

## Using Impro-Visor

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2 January 2012

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## What is Impro-Visor?

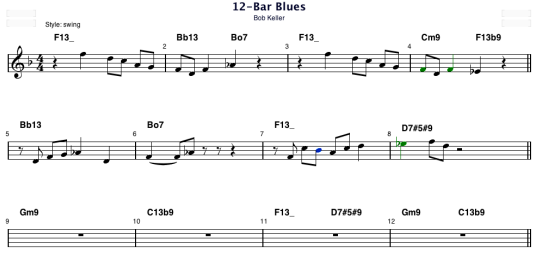
- Impro-Visor is notation and playback software designed for jazz musicians.
- For more details, please see: <http://www.cs.hmc.edu/~keller/jazz/improvisor/>

## 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

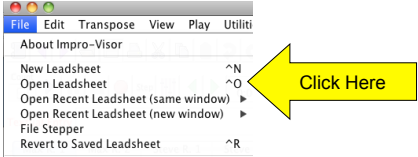
12-Bar Blues  
Bob Keller



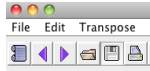
## Opening Leadsheet Files

- 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

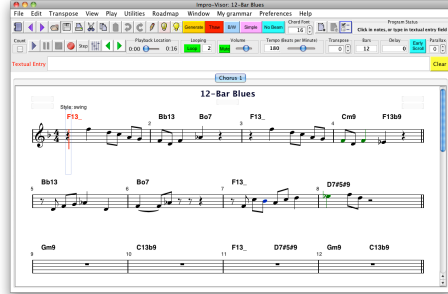


### Opening Leadsheet File from the Icon Bar



Click Here,  
then refer to the previous page

### Open\_tutorial.ls



### Browsing Leadsheets

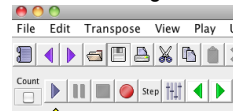
- The leadsheets in a single directory can be browsed step-wise by using the **purple** arrow buttons.



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

### Play the Leadsheet

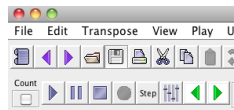
- 3 ways to play the entire leadsheet:
  - Press I key
  - Press shift-return
  - Click the lower left triangle icon



Click here

### Stop Playback

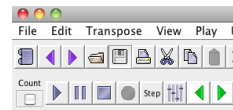
- 2 ways to stop playback:
  - Press the K key
  - Click the square icon



Click here

### Pause or Resume Playback

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



Click here

### 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.



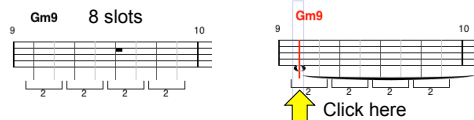
### Transposing Settings for Eb

- 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.

Click here

### Shortening a Note's Duration

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

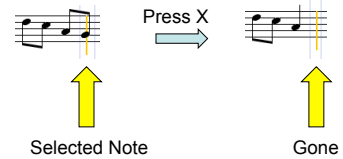
Click where note should stop

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

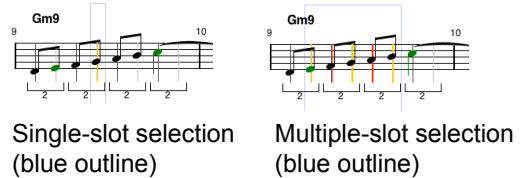


### To Remove Notes and Close the Gap

- 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



### 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.



### 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.

Previous selection

Shift-click inside to select 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.

Click Here

### Two Ways to Unselect Everything

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

Click Here (left margin)

OR

Click Here (right margin)

### 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.

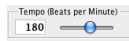
### Count-In for Playback

- 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.

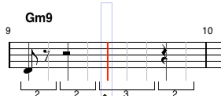


Click to open mixer



### 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.

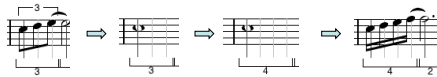


Brackets above notes are part of the notation.

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 r8/3 g+4+16

up an octave    up an octave

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 should end.
- Press R 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.

Click Here

### 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.



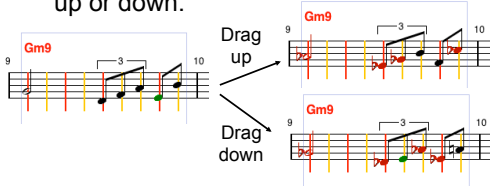
### Icons for Undo/Redo

- 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 transposition:
  - **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.

