

# Using the Impro-Visor Style Editor

keyed to Impro-Visor version 5.13

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## Preface

- This document goes through the Impro-Visor style specification language and its Style Editor in some detail.
- Details in slides 6-27 can be skipped on the casual first reading. However, knowing some of the details can make editing go faster in some cases.
- The piano roll editor component is probably the simplest to use if one desires to avoid exposure to the language itself.

## What is a “Style”?

- By a “style” in Impro-Visor, we mean a specification used to create the background tracks from a chord progression.
- Each style is stored in its own file, with the file name being the style and the extension .sty

## Styles vs. Grammars

- Please do not confuse *styles*, which are used to create accompaniment, with *grammars*, which are used to create melody.
- In effect, a style is a kind of grammar, but is more limited in its current form. Also, the results of a grammar conform to a melodic style, but this is a different sense of the word “style”.

## Styles are Text Files

- Styles are stored as text files, and can be edited by an external text editor.
- However, for a variety of reasons, it is often easier to use the Style Editor provided inside Impro-Visor.

## Technical Details that can be skipped

- The non-specialist can skip the next 20 or so slides (to “Opening the Style Editor”), as these give details on how styles are represented in text.
- It is not necessary to know these details to create or modify styles. However, it can be helpful to know what you are seeing when using the basic Style Editor interface.

## Example Impro-Visor Style File Contents for a style called "rhythm-and-blues"

```
(style
  (name rhythm-and-blues)
  (bass-high g-)
  (bass-low c--)
  (bass-base c--)
  (swing 0.65)
  (comp-swing 0.5)
  (voicing-type open)
  (chord-high c)
  (chord-low c-)
  (comments )
  (bass-pattern (rules B8/3 R8/3 B8/3 B8/3 R8/3 B8/3 B8/3 R8/3 B8/3 B8/3 R8/3 B8/3) (weight 46.0))
  (bass-pattern (rules B8/3 R8/3 B8/3 B8/3 R8/3 B8/3) (weight 18.0))
  (bass-pattern (rules B8/3 R8/3 B8/3) (weight 10.0))
  (drum-pattern
    (drum Acoustic_Bass_Drum X8+32/3 R8/3+32/3 X8 R8 X8 R8 X8 R8)
    (drum Closed_Hi-Hat X8/3 R8/3 X8/3 X8/3 R8/3 R8/3 X8/3 X8/3 R8/3 X8/3 X8/3 X8/3 R8/3 R8/3 X8/3)
    (drum Acoustic_Share R4 X8 R4+8 X8 R8)
    (drum Tambourine R4 X8 R4+8 X8 R8)
    (weight 50.0)
  )
  (chord-pattern (rules X2 R8 X8 R4) (weight 50.0))
  (chord-pattern (rules X2) (weight 24.0))
  (chord-pattern (rules X4) (weight 100.0))
)
```

## What a Style Specifies

- Bass patterns
- Drum patterns
- Chord (instrument) patterns
- Other meta-data
  - Accompaniment instrument ranges
  - Swing values
  - Voicing type for chords

## What a Style Does Not Specify

- Meter (4/4 vs. 3/4, etc.), even though some styles are created to work with a specific meter.
- Instruments: The choice of chord and bass instruments is set within the leadsheet, rather than the style, even if the style is intended to work with a specific instrument (e.g. banjo vs. piano).

## Pattern Selection Points

- Patterns are used to create accompaniment.
- For chords and bass, a pattern is selected for each slot in which a chord is struck. (The symbol / in the leadsheet does not count as a chord strike in this case.)
- For percussion, a pattern is selected based upon the number of beats remaining, independent of whether a chord is specified.

## Pattern Lengths for Chords and Bass

- Patterns are devised with a meter in mind usually. For 4/4 time, it is typical to have chord and bass patterns of length 4, 2, and 1 beats, as those are common spans of chords. We could also include patterns of length 8, 6, 1/2, etc.
- A 3-span could be filled by one pattern of length 2 and one of length 1.
- If no chord pattern exists for a given span, then the span will be filled by just holding the chord for the duration of the span. If no bass pattern exists, then the bass line will be left empty.

