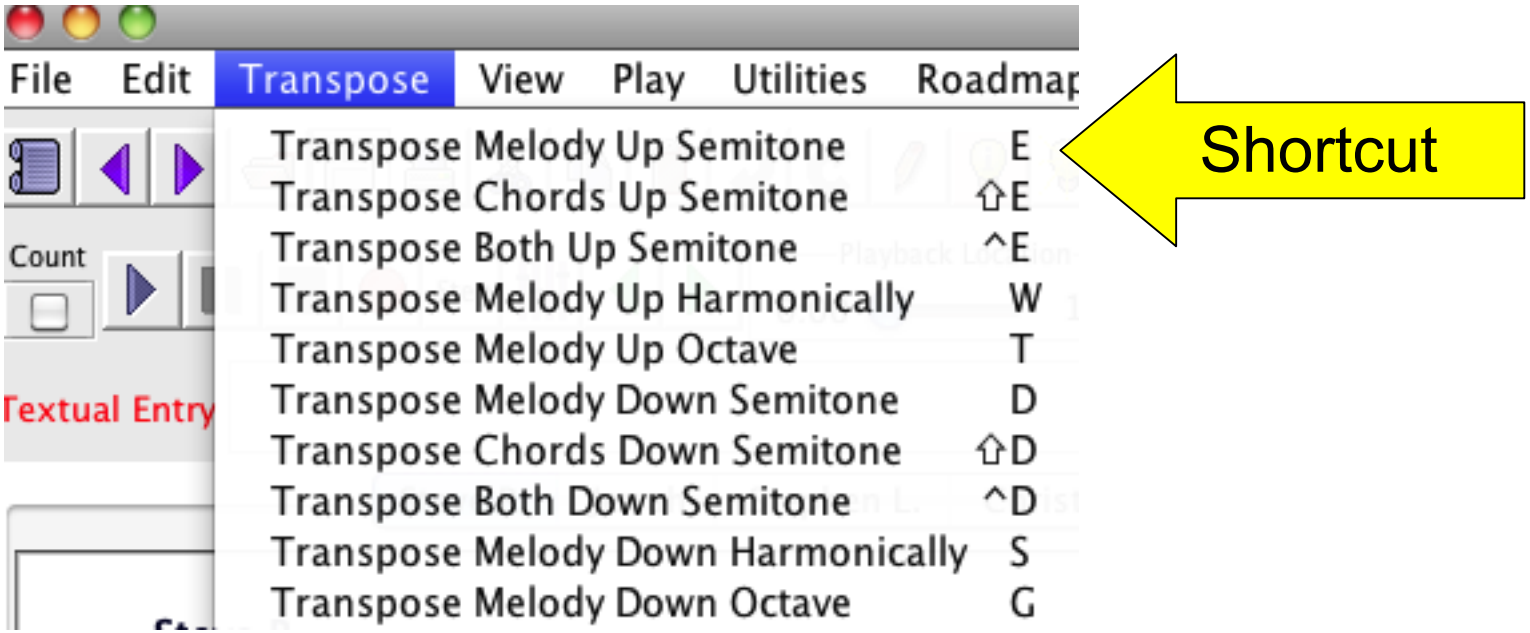


Still More Ways to Correct

- You can transpose the notes by keystroke.
- There are two types of transpostion:
  - **Simple**: Moves the notes chromatically.
    Use D key for down, E key for up.
  - **Harmonic**: The notes are made to conform to the chord.
    Use S key for down, W key for up.

Menus can help with key shortcuts.

- The Transpose menu states the options.
- Note that you can also transpose by octaves at a time: T for up, G for down.



Switching Note Enharmonics

- Press the space bar to toggle the enharmonic sense of selected notes:

ab ↔ g#

bb ↔ a#

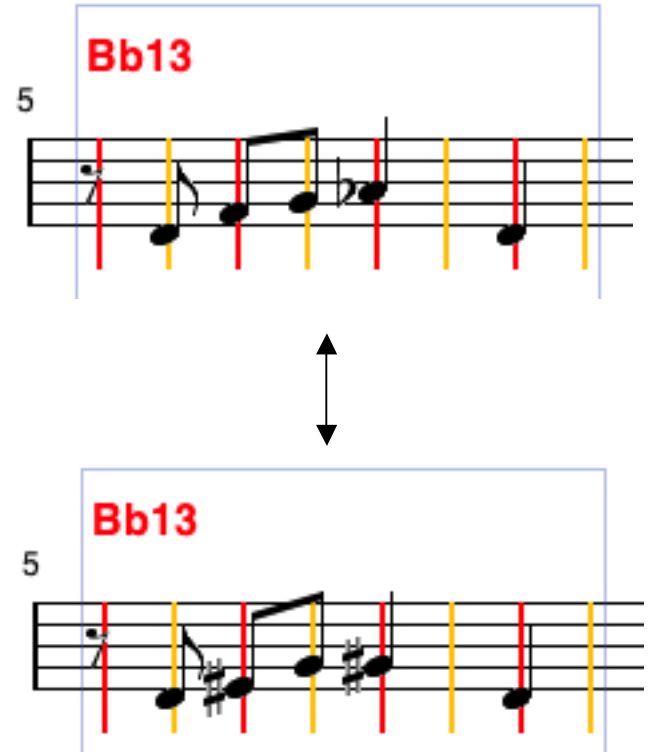
cb ↔ b b# ↔ c

db ↔ c#

eb ↔ d#

fb ↔ e

gb ↔ f# e# ↔ f

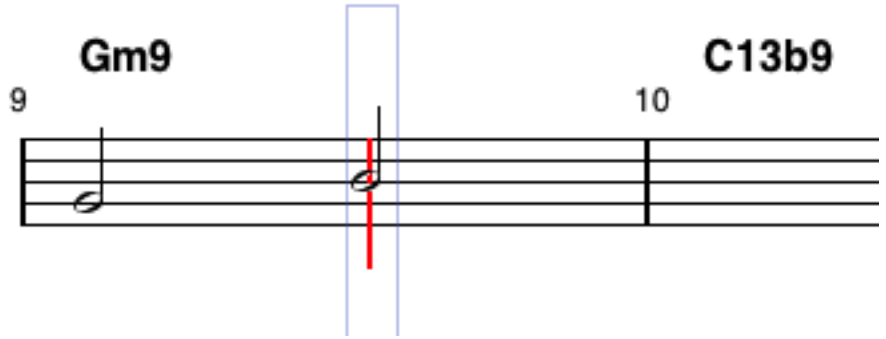


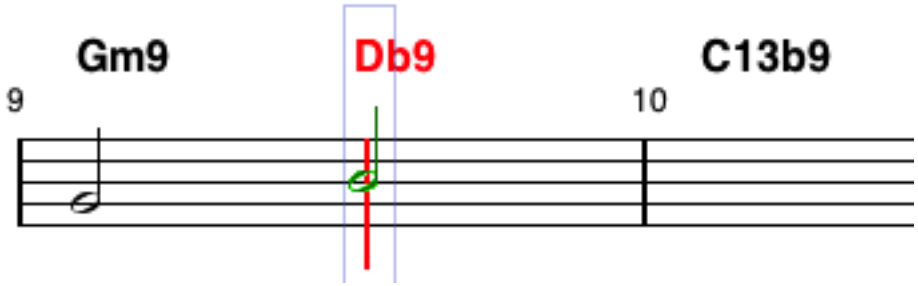
Entering Chords

- Select the slot where chord entry is to start.
- Type chords in the text area and press enter.
- Chords always start with upper case.
- Notes always start with lower case.
- Separate measures with | or , (comma).
- Chords within a measure will be equally spaced in time.

Entering Chords Example

Press enter



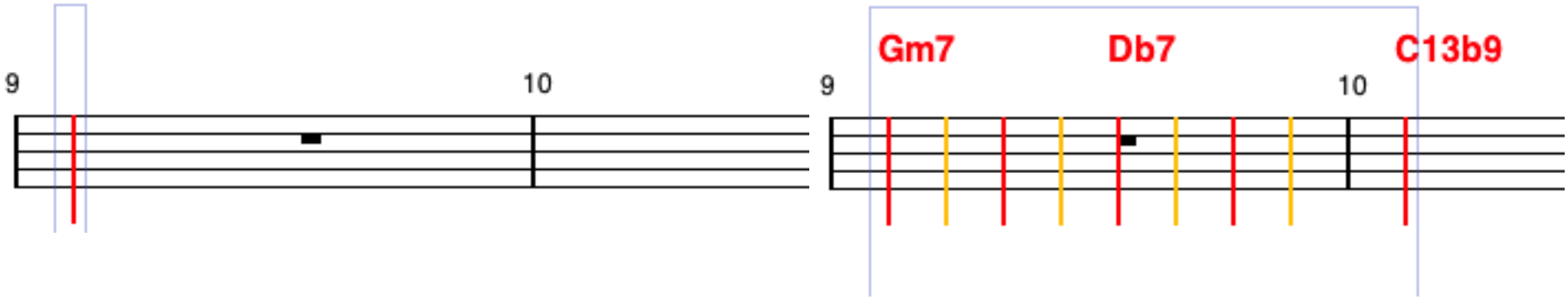


Entering Chords Example

Textual Entry Gm7 Db7, C13b9

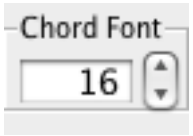
Press enter

Starting slot selected



Chord Font Size

- The font size of chords above the staff can be set using this adjustment.



- The number is the point size of the chord symbol.

Correcting Chord Entry

- Do not change the selected slot.
- Just type the corrected chords into the textual area.
- Press enter.
- This will overwrite the previous chords.

Entering the Same Chords Elsewhere

- With the chords already in the textual entry, select the new position.
- Press enter.

Mixed Text

- Chords and notes can be freely mixed.
- Chords are identified as starting with upper case letters.
- Notes are identified as starting with lower case letters.
- They have different ways of defining durations however. Bar lines mean nothing to notes.

Transposing Chords

- Similar to transposing notes, press Shift-D for down, Shift-E for up.

- You can transpose notes and chords **together**:
  Control-D for down, Control-E for up.

Transposing Chords and Notes

Copying, Cutting, and Pasting Notes

- Use **C key** to copy notes in a selection.
- Use **X key** to cut (remove) notes in a selection.
- Use **V key** to paste them back, or paste them elsewhere (any number of times).
- Use **J key** to copy notes to the textual area.
- The following icons can also be used:

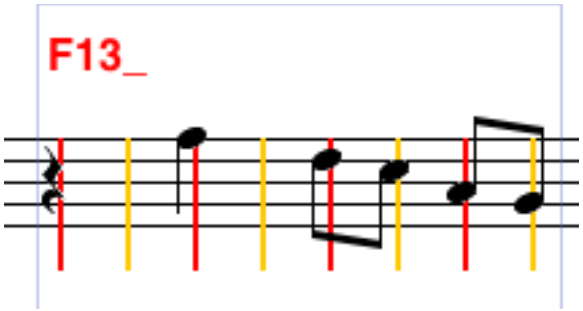
Copying, Cutting, and Pasting Chords

- Use **Shift-C** to copy chords in a selection.
- Use **Shift-X** to cut (remove) chords in a selection.
- Use **Shift-V** to paste them back, or paste them elsewhere (any number of times).
- Use **Shift-J** to copy chords to the textual area.

Copying, Cutting, and Pasting Chords and Notes

- Use **Control-C** to copy notes and chords in a selection.
- Use **Control-X** to cut (remove) notes and chords in a selection.
- Use **Control-V** to paste them back, or paste them elsewhere (any number of times).
- Use **Control-J** to copy notes and chords to the textual area.

Use Control-J to copy notes and chords to the textual area.



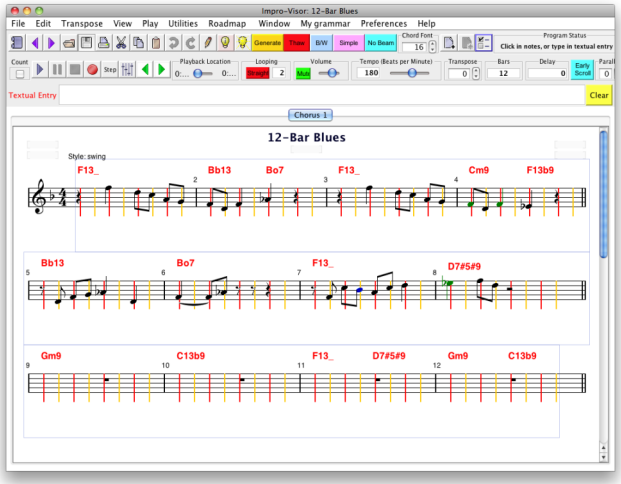
Press
Control-J

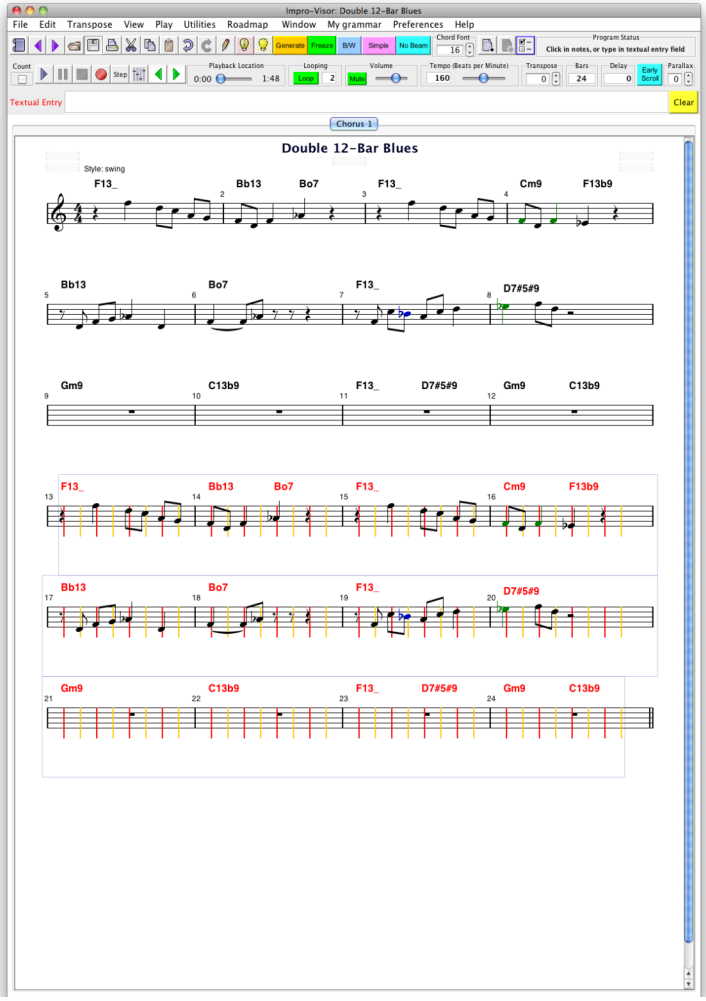
This is a good way to learn the textual notation.

Cutting & Pasting from One Leadsheet to Another

- Any number of leadsheets can be open concurrently.
- Use the cut, copy, and paste controls to cut and paste from one leadsheet to another.
- This can be used to merge several leadsheets into one.

Example: Pasting two copies of one sheet onto a second





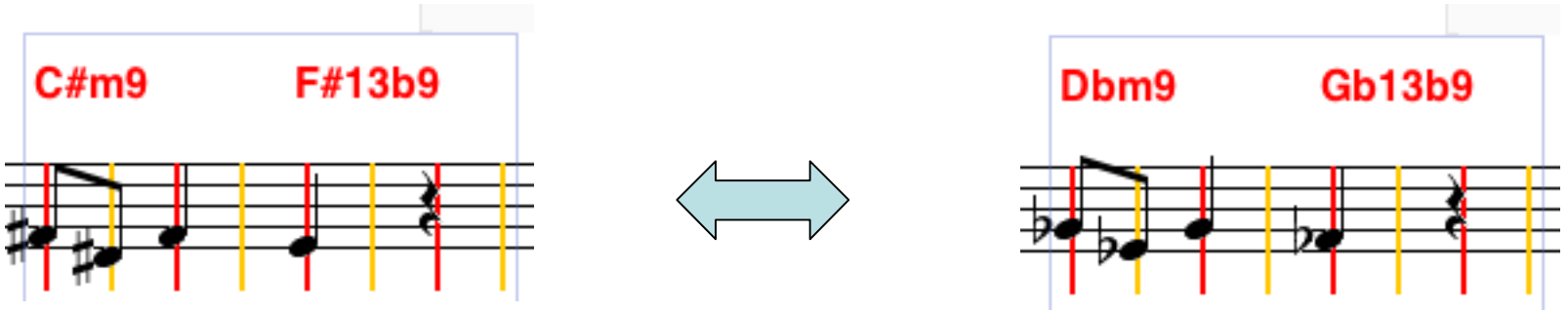
Press ^A to select all on the first sheet.
Press ^C to copy all of the first sheet.
Press ^V on the second sheet.
Position the cursor at bar 13.
Press ^V on the second sheet again.

Switching Chord Enharmonics

- Similar to switching notes, press shift-Spacebar to change chord enharmonics.

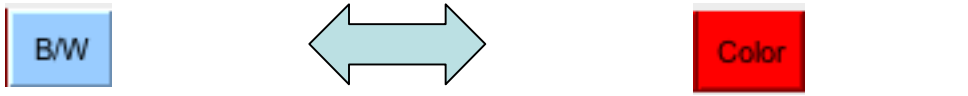
- Press control-Spacebar to change both note and chord enharmonics at the same time.

Using Control-Spacebar to Switch Chord Enharmonics



Note Coloration

- Note coloration can be toggled.
- It is on by default.



Coloration is on

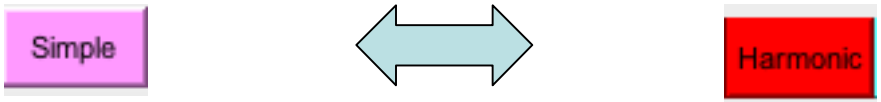
Coloration is off

Meaning of Note Colors

- Black: Note is a chord tone.
- Green: Note is a “color” tone, a tone that is not in the chord, but sonorous with the chord.
- Blue: Note is an approach, a chromatic half step from the next note, provided that note is a chord tone or color tone.
- Red: None of the above.

Note Entry

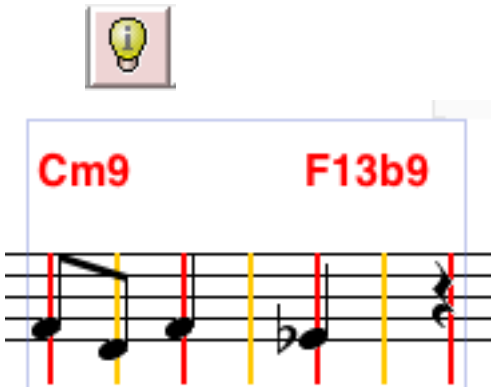
- Note entry is harmonic or simple.
- It is harmonic by default. This means that clicks gravitate to chord and color tones automatically.