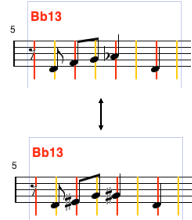
- The Transpose menu states the options.
- Note that you can also transpose by octaves at a time: T for up, G for down.



### Switching Note Enharmonics

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

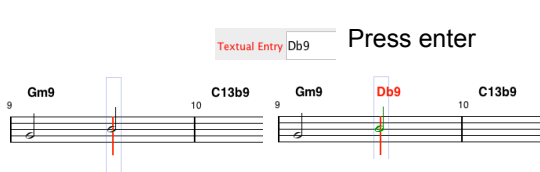
ab ↔ g#  
 bb ↔ a#  
 cb ↔ b      b# ↔ c  
 db ↔ c#  
 eb ↔ d#  
 fb ↔ e  
 gb ↔ f#      e# ↔ f



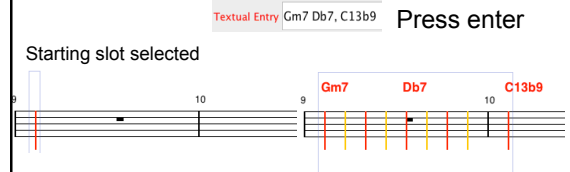
### Entering Chords

- 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



### Entering Chords Example



### 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

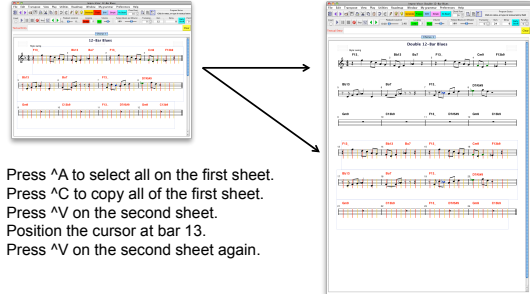
Textual Entry r4 f+4 d+8 c+8 a8 g8 F13\_ |

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

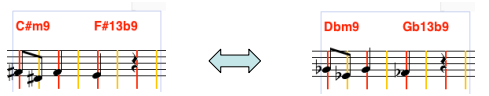


Press ^A to select all on the first sheet.  
 Press ^C to copy all of the first sheet.  
 Press ^V on the second sheet.  
 Position the cursor at bar 13.  
 Press ^V on the second sheet again.

Switching Chord Enharmonics

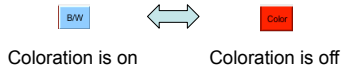
- Similar to switching notes, press shift-Spacebar to change chord enharmonics.
- Press control-Spacebar to change both note and chord enharmonics at the same time.

Using Control-Spacebar to Switch Chord Enharmonics



### Note Coloration

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

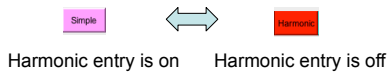


### Meaning of Note Colors

- 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.

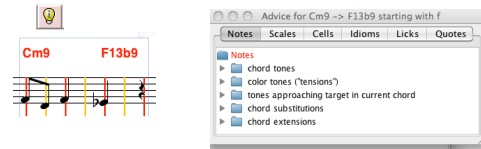
### Note Entry

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



### Using Advice

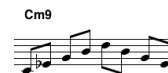
- There are six types of advice.
- Advice is opened from the left light-bulb icon.
- At least one slot must be selected first.



### 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

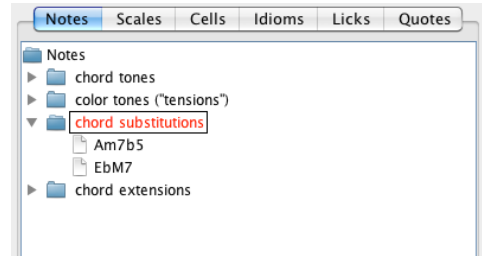
### Chord Tone Advice



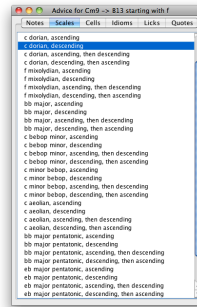
### Color Tone Advice



### Chord Substitution Advice

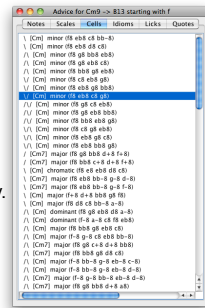


### Scale Advice



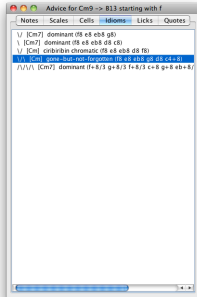
If a note is selected, the scale starts with that note, rather than the tonic.