## Pattern Lengths for Drums

- Usually drum patterns are all of the same length. For 4/4 time, for example, they would typically be of length 4 beats, although length 8 is another choice (which might be used for some latin rhythms).
- Unlike chords and bass, we don't want to start a new drum pattern on each chord strike.

## Chord Patterns

- Chord patterns are probably the simplest, and can provide a starting point for understanding the notation in other patterns.
- Each chord pattern is a sequence of terms of the form  $Xd$  or  $Rd$ , where  $d$  is a duration specification (next slide), or  $Vn$  where  $n$  is a volume level (an integer between 0 and 127).
  - $Xd$  means the chord is to be struck and held for duration  $d$ .
  - $Rd$  means there is a **rest** for duration  $d$ .

## Durations

- The form of a duration is exactly the same as note durations in the **leadsheet notation**, which is based on fractions of a beat, as in music theory:
    - 1 means a whole note (4 beats)
    - 2 means a half note (2 beats)
    - 4 means a quarter note (1 beat)
    - 8 means an eighth note (1/2 beat)
    - 16 means a sixteenth note (1/4 beat)
- continued next slide

## Durations, Continued

- Triplets
    - 4/3 means a quarter note triplet (2/3 of a beat)
    - 8/3 means an eighth note triplet (1/3 of a beat)
  - Dotted notes
    - 4. means a dotted quarter note (1.5 beat)
    - 8. means a dotted eighth note (3/4 beat)
    - 4.. means a double-dotted quarter note (1.75 beat)
- continued next slide

## Additive Durations

- Durations can be added to get unusual durations. For example,
  - 4+16 means a quarter note plus a sixteenth note in duration
  - 4.+8/3 means a dotted quarter note plus an eighth note triple in duration

## Example Chord Pattern

- (rules X2 R8 X8 R4)
- "rules" is a keyword that distinguishes this part from other attributes of the pattern (such as *weight* and *push*).
  - X2 means strike the chord and hold for half-note value.
  - R8 means to rest an eighth note value.
  - X8 means strike for an eighth note value.
  - R4 means to rest for a quarter note value.
- In total, we have  $2 + 1/2 + 1/2 + 1 = 4$  beats in this pattern.

## Other Parts of a Chord Pattern

- (weight  $w$ ) where  $w$  is a number, possibly with a decimal fraction, determines how likely this pattern is to get used.
- (push  $d$ ) where  $d$  is a duration, specifies that this pattern is to be "pushed" ahead of the beat, that is anticipated. Durations use the same notation here as with X or R, but there is no X or R.

## Use of Weights

- For a given span, all chord patterns of that span are collected together.
- Their weights are first summed to get  $s$ .
- A pattern with weight  $w$  is chosen with *probability*  $w/s$ .
- Note that if there is only one pattern of a given span, the weight will not matter, because  $s$  will be exactly that weight.

## Example with Weights

- Suppose the patterns of duration 4 are:
  - (chord-pattern (rules X2 R8 X8 R4) (weight 50.0))
  - (chord-pattern (rules X2. X4) (weight 25.0))
  - (chord-pattern (rules X8 R8 X2.) (weight 25.0))
- The sum of the weights is 100.
- The first pattern is chosen half (50/100) the time, and the other two patterns are each chosen one quarter (25/100) of the time.

## Bass Patterns

- Bass Patterns are similar to chord patterns, in that the same duration notation is used.
- As with chord patterns, you are advised to include at least one pattern of each of several common span lengths, such as 4, 2, 1, and perhaps 8.
- A longer span will be filled by using shorter spans in sequence. A span shorter than the ones available will not be filled and no bass note will be played.
- However, bass pattern elements need to specify a *function* for each note, as well as the fact that the note is being struck.
- Moreover, these functions have to work over any type of chord (major, minor, dominant, half-diminished, etc.), which leads us to our particular way of specifying bass note choices.