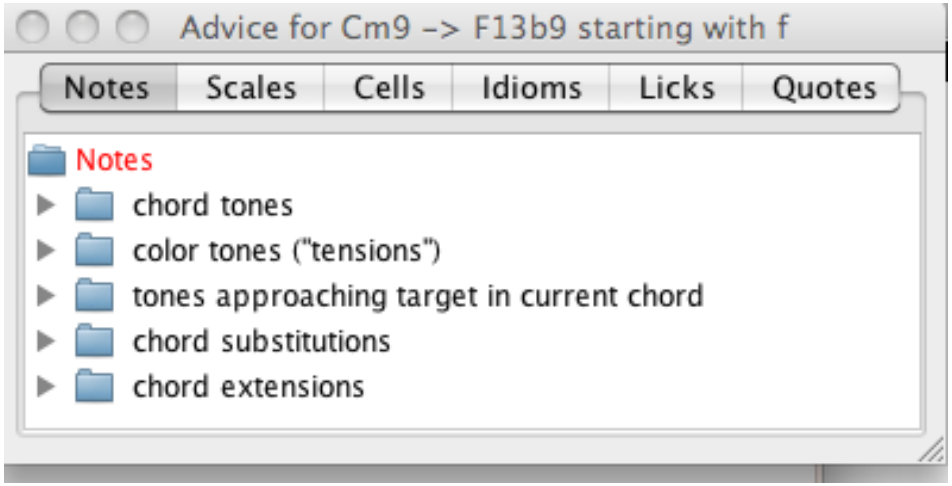


Harmonic entry is on Harmonic entry is off

Using Advice

- There are six types of advice.
- Advice is opened from the left light-bulb icon.
- At least one slot must be selected first.

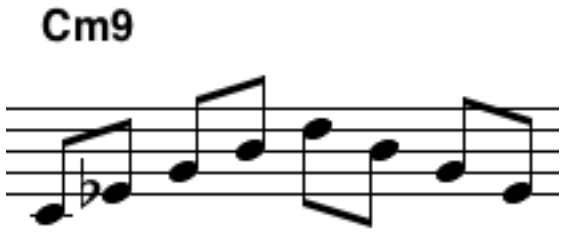




Advice and Chords

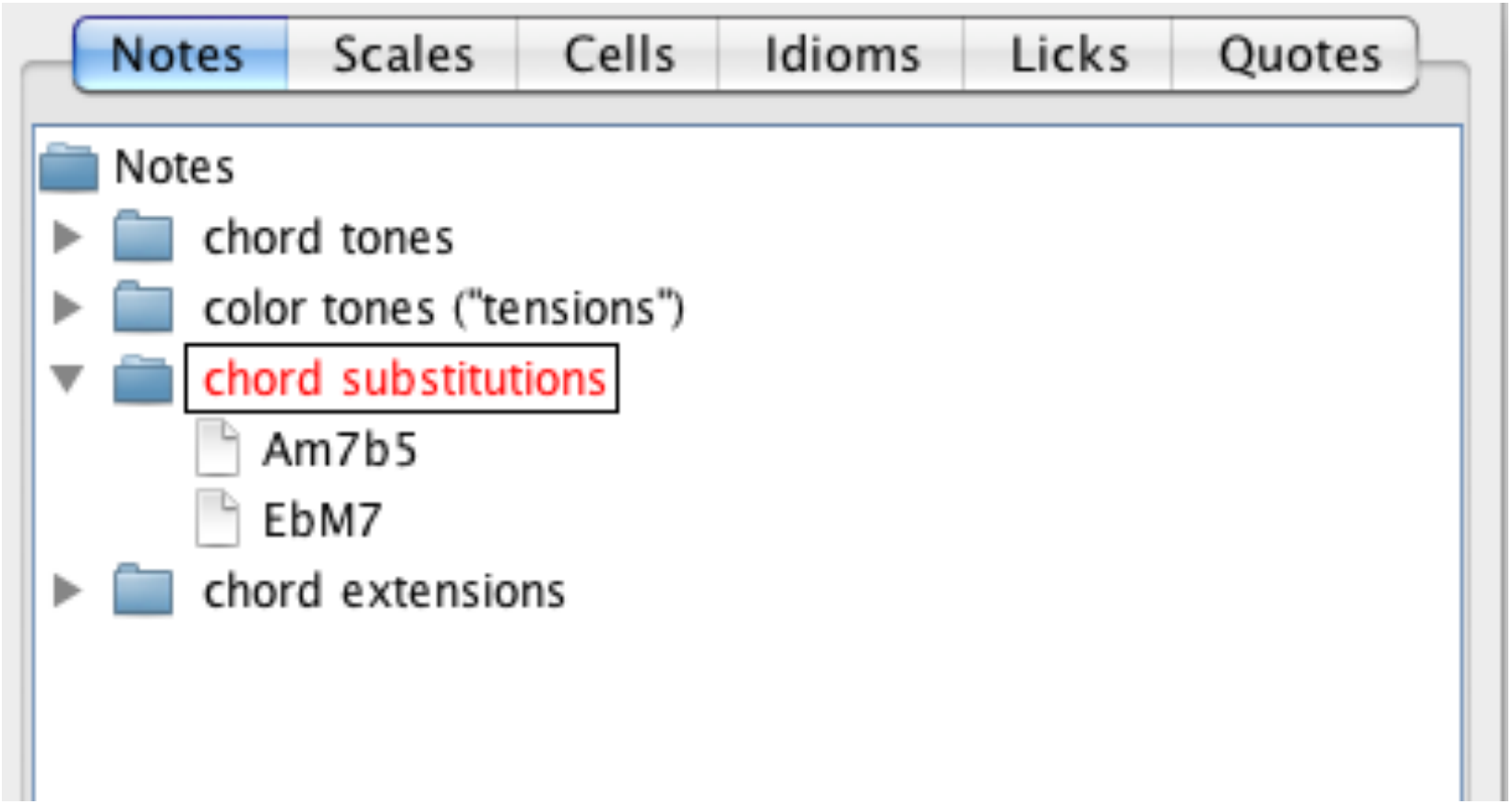
- Advice may depend on the first note, if there is one.
- Some advice depends only on the first chord:
  - Scales
  - Cells
  - Idioms
- Other advice depends on the first two chords:
  - Licks
  - Quotes

Chord Tone Advice

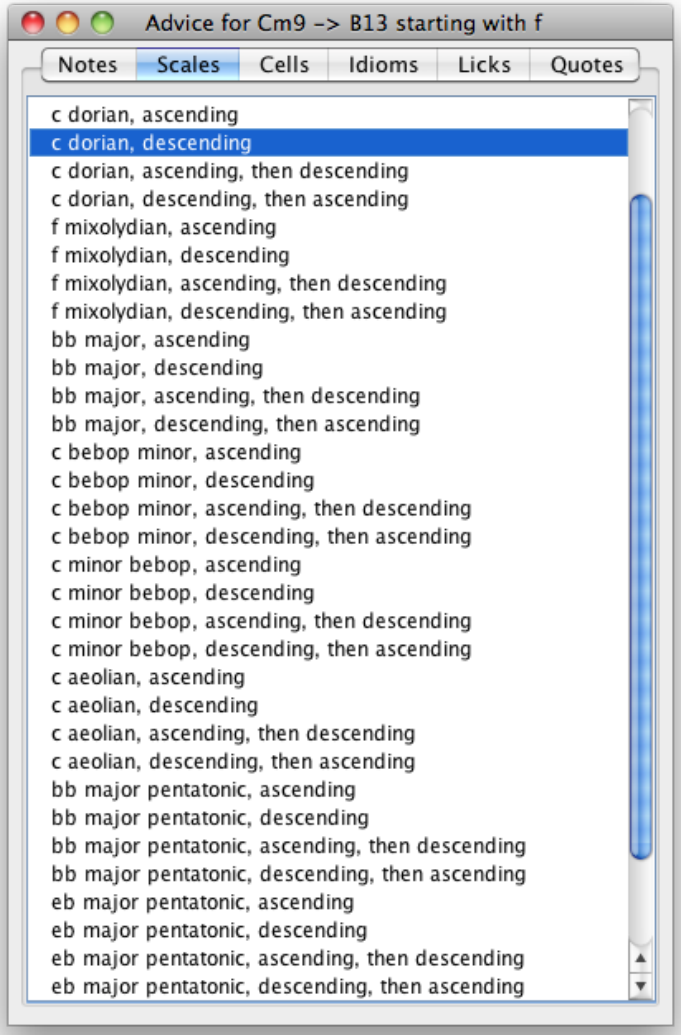


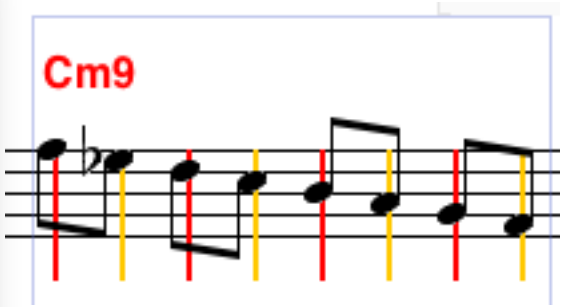
Color Tone Advice

Chord Substitution Advice



Scale Advice



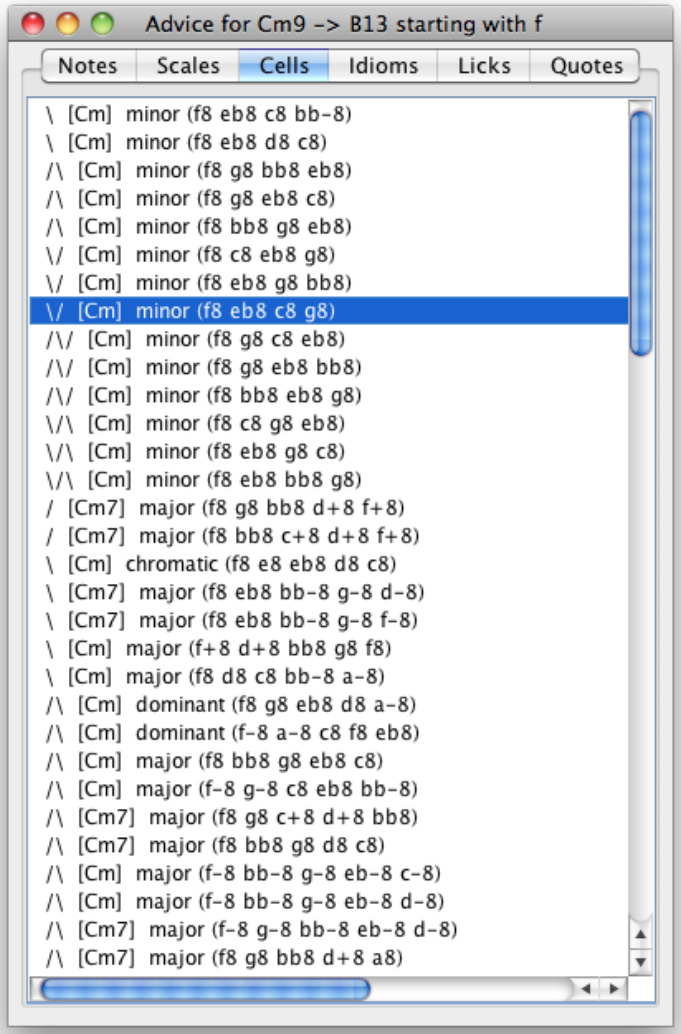


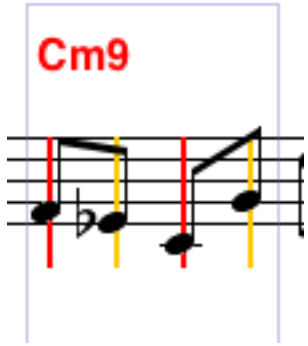
If a note is selected, the scale starts with that note, rather than the tonic.

Cell Advice

A **cell** is a small sequence of notes, usually of equal duration.

Cells depend on the first chord only.

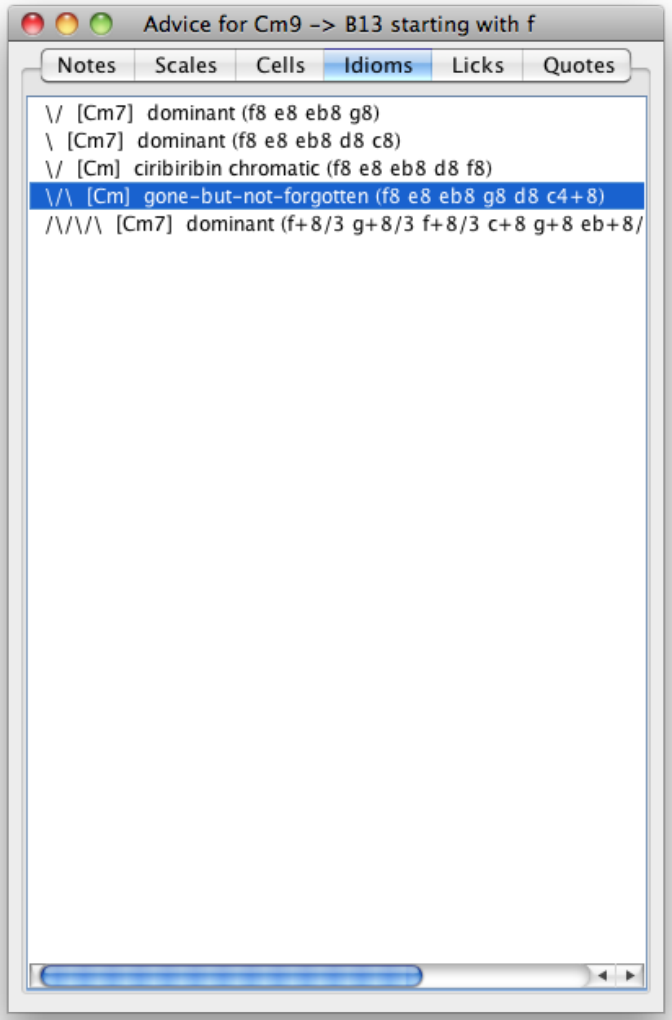


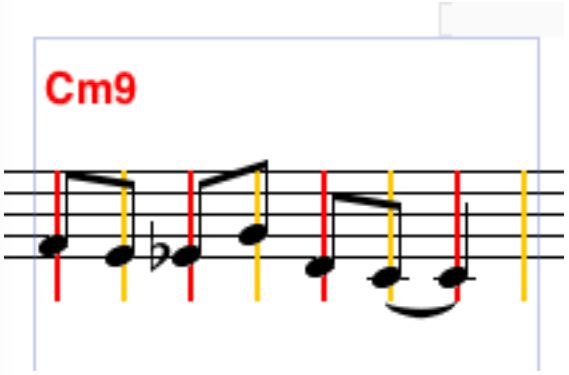


Idiom Advice

An **idiom** is a short, commonly-heard, melodic fragment.

Idioms depend on the first chord only.

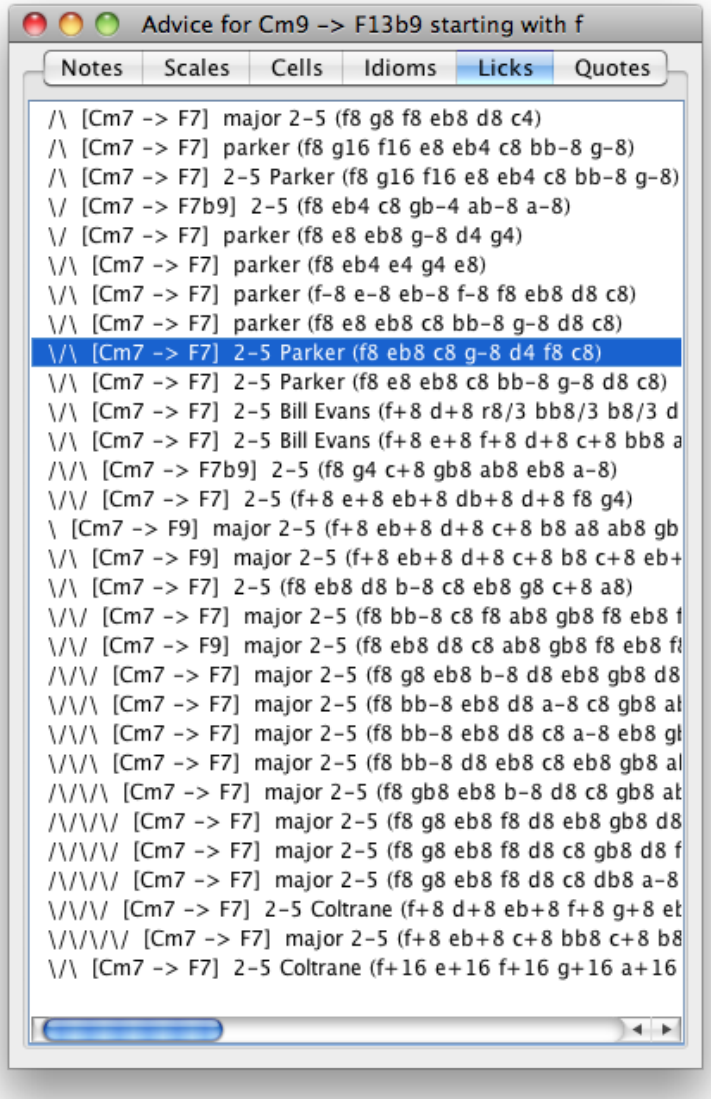


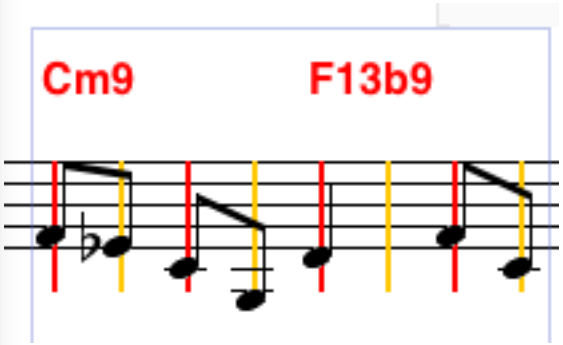


Lick Advice

A **lick** is a short, commonly-heard, melodic fragment.

Licks depend on the first two chords.