### Cell Advice



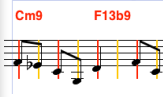
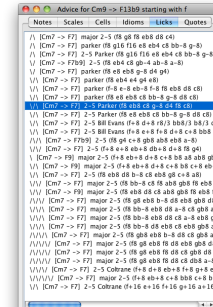
A cell is a small sequence of notes, usually of equal duration. Cells depend on the first chord only.

### Idiom Advice



An idiom is a short, commonly-heard, melodic fragment. Idioms depend on the first chord only.

### Lick Advice



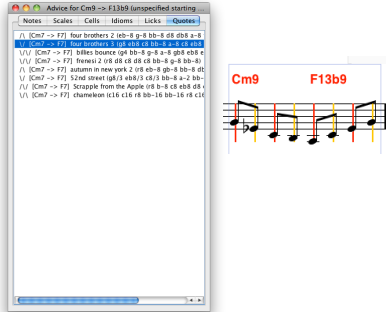
A lick is a short, commonly-heard, melodic fragment. Licks depend on the first two chords.



### Quote Advice

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

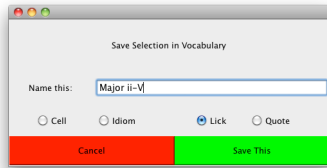
Quotes depend on the first two chords.



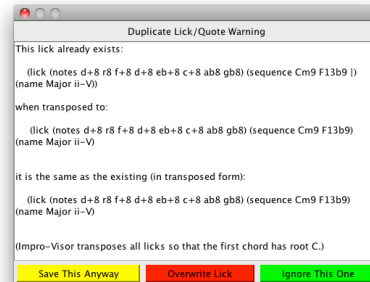
### Make Your Own Advice

- 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

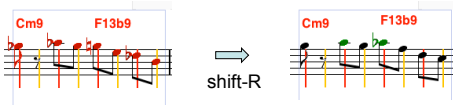


### Automatic Duplicate Prevention



### 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 generate 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  $2 \times 4 = 8$ .
- So for a 12-bar blues, we copy two choruses into one 24-bar chorus, as shown next.

Trading Fours

12-Bar Blues

## 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.


## Existing Grammars

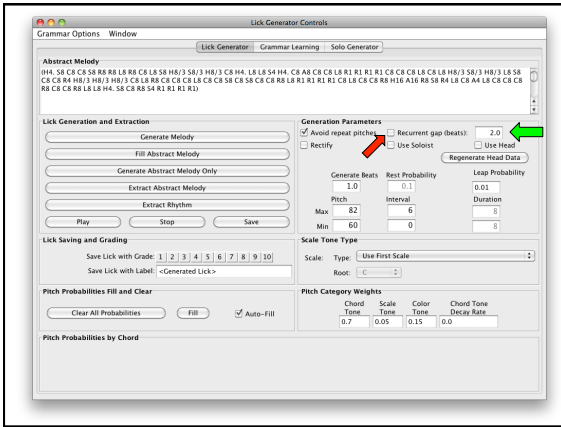
- Impro-Visor comes with grammars learned from transcribed solos of various artists.
- In some cases, only a single solo was used, in others multiple solos.
- **Disclaimer:** We do not claim that a given grammar completely characterizes the named player. These grammars were derived from very limited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

## Grammars Available

- Backup
- Bare
- BillEvans
- CharlieParker
- CliffordBrown
- ColemanHawkins-Ballads
- DaveLieberman
- DexterGordon
- DizzyGillespie
- FreddieHubbard
- JimmyHeath
- JJohnson
- JohnColtrane
- KeithJarrett
- 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**: 



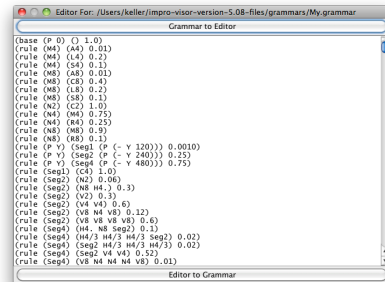
## Recurrent Improvisation

- 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.

