Impro-Visor Tutorial

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(keyed to Version 3.36)

Welcome to Impro-Visor, a program to help musicians construct melodies similar to ones that might be improvised over given songs. With Impro-Visor, you can playback your melodies as soon as you enter them, with automatically generated rhythm-section accompaniment. In addition to this aural feedback, you can also get visual feedback that will help you learn which notes sound the best over which chords. You can also use Impro-Visor for play-along practice, notation, transcription and song composition.

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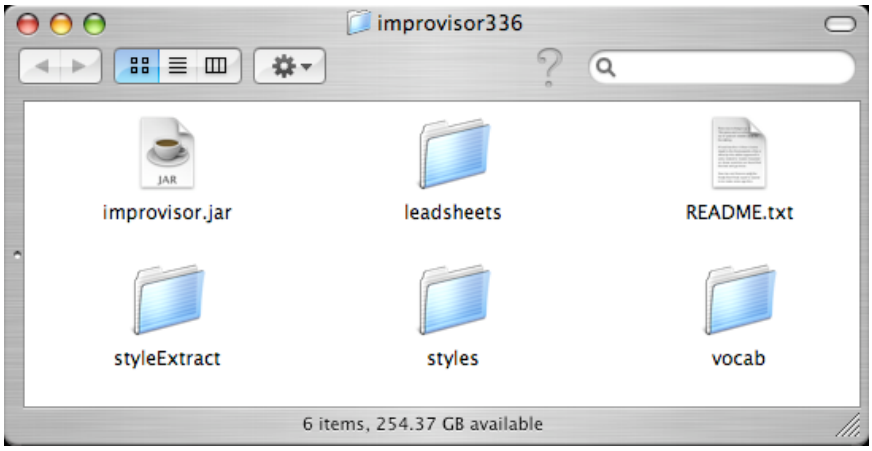
The screen shots that you see in this document were made on a Mac running MacOSX. However, Impro-Visor also runs on Windows (XP, 2000, and Vista), and Linux. In short, it will run on any platform that supports Java 1.5 or later. You must have such a version of Java installed on your machine before running Impro-Visor.

1. **The Distribution Folder**: It is assumed that you've downloaded the program from the user group website. If you open the Impro-Visor folder, you should see something like the following:



The Impro-Visor distribution folder

If you don't have this configuration, you may have not unzipped the release into a single folder. In this case, you need to go back and do that.

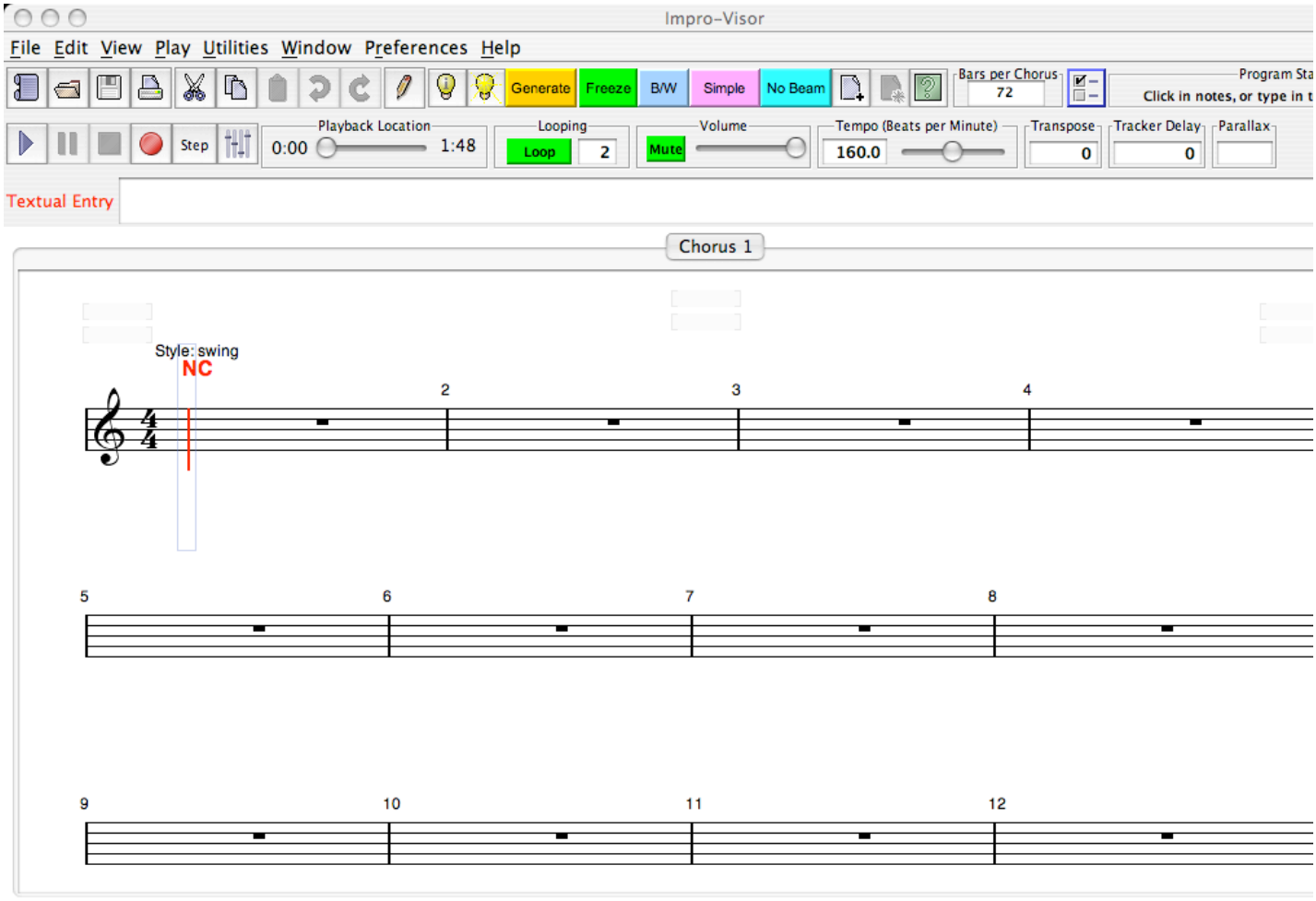
With the exception of the program file, **improvisor.jar**, most of the files are text files, even though they may have an extension other than .txt. You may look at these files with a regular text editor. However, because many of them were produced on a Mac, they may lack niceties, such as carriage returns. In any case, it is our intent that the files be opened from within the program. The content of these folders is:

Folder	Contents
leadsheets	various kinds of leadsheets that can be played with the program. Included here is "The Imaginary Book" of chord changes to 2500 tunes or more
vocab	vocabulary information and other information, such as preferences, that are loaded by the program
styles	each file represents a style that can be played by the program. More styles may be added by the user
styleExtract	example for extracting style specifications from MIDI files

2. **Starting the program**: Double-click the **improvisor.jar** file. You should get a splash screen below for a short while as Impro-Visor loads the vocabulary.

The Impro-Visor splash screen

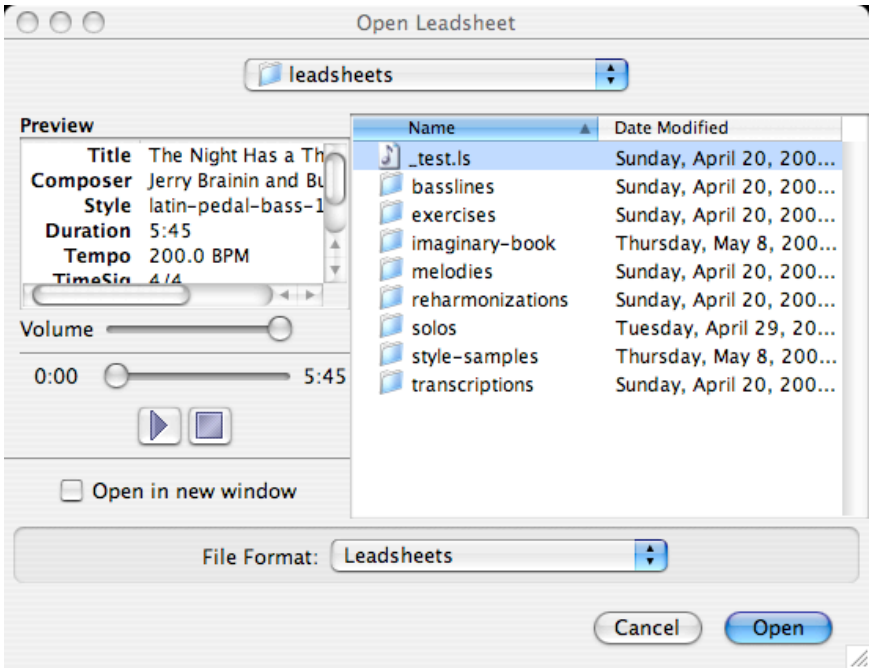
Then a window similar to the one below should open. (If the splash screen persists for a long time, say several minutes, then something may be wrong with the configuration.)



Impro-Visor leadsheet window

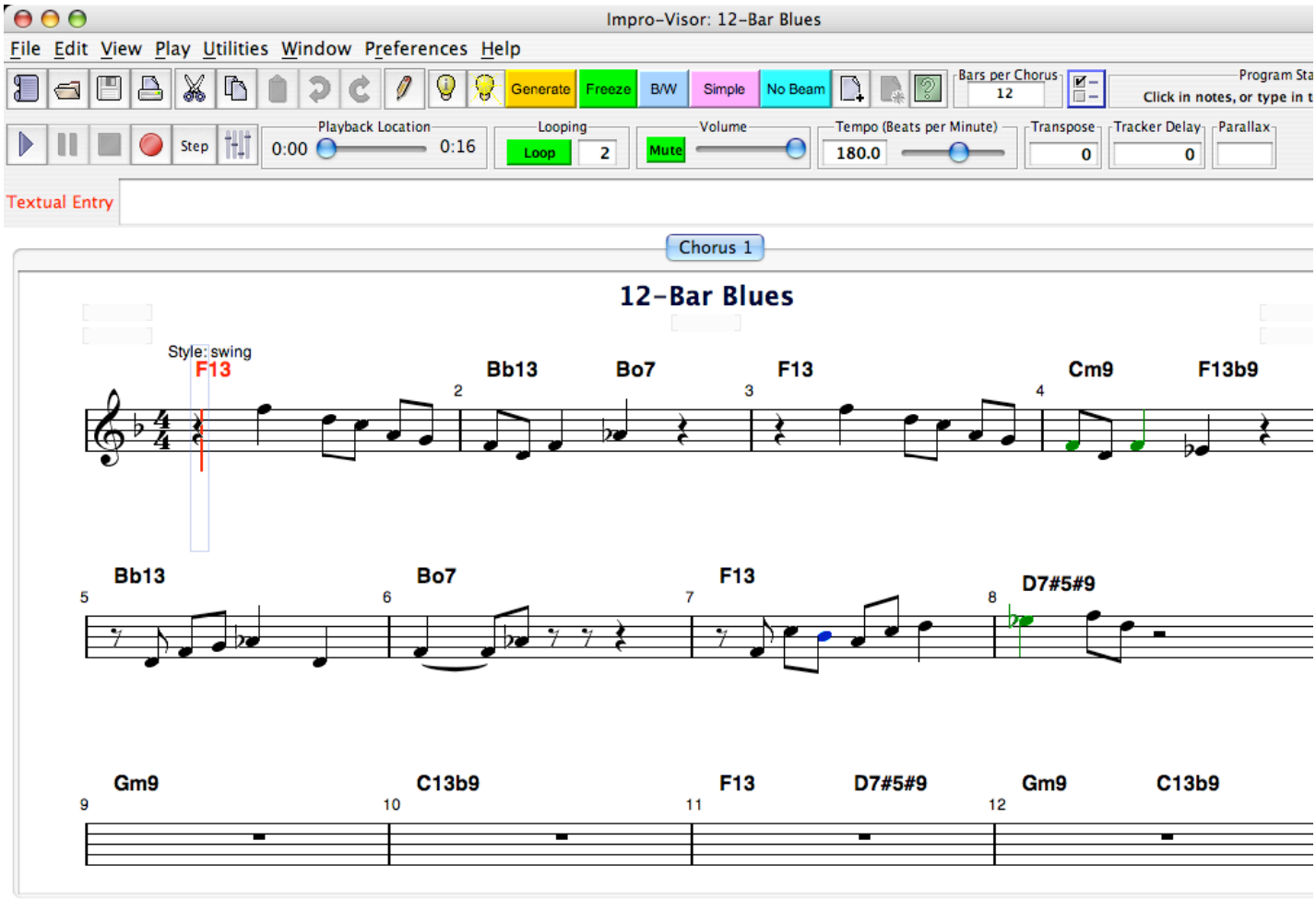
This window is a blank "leadsheet", a sheet on which melody and chords are entered. Although treble staves are showing above, bass and grand staves are also possible. It is also possible to have multiple leadsheets open at the same time, and to cut and paste between them.

3. **Loading an existing leadsheet**: Click the open-file icon (the second icon on the upper left, which looks like a file folder. You should get a file chooser similar to the one below.



File chooser

4. **Open** exercises, then _tutorial.ls, as **a sample leadsheet**. This leadsheet is only 2/3 completed. Finishing it will be our first task.



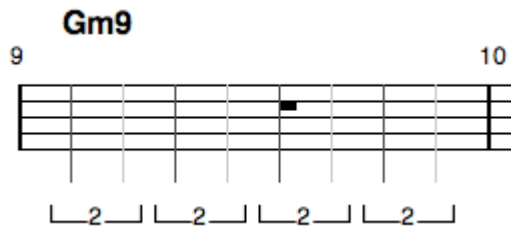
Tutorial leadsheet

5. **Play this leadsheet** by clicking the triangular icon in the second row. All sound from Impro-Visor comes through MIDI (Musical Instrument Digital Interface). You may have to access a control panel to make sure that MIDI playback is enabled on your computer.