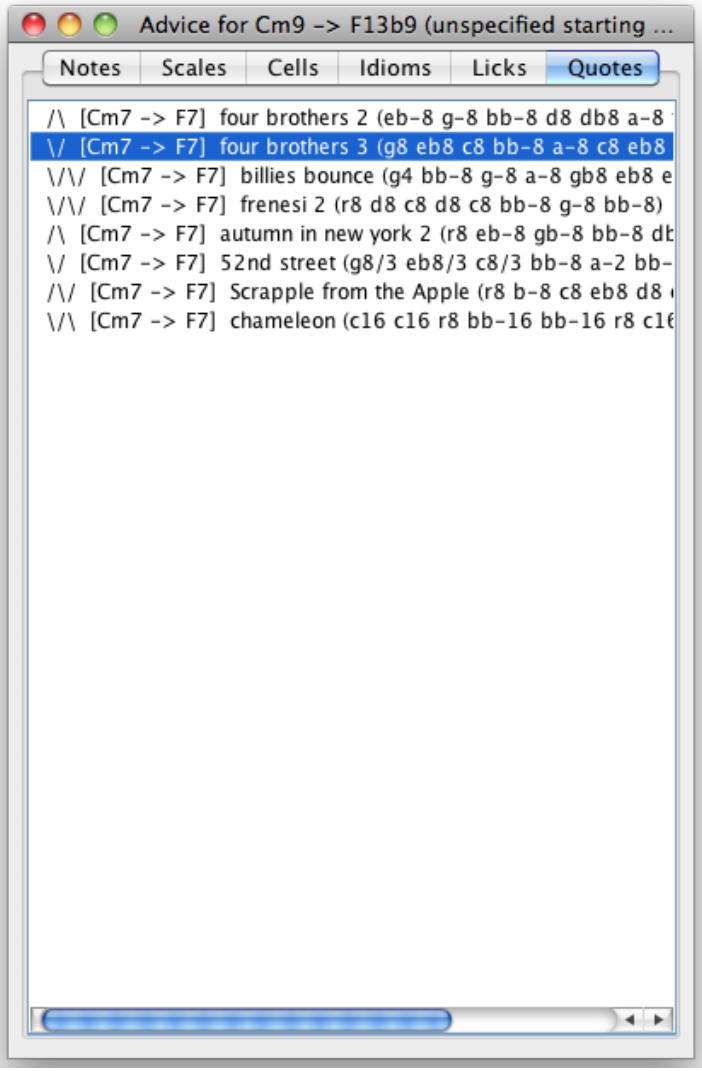


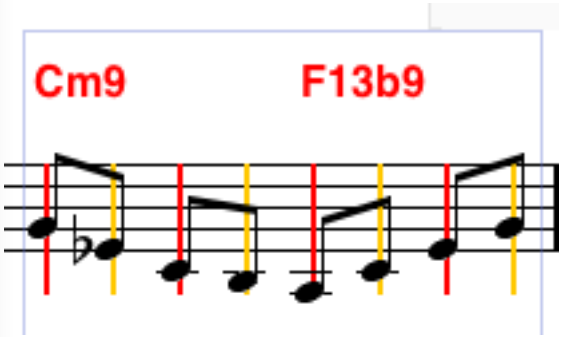


Quote Advice

A **quote** is a melodic fragment taken from another tune or solo.

Quotes depend on the first two chords.

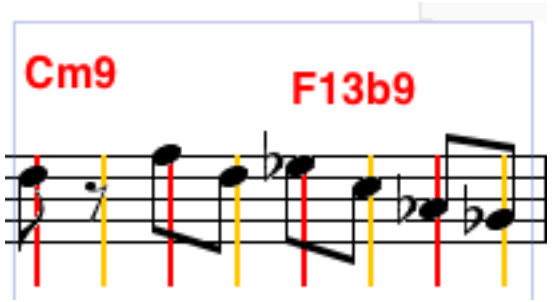


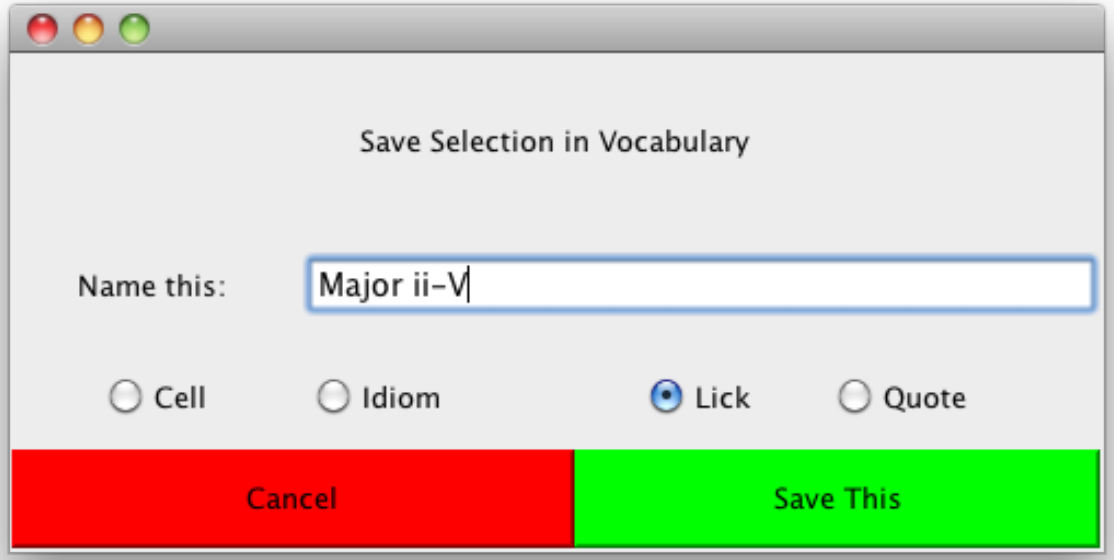


Make Your Own Advice

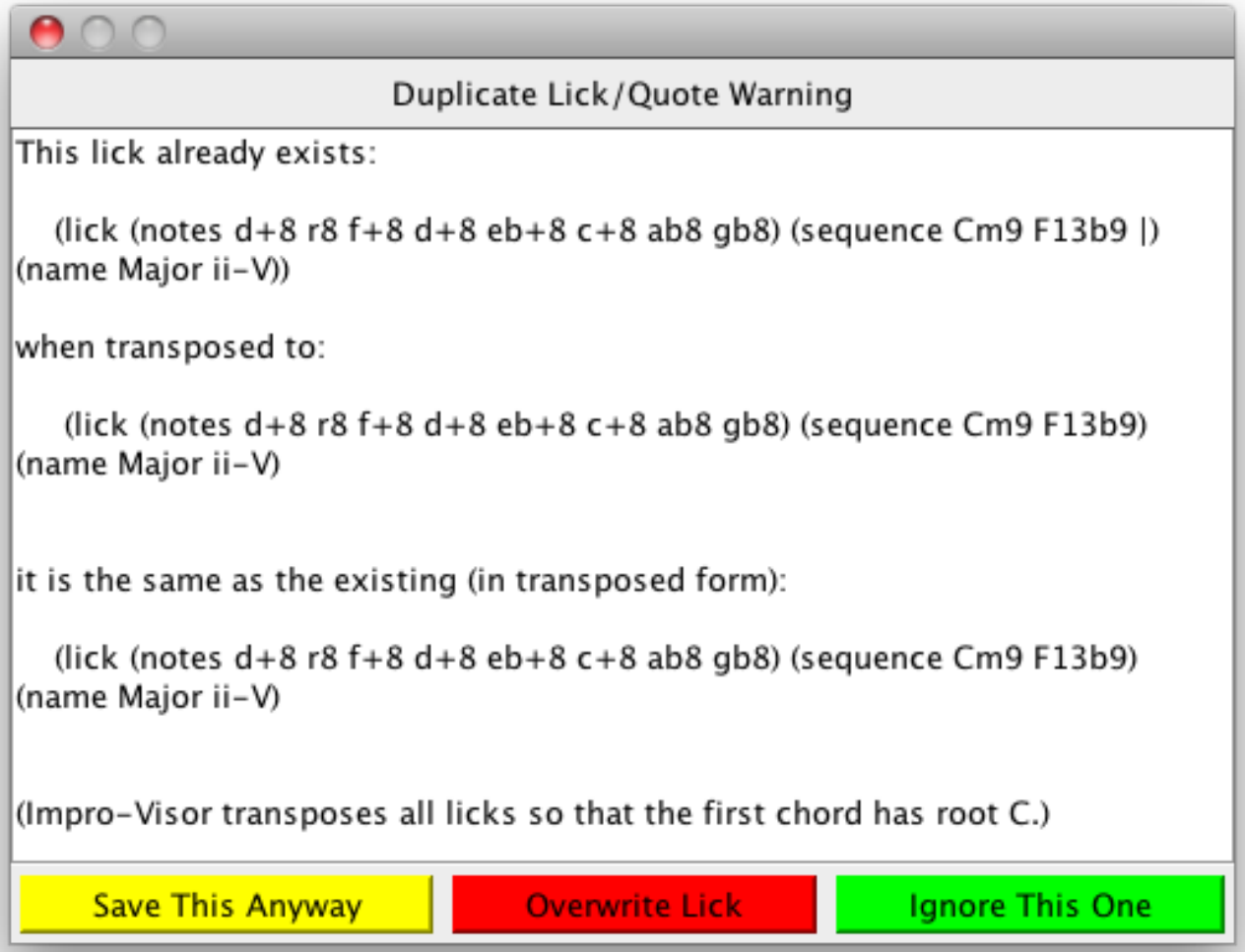
- Add new cells, idioms, licks, and quotes to your library.
- Select notes, preferably over one or two chords.
- Press the U key.
- Give the item a name and indicate the type.

Make Your Own Advice



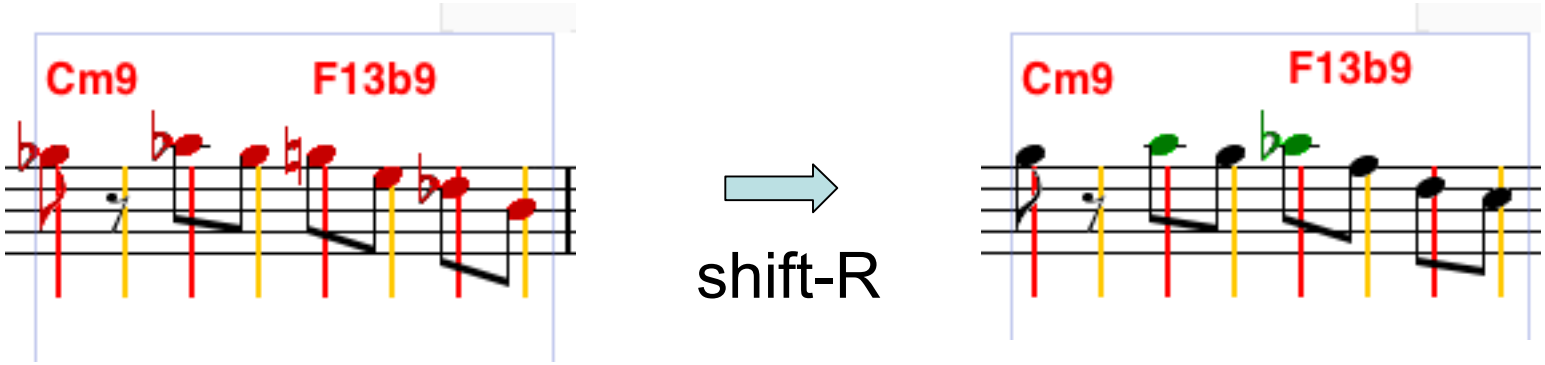


Automatic Duplicate Prevention



Rectification

- A lick can be shaped to fit other chords.
- The **rectify** feature (shift-R key) will pull any notes into line with the chords so that the notes are chord or color tones.



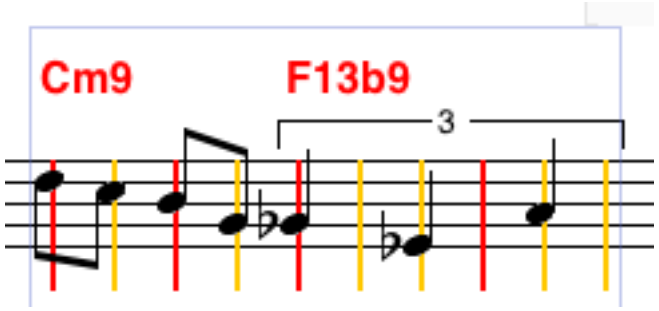
Lick Generation

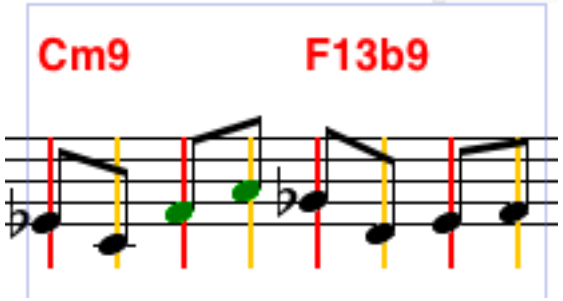
- The library can provide an arbitrarily-large collection of suggestions.
- However, it may be deficient in ones for certain chord combinations.
- Also, it does not cover arbitrary chord combinations.
- A more general, dynamic, capability is provided by the lick generator.

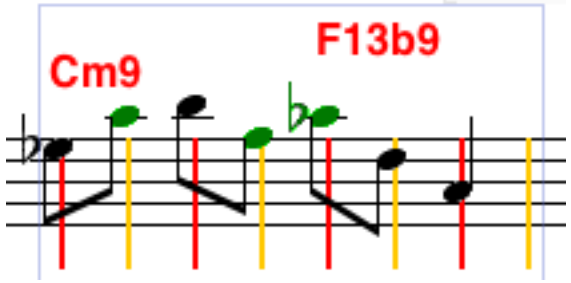
Lick Generator

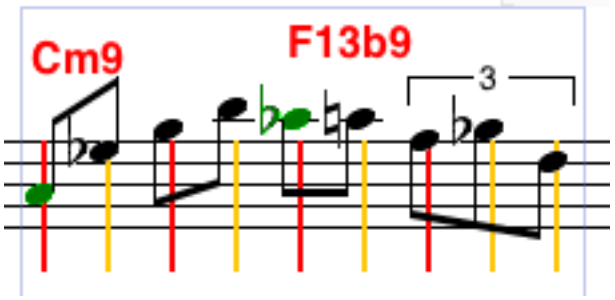
- The lick generator will generator melodic sequences over any chord sequence.
- Generation is based on the notion of a **grammar**.
- A grammar specifies ways to fill musical space **probabilistically** (not deterministically), which ensures **novelty**.

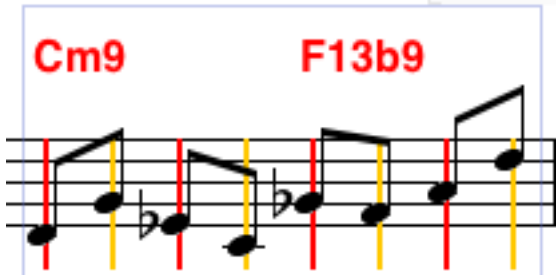
Examples of Generated Licks

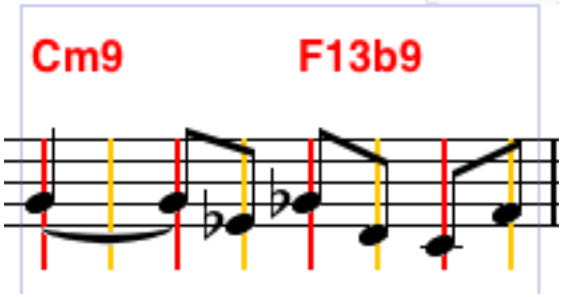




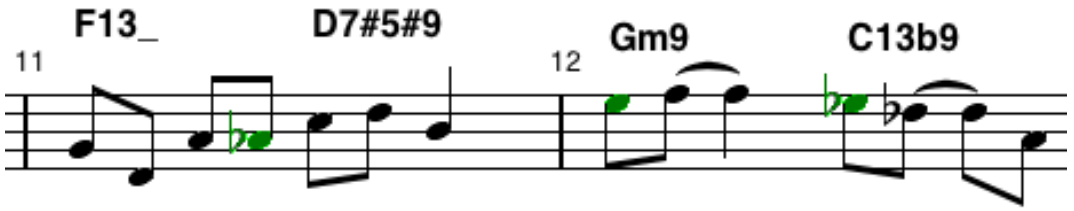


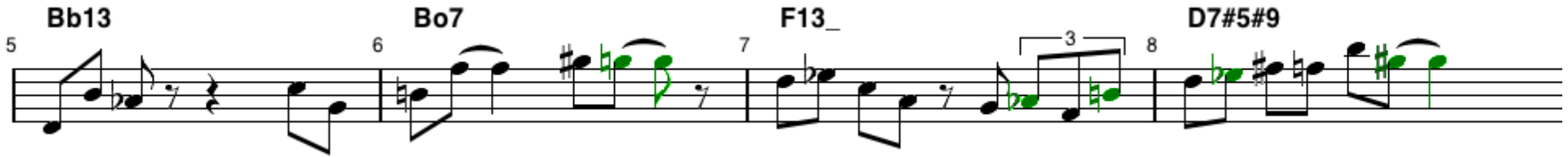


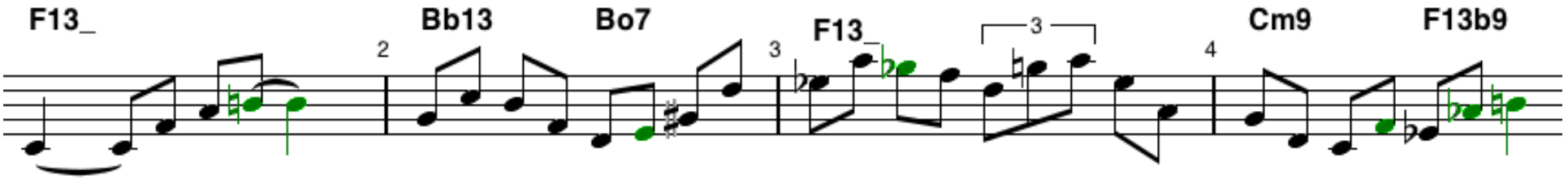




Examples of Longer Licks







Limitations

- Not every lick generated is guaranteed to sound interesting.
- Most will be consistent with the harmony.
- Coherence may be lacking.