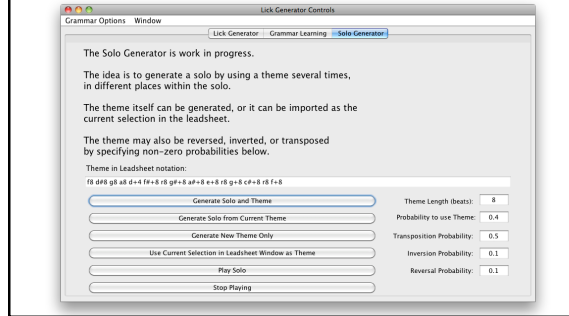
## Grammar Editor Frame




### 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



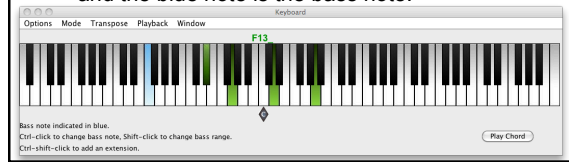
### Chord Stepping

- 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

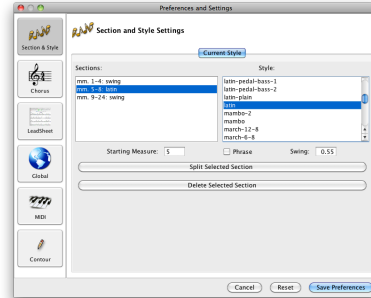
### Six Separate Preference Frames

- 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



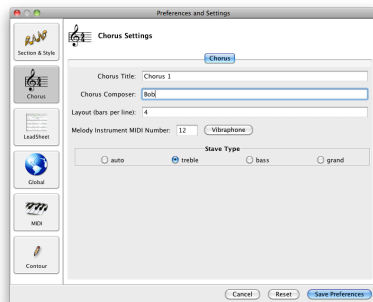
## Sections vs. Phrases

- 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.

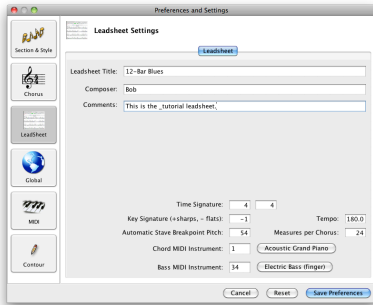
### Layout (Bars Per Line) Setting Examples

- 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.

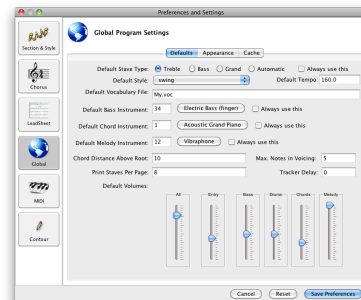


- The default setting is initially 72.
- Setting the bars to fewer than the number of bars in use will bring up a warning dialog, because the additional bars will be lost.

### Global Preference Settings

- These control various default settings and print options.
- There are 3 tabs:
  - Defaults
  - Appearance
  - Cache

### Global Preference Frame Defaults Tab

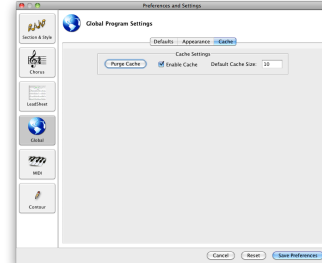


### Global Preference Frame Appearance Tab



### Global Preference Frame Cache Tab

The cache is used to avoid recomputing advice items.

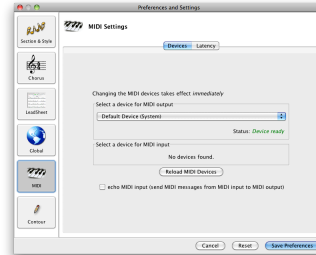


### MIDI Preference Settings

- MIDI settings select MIDI (Musical Instrument Digital Interface) input and output.
- There are two tabs:
  - Devices
  - Latency

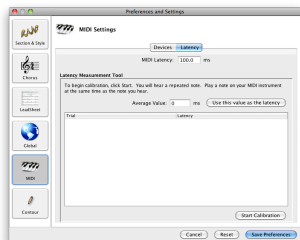
### MIDI Preferences Device Tab

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.