6. **Controlling playback**: You can pause playback by clicking the two vertical bars, or stop it by clicking the box. There are also key strokes that start and stop, and these may be more convenient in many cases:

Keystroke	Effect
k	stops ("kills") the playback
i	starts playback from the beginning

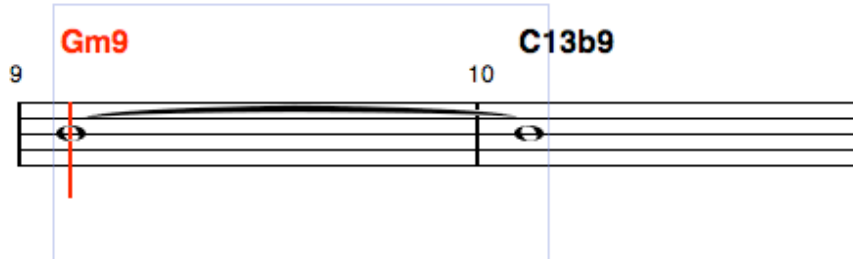
7. **Positioning the mouse on the staff**: As you move the mouse over the staves, you will note a some vertical lines become highlighted, and there are brackets beneath, as shown:



Slot display

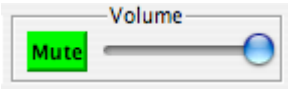
8. We call the vertical lines **slots**. These are places where notes can be clicked in using the mouse. (Notes can also be typed in, but we will cover this later.) By default, there are two slots per beat (as shown by the bracket 2's), so the duration between one slot and the next is that of an eighth note. There are actually 120 slots in one beat, but only a few of them typically show, to avoid clutter.

9. **Entering notes**: Click somewhere on the stave near the first slot. You should get a note something like the following:



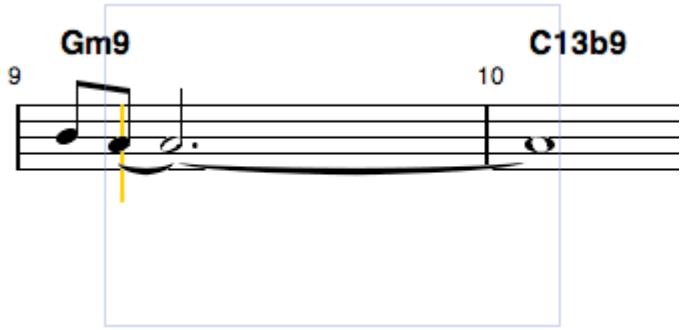
First note clicked (bar 9)

You should hear your note in the context of the chord being played along with it.
(If you don't want to hear it, you can silence everything by toggling the Mute button.)



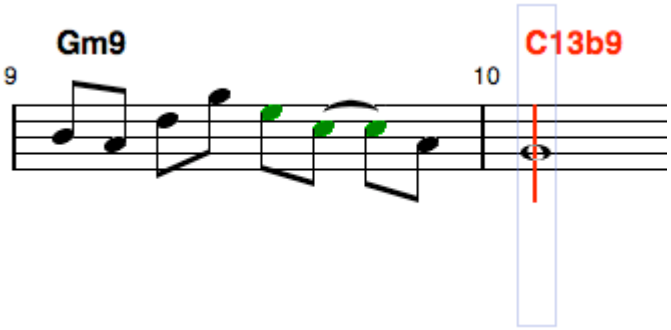
Mute button and volume control

10. **Shortening notes**: Most likely you did not want a note this long. That's ok. Impro-Visor is just trying to make it faster to enter notes, by not requiring you to enter a duration for each note separately. To see how this works, click on the next slot, to get a display similar to the one below:



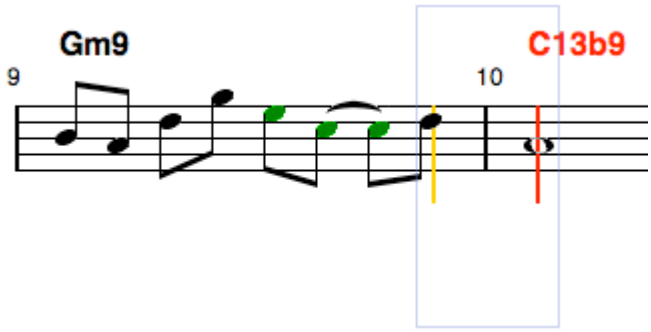
Additional note clicked

Continue entering notes with different durations, until you have 7-8 notes, something like what is shown:



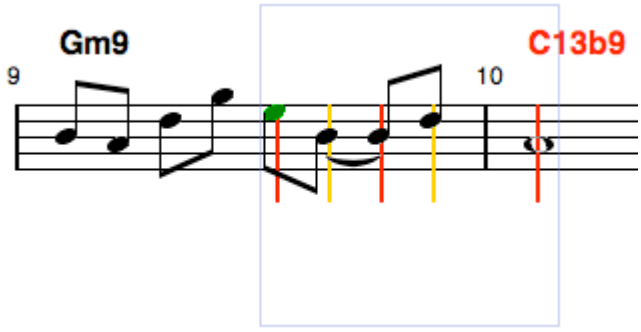
Several notes clicked

11. **Making corrections:** If at any point you don't like what you entered, just go back and click over it. Impro-Visor will never put more than one note in a slot. Moreover, as you click a different pitch in a slot, then duration of the note will remain the same.

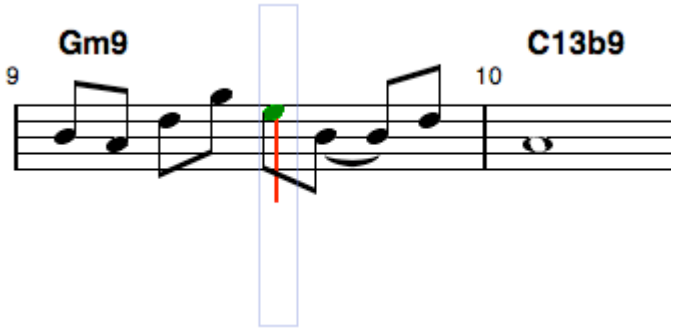


Pitches were modified, but durations remain the same.

12. **Selecting a slot without entering a note:** To do serious editing with Impro-Visor, you will want to know how to select a slot without setting or changing a note. Select a single slot **outside the current selection** is a two step process: (1) Hold the shift key and click on the slot, then (2) click again. For example, to click on the e note above, I hold the shift key and click there, then click again. The first step extends the current selection, while the second reduces the selection to a single note.



Step (1): shift-click on e slot extends the existing selection to that slot.



Step (2): shift-click reduces the selection to a single slot.

Had it been the case that there was no selection initially, only step 2 would have been necessary.

13. **Summary of selection sequences**: While the above steps might seem to be more complex than what you are used to, they are designed to make editing go really fast. This is probably the most complex sequence you will have to learn. So here is a summary:

Keystroke	Effect
click without shift	enters a note
shift-click, with **no current selection**	selects a slot, without entering a note
shift-click, **outside** current selection	extends selection to the slot on which you clicked
shift-click, **inside** current selection	selects just one slot, without entering a note

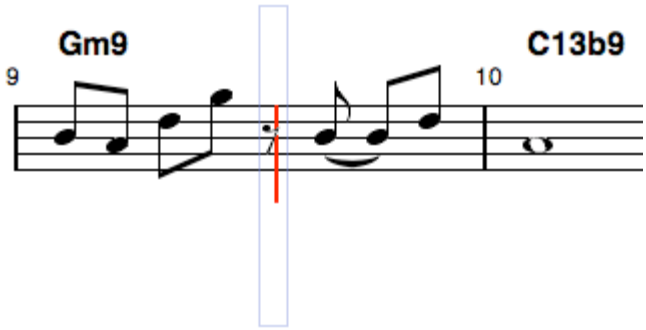
To select the window without selecting a slot or creating a note, click in the margins on either side of the staves.

Note that a selection can extend over multiple staves.

14. **To un-select everything**, press the **escape** key. To select everything, press **control-a**.

Keystroke	Effect
escape	un-selects everything
control-a	select all slots

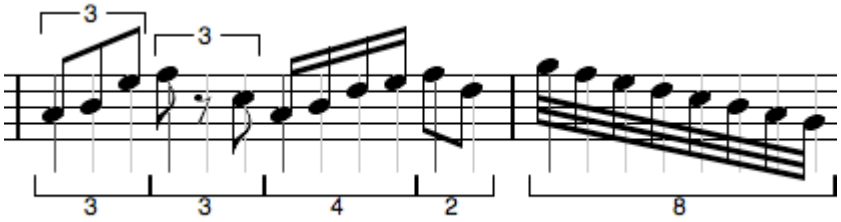
15. **Adding rests**: To add a rest, you simply select a single slot, as above, then press the **r** key. Rests have characteristics similar to notes. They just don't have any pitch. Thus the value of the rest will be that of the note it replaces. The figure below shows a rest added where the e had been. An alternate way to add a rest is to click on a slot while pressing both shift and control.



Adding a rest using the r key.

Keystroke	Effect
r	put a rest in the selected slot
shift-control-click	select a slot and put a rest there

16. **Changing the slot spacing**: To enter triplets, sixteenth notes, etc., the slot spacing needs to be changed. By pressing a numeric key, one of 1, 2, 3, 4, 5, 6, 8, 9 the slot spacing changes to that many slots showing per beat. Thus for eighth-note triplets, press three and enter the notes or rests. For sixteenth notes, press 4 and enter the notes as shown:

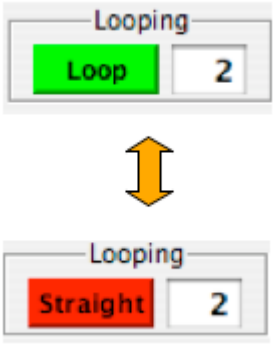


Triplet, sixteenth-, eighth-, and thirty-second- note slot spacing.
The brackets on top are the triplet brackets. The brackets below show the slot spacing.

17. **Playing a selection:** Once you have entered some notes, you might want to hear how just that phrase sounds. First select the phrase, using the steps outlined above (requires two shift-clicks usually). Then press **return** (or enter on some keyboards). You should hear just that selection played, with some accompaniment.

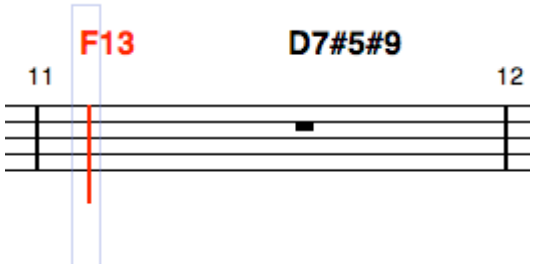
18. **To play the selection, *then continue playing to the end of the chorus*:** Hold shift when you press return.

19. **Looping playback:** Press the green Loop button to have the playback repeated the desired number of times. If you set the times to 0, it will loop until stopped (with the stop button or k key). Press the Straight button to not loop any further.



Toggling the loop button

20. **Getting Advice**: Let's move on and select the first slot in measure 11.

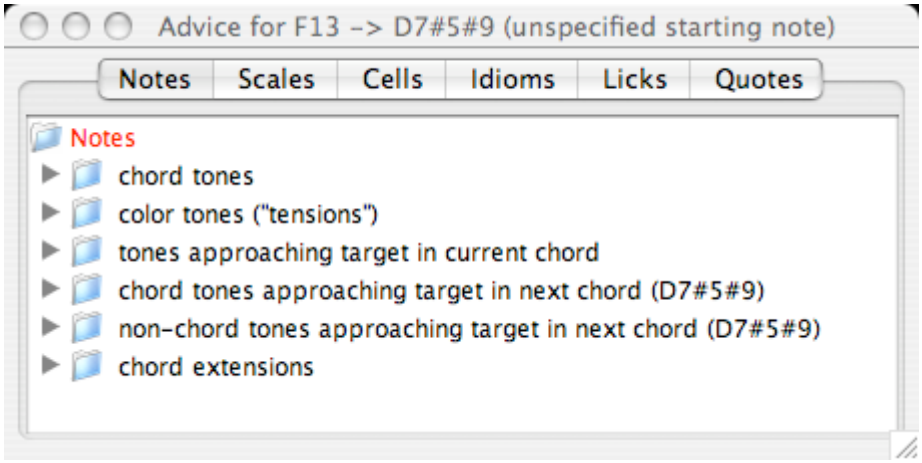


Select first slot in bar 11

To ask Impro-Visor for advice on what might be played, we could click left-hand light bulb icon:

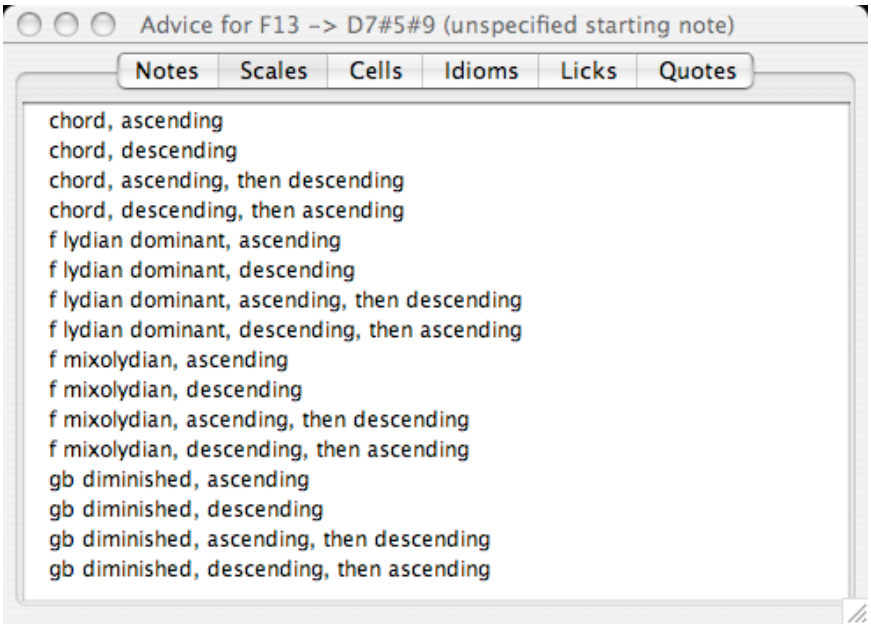
Advice icon

A menu similar to the following should open.



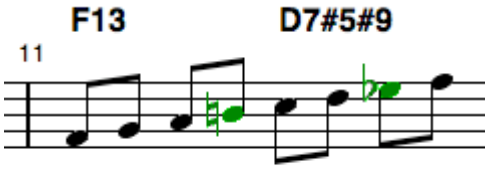
An advice menu

21. Each item opens to a set of things that might be played at this point. We encourage you to explore these, as they contain elements of jazz music theory, indicating the spelling of the first chord, scales that go with the first chord, and transitional information. For example, the **Scales tab** opens the following menu of choices:



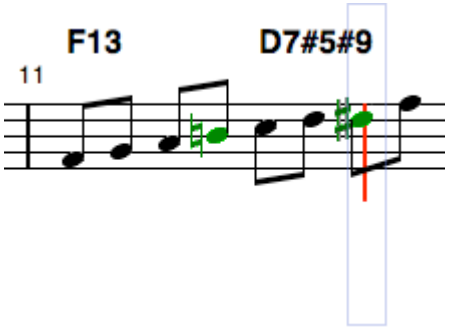
Scales tab of the advice menu

from which we can select one of the suggested scales to see how its tones fit the progression.