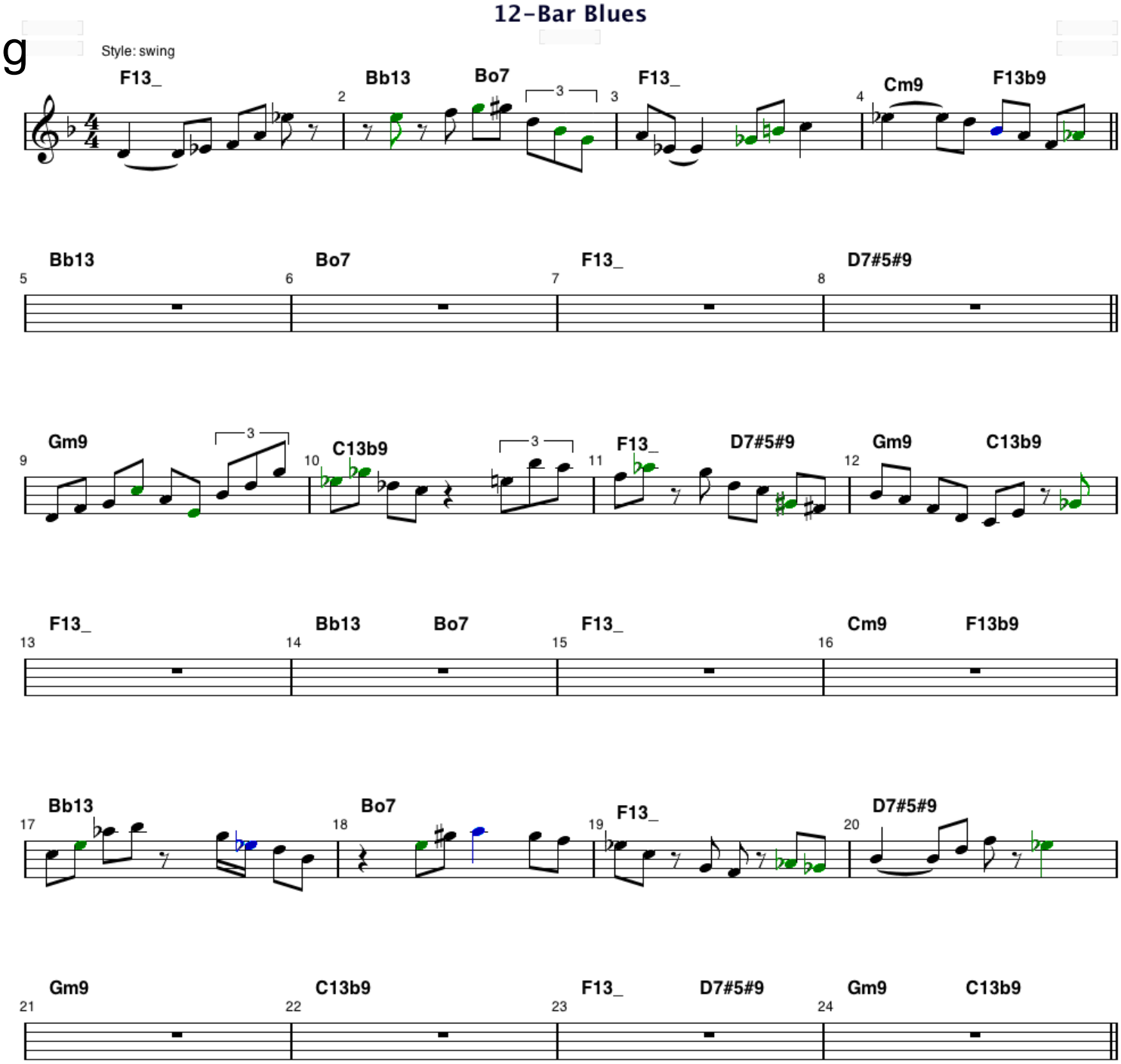
More on Generation

- Entire choruses can be generated in near real-time.
- This can be used for **trading** fours, eights, etc.
- The grammar can be set to **drop out** every so many bars.

Trading Setup

- A special grammar, such as MyFours, is used to trade fours.
- The tune must have a number of bars that is a multiple of 2 x 4 = 8.
- So for a 12-bar blues, we copy two choruses into one 24-bar chorus, as shown next.

Trading Fours



Notes on Trading

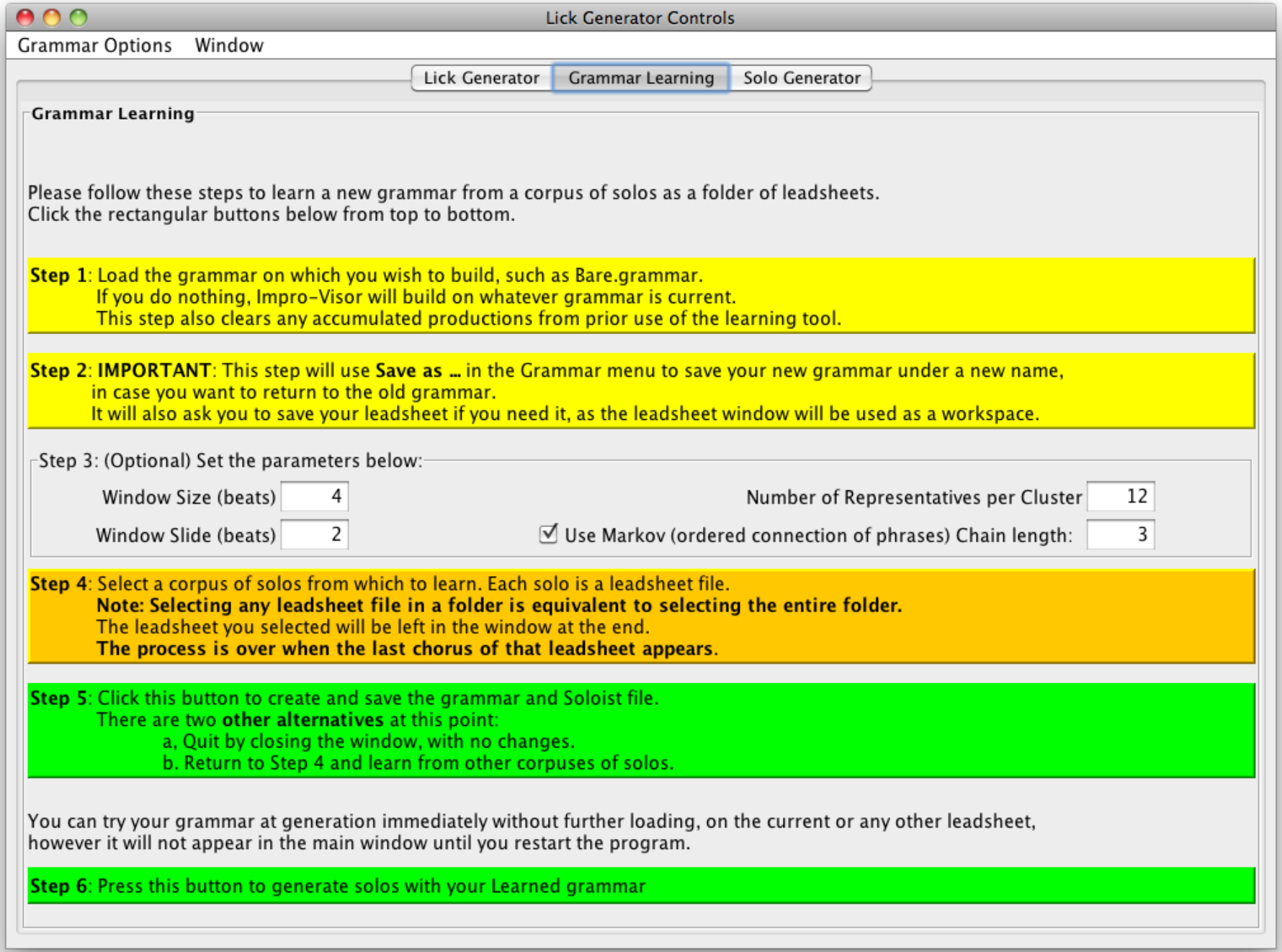
- The program is not reacting to the user in real time.
- The entire chorus is generated in advance.
- (This may change in the future.)

Grammar Choices

- User may select from a variety of grammars.
- User may modify an existing grammar (make it simpler or more complex).
- User may create grammar from scratch.

Grammar Learning Tab

- Impro-Visor provides the ability to learn a grammar from a corpus of one or more transcribed solos.
- The solos must be represented in Impro-Visor leadsheet form.
- The program does the rest.
- The grammar learning interface is shown on the next slide.


Lick Generator Controls
Grammar Options
Window
Lick Generator
Grammar Learning
Solo Generator
Grammar Learning
Please follow these steps to learn a new grammar from a corpus of solos as a folder of leadsheets.
Click the rectangular buttons below from top to bottom.
Step 1: Load the grammar on which you wish to build, such as Bare.grammar.
If you do nothing, Impro-Visor will build on whatever grammar is current.
This step also clears any accumulated productions from prior use of the learning tool.
Step 2: IMPORTANT: This step will use Save as ... in the Grammar menu to save your new grammar under a new name,
in case you want to return to the old grammar.
It will also ask you to save your leadsheet if you need it, as the leadsheet window will be used as a workspace.
Step 3: (Optional) Set the parameters below:
Window Size (beats)
4
Window Slide (beats)
2
Number of Representatives per Cluster
12
Use Markov (ordered connection of phrases) Chain length:
3
Step 4: Select a corpus of solos from which to learn. Each solo is a leadsheet file.
Note: Selecting any leadsheet file in a folder is equivalent to selecting the entire folder.
The leadsheet you selected will be left in the window at the end.
The process is over when the last chorus of that leadsheet appears.
Step 5: Click this button to create and save the grammar and Soloist file.
There are two other alternatives at this point:
a, Quit by closing the window, with no changes.
b. Return to Step 4 and learn from other corpuses of solos.
You can try your grammar at generation immediately without further loading, on the current or any other leadsheet,
however it will not appear in the main window until you restart the program.
Step 6: Press this button to generate solos with your Learned grammar

Existing Grammars

- Impro-Visor comes with grammars learned from transcribed solos of various artists.
- In some cases, only a single solo was used, in others multiple solos.
- **Disclaimer**: We do not claim that a given grammar completely characterizes the named player. These grammars were derived from very limited information.

Grammars Available

Backup
Bare
BillEvans
CharlieParker
CliffordBrown
ColemanHawkins-Ballads
DaveLiebman
DexterGordon
DizzyGillespie
FreddieHubbard
JimmyHeath
JJJohnson
JohnColtrane
KeithJarrrett
LeeMorgan
MilesDavis
My
MyFours
Outside
RedGarland
TomHarrell-Waltzes
TomHarrell
Zoo

More on How Grammars Work

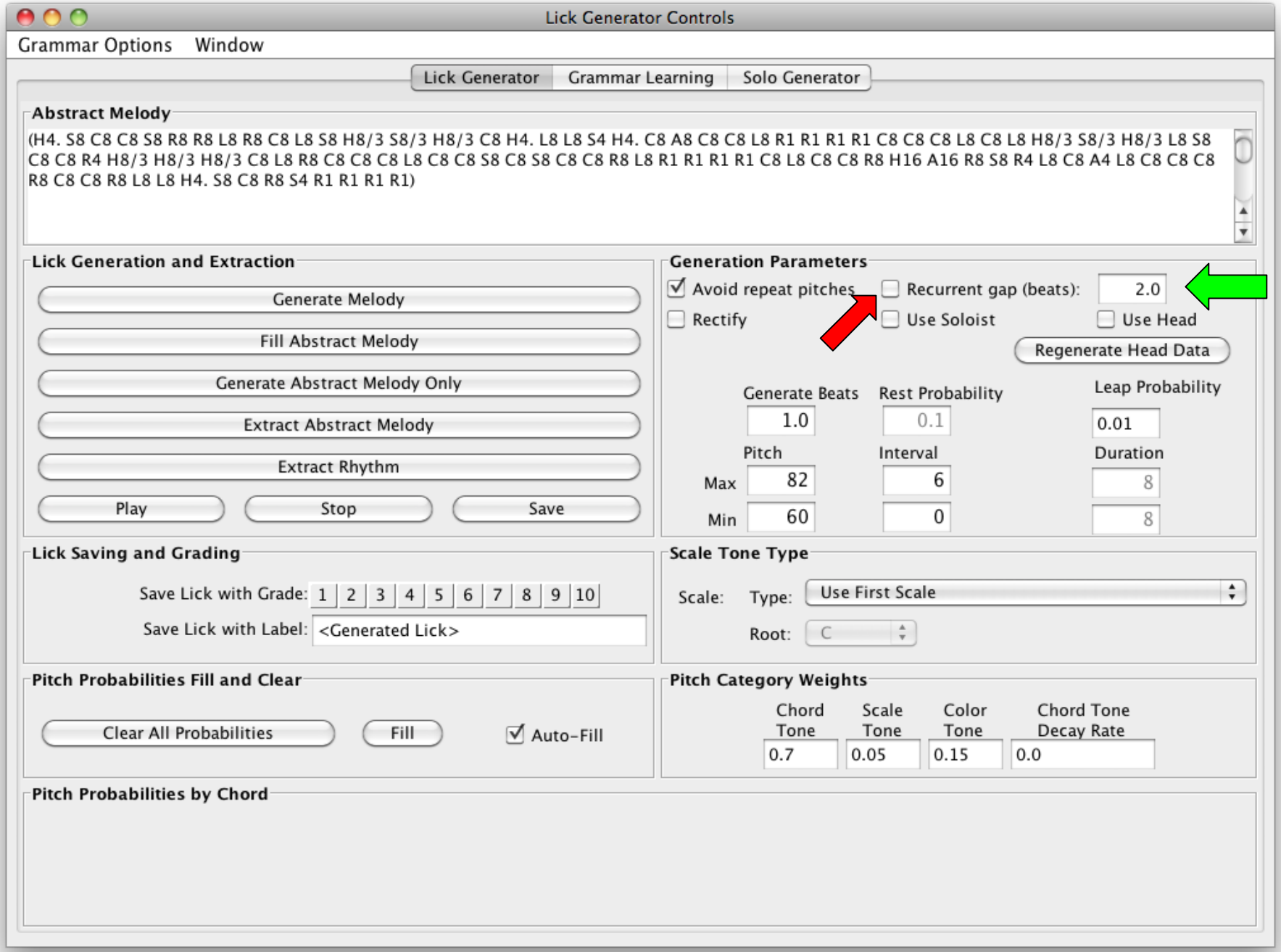
- The grammar generates an abstract melody containing:

  abstract notes

  = note categories with durations.

- Abstract notes are replaced with actual notes on a probabilistic basis.

- The next slide shows the lick generator control panel, with an abstract melody. The panel is opened with **Control-G** or the **righthand lightbulb** icon:


Lick Generator Controls
Grammar Options
Window
Lick Generator
Grammar Learning
Solo Generator
Abstract Melody
(H4. S8 C8 C8 S8 R8 R8 L8 R8 C8 L8 S8 H8/3 S8/3 H8/3 C8 H4. L8 L8 S4 H4. C8 A8 C8 C8 L8 R1 R1 R1 R1 C8 C8 C8 L8 C8 L8 H8/3 S8/3 H8/3 L8 S8 C8 C8 R4 H8/3 H8/3 H8/3 C8 L8 R8 C8 C8 C8 L8 C8 C8 S8 C8 S8 C8 C8 R8 L8 R1 R1 R1 R1 C8 L8 C8 C8 R8 H16 A16 R8 S8 R4 L8 C8 A4 L8 C8 C8 C8 R8 C8 C8 R8 L8 L8 H4. S8 C8 R8 S4 R1 R1 R1 R1)
Lick Generation and Extraction
Generate Melody
Fill Abstract Melody
Generate Abstract Melody Only
Extract Abstract Melody
Extract Rhythm
Play
Stop
Save
Generation Parameters
Avoid repeat pitches
Recurrent gap (beats):
2.0
Rectify
Use Soloist
Use Head
Regenerate Head Data
Generate Beats
Rest Probability
Leap Probability
1.0
0.1
0.01
Pitch
Interval
Duration
Max
82
6
8
Min
60
0
8
Lick Saving and Grading
Save Lick with Grade:
1
2
3
4
5
6
7
8
9
10
Save Lick with Label:
<Generated Lick>
Scale Tone Type
Scale:
Type:
Use First Scale
Root:
C
Pitch Probabilities Fill and Clear
Clear All Probabilities
Fill
Auto-Fill
Pitch Category Weights
Chord Tone
Scale Tone
Color Tone
Chord Tone Decay Rate
0.7
0.05
0.15
0.0
Pitch Probabilities by Chord

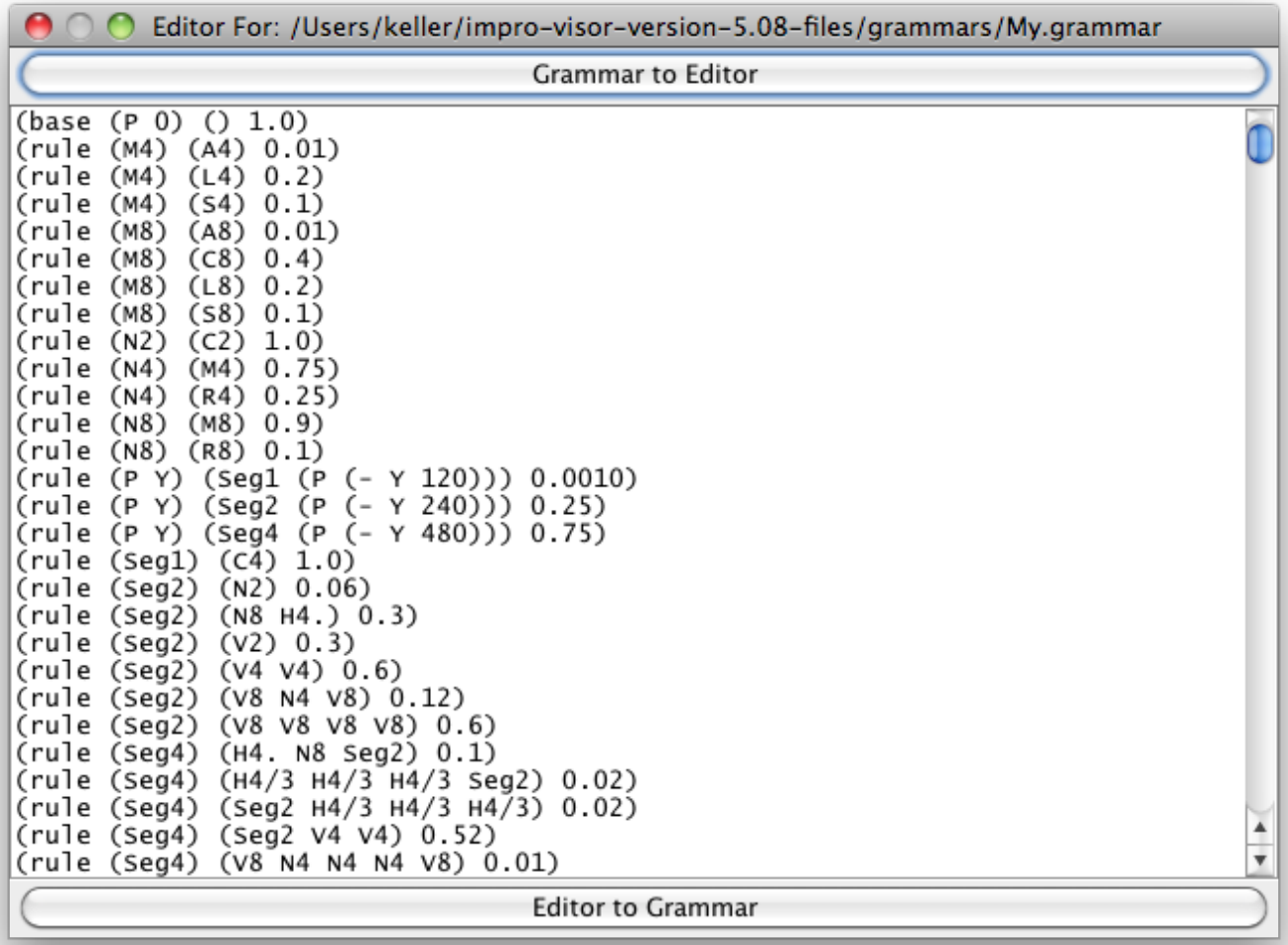
Recurrent Improvisation

- In order to trade with the program indefinitely, a recurrent option is available. See the red arrow on the previous page.
- It causes the program to generate a new chorus at the end of the current chorus.
- Currently there may be a slight “hiccup” between choruses, depending on how the gap time is adjusted (see green arrow on previous page). This will likely be remedied in the future.
- Eventually the program will run out of memory, because each chorus saved (press z to search backward through choruses).