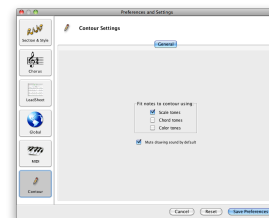


### Contour Preferences Frame

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



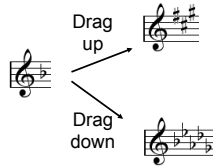
Pencil tool icon





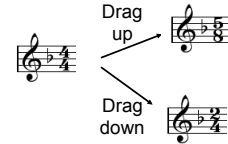
### Shortcut for Setting Key Signature

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



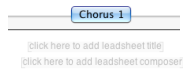
### Shortcut for Setting Time Signature

- 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.



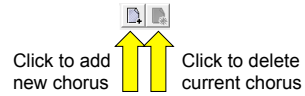
### Shortcut for Leadsheet Title

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



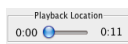
### Adding and Deleting Choruses

- The + icon adds a new chorus at the end.
- The \* icon deletes the current chorus (can't be undone).



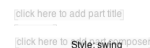
### Playback Location Slider

- 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

### 12-Bar Blues

<b>F Major</b>		<b>Bb Major</b>	
To IV n Back		Straight Launcher	
F13	Bb13	Bb7	F13
		Cm9	
Bootstrap			
<b>F Major</b>			
IV n Back + Dropback			
Bb13	Bb7	F13	D7#5#9
<b>F Major</b>			
Straight Cadence + ...		POT	
Gm9	C13b9	F13	D7#5#9
		Gm9	
		C13b9	

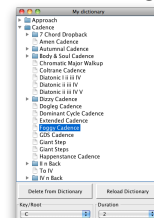
## Bricks

- 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)

<b>C Major</b>			
Foggy Cadence			
Eb7	Dm7	G7	C



Drag bricks into place.

### Roadmap Under Construction

<b>C Major</b>				<b>F Major</b>			
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))
)
```

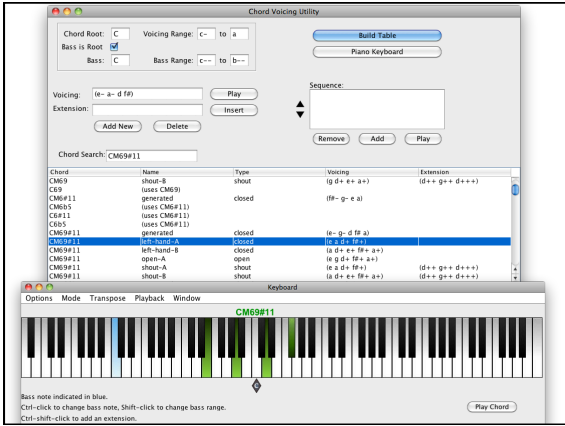
← Matching paren

## 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.

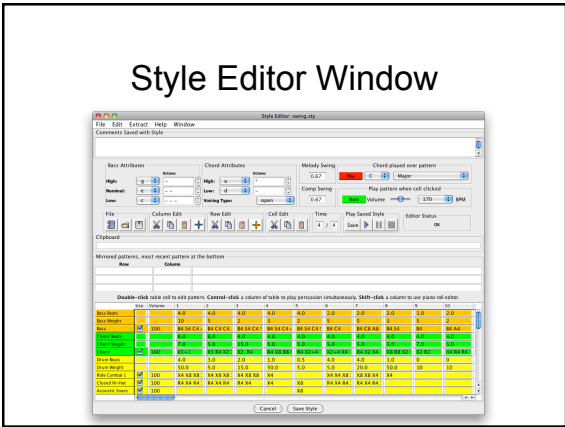


## Style Definitions

- 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.



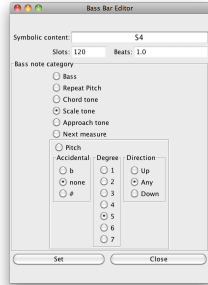
## Piano Roll Editor for First Column in Style Editor Window

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.

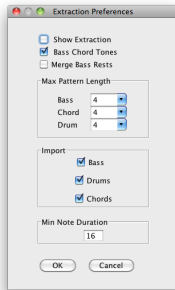
## Bass Note Editor



## 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 3<sup>rd</sup> 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 3<sup>rd</sup> product, such as iTunes, to create MP3.



### 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>