F Lydian dominant scale

22.**Toggling Enharmonics:** If you wish to toggle the enharmonic representation of notes in a selection (e.g. switch eb to d#), simply press the space bar. This does not change the sound, only the visual representation.

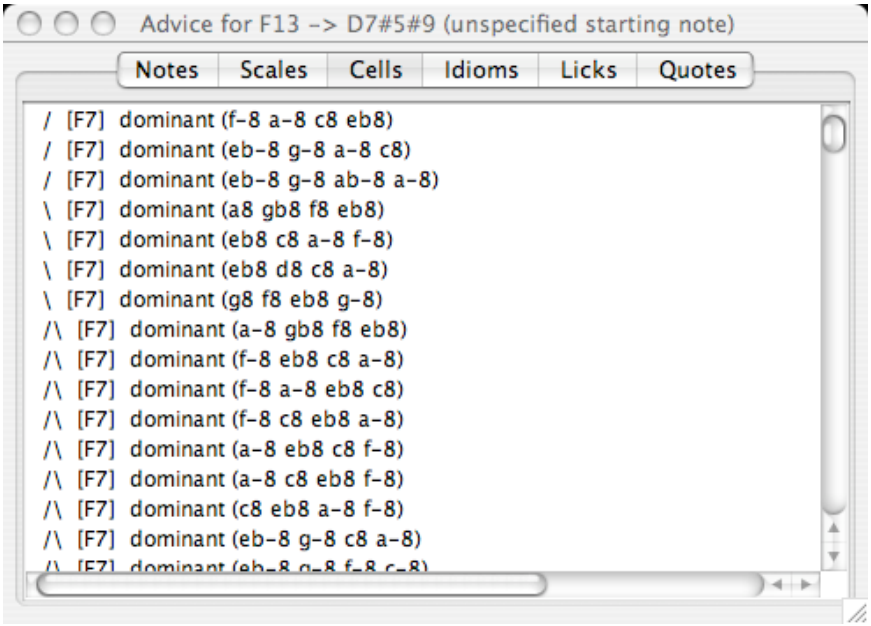


Toggling eb to d#

To do the same for chords (e.g. Db7 to C#7), press the space bar while holding shift. To toggle for both notes and chords, press the space bar while holding control.

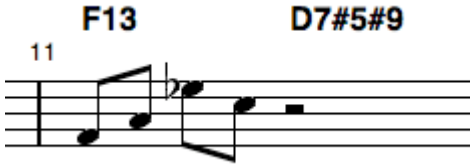
Keystroke	Effect
space	toggle enharmonics of all notes in selection
shift-space	toggle enharmonics of all chords in selection
control-space	toggle enharmonics of all chords and notes in selection

23. Alternatively, selecting the **Cells tab** shows a variety of cells (short note sequences) over the current chord:



Cells tab of the advice menu

The slashes on the left indicate the directionality of the sequence (/ for up, \ down for down). Selecting, for example, /\ [F7] dominant (f-8 a-8 eb8 c8) gives us the following, when transposed up an octave.

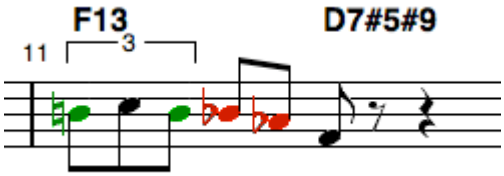


A simple cell from the vocabulary

24. Cells and other melodies are not always saved in the octave you might desire. To **transpose** a selection up an octave, press the **t key**. To transpose down an octave, press the **g key**.

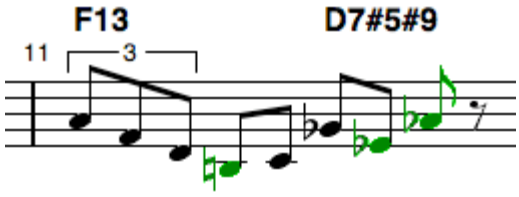
Keystroke	Effect
t	transpose selected notes up an octave
g	transpose selected down up an octave

25. **Idioms** are similar to cells, in that they are selected based on one chord. However, the term idiom suggests a melody that is a familiar jazz cliché. Below is an example of an idiom, which happens to be blues oriented, /\ [F7] blues (b-8/3 c8/3 b-8/3 bb-8 ab-8 f-8):



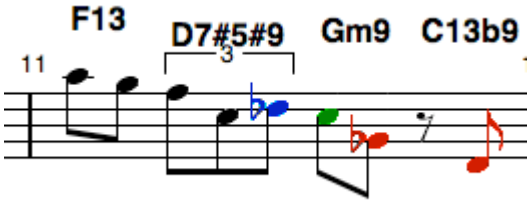
A blues idiom from the vocabulary

26. At the next level of complexity are **licks**, which are based on one chord or two consecutive chords. Here is an example of a lick for the current two-chord sequence, \/\/ [F13 -> D7#5#9] I7-VI7alt (a8/3 f8/3 d8/3 b-8 c8 gb8 eb8 ab8 r8):



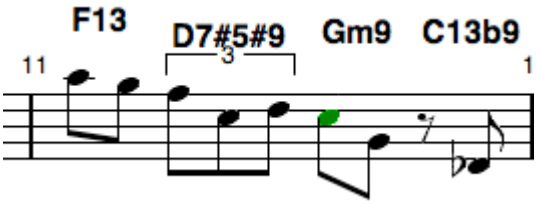
A two-chord lick from the vocabulary

27. Although licks are indexed over at most two chords, they can be used over any number of chords. The just might not sound as good. (The reason we index on only two chords is to keep the licks short, which permits combining them together in more ways than if we stored long licks.) For licks that don't quite fit the harmony, Impro-Visor provides a rectify feature that will pull arbitrary notes in line with the chords. For example, if we try a lick intended for two chords over a 4-chord sequence, we may get some disagreeable notes (shown in red):



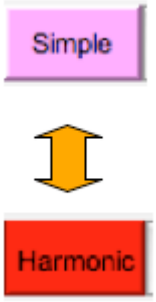
A lick that doesn't quite fit the chord progression

we can **rectify** the sequence by pressing **control-r** with the sequence selected.



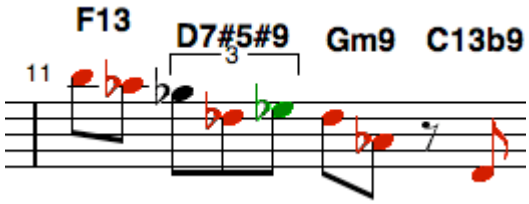
Rectified lick

28. Notes entered by point and click are generally rectified **harmonically** upon entry. For example, if the current chord is C7 and the B line on the staff is clicked, you will get a B-flat, corresponding to the chord. If you prefer simple, rather than harmonic entry, toggle the simple button on the menu bar:



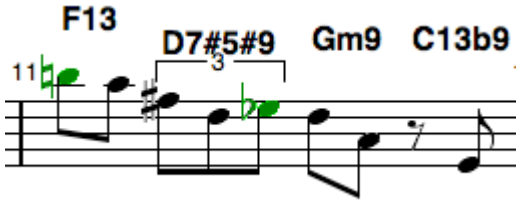
Toggling simple vs. harmonic note entry

29. This seems like an appropriate to bring up the other forms of **transposition**. Simple transposition raises the selection up or down chromatically in half steps. We use the e key for up, and the d key for down. Harmonic transposition raises the selection up or down harmonically. This is similar to chromatic transposition, followed by rectification. For example, here is the previous lick transposed up chromatically:



Previous lick transposed up chromatically

and here it is transposed up harmonically:



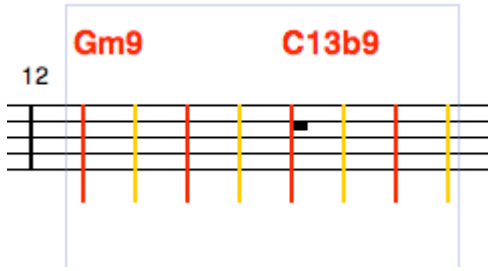
The lick before, transposed up harmonically

Keystroke	Effect
t	transpose selected notes up an octave
g	transpose selected down up an octave
e	transpose selected notes up a half-step
d	transpose selected notes down a half-step
shift-t	transpose selected notes up harmonically
shift-g	transpose selected notes down harmonically
shift-R	rectify the selection (bring in line with the harmony)

Notes can also be transposed up or down any number of steps by **dragging** any one of the notes in a selection. If you hold the alt-key (option-key on Macintosh) when dragging, you will get harmonic transposition. Otherwise you will get simple transposition. (Note: You cannot drag both horizontally and vertically in the same action. This is by design.)

30. The final tab in the advice menu is **Quotes**, which are melodies borrowed from other songs or solos. Quotes are considered a form of humor in jazz improvisation, and the musician will learn to recognize when a quote will work over particular chords based on sounds.

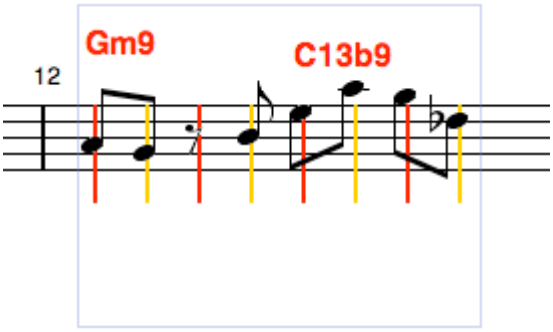
31. **Using the Lick Generator:** For the final measure of the tune, we'll take a different approach to getting advice: Letting Impro-Visor generate a new lick for us. Select all of the slots in the last measure:



Measure 12 slots selected

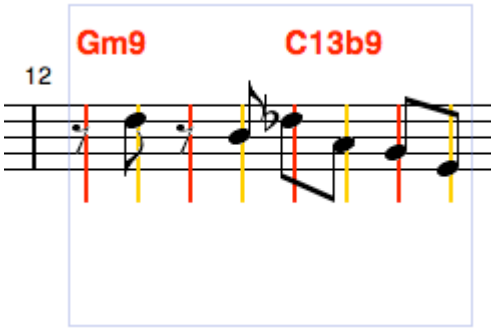
Then press the Generate button on the menu bar.

The following is one example of a lick that might be generated.



A generated lick

If you don't like this lick, press Generate again and again until you find one that you do. Here's another example:



Another generated lick

You may alternatively generate licks by key stroke:

Keystroke	Effect
control-u	generate lick

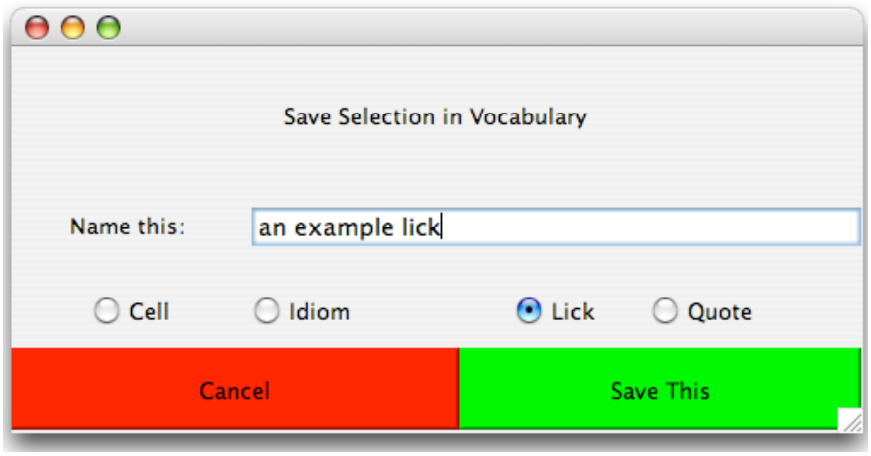
32.If you press Generate with only one slot selected, the lick generate will generate from that point to the end of the chorus. If no slot is selected, it will generate the entire chorus.

33. **Undoing entries**: Impro-Visor supports unlimited un-do and re-do, so if you want to back up an reconsider something that was entered or generated, then erased, use the **z** key to undo. Use the **y key** to redo what was undone. Not every action is undoable, but most involving the entry and erasure of notes are. As an alternative, the circular arrow buttons shown can be used to undo and redo:

Undo and redo buttons

Keystroke	Effect
z	undo last action
y	redo last undone action

34. **Saving a lick**: When you run across a lick that you'd like to save for future reference, you may save it in your vocabulary. Then Impro-Visor can recall that as a suggestion, transposed to the key of the moment. Pressing the **u key** will open the following dialog:



Lick-saving dialog

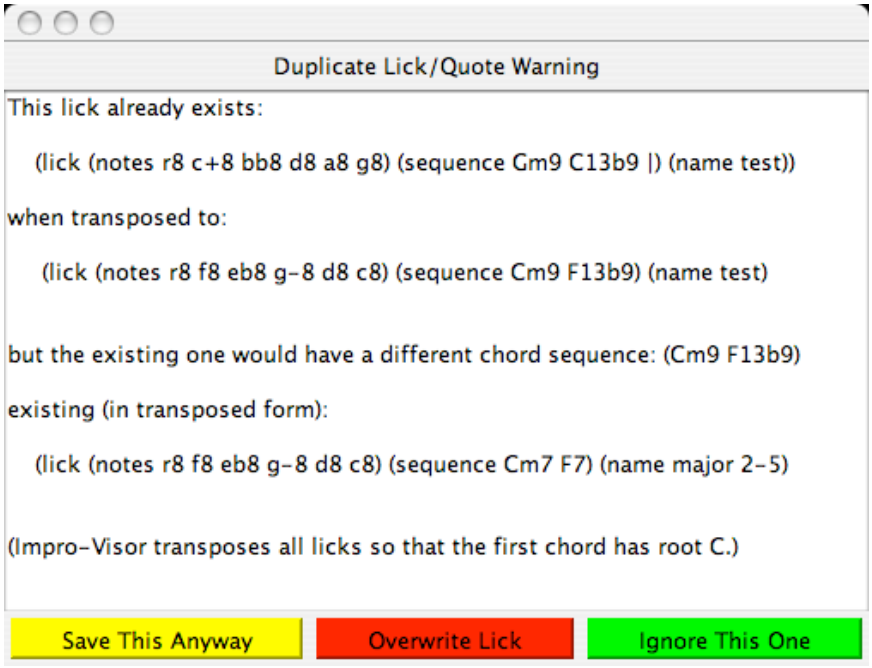
The names do not have any formal significance for indexing, but they do show up in the advice menu.

Optionally type a name, as shown, and select one of the four categories, then press either Save or Cancel. Once again, here is the meaning of the four categories:

Category	Meaning
Cell	small sequences of notes, often of uniform duration, such as eighth notes. Cells are indexed in Impro-Visor by just the first chord in the selection.
Idiom	familiar-sounding sequences. As with cells, they are also indexed by just the first chord.
Lick	tend to be more complex sequences. Licks are indexed by the first two chords, or the first chord if there is only one.
Quote	a melodic fragment from a known tune or solo. As with licks, they are indexed by up to two chords. I suggest naming quotes using the tune from which they are taken.