Grammar Editor

- The current grammar can be edited in place.
- It is a good idea to use Save-As to avoid corrupting a workable grammar.
- Read about how grammars work in some of our papers before trying to edit them.

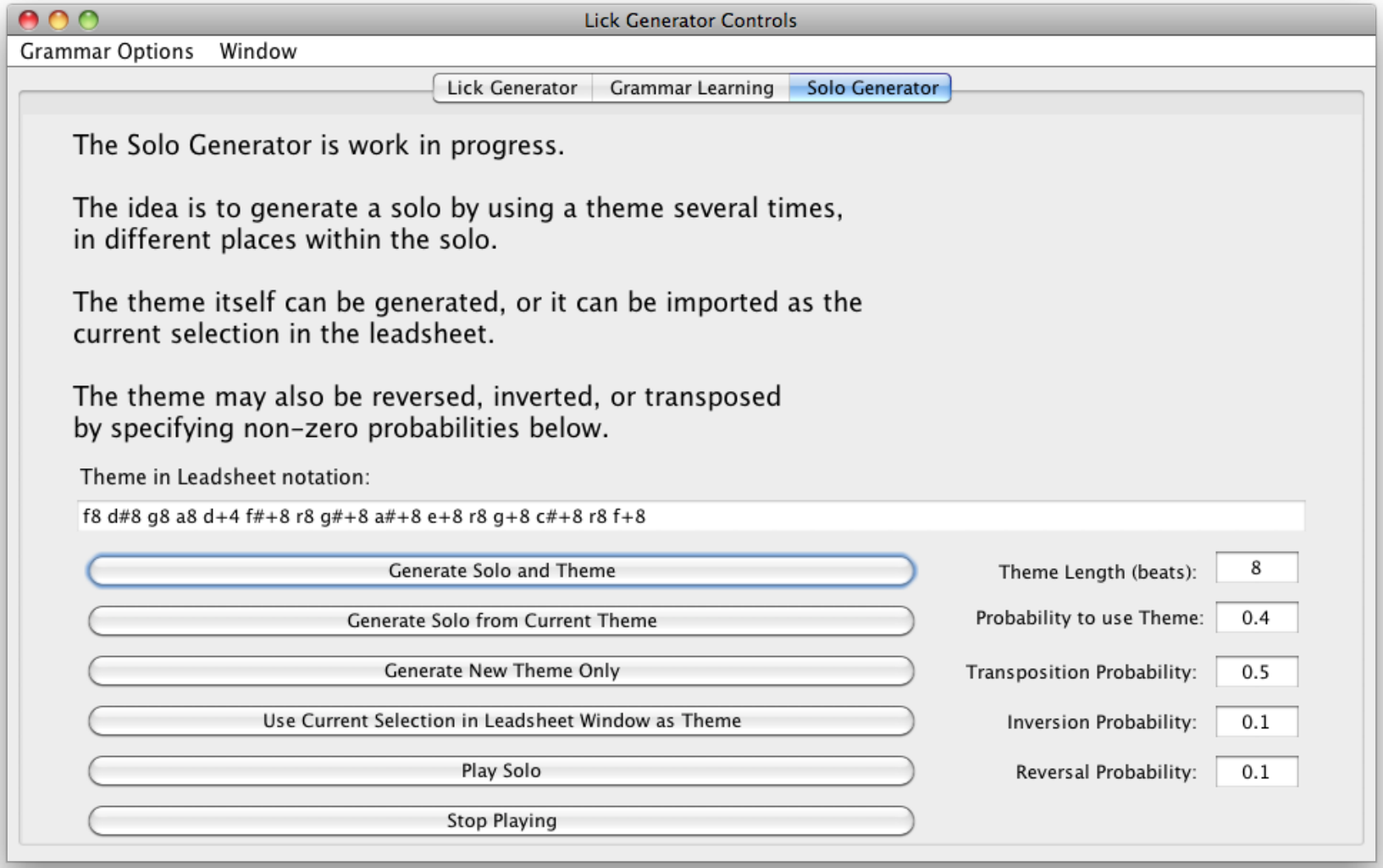
Grammar Editor Frame



Solo Generator Tab

- The solo generator is a research work in progress, started by David Morrison.
- The idea was to generate a solo that reused a theme probabilistically.
- The theme can be generated or hand-crafted.

Solo Generator Tab



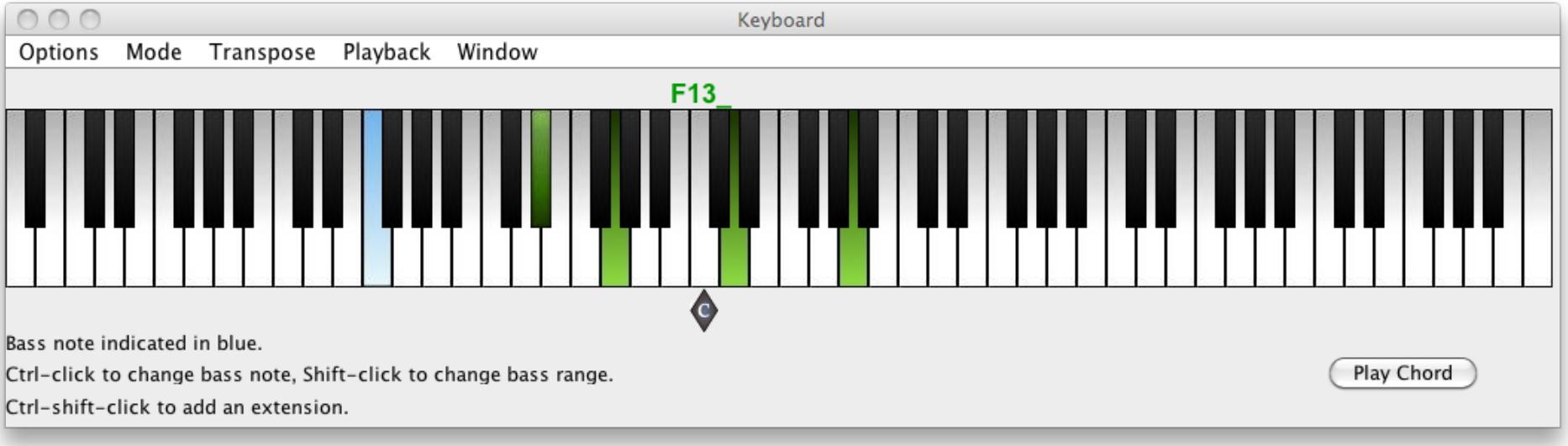
Chord Stepping

- Chord stepping allows you to play each chord individually in the leadsheet, without hearing the melody.
- The green arrows step this type of playback:
  - The right arrow steps to the next chord and plays.
  - The left arrow steps to the previous chord, but does not play.

- Press the square button when done stepping, to return to normal playback.

Keyboard Chord Visualizer

- Chords being played can be visualized on a piano keyboard.
- Press control-K to open the keyboard.
- The green notes are the notes in the voicing, and the blue note is the bass note.



Setting User Preferences

- Preferences are available from
  - The menu bar

  - The icon bar
  - Pressing the P key

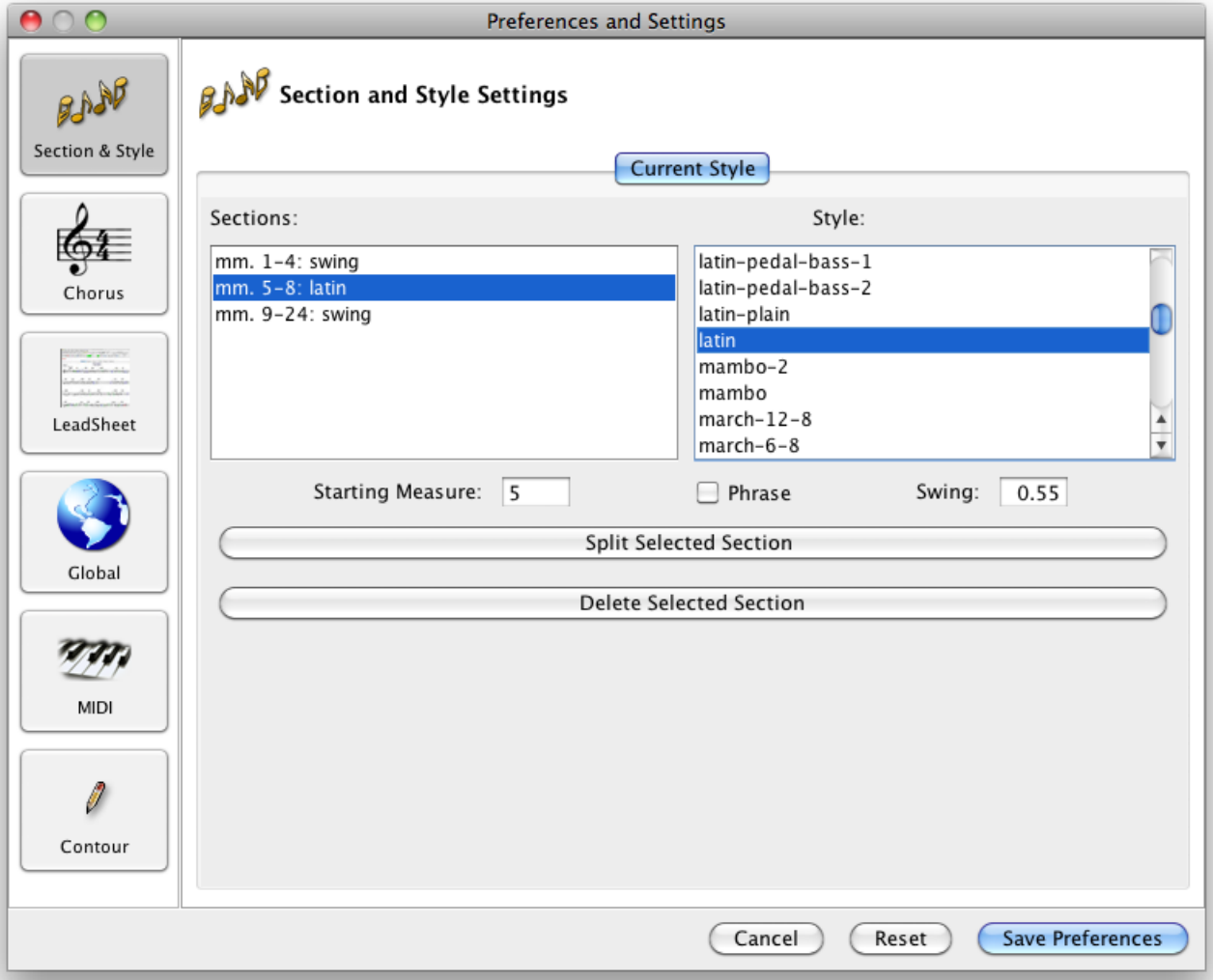
Six Separate Preference Frames

- Section & Style
- Chorus
- Leadsheet
- Global
- MIDI
- Contour

Section & Style Preferences

- A chorus has one or more sections.
- Currently the section structure of all choruses is the same.
- Each section can have its own style.
- This frame allows you to add or remove sections.
- A new section is added by splitting an existing section into two, then adjusting its starting measure.

Section & Style Preference Frame



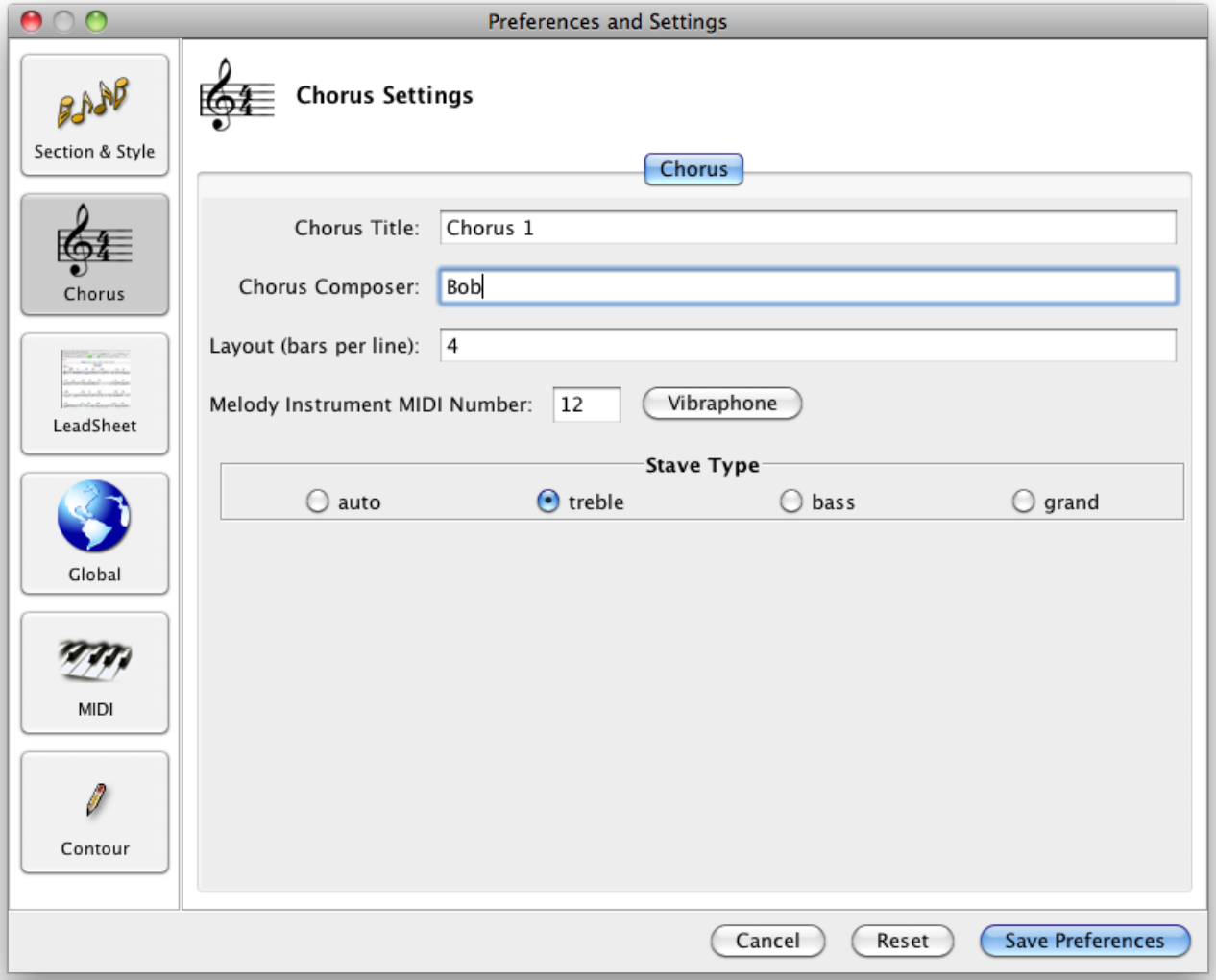
Sections vs. Phrases

- A phrase is essentially the same as a section, except:
  - Sections are shown with a double bar.
  - Phrases are shown with an apostrophe.
- There is also a distinction in roadmapping.
- A roadmap can provide a faster way to setup sections.

Chorus Preferences

- These preferences are specific to a chorus.
- Each chorus can have a different melody instrument, staff type, etc.
- The layout (bars per line) is also defined here, although it currently applies to all choruses uniformly.

Chorus Preference Frame



Layout (Bars Per Line) Setting

- This optional setting controls the number of bars per line on the leadsheet.
- If nothing is specified, the layout is adjusted based on density.
- If some numbers are specified, then those are the numbers of bars on successive staves.
- If there are more staves than numbers, the last number is used for all the remaining staves.