Keystroke	Effect
u	save lick, quote, cell, idiom

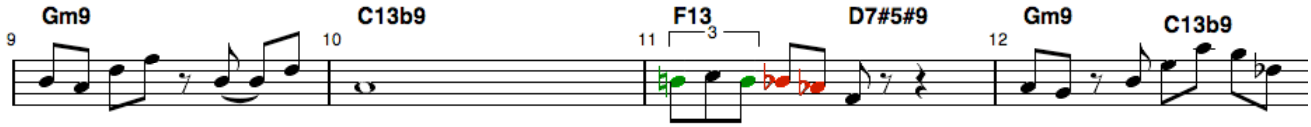
35. **To avoid saving a duplicate lick or quote**, Impro-Visor checks new licks against all licks in the database, modulo transposition. If a duplicate is found, you will get a warning:



Duplicate lick or quote warning

No corresponding check is made for duplicate cells, as cells generally can serve more than one chord.

36. **Touching up melodies:** Once you have a somewhat passable melody, it is often worthwhile to go back and edit it some more, for example, to make it "jazzier". Before going on, consider playing the entire chorus, which includes the given eight bars, plus the four we've filled in, as shown below:



Completed last 4-bars

Here are some of the edits I typically make:

a. **Introduce rests**: Select a note (using the shift-click technique), then type r. I tend to avoid starting a melody on the down-beat, so that is one place I would tend to introduce rests. The other place is at the end of long notes, to leave breathing space between it and the next note, and to suggest the end of a phrase.

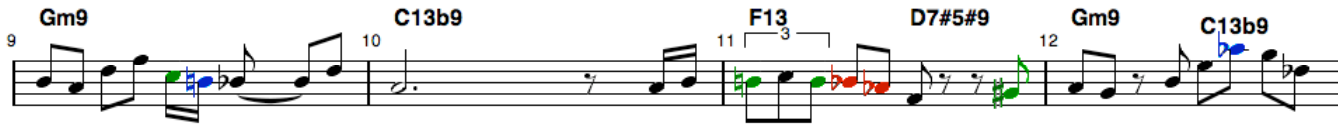
b. **Eliminate notes**, extending the previous note or rest into their place. To do this, select the note, then type **key x**. Similarly, x on a note or rest following another note can be used to **extend the earlier note**. This key can be used to make notes arbitrarily long.

c. **Add pickups**: The current stored advice doesn't have a good way to represent pickups before the beat, so they tend to not be there. I often introduce these myself, usually by adding an eighth-note a half-step below or (less often) above then note that would follow. Sometimes I use two sixteenths or a

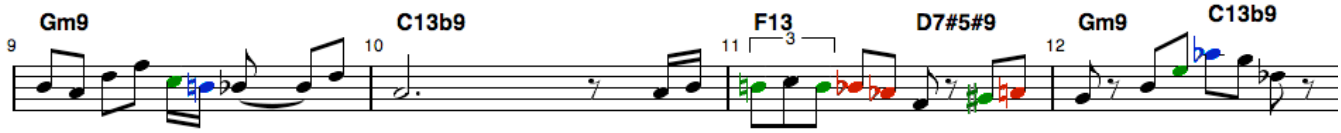
triplet instead of an eighth-note.

d. **Replace a repeated note with a different note**: My personal preference is to avoid repeated notes in a phrase, although there are exceptions for effect. The lick generator will sometimes generate repeated notes, although it tries to avoid them. If I spot them, I might change the pitch on one or more notes that are repeated.

e. **Jog the melodic line in time**: One way to do this is to selected the notes to be jogged. Then drag on one of the notes to the left or right, as desired. The second figure below shows the result of dragging the first phrase a half-beat to the left, which gives a different sound, partly due to the difference in treatment of notes on and off the beat in a swing style. Evidently, Thelonious Monk experimented a lot with jogging melodic lines in his compositions (such as "Straight, No Chaser", to name just one).



Previous melody line, touched up using a-d.



Previous melody line, with the last two phrases jogged to the left.

37. **Copying, cutting and pasting melodies**: To copy a melody and paste it somewhere else on the sheet:

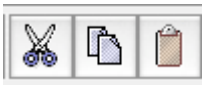
a. Select the notes to be copied.

b. Press the **c key** (for "copy").

c. Select the starting slot where you wish to paste the melody.

d. Press the **v key** (standard abbreviation for pasting).

Use the **x key** instead of c if you wish to cut the original selection. Cutting, copying, and pasting is also achievable by the following three buttons, respectively:



Cut, copy, and paste buttons

You may paste a copied selection any number of times. Use the **z key** to undo recent pastings. Once you have pasted, you may wish to transpose the result or modify it in some other way. You can also click in different pitches to the same rhythmic pattern, as we've already described.

Keystroke	Effect
c	copy melody (to invisible clipboard)
v	paste copied melody (from invisible clipboard)

x	cut melody (and copy to invisible clipboard)

A selected melody can also be transferred to and from the **textual entry area**, which is not the same as the clipboard used for cut and paste. Pressing enter in the textual area will paste the melody starting at whatever slot is currently selected. This is convenient for pasting the same melody more than one place. The following commands are also useful in this context:

Keystroke	Effect
j	copy melody selection to text area
b	paste melody in text area onto leadsheet at selected slot

38. **Note coloration**: As you've probably noticed, notes are shown in various colors. These colors have tutorial significance, as explained below. If you don't like coloration, you can turn it off by pressing the button labeled B/W (for "black and white"), and toggle it back by pressing Color.

Toggling note coloration

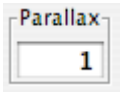
Here is the default meaning attached to the colors, of which there are four:

Note Coloration Default Options		
Color	**Name**	**Meaning**
Black	Chord-tone	The note is in the current chord.
Green	Color-tone	The note is not in the current chord, but is complementary and compatible with it.
Blue	Approach tone	The note is not one of the above, but approaches a note in one of the above categories chromatically. This is a common device used in jazz.
Red	Other	This note is not one of the above. If it is a short note, it might be acceptable as a passing tone or neighboring tone. If long, it might suggest reconsideration, as it will tend to make an aural statement.

The user can easily experiment with changing to a different note, for example by using the e (up) and d (down) keys to transpose.

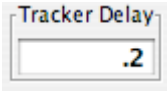
Impro-Visor note categorization comes from the vocabulary file. If you disagree with a categorization, it can be changed to suit by modifying the vocabulary.

39. **Note entry parallax**: The parallax text field in the menu bar adds the indicated number of pixels in the vertical dimension to your click position when entering notes. This can be used to accommodate variations in monitors, monitor positions, and tastes. Use a negative number to subtract pixels.



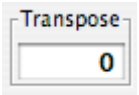
Parallax field

40. **Tracker delay**: When a selection is played, there is a green vertical tracking line moving from slot to slot. On some systems, the line starts ahead of the sound. This is a function of the MIDI playback, which is not under Impro-Visor's control. To delay the line from the sound, enter the number of seconds, in decimal notation in this field.



Tracker delay field

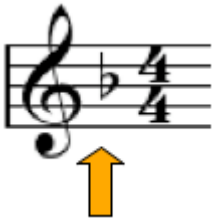
41. **Transpose**: The transpose field transposes the **playback** up or down the indicated number of semitones from what is written in the notation. The use envisioned is for transposing instruments. For example, for a Bb instrument (trumpet or tenor sax), use -2 and enter notes as if you were writing for that instrument. For an Eb instrument, use +3. You need to adjust the key signature manually. Transpose does not change the notation, just the playback.



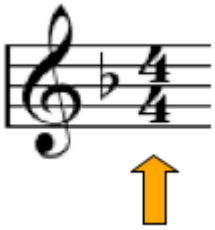
Playback transposition field

Note: Generally, you must press return to have the edit of a text field (such as the Transpose field) take effect.

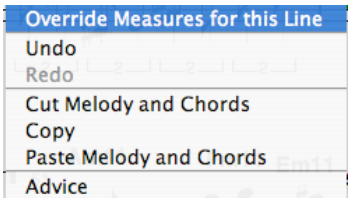
42. **Key signature**: The key signature can be changed in the Preference > Leadsheet menu, or by the following action: Position the mouse in the key signature area. Then *slowly* drag up to subtract flats and add sharps, or down to do the opposite.


Drag up or down here to change key signature

43. **Time signature**: The time signature also can be changed in the Preference > Leadsheet menu, or by the following action: Position the mouse over the time signature. Then *slowly* drag up or down. The numerator (upper number) increases the fastest, then the denominator (lower number). The "highest" time available is 12/8 and the "lowest" is 1/1. Odd times, such as 11/4 are allowed.

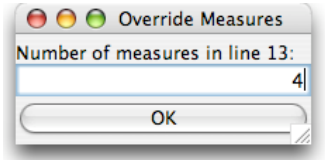

Drag up or down here to change time signature

44. **Adjusting the layout**: Impro-Visor tries to lay out the measures based on the note and chord density. However, it is not perfect. There are two ways to adjust the layout to suit: By **control clicking** on a stave, a menu will open giving you the option of setting the number of measures for that stave:



The control-click popup

By selecting the first item, you get



Single-line measure adjustment

allowing you to enter the desired number of measures. This approach is best for temporary fixes.

45.**Freezing and thawing**: A more permanent layout is obtained by "freezing" the layout. Pressing the Freeze button will keep the measure distribution as it is now.

Freeze and thaw buttons

You can also specify the layout explicitly in the Chorus preference menu:

Chorus measure adjustment

Specified in this line are number of measure per line, line by line. If there are fewer numbers than there are lines, the last number is used for the remaining lines. For example, the specification above indicates 4 bars for the first line, 2 each for the next two lines, 4 for the next, then 2, then 4 for all remaining lines. Having any numbers in the Layout field is equivalent to having the layout frozen. (Since this layout really affects *all* choruses, it more properly belongs in the Leadsheet preferences menu.)

46. **Adding choruses**: Any number of choruses can be played. The current model for Impro-Visor is that there is one chorus structure, which can be played any number of choruses with different melodies. Although the chord sequence and length is the same for each chorus, the background will vary among choruses. To add a new chorus, press the page + icon:

Button for adding a new chorus

Currently, new choruses are added only following the existing choruses.

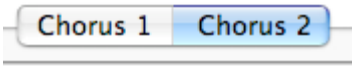
47. **Removing Choruses**: To remove the currently-selected chorus, press the page * icon:

Button for deleting the current chorus

Note: Removing a chorus is not undoable. The contents will be lost, unless you have previously copied it. You will be asked whether you want to delete a chorus:

Chorus deletion dialog

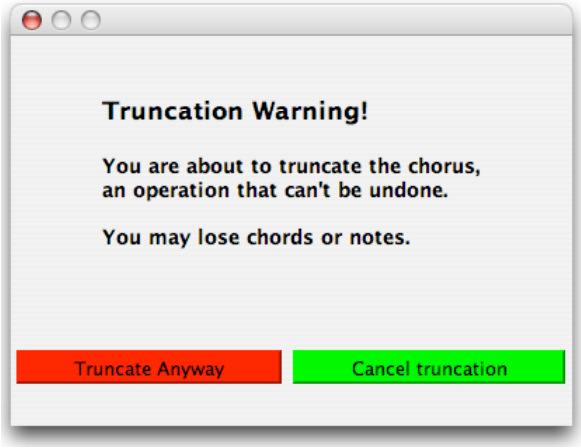
Choruses are referred to as "tabbed parts" because they are accessible by clicking the tabs at the top of the stave area:



Chorus tabs

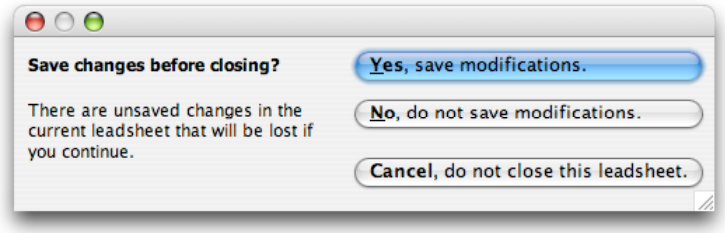
The highlighted tab corresponds to the current chorus.

48. **Changing the number of bars in choruses** may be done with the **Bars per Chorus** field. Impro-Visor opens a new leadsheet with a generous number of bars. Often, this number should be shortened to accommodate the current song. If shortening would truncate chord or melody information in any chorus, a warning dialog is issued first, so that content is not inadvertently lost. Again, all choruses have the same length, so that shortening one will shorten them all. Also please note that changing the length of choruses is not undoable currently.



Chorus truncation dialog

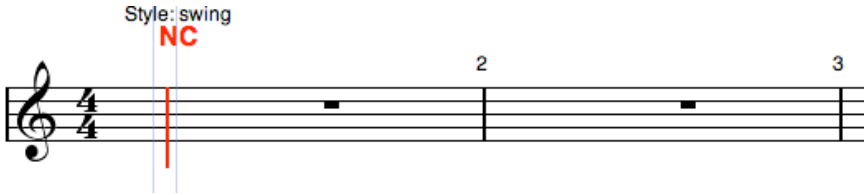
49. **Starting a fresh leadsheet**: From the File menu, select New Leadsheet, or use the shortcut control-N. This opens a new blank leadsheet, in addition to ones that may be open already. It will look like the one at the beginning of this tutorial. You may cut and paste melody and chords from one to the other. You can close one or more of the open sheets. If you have unsaved modifications, it will offer to save them first.



Unsaved modifications dialog

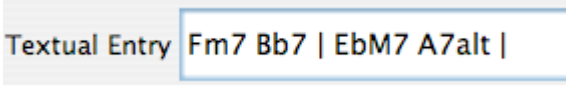
50. **Opening another leadsheet**: This uses the current window. It does not create a new one. If there are unsaved modifications, you will be given the chance to save them.

51. **Entering chords:** Let's suppose that we start with a new leadsheet, with the first two bars as shown.



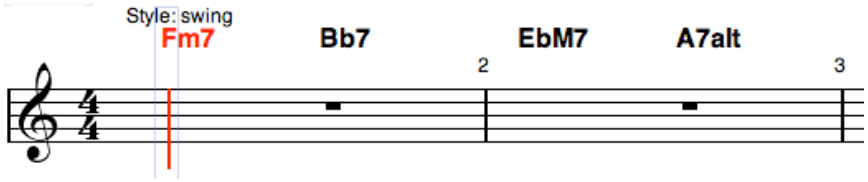
New leadsheet, with first slot selected

When chords are entered, entry always starts at the currently selected slot. The quickest way to enter one or more chords is to select the Textual Entry window, and enter the chord names. Measures can be separated either with the vertical bar, or with commas. (Don't use slash, which has a different meaning.)



Using textual entry for chords

When return is pressed, these chords are transferred to the leadsheet:



Chords transferred to the leadsheet

52. **Slash chords** (which specify a bass note after the slash) are indicated with a forward slash, such as D/E.

53. **Polychords** (one chord stacked atop another) are indicated with a backward slash, such as D\Bb.

54. **The textual entry field itself can be edited** by using the edit features of the operating system, such as cut, copy, and paste. On a Macintosh, for example, these would be command-x, command-c, and command-v. This can be extremely handy.

55. **An alternate way to transfer the chords to the leadsheet** is to select the slot where the transfer is to begin after entering the chords, then press the (upper-case) **B key**. This is particularly convenient when the same sequence is to be transferred multiple times, as you don't have to return to the textual entry field and press return each time.

56. **To transfer chords in a selection back** to the leadsheet, select the chords, then press the **J key**.

57. **To copy, cut, and paste chords from the leadsheet:** The commands are analogous to those for melody, except the shift key is held. The **C key** copies the chords, the **X key** cuts the chords, and the **V key** pastes the chords.

Keystroke	Effect
shift-C	copy chords (to invisible clipboard)
shift-V	paste copied chords (from invisible clipboard)
shift-X	cut chords (and copy to invisible clipboard)
shift-J	copy chords from selection to text area
shift-B	paste chords from text area to current slot

58. **To copy, cut, and paste chords *and* melody together from the leadsheet**: The commands are analogous to those for melody, except the control key is held. The **Control-c key** copies melody and chords, the **Control-x key** cuts the melody and chords, and the **Control-v key** pastes the melody and chords.

Keystroke	Effect
control-c	copy chords and melody (to invisible clipboard)
control-v	paste copied chords and melody (from invisible clipboard)
control-x	cut chords and melody (and copy to invisible clipboard)
control-j	copy chords and melody from selection to text area
control-b	paste chords and melody from text area to current slot

59. To **transpose chords**, or **chords and melody**:

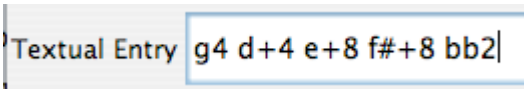
Keystroke	Effect
shift-E	transpose chords up a half-step
shift-D	transpose chords down a half-step
control-e	transpose chords and melody up a half-step

control-d	transpose chords and melody down a half-step

60. **Entering melody textually**: Melody is saved, and may be loaded, using a textual notation, in the same textual entry field as chords. In distinction to chords, which always begin with upper-case letters, melody notes begin with lower-case letters. A melody note consists of:

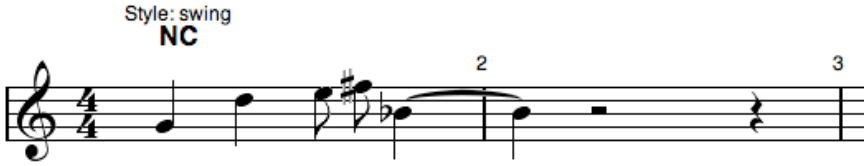
    - a pitch designator (a, b, c, d, e, f, g) possibly followed by an accidental (#, b) for sharp and flat.
    - an optional octave designator (+, ++, +++, -, --, ---) for octaves above or below the octave including middle C and above. The default is the octave just mentioned.
    - an optional duration designator (4 for quarter note, 8 for eighth note, etc.) with + being used to add durations. The default is an eighth note.

For example, entering the following melody as text:



Using textual entry for melody

produces



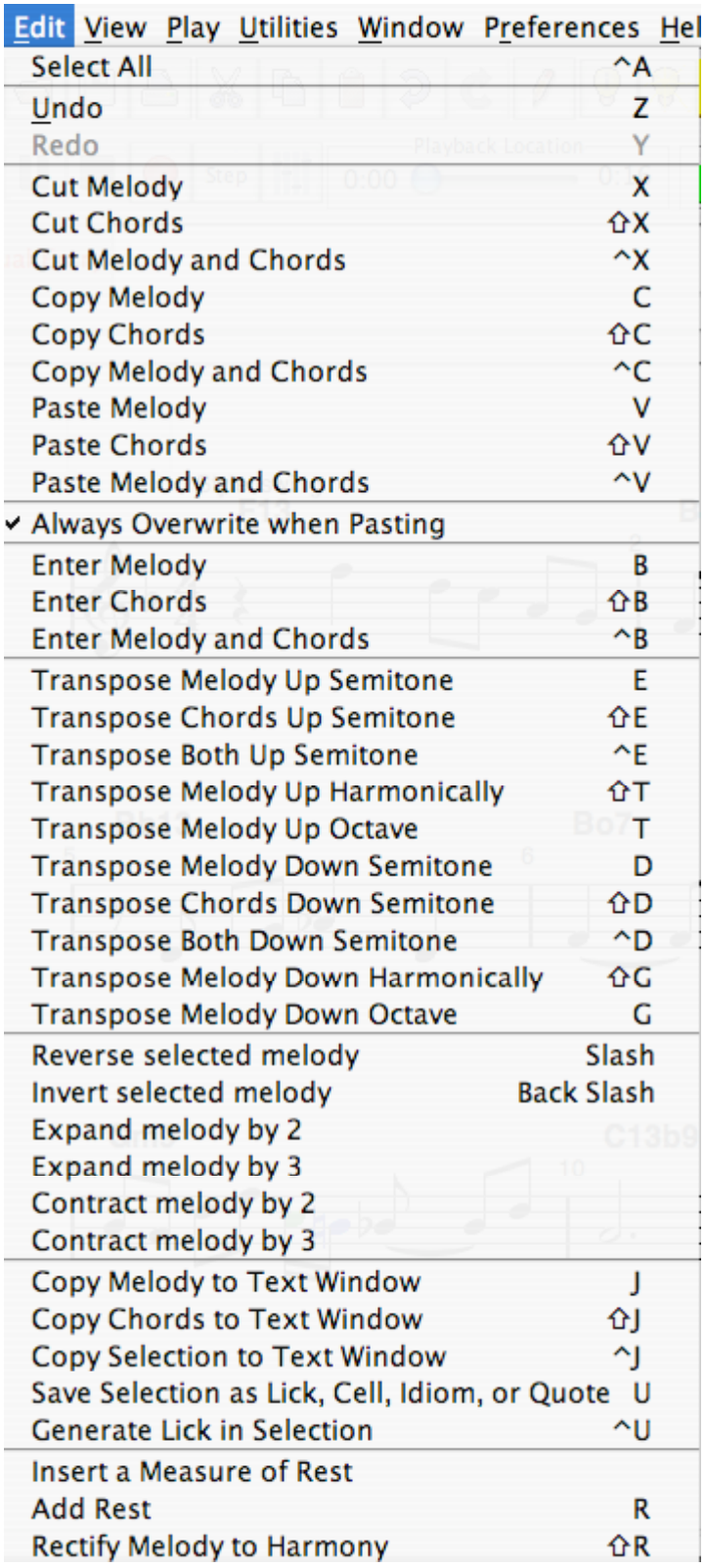
Melody as entered from textual edit

61. **To transfer selected melody from the leadsheet back to the textual entry field**, press the **j key**.

62. **Both melody and chords can be entered at the same time.** The two are separated into "tracks" using the upper- and lower-case distinction for chords vs. melody.

63. **To transfer both selected chords and melody** to the leadsheet from the textual entry, use **Control-b**, and to transfer back, use **Control-j**.

64. ***A summary of most of the key stroke commands*** can be obtained by examining the edit menu:

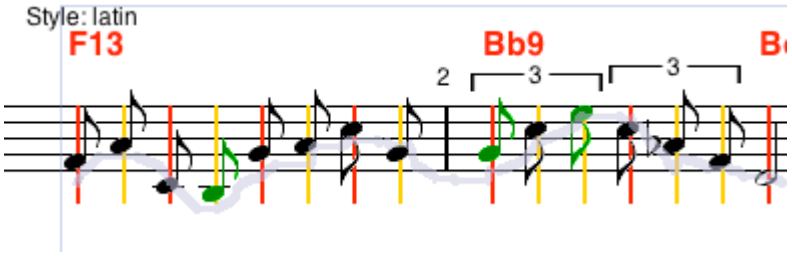


Edit menu contents

65. **The Drawing feature** allows a melody to be drawn on the screen. It is automatically adjusted to conform to chords and scales. Thus this is a feature that could be used by the musically unsophisticated to draw a melodic line with a particular shape. To use it, click the button with the pencil icon:

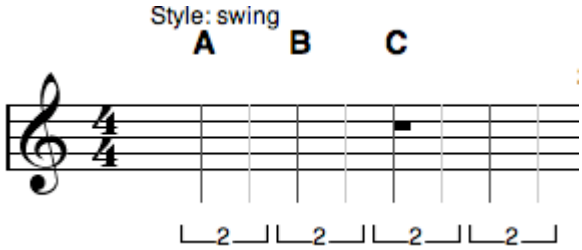
Drawing button

Then drag the mouse over the part of the staff at which a melody is desired, moving up and down as you go. The notes are determined by the slot spacing.



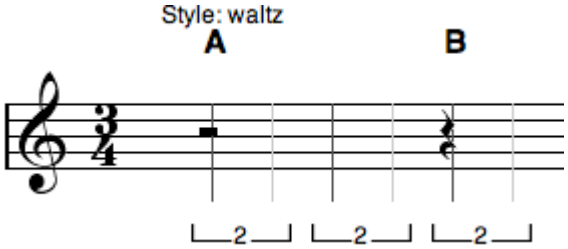
Drawing a melody with the mouse

66. **Uneven spacing of chords** is achieved by using single slash characters (separated from chords by blanks). The rule is that all chord and slash symbols within a bar are counted up and the space divided evenly among them. For example, to produce the following distribution, where C gets half of the space:



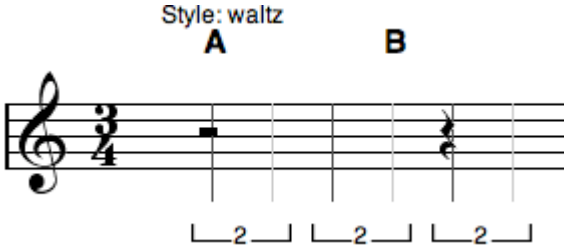
Uneven chord distribution

To get the distribution above, use the sequence A B C /. This is much more convenient that the alternative of clicking each indivual slot and entering the chord separately. As another example, in $\frac{3}{4}$ time, we might want the following:



Uneven chord distribution in $\frac{3}{4}$ time

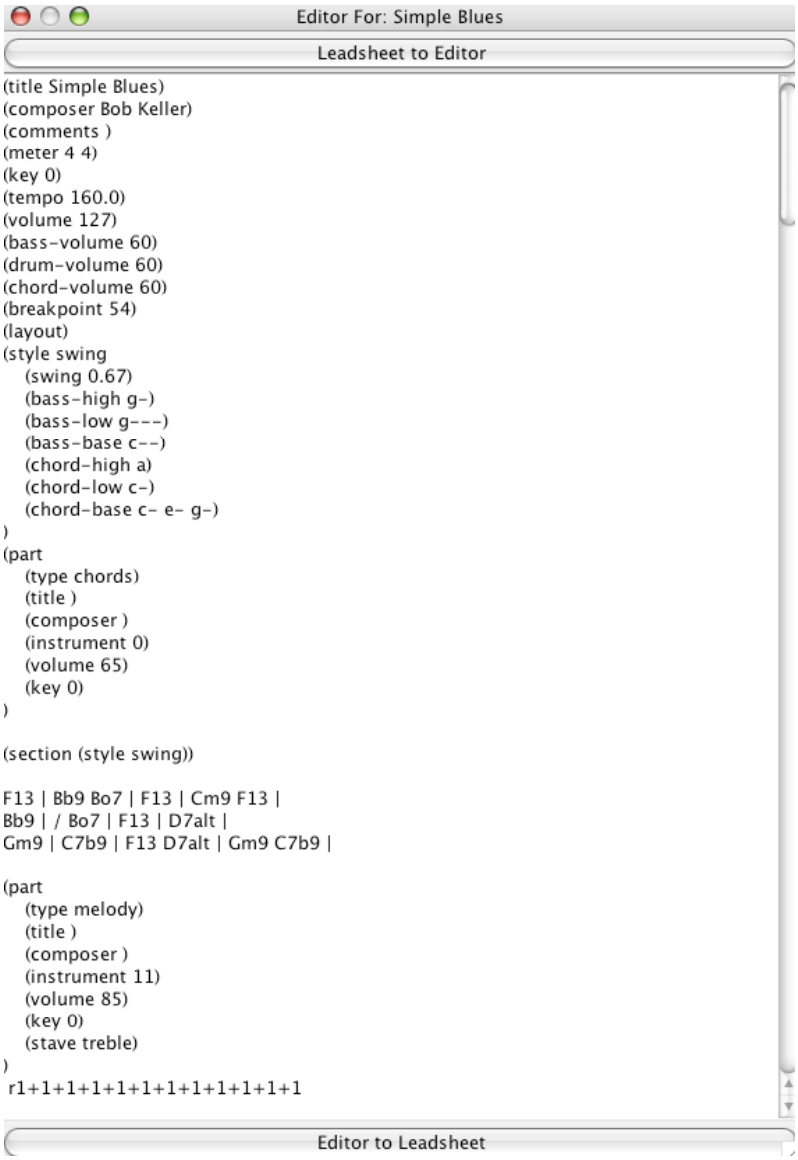
To achieve the preceding, use A / B, since there are three beats to a bar. If you were to instead to use just A B, you'd get a duplet rhythm, which, while interesting, would be less common:



Duplet chord distribution in $\frac{3}{4}$ time

67. **Chords can be aligned to any slot,** by using enough slashes to divide up the space. Currently 120 slots per beat are available, giving many gradations. Slashes can be combined with the NC (no-chord) symbol to achieve hits, breaks, and other effects.

68. **Leadsheet text editor**: Additional **meta-data**, such as the key signature, tempo, and so on, will be automatically saved when a leadsheet is saved from Impro-Visor. Thus one can simply start with a fairly bare file of chords, read it into Impro-Visor, then write it back out and the meta-data will have been inserted. These items can be edited with any text editor, such as NotePad, Emacs, Word, etc. Impro-Visor itself also provides a **minimal text editor** that can be used to edit the file. If we open this editor from the Utilities menu, we can see the form in which Impro-Visor will save it. Changes made in this editor will not take effect until the Editor-to-Leadsheet button is pressed. These changes are not undoable, although you can always re-edit the content and press the Editor-to-Leadsheet button again.