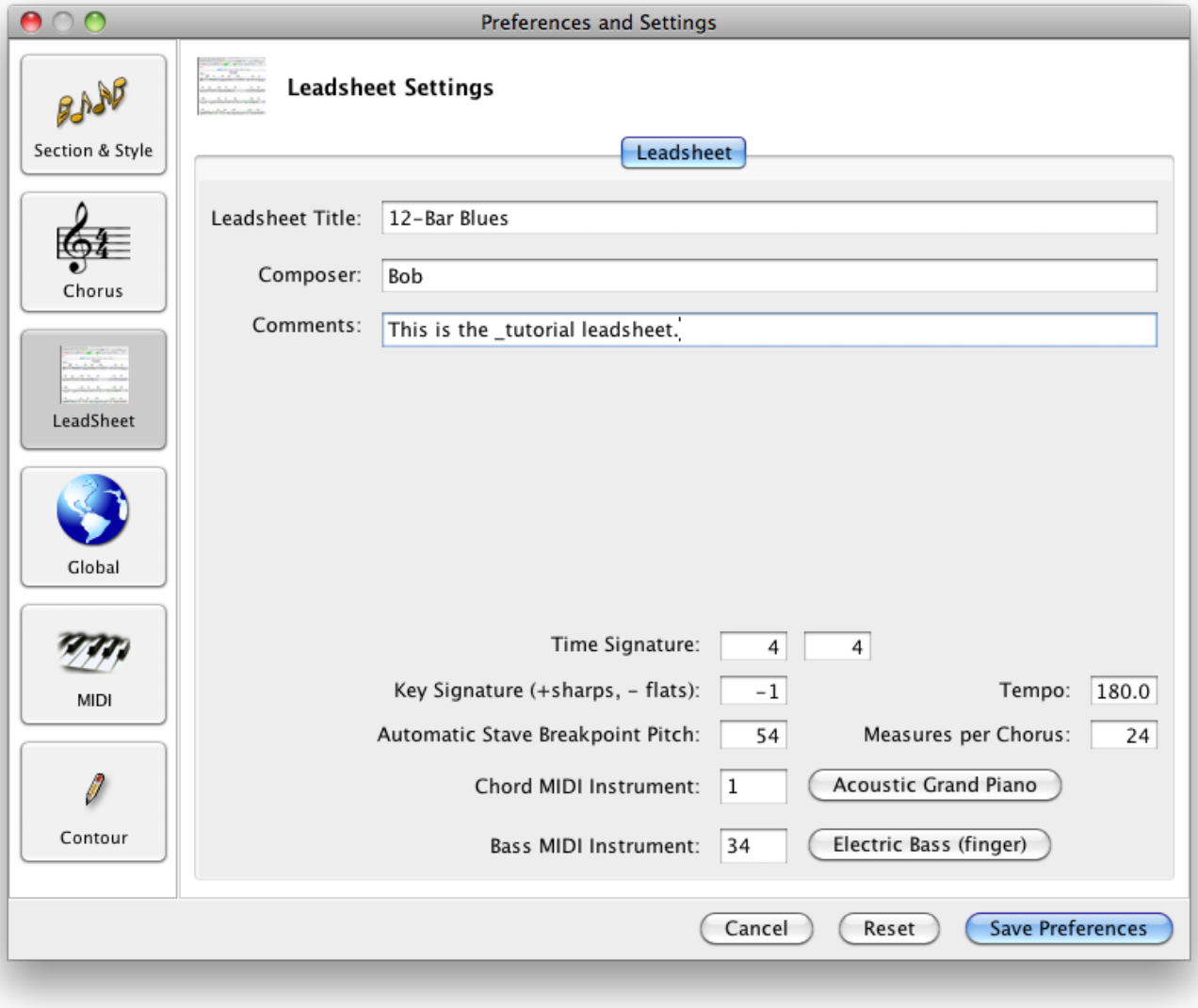
Layout (Bars Per Line) Setting Examples

- 4 means 4 bars per line throughout.
- 5 4 means 5 bars for the first line and 4 for all other lines.
- 2 2 8 means 2 bars for the first two lines, then 8 bars for all other.

Leadsheet Preference Settings

- These settings are particular to the entire leadsheet:
  - Time signature
  - Key signature
  - Tempo
  - Chord instrument
  - Bass instrument

Leadsheet Preference Frame



Bars Per Chorus

- Bars Per Chorus can also be set in the leadsheet window.

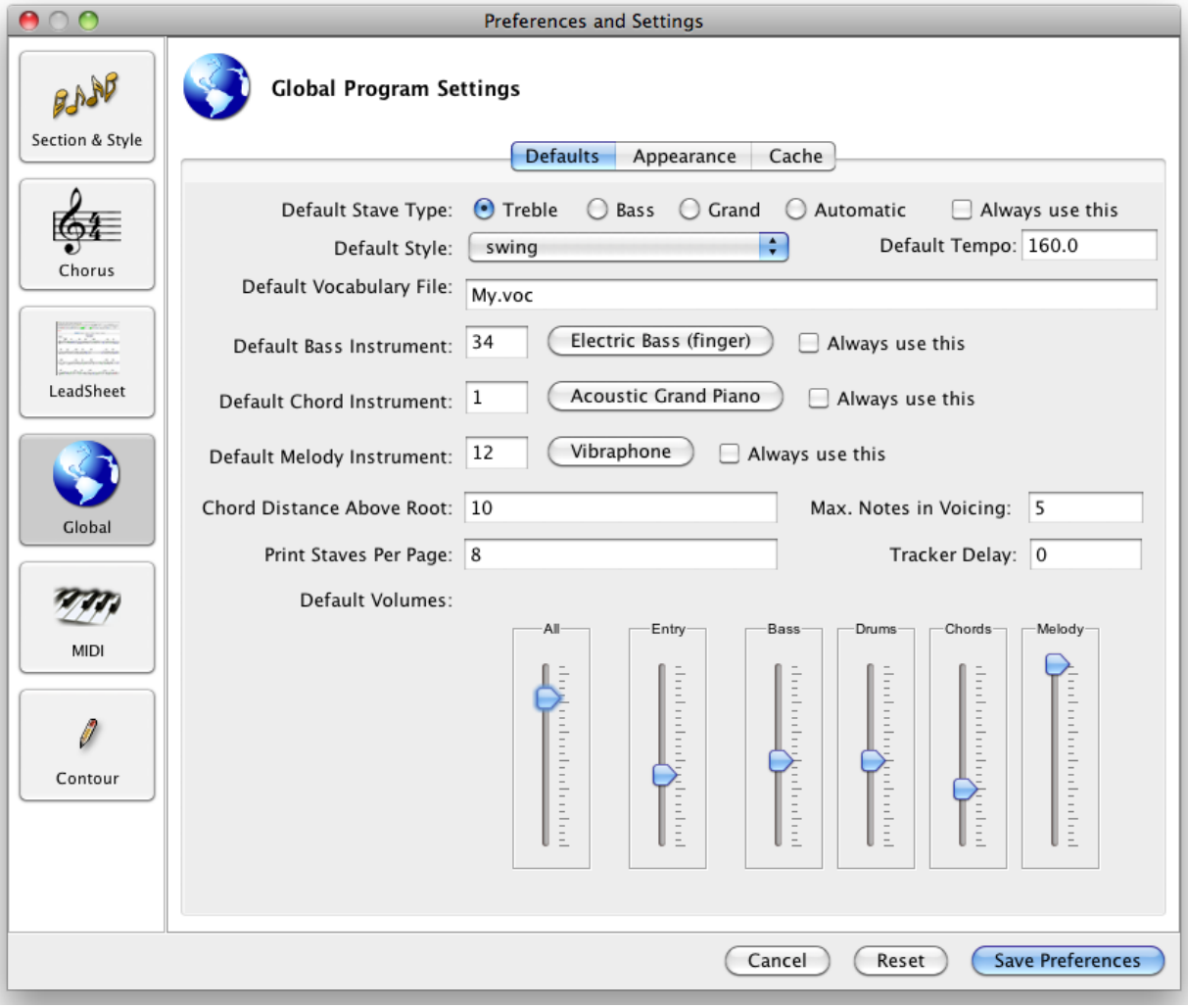
- The default setting is initially 72.
- Setting the bars to fewer than the number of bars in use will bring up a warning dialog, because the additional bars will be lost.

Global Preference Settings

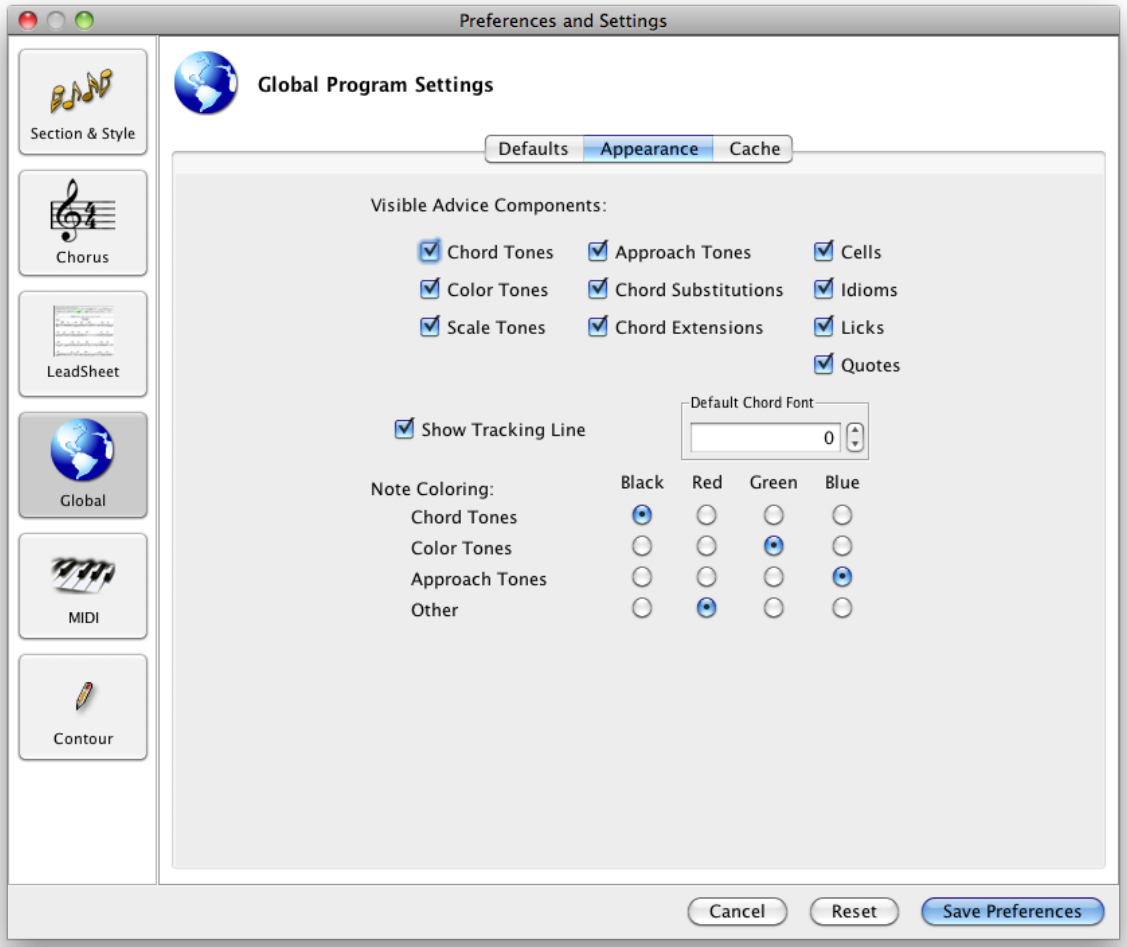
- These control various default settings and print options.

- There are 3 tabs:
  - Defaults
  - Appearance
  - Cache

Global Preference Frame
Defaults Tab

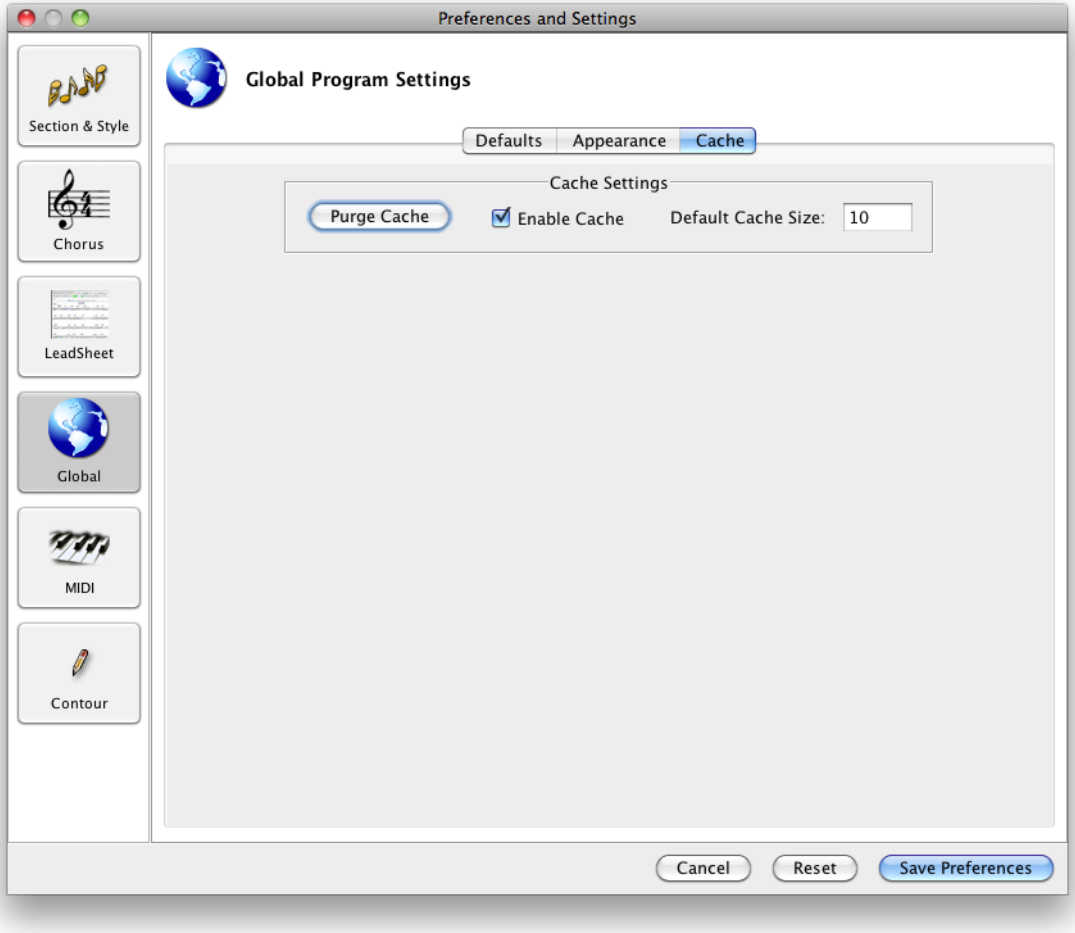


Global Preference Frame Appearance Tab



Global Preference Frame Cache Tab

The cache is used to avoid recomputing advice items.



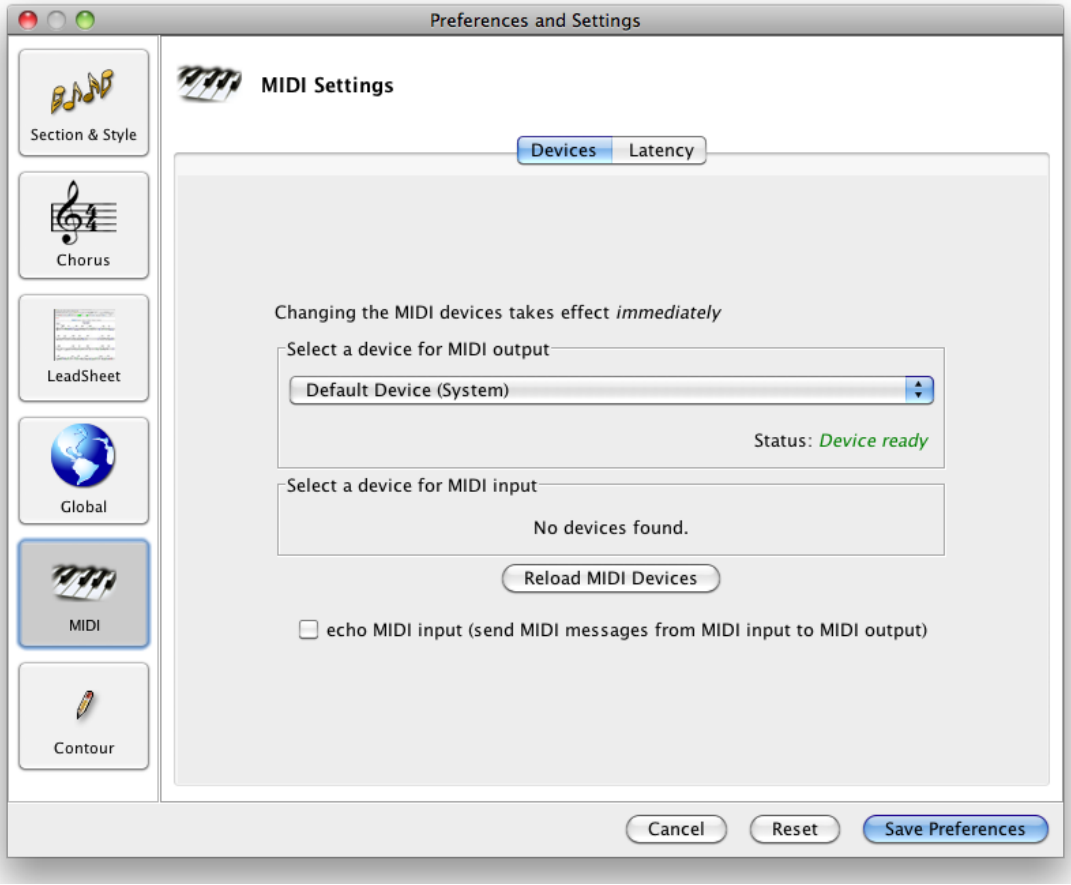
MIDI Preference Settings

- MIDI settings select MIDI (Musical Instrument Digital Interface) input and output.

- There are two tabs:
  - Devices
  - Latency

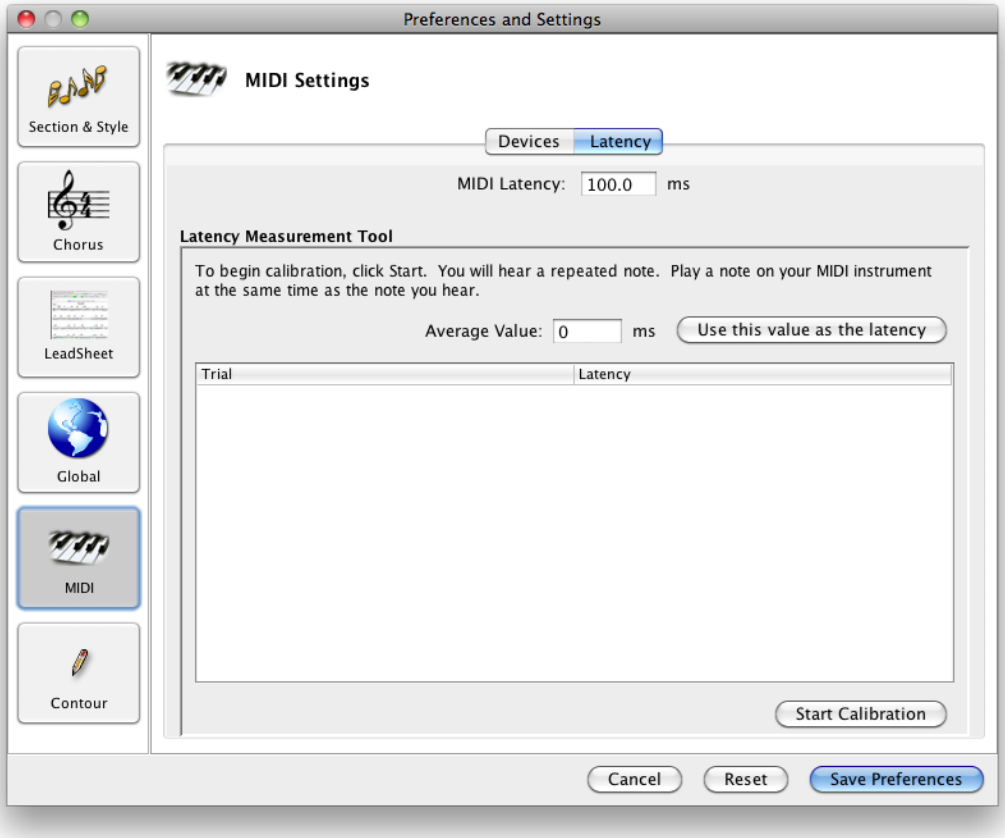
MIDI Preferences
Device Tab

Use this to select MIDI devices other than the ones built-in to your computer.