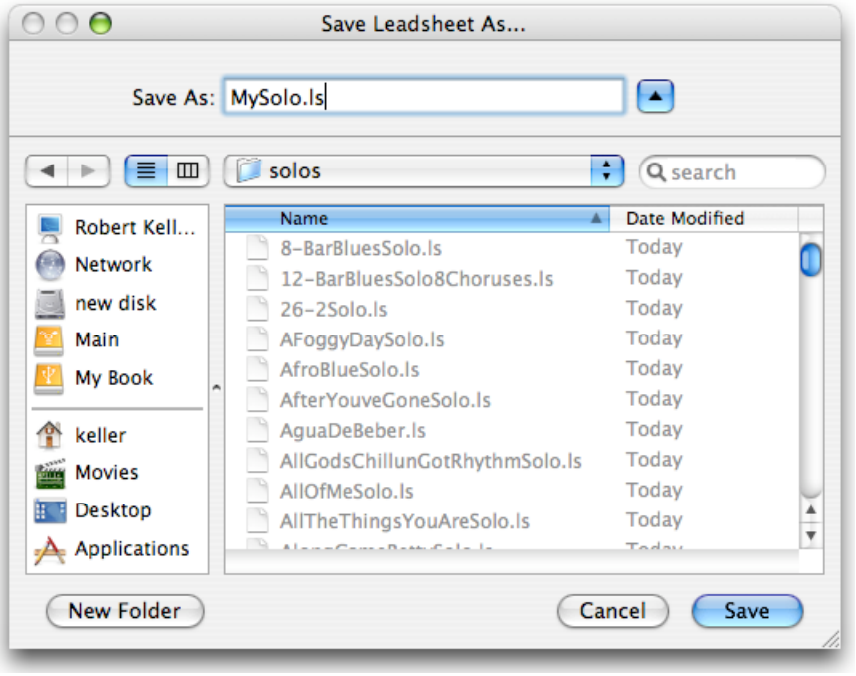


Textual editor for the entire leadsheet

The textual editor is useful for changes to the leadsheet that can't be done by a few simple actions, such as inserting a few bars of chords or melody at arbitrary points within. Changes made to the text can affect the number of measures in the leadsheet.

Keystroke	Effect
control-f	Open the textual leadsheet editor.

69.**Files should be saved with extension .ls** ("leadsheet") for future loading:



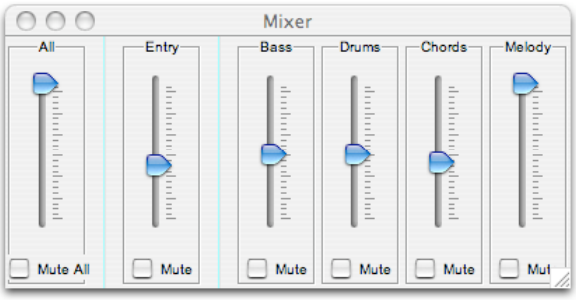
Leadsheet save dialog

70. **MIDI files of the playback** can be saved by selecting **Export Leadsheet to MIDI** from the File menu.

71. You can control the volume of individual instruments and note entry by opening the **mixer panel** using this button:

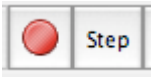
Mixer panel button

72. **The mixer sliders** control the volume of each instrument and the note entry separately:



Mixer panel

73. **MIDI recording from an external MIDI instrument** can be done by clicking either the red circle button for continuous record, or pressing the Step button for step recording.



Record buttons

This feature requires a third-party MIDI program on the Macintosh, such as Mandolane (http://www.mandolane.co.uk/). This is because Java sound is not well supported on Macs. Also, at one point there was some kind of conflict between MIDI recording and printing on the Mac. This needs to be checked. MIDI recording is one of the least exercised features of the program.

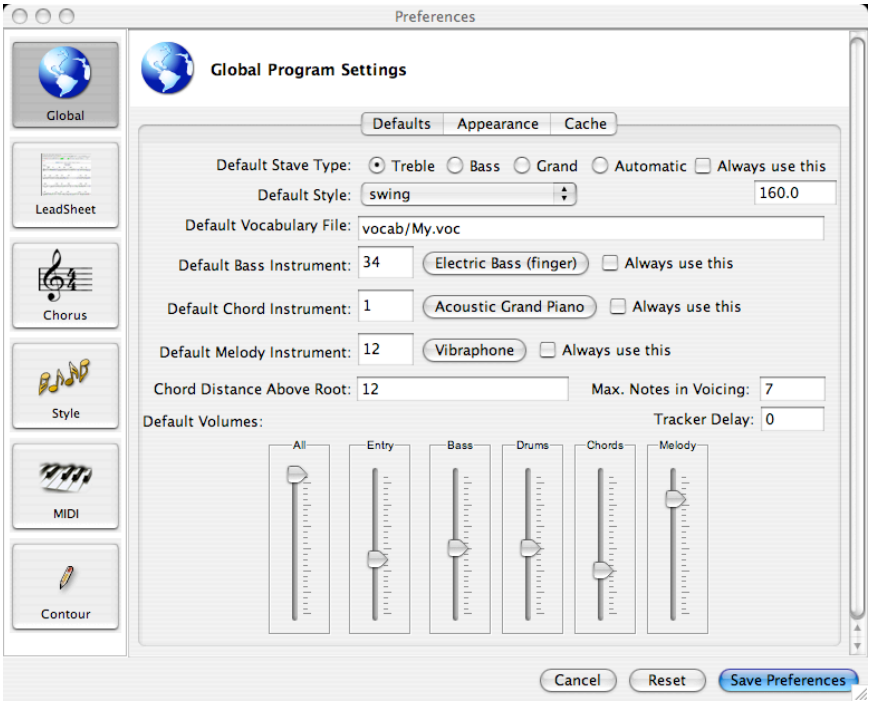
74. **The preference dialogs** can be opened using this button:

Preferences button

There are several separate panels. The current preference panel can also be opened with just the **p** key.

Keystroke	Effect
p	Open the preference dialog.

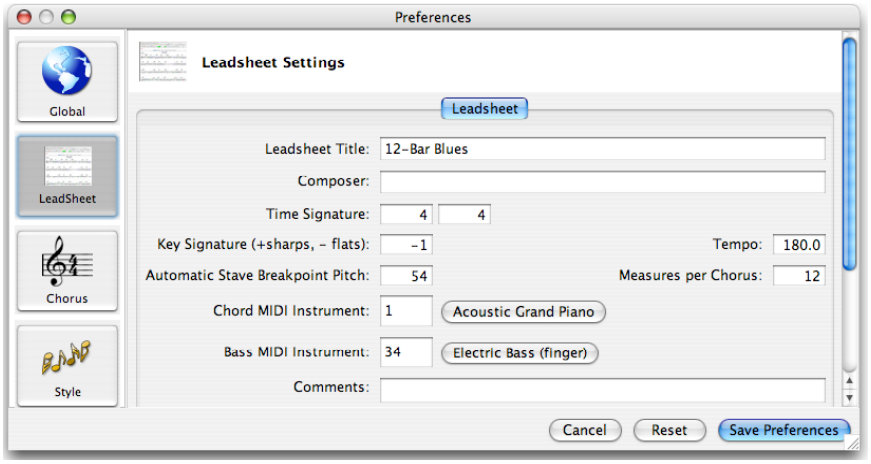
75. **Global settings** control default values, such as are used when new leadsheets are opened.



Global preferences

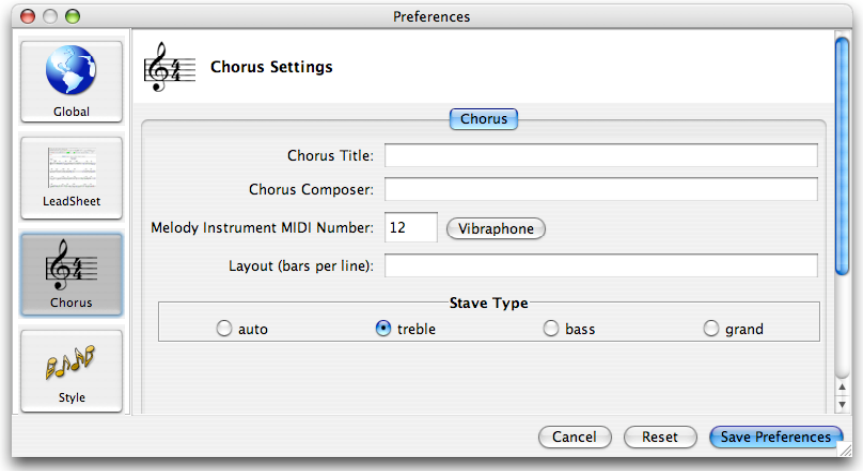
The "**Always use this**" boxes over-ride the setting in the leadsheet itself. For example, if you always want the leadsheet to open with bass clef, click **Bass** and **Always use this**. Similarly, you can over-ride the instrument choices that are present in the leadsheet.

76. **Leadsheet settings** control those things that are specific to the leadsheet (vs. specific choruses):



Leadsheet preferences

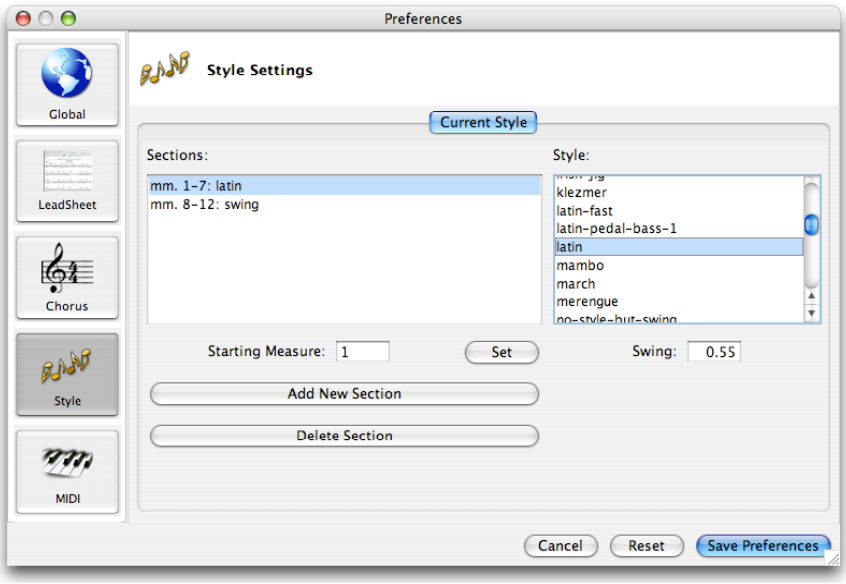
77. **Chorus settings** control those things specific to a chorus:



Chorus preferences

Currently the **Layout**, however, applies to all choruses, not just this one. It is a series of numbers indicating the number of measures on each line of the leadsheet. If this is blank, Impro-Visor will adjust the layout automatically. This field can be set manually, or automatically, by toggling the Freeze button on the menu bar, as was described earlier.

78. **Style settings** control the style, and permit the introduction of new sections of a chorus with different styles:

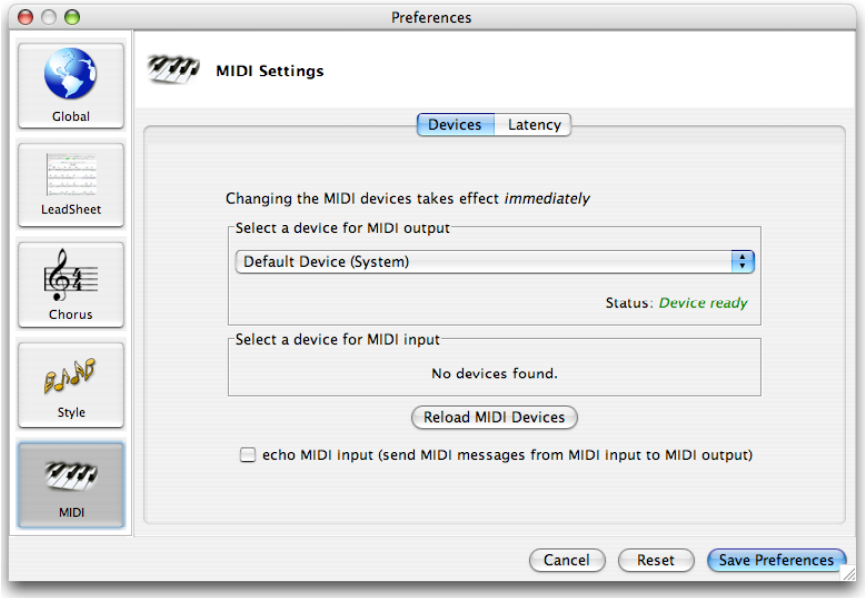


Style settings

If the leadsheet has only one style section, it may be changed by selecting a different style in the right-hand menu.

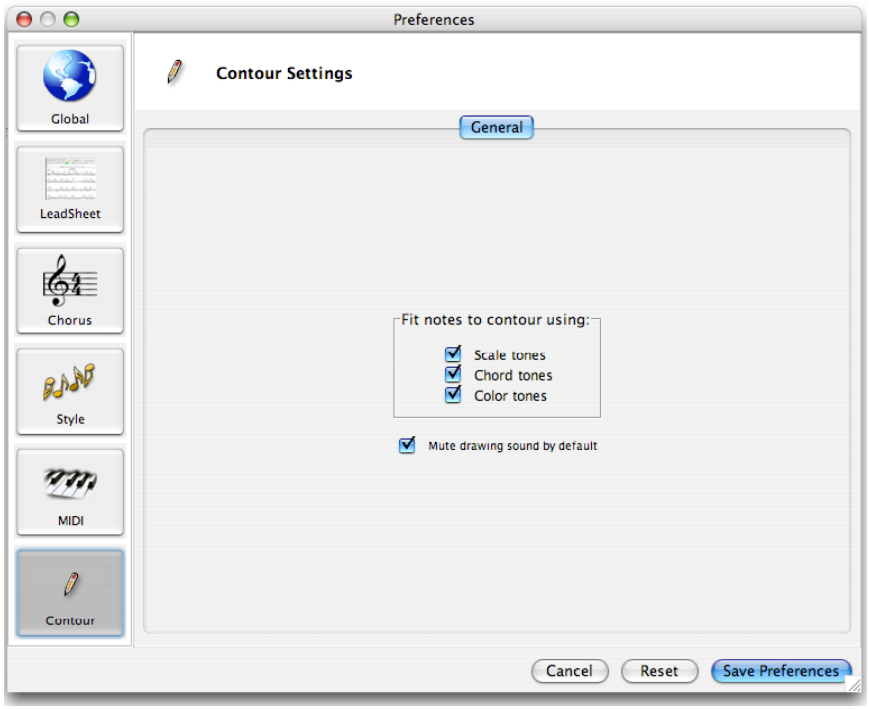
If there are multiple style sections, as indicated by the left-hand menu, then each section is set independently. Adding a new section splits the current section into two equal pieces. The boundary is then adjusted by setting the Starting Measure of the second section of the split.