MIDI Preferences Latency Tab

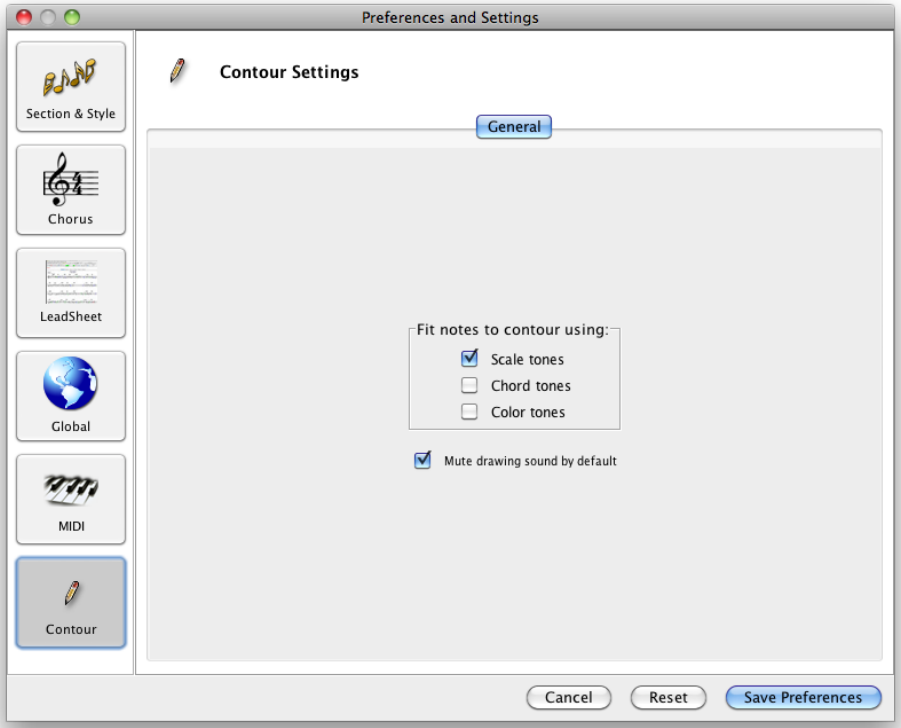
Use this to calibrate the latency of a MIDI **input** device, if you use one.



Contour Preferences Frame

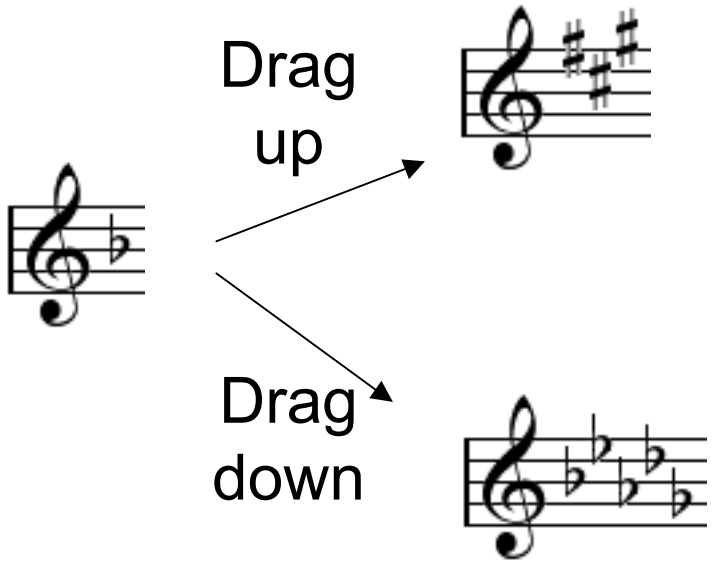
These settings determine the kind of rectification done in contour melody drawing, using the pencil tool, an alternative to point and click.

Pencil tool icon



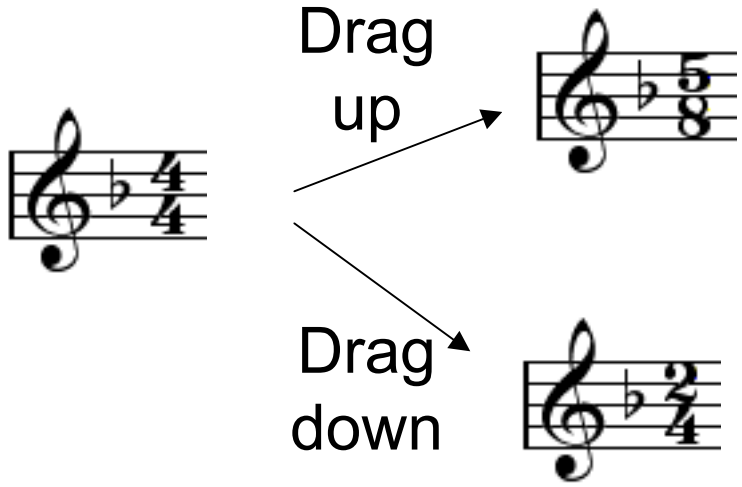
Shortcut for Setting Key Signature

- Position the mouse over the key signature area, then drag up or down.



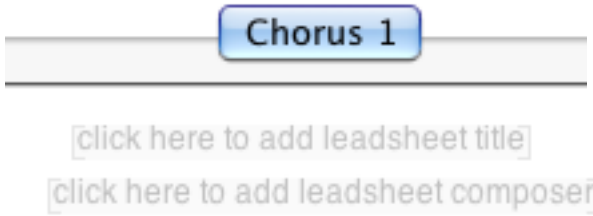
Shortcut for Setting Time Signature

- Position the mouse over the time signature area, then drag up or down.
- The bottom number changes more slowly than the top, range 1:1 to 12:8.



Shortcut for Leadsheet Title

- The title and composer only appears on the first chorus.
- These can be entered in the grey areas near the top center.



Adding and Deleting Choruses

- The + icon adds a new chorus at the end.

- The * icon deletes the current chorus (can't be undone).

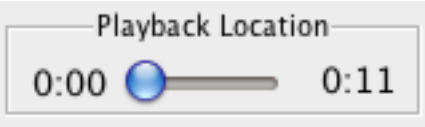
Click to add new chorus

Click to delete current chorus

Playback Location Slider

- This slider shows the location of playback within the entire leadsheet, including all choruses, when it is played.

- By manipulating the slider, the location can also be set.



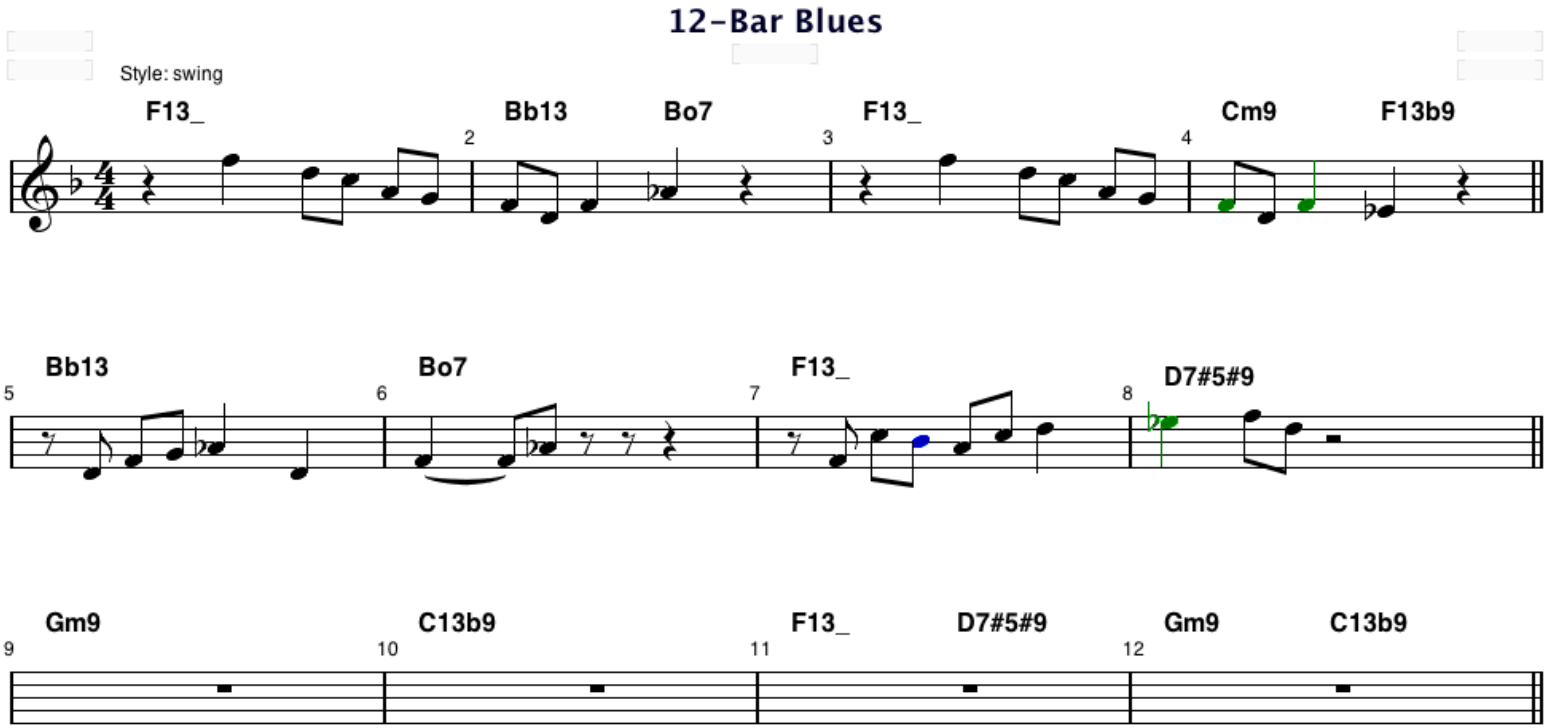
Shortcuts for Chorus Title, etc.

- Similar to the leadsheet title and author, chorus title and author can be added for each chorus, by clicking in the grey areas on the lefthand side and typing.
- Similar areas on the righthand side can be used for added information, such as data and show/album title.

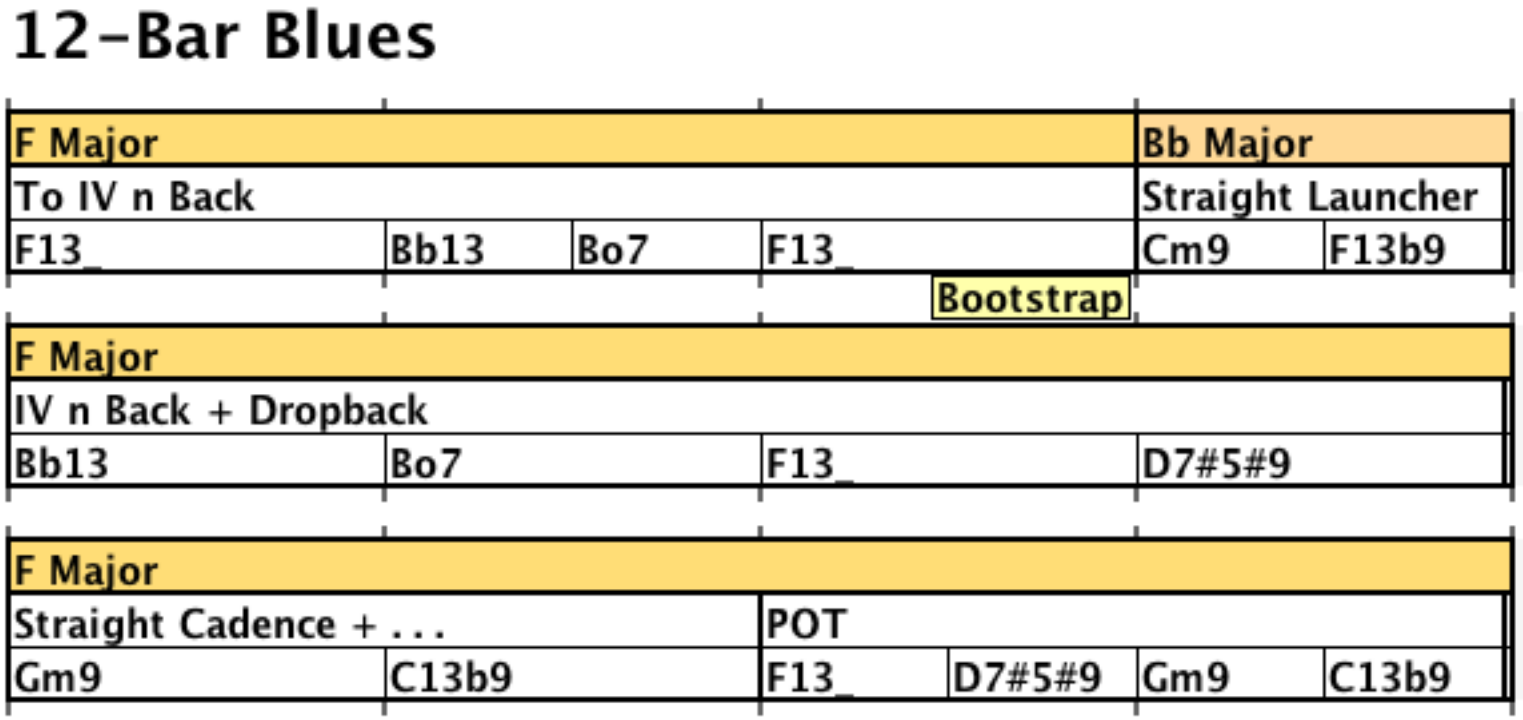
Roadmaps

- A roadmap can be used to provide an explanation of the chord progressions in a leadsheet.
- It also shows the inferred keys for each part of the progression.
- The nomenclature within a roadmap is explained elsewhere.

12-Bar Blues Tutorial



Roadmap Generated for the 12-Bar Blues



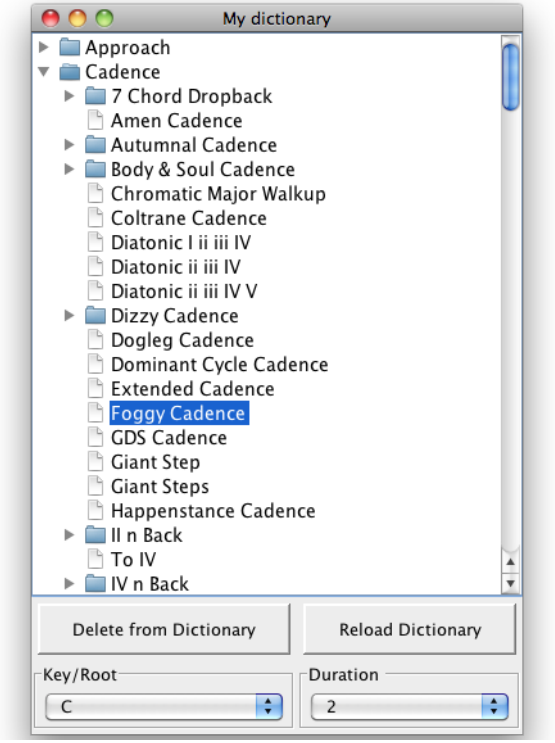
Bricks

- The roadmap rows consist of bricks with various names, such as Straight Cadence, POT (Plain Old Turnaround).
- Across the top of each row there is a strip indicating the approximate key of each brick.
- The chords are in a strip across the bottom of each row.

Building with Bricks

- In addition to their analytic use, bricks can be used to synthesize a chord progression for a tune, and eventually turn it into a leadsheet.
- A brick dictionary provides a menu of options.
- The bricks are categorized by type.
- The user sets the keys and brick durations.
- Drag the selected brick into position in the roadmap.

Brick Dictionary



Brick preview (select from Dictionary)

C Major			
Foggy Cadence			
Eb7	Dm7	G7	C

Drag bricks into place.

Roadmap Under Construction

C Major							
Foggy Cadence				Foggy Cadence			
Eb7	Dm7	G7	C	Eb7	Dm7	G7	C

Half Nelson

Vocabulary File

- The vocabulary file (default: My.voc) defines various musical items:
  - Scales by name
  - Chords by name
  - Cells, Idioms, Licks, Quotes
  - The default style specification

- These can be edited with a text editor outside of Impro-Visor.

- Definitions can be modified or added.

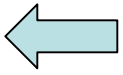
- We will show these by example.

- In all cases, **the parenthesis structure must be preserved**, or the file may become unreadable.

Scale Definition in Vocabulary

Each scale type is defined only once, with C as the tonic:

```
(scale
    (name C lydian)
    (spell c d e f# g a b c)
   )
```

 Matching paren

Chord Definition in Vocabulary

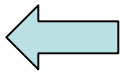
We give an abbreviated version, without voicings.

```
(chord
    (name CM69)
    (pronounce C major six nine)
    (key c)
    (family major)
    (spell c8 e8 g8 a8 d8)
    (color b8 f#8)
    (priority d8 e8 a8 g8 c8)
    (scales
        (C major)
        (C lydian)
        (C bebop major)
    (voicings … see next slide …)
)
```

Sample Voicings that Go Inside Chord Definition

Voicings can be entered textually or by keyboard using the Voicing Editor.
Voicings are optional. They can be auto-generated.

```
(voicings
    (left-hand-A (type closed)(notes e8 g8 a8 d+8)(extension))
    (left-hand-B (type closed)(notes g8 d+8 e+8 a+8)(extension))
    (quartal (type open)(notes e8 a8 d+8 g+8)(extension))
    (shout-A (type shout)(notes e8 g8 a8 d+8)(extension d++8 g++8 d+++8))
)
```

 Matching paren

Sample Lick Definitions

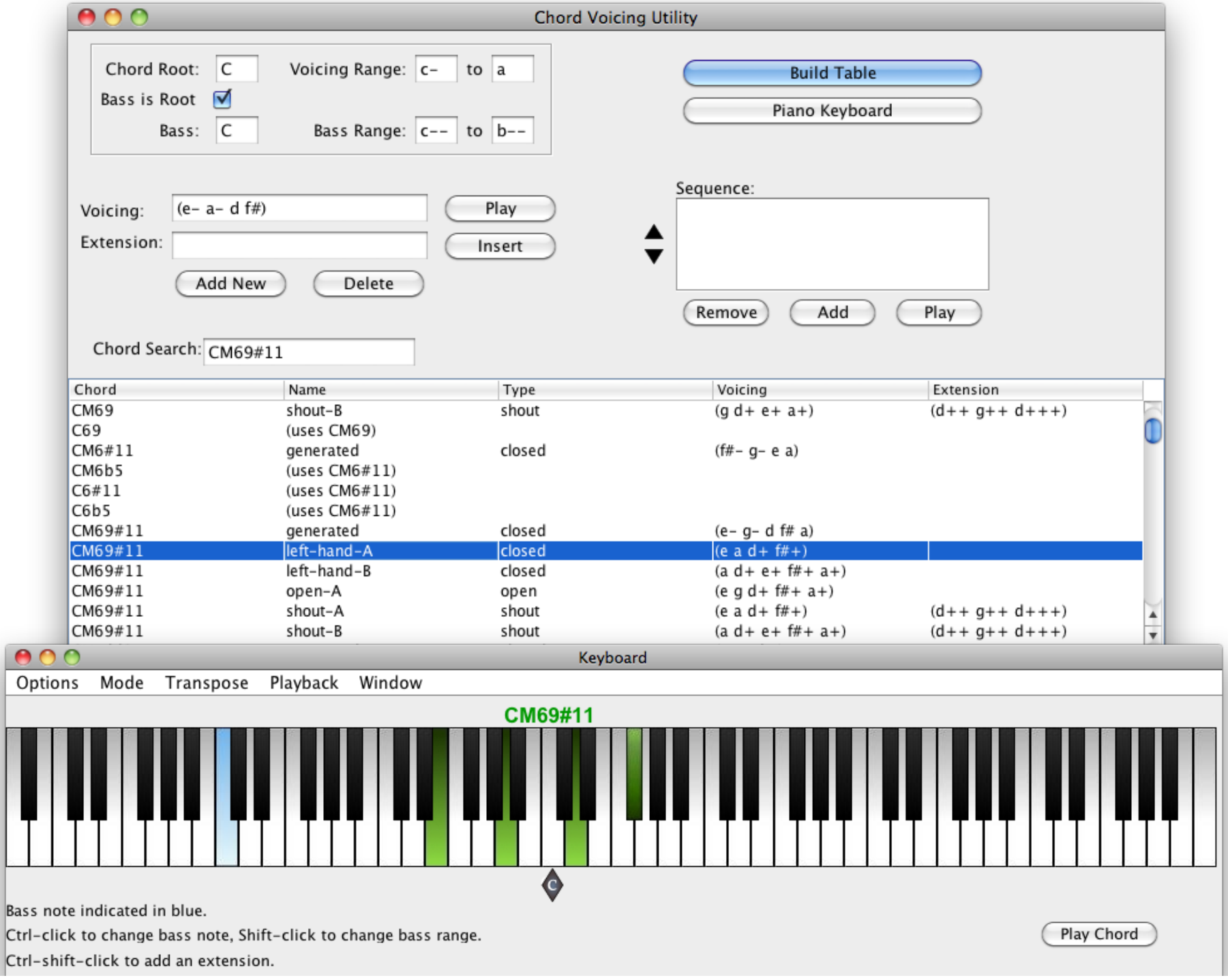
(lick (notes d8 f8 a8 e8 c8 f#8 bb4) (sequence G7 C7 |) (name dominant Cycle))

(lick (notes r8 eb8 gb8 bb8 ab8 c+8 eb+4) (sequence Ebm7 Ab7 |) (name Major 2-5))

Voicing Editor

- The Voicing Editor can be used to examine, edit, and enter new, chord voicings.

- The next page shows the voicing editor used with the keyboard.


Chord Voicing Utility
Chord Root: C
Voicing Range: c- to a
Bass is Root
Bass: C
Bass Range: c-- to b--
Build Table
Piano Keyboard
Voicing: (e- a- d f#)
Play
Extension:
Insert
Add New
Delete
Sequence:
Remove
Add
Play
Chord Search: CM69#11
Chord Name Type Voicing Extension
CM69 shout-B shout (g d+ e+ a+) (d++ g++ d+++)
C69 (uses CM69)
CM6#11 generated closed (f#- g- e a)
CM6b5 (uses CM6#11)
C6#11 (uses CM6#11)
C6b5 (uses CM6#11)
CM69#11 generated closed (e- g- d f# a)
CM69#11 left-hand-A closed (e a d+ f#+)
CM69#11 left-hand-B closed (a d+ e+ f#+ a+)
CM69#11 open-A open (e g d+ f#+ a+)
CM69#11 shout-A shout (e a d+ f#+) (d++ g++ d+++)
CM69#11 shout-B shout (a d+ e+ f#+ a+) (d++ g++ d+++)
Keyboard
Options Mode Transpose Playback Window
CM69#11
C
Bass note indicated in blue.
Ctrl-click to change bass note, Shift-click to change bass range.
Ctrl-shift-click to add an extension.
Play Chord

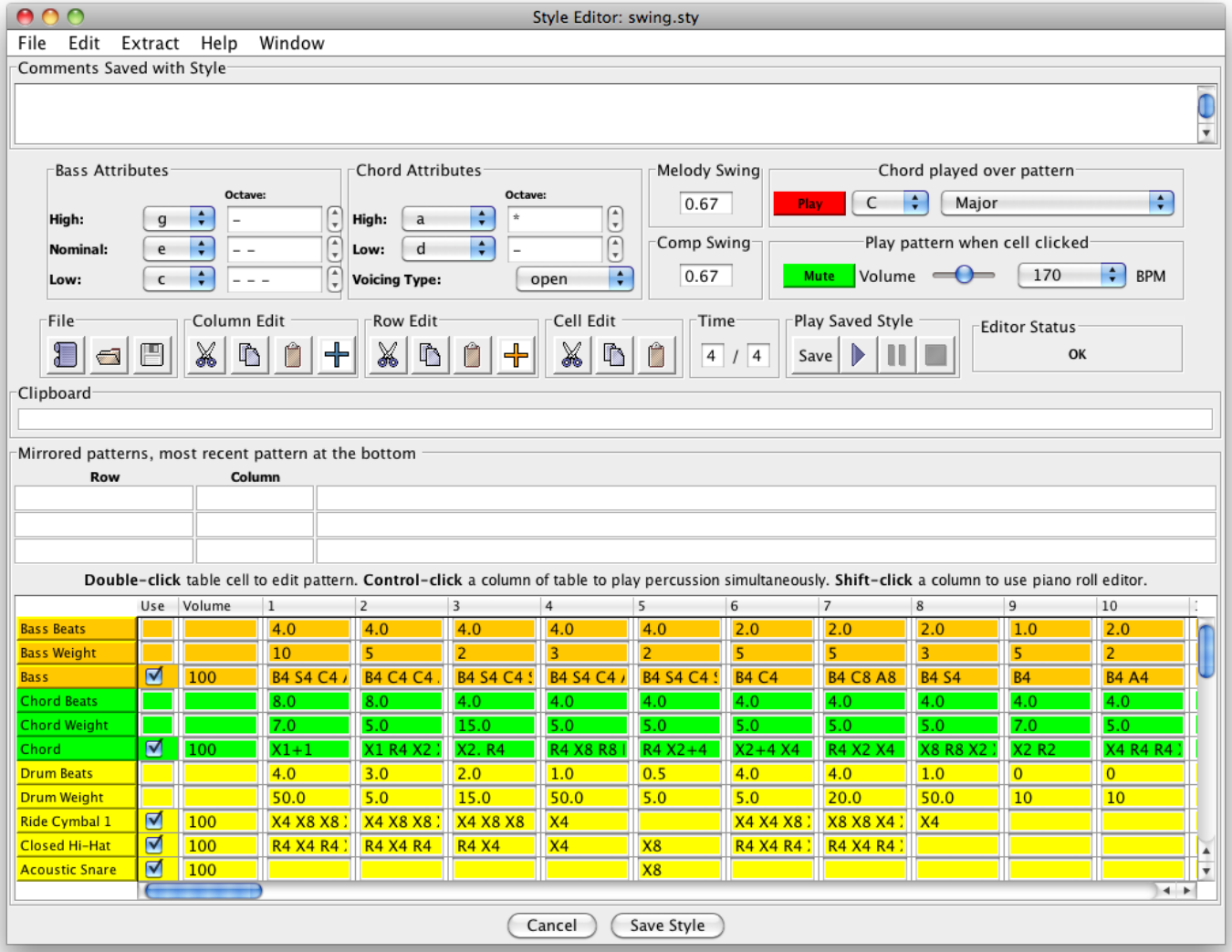
Style Definitions

- Each style is defined by a single file.
- A style contains sets of patterns, one set each for:
  - Chord instrument
  - Bass instrument
  - Drums
- The patterns are selected independently. Currently there is no linkage between them.
- A drum pattern consists of a number of sub-patterns for different percussion instruments. These are linked.
- Other information included are swing settings for both melody and rhythm instruments, range information, and types of voicings to use (as identified in the vocabulary file).

Style Editor

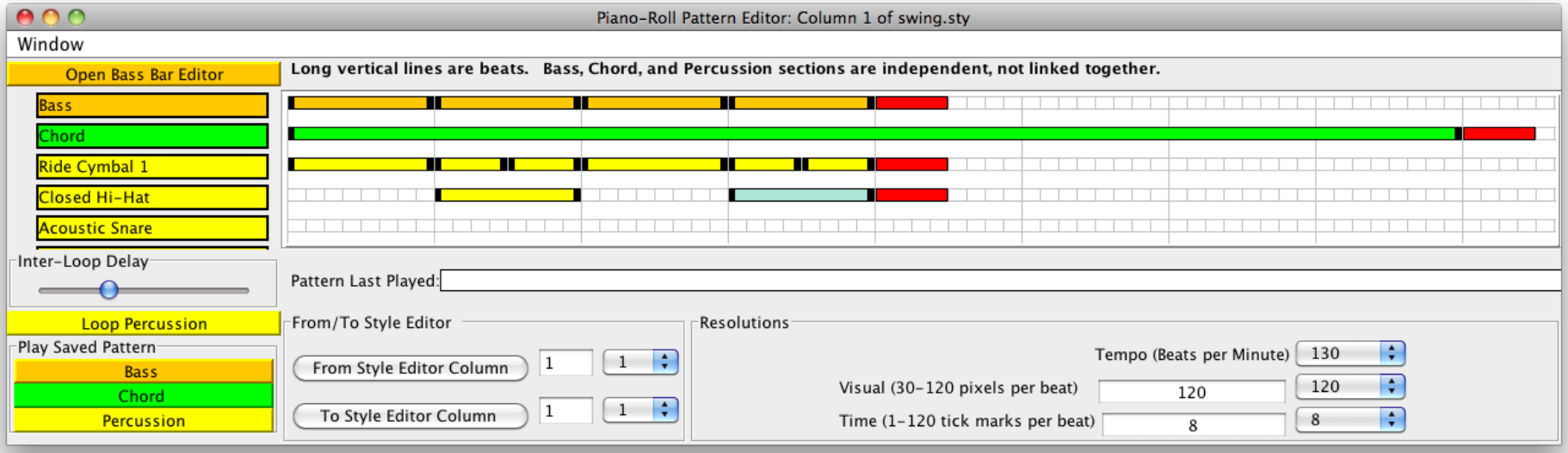
- The Style Editor displays all patterns for a given style in a spreadsheet form.
- A column of individual patterns can be edited by a Piano Roll Editor, or by text. The former is advised for the non-expert.
- Any cell will play when clicked.
- If a drum cell is control-clicked, the entire pattern plays with all instruments.

Style Editor Window



Piano Roll Editor for First Column in Style Editor Window

The piano roll is opened by shift-clicking on the corresponding column.

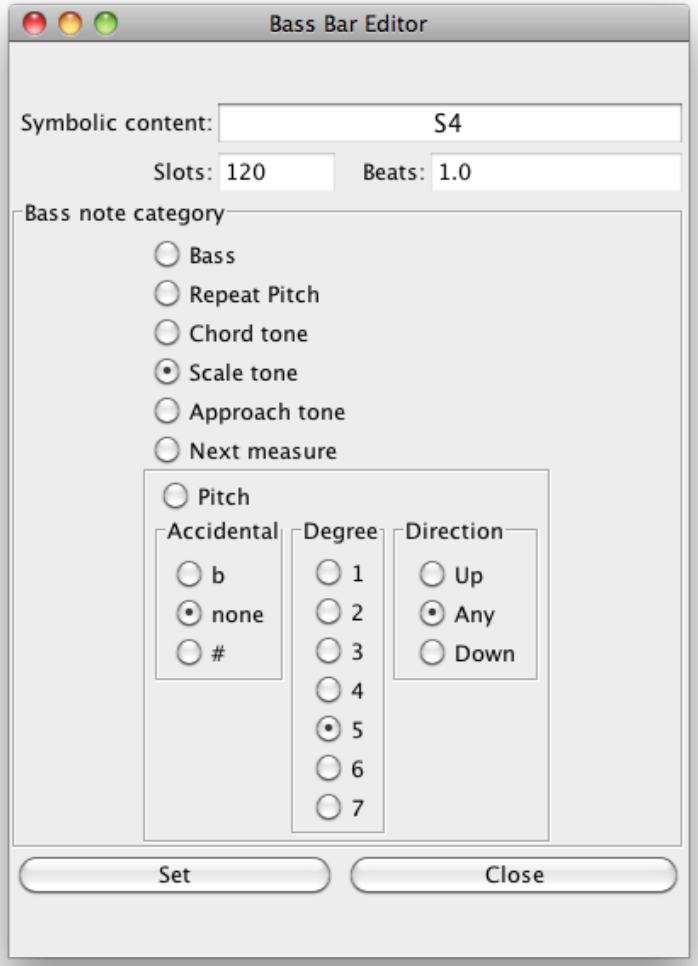


Bass Note Editor

- From the piano roll editor, a special window can be opened to edit bass notes.

- The choices are general so that one bass pattern can be applied to any chord type.

Bass Note Editor



Style Learning

- An accompaniment style can be **learned** from a MIDI file, as long as there is a synchronized leadsheet file containing the chords to go with it.

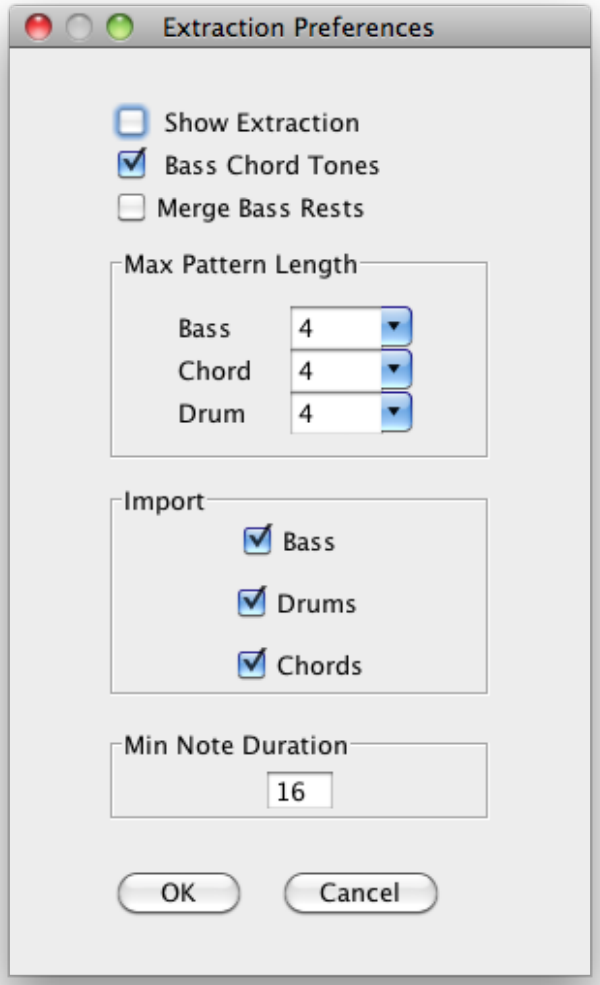
- This is done by invoking the **Extract** from within the Style Editor window.

- Once the extraction is done, some tweaking is typically necessary.

- It is best if the style does not mix multiple sub-styles.

- The next slide shows the preferences panel for the Style Extractor.

Style Extractor Preferences



Printing Leadsheets

- Leadsheets can be printed a single chorus at a time, or all at one.

- See the Global Preferences frame for setting the number of staves per line, for example to use with different paper sizes.

Exporting MIDI Files

- The entire leadsheet, or any playable section, can be exported as a MIDI file, which can be played externally, converted to audio, used as input for other tools, etc.

- Select Export MIDI from the File menu.

Cannot Import MIDI Currently

- Except for the style learning feature, which only applies to accompaniment styles, there is currently no other MIDI import.

- It may be possible to use a 3rd party tool to do this, by first converting from MIDI to MusicXML.

Streaming Output to External MIDI

- Impro-Visor output can be streamed to either an external MIDI device, such as an electronic piano, or to other software, such as a MIDI player.

- You will need to select the device or software in the MIDI Preferences frame.

Example: ARIA Player Setup

- The next page shows the way the setup looks on Garritan's ARIA player.

- You can also use this player to convert the MIDI out to audio, then use a 3rd product, such as iTunes, to create MP3.

Garritan ARIA Player
Ensemble
GARRITAN ARIA PLAYER
1 Vintage Electric Piano
2 Steinway Jazz Piano
3 Jazz Fretted Bass 2 KS
4 GM Classic Jazz Drum Kit
5 empty
6 empty
7 empty
8 empty
9 empty
10 empty
11 empty
12 empty
13 empty
14 empty
15 empty
16 empty
Tune 0 1/2
SEND
PAN
M S
0 dB
-13 dB
-4 dB
-4 dB
-oo dB
MIXER
CONTROLS
EFFECTS
SETTINGS
MOD
KEYSWITCHES
Empty
Empty

MIDI Channel Assignment

- Currently the channel assignments for Impro-Visor are fixed, as follows:
  - Channel 1 = Melody
  - Channel 4 = Chords
  - Channel 7 = Bass
  - Channel 10 = Drums

Exporting Music XML

- MusicXML can be exported on a chorus-by-chorus basis.

- MusicXML is usable as input for a wide variety of notation programs, including MuseScore, Sibelius, Finale, etc.

Importing MusicXML

- MusicXML cannot be imported directly.

- However, MuseScore has a plug-in that will convert a MusicXML leadsheet to an Impro-Visor leadsheet: http://musescore.org/en/project/xml2impro-visor