79. **MIDI settings** control the MIDI interface



MIDI settings

80.**Drawing contour settings** control the drawing interface, which is explained below.

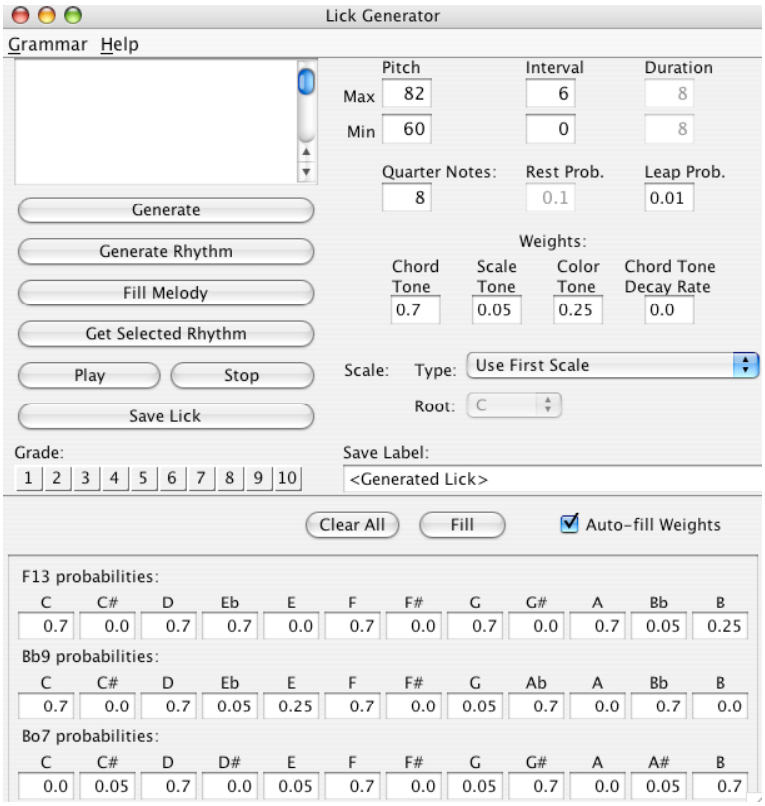


Contour settings

81. **The lick generator controls** are in a separate panel, which can be opened by clicking the right-hand light bulb button.:

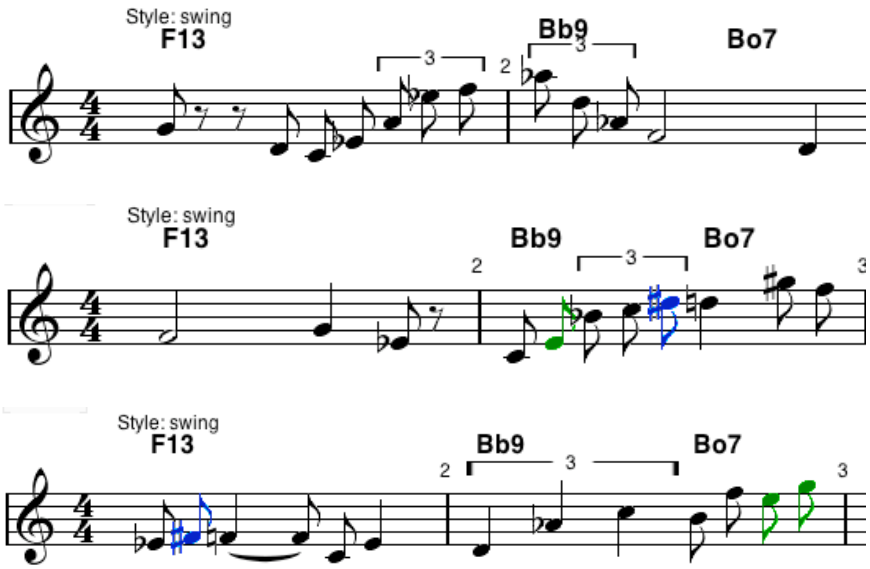
Lick-generator opening button

The lick generator opens with lots of buttons and numbers, but you can ignore most of them for starters. Simply press the Generate button below the small window in the upper left. If you don't like what you get, press again.



Lick-generator controls

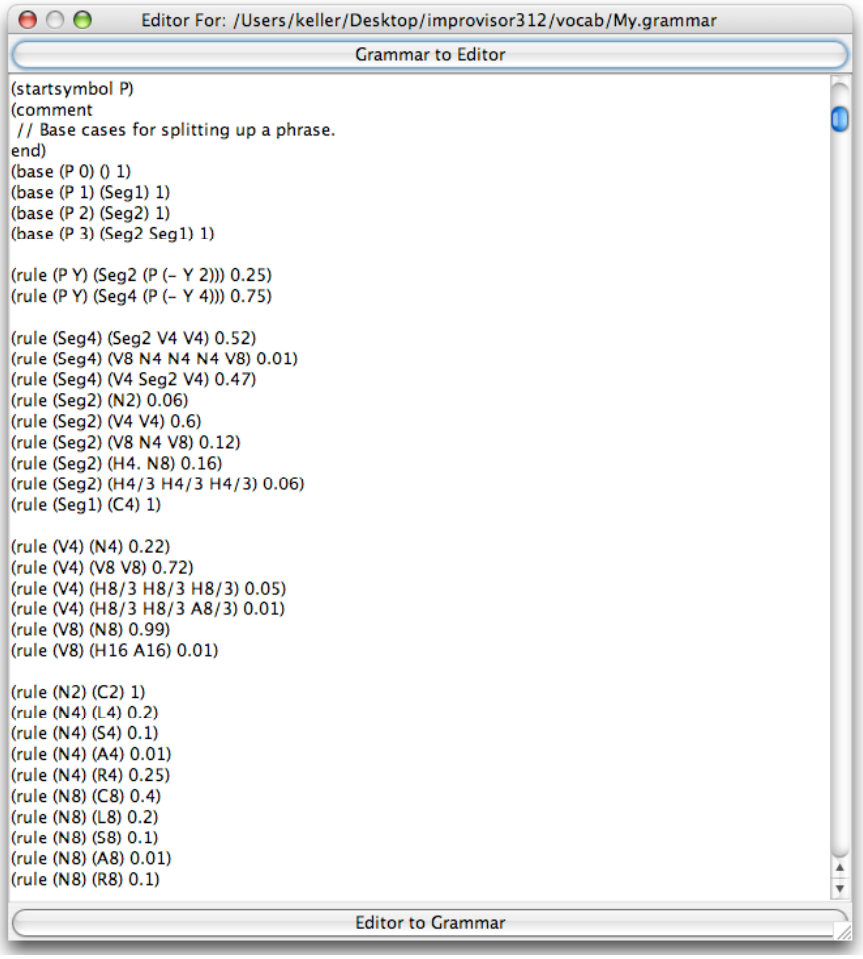
Below are some samples generated by the Lick Generator for this particular setting.



More generated licks

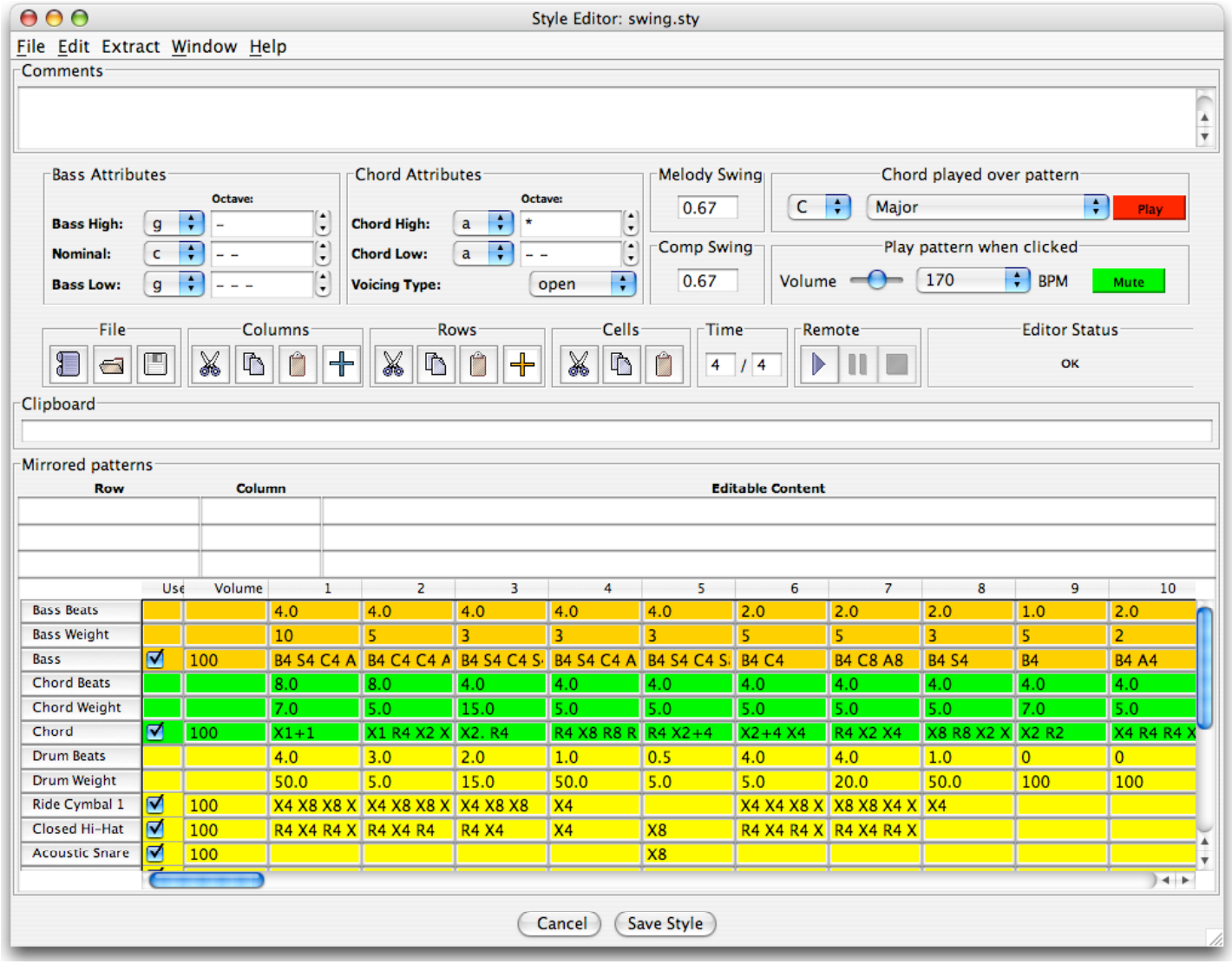
82. **The lick grammar can be edited** by selecting edit from within the lick generator. The editor functions in a manner similar to the leadsheet editor. We won't go into how the grammar works here, but it is described in some of our publications. If you decide to change it, it might be good to save a backup copy. The contents of

the grammar distributed with version 3.36 is shown below. There is additional meta-data in the upper part of the grammar file which is not shown here.



The grammar editor window

83. **The style editor** is a new feature in version 3. It takes the form of a spreadsheet as shown below. A description of how to use the style editor will be provided at a future time. However, there is a separate help window available in style editor for hints. At present, there is no undo/redo in the style editor, so please be careful. It is a good idea to back up your styles directory before editing.

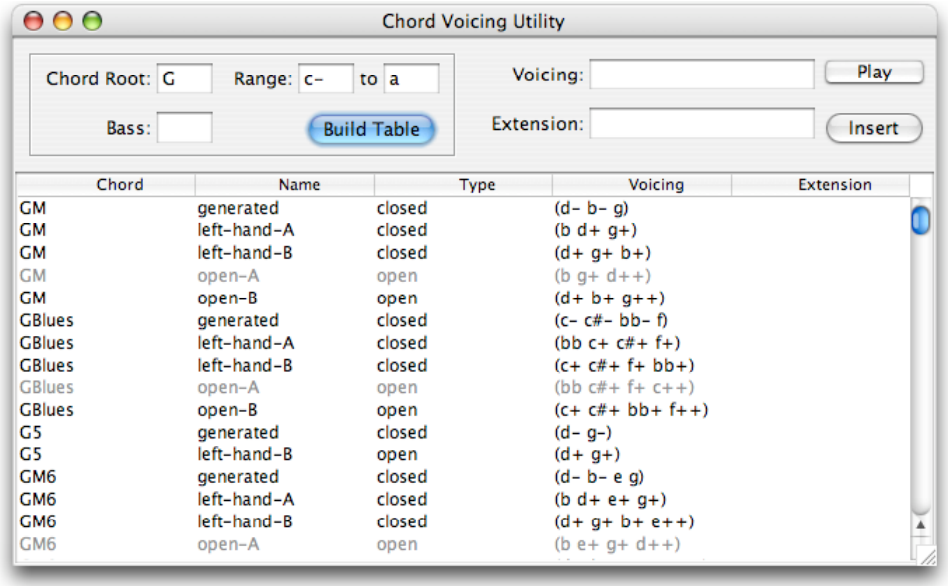


The style editor window editing the "swing" style

The Chord popup in the style editor provides a display of all chord currently available, and allows you to hear the chord in isolation.

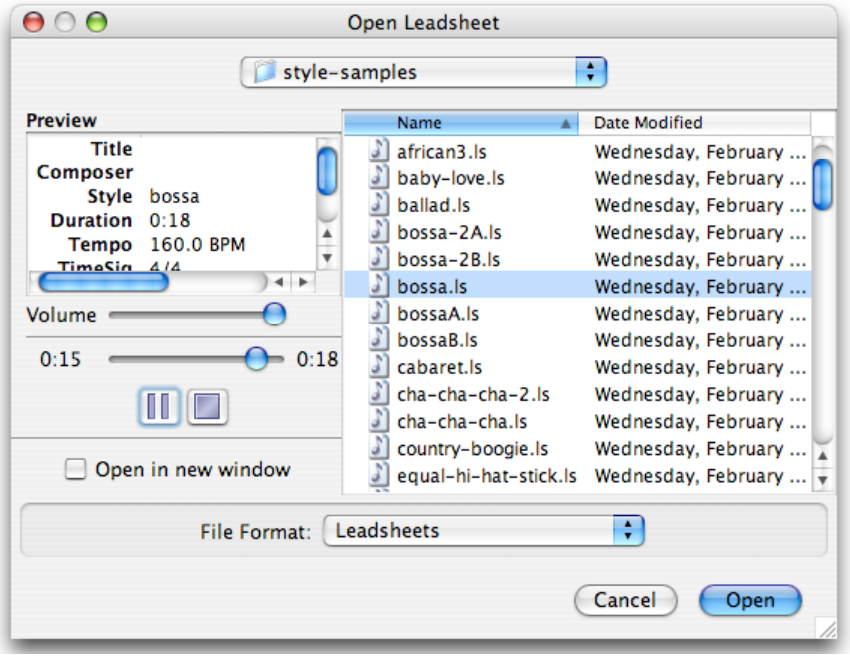
Keystroke	Effect
control-y	Open the style editor.

84. **The Chord Voicing Utility** allows you to sample various chord voicings in isolation. It does not allow you to enter new voicings into the vocabulary, although you can play them. Currently voicings are entered into the vocabulary file using a text editor. This utility also provides a good way to explore available chords.



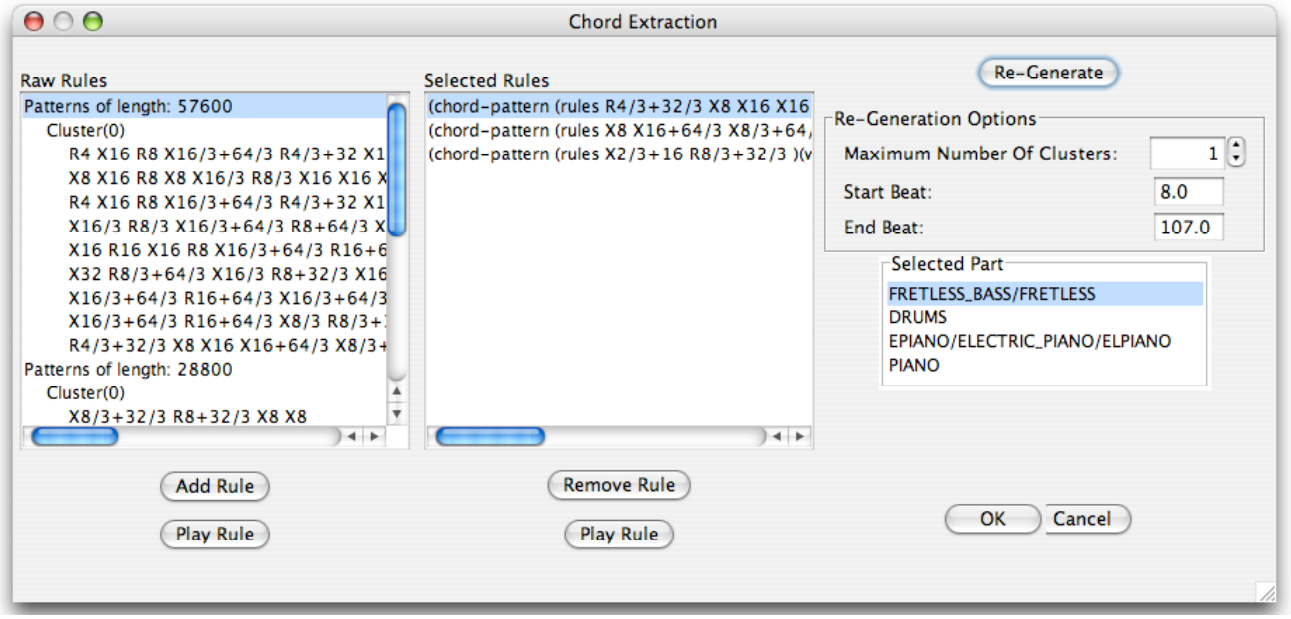
Chord voicing utility

85. **Style sample leadsheets have been provided**. As we add styles, we will try to keep a leadsheet that exhibits the style in the leadsheets/style-samples directory. A convenient way to preview styles is to press the play button with this directory. Then you can go from one style sample to the next to get an idea of how each style sounds, without actually loading the leadsheet.



With play button pressed, click on the styles you are interested in previewing.

86. **The Style extractor** is a new facility that will extract a style from a MIDI file accompanied by a leadsheet file that contains the chords. Chose Extract Style (**Control-e**) from the Extract menu. A sample MIDI file and accompany leadsheet file has been provided in the directory style-extract in the current release. The Style Extractor has its own set of windows, that will be opened if the corresponding preference box is checked. This window gives details of how raw data is clustered to produce the style rules. However, it is not usually necessary to view the workings at this level to be able to extract a style.



One of the style extractor windows

87. **Conclusion**: This concludes the Impro-Visor tutorial for the present. Please contact improvisor AT cs DOT hmc DOT edu if anything is unclear. For additional information, visit the Impro-Visor home page:

    http://www.cs.hmc.edu/~keller/jazz/improvisor

88. **Acknowledgment**: The software described here were designed and developed by the author, together with Martin Hunt, Stephen Jones, David Morrison, Belinda Thom, David Wolin, and Steve Gomez (Dartmouth College), Jim Herold (Cal Poly Pomona), Brandy McMenamy (Carlton College), Sayuri Seojima, and John Goodman (Open University in the U.K.). This project was supported by a Mellon Foundation Faculty Enhancement grant to Professors Keller and Thom, and by the National Science Foundation REU Program under grant Award No. 0451293 to Harvey Mudd College, and by a grant from the Baker Foundation.

89. Glossary

Glossary of Impro-Visor Terminology	
Term	**Meaning**
advice	Suggestions for melodies that can be played over given chords.
approach tone	A tone not in a chord that is adjacent to a tone that is in the chord.
bar	A colloquial term for a measure of music.
cell	A small melodic fragment aligned with one chord.
chord symbol	A somewhat standardized notation for representing chords with a few characters.
chorus	One time through the chord changes of a piece.
clipboard	A metaphor designating a place off-screen to which content is copied.
color tone	A tone not in a chord but compatible with the sound of the chord.
dialog	A user interface feature for entering information, such as preferences.

freeze	To set the numbers of measures per line in a leadsheet.
harmonic entry	Entering notes that are aligned to the current chord, rather than chromatically.
idiom	A familiar jazz melodic fragment aligned with one chord.
jar	A file type, standing for *Java archive*.
leadsheet	A sheet with chord symbols and a melody line, which can be used to represent a song or a solo over the chords.
lick	A short melodic fragment aligned with one or two chords.
meta-data	Data that is not melody or chords directly, but which provides additional information, such as key signature, time signature, etc.
MIDI	Musical Instrument Digital Interface
mixer	A device that combines several sound tracks together in specified volumes.
NC	Abbreviation for No Chord.
parallax	The change of apparent location depending on viewing angle.
pickup	A note or a few notes placed before the downbeat of a melody.
polychord	A chord constructed of one smaller chord stacked atop another, such as a triad over a dominant chord. Polychords are noted using the back-slash \ in Impro-Visor. See also slash chord.
quote	A melodic fragment from a familiar song or solo.
rectify	To align a melody to be consistent with a chord sequence.
slash chord	A chord consisting of a chord and a specific bass note, which may or may note be in the original chord. In Impro-Visor, slash chords are indicated with /. See also polychord.
slot	A symbolic time at which a chord or melody note can be played. Impro-Visor currently has 120 slots per beat. A subset of the slots typically shows within the beat at a given time.
style	A specification of how the accompaniment (chords, bass, percussion) are generated.
thaw	To unset the numbers of measures per line in a leadsheet, leaving those numbers open to dynamic adjustment.
transpose	To raise or lower the pitch of all notes or chords in a selection.
vocabulary	A file containing the specification of musical material, such as scales, chords, licks, etc.
voicing	The order in which the various notes of a chord are stacked.

90. Keystroke Summary

Area	Stroke	Effect
Playback	k	stops ("kills") the playback
	i	starts playback from the beginning
Select all of chorus	escape	un-selects everything
	control-a	select all slots
Add rest	r	put a rest in the selected slot
	shift-control-click	select a slot and put a rest there

Transposition	t	transpose selected notes up an octave
	g	transpose selected down up an octave
	e	transpose selected notes up a half-step
	d	transpose selected notes down a half-step
	shift-t	transpose selected notes up harmonically
	shift-g	transpose selected notes down harmonically
	shift-E	transpose chords up a half-step
	shift-D	transpose chords down a half-step
	control-e	transpose chords and melody up a half-step
	control-d	transpose chords and melody down a half-step
Rectification and other edits	shift-R	rectify the selection (bring in line with the harmony)
	/	reverse the selected melody
	\	invert the selected melody
Enharmonics	space	toggle enharmonics of all notes in selection
	shift-space	toggle enharmonics of all chords in selection
	control-space	toggle enharmonics of all chords and notes in selection
Undo/Redo	z	undo last action
	y	redo last undone action
Licks	control-u	generate lick
	u	save lick, quote, cell, idiom
Cut/Paste/Copy	c	copy melody (to invisible clipboard)
	v	paste copied melody (from invisible clipboard)
	x	cut melody (and copy to invisible clipboard)
	j	copy melody selection to text area
	b	paste melody in text area onto leadsheet at selected slot
	shift-C	copy chords (to invisible clipboard)
	shift-V	paste copied chords (from invisible clipboard)
	shift-X	cut chords (and copy to invisible clipboard)
	shift-J	copy chords from selection to text area
	shift-B	paste chords from text area to current slot
	control-c	copy chords and melody (to invisible clipboard)
	control-v	paste copied chords and melody (from invisible clipboard)
	control-x	cut chords and melody (and copy to invisible clipboard)
	control-j	copy chords and melody from selection to text area
	control-b	paste chords and melody from text area to current slot
Editors	control-f	open the textual leadsheet editor
	control-y	open the style editor
	p	open the preference dialog
Files	control-n	open a new leadsheet window
	control-o	open a new file in the current window
	control-s	save the current file
	control-w	save the current file, specifying the name
	control-r	revert the current file from the saved copy
	control-p	print the leadsheet
	control-q	quit Impro-Visor

91. Supplied Scale Vocabulary

The meaning of each scale is defined in the vocabulary text file vocab/My.voc, where each scale is defined relative to a tonic C. Note that some scales are synonyms for one another.

altered	flat six pentatonic	lydian dominant pentatonic	neopolitan major

arabian	flat three pentatonic	lydian minor	pentatonic
augmented	gypsy	lydian pentatonic	neopolitan minor
augmented heptatonic	harmonic major	lydian pentatonic	oriental
balinese	harmonic minor	major	pelog
bebop	hindu	major blues	pentatonic
bebop dominant	hirajoshi	major flat two pentatonic	persian
bebop locrian	hungarian minor	major pentatonic	phrygian
bebop major	in-sen	malkos raga	piongio
bebop minor	indian	melodic minor	pomeroy
blues	ionian pentatonic	melodic minor fifth mode	prometheus
chinese	iwato	melodic minor second mode	purvi raga
composite blues	kafi raga	minor #7 pentatonic	ritusen
diminished	kumoi	minor bebop	romanian minor
diminished whole tone	kumoijoshi	minor blues	scriabin
dominant	leading whole tone	minor hexatonic	spanish
dorian	locrian	minor pentatonic	spanish heptatonic
dorian augmented	locrian major	minor seven flat five pentatonic	super locrian
double harmonic lydian	locrian pentatonic	minor six diminished	super locrian pentatonic
double harmonic major	locrian#2	minor six pentatonic	todi raga
egyptian	lydian	mixolydian	vietnamese 1
enigmatic	lydian #5 pentatonic	mixolydian pentatonic	vietnamese 2
flamenco	lydian augmented	mystery #1	whole tone
	lydian dominant	neopolitan major	whole tone pentatonic

92. Supplied Chord Vocabulary

The root pitch is placed in front of any of the following. Any may be followed by a slash for the bass note, or a backslash for a polychord for more combinations. The meaning of each symbol is defined in the vocabulary text file My.voc, where each chord is defined relative to a tonic C. Note that some chords are synonyms for one another. My preference for chord symbols is:

Symbol	Meaning
M	Major
m	Minor
o	Diminished
sus	Suspended (4 by default)
7, 9, 11, 13	Dominant if used alone

I've introduced other symbols such as **Maj** or **maj** because people have asked for them. I don't prefer them myself because they take up precious space on the chord line, and also take longer to type. Also, the list of possible alternatives is pretty open-ended. I introduced **h** as a short-hand for half-diminished, which would ordinarily be m7b5 (minor-seven, flat five) for this reason. Here is the full list of chords in the vocabulary as I write this.

+	7#5b9#11	7sus4	M7#5sus4	add9no3	mM9b6
+7	7#5sus4	7sus4b9	M7#9#11	addb9	mMaj7
+add#9	7#9	7sus4b9b13	M7+	aug	mMaj7b6
+add9	7#9#11	7susb9	M7add13	aug7	mMaj9
11	7#9#11b13	9	M7b5	dim	mMaj9b6
11b9	7#9b13	9#11	M7b6	dim7	madd4
13	7+	9#11b13	M7b9	h11	madd9
13#11	7add13	9#5	M7sus4	h7	maj#5
13#9	7add6	9#5#11	M9	h9	maj13

13#9#11	7alt	9+	M9#11	m	maj13#11
13b5	7aug	9b13	M9#5	m#5	maj7
13b9	7b13	9b5	M9#5sus4	m+	maj7#11
13b9#11	7b5	9b5b13	M9b5	m11	maj7#5
13no5	7b5#9	9no5	M9sus4	m11#5	maj9
13sus	7b5b13	9sus	Madd9	m11b5	maj9#11
13sus4	7b5b9	9sus4	Maj#5	m13	maj9#5
2	7b5b9b13	Bass	Maj13	m6	mb5
4	7b6	Blues	Maj13#11	m69	mb6
5	7b9	M#5	Maj7	m6b5	mb6M7
6	7b9#11	M#5add9	Maj7#11	m7	mb6b9
6#11	7b9#11b13	M13	Maj7#5	m7#5	o
67	7b9#9	M13#11	Maj9	m7add11	o7
69	7b9b13	M6	Maj9#11	m7add4	o7M7
6b5	7b9b13#11	M6#11	Maj9#5	m7b5	oM7
7	7b9b13sus4	M69	Mb5	m9	phryg
7#11	7b9sus	M69#11	Mb6	m9#5	sus
7#11b13	7b9sus4	M6b5	Msus2	m9b5	sus2
7#5	7b9sus4	M7	Msus4	mM7	sus24
7#5#9	7no5	M7#11	add2	mM7b6	sus4
7#5b9	7sus	M7#5	add9	mM9	susb9

I might add more abbreviations, but if you can't wait, just edit the My.voc. For example, if you want – to stand for minor, add the following:

```
(chord
        (name C-)
        (pronounce C minor)
         (same Cm)
        )
```

Make sure the parentheses balance, otherwise some aspects of your vocabulary could be ignored.
It is best to use a text editor such as Emacs, which flashes matching parentheses.