## Bass Pattern Elements

- $Bd$  or  $Xd$ , where  $d$  is a duration as before, mean that the bass note of the chord is struck with duration  $d$ . The note is often the root of the chord, but it could be different in the case of a slash chord. For example, if the chord is D/C, then the bass note is C, not D, which is the root.
- The reason for having both B and X is for ease in copying a drum or chord pattern to bass.

continued

## Bass Pattern Elements, continued

- $Cd$  means that some randomly-chosen *Chord* tone is chosen for striking. It could be the bass tone, or any other.
- $Ad$  means that a tone that *Approaches* the next bass note by a chromatic half-step is to be used.
- $= d$  means that the previous pitch is to be struck again, and held for duration  $d$ .
- $Nd$  is not currently working, so don't use it until advised that it is ok. (It originally meant to start the *Next* bass note before the next chord).

continued

## Bass Pattern Elements, continued

- $Sd$  means that some randomly-chosen *Scale* tone is to be used. The scale will be the first type of scale listed with the chord in the vocabulary (My.voc file). For example, if the chord is a m7, then the Dorian scale, based on the same root as the chord's root, will be used.
- $(X e d)$  means that the note at scale degree  $e$  will be struck for duration  $d$ . Degree  $e$  can be any of 1, 2, 3, 4, 5, 6, 7 optionally preceded by a # or b (for flat).
- $(X e d U)$  and  $(X e d D)$  are like  $(X e d)$ , but further specify that the next bass note is *Up* or *Down* from the previous, provided this can be done within the allowed range.

## Drum Patterns

- Drum pattern elements are similar to chord pattern elements,  $Xd$ ,  $Rd$ , and  $Vd$ .
- However, unlike bass and chords, drum patterns can consist of several patterns for different percussion instruments played concurrently.

## Drum Pattern Example

- The pattern below is from the style file shown earlier.
- The word “drum” is a keyword indicating the pattern for an individual instrument, the General MIDI name or number of which must follow.
- Weights for drum patterns are for the entire pattern, similar to chord and bass patterns.

```
(drum-pattern
 (drum Acoustic_Bass_Drum X8+32/3 R8/3+32/3 X8 R8 X8 R8 X8 R8)
 (drum Closed_Hi-Hat X8/3 R8/3 X8/3 X8/3 R8/3 X8/3 X8/3 X8/3 R8/3 X8/3 X8/3)
 (drum Acoustic_Snare R4 X8 R4+8 X8 R8)
 (drum Tambourine R4 X8 R4+8 X8 R8)
 (weight 50.0)
)
```

## Drum Pattern Lengths

- Unlike chord and bass, drum patterns will usually all be the same length, some multiple of the meter (e.g. length 4 for 4 beats to a measure).
- Each individual drum sub-pattern should have the same length. If any is shorter, it will be padded to be the length of the longest sub-pattern.

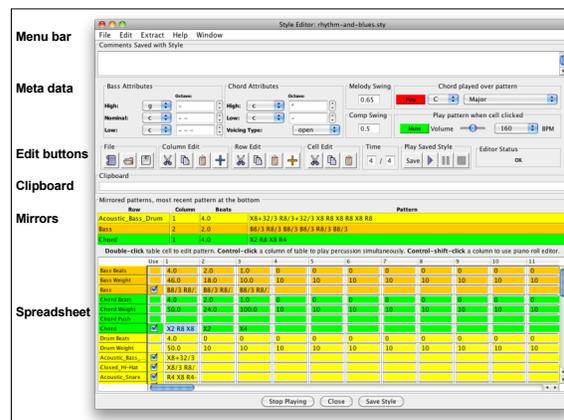
## Opening the Style Editor

- The Style Editor can be opened from any Leadsheet window, by either:
  - Pressing Control-Y
  - Using the Utilities menu in the menu bar.



## Organization of the Style Editor

- The Style Editor window is organized like a spreadsheet app.
- *Meta-data* settings are at the top.
- At the bottom is a *spreadsheet* with instruments as rows and patterns as columns.
- In the middle are three *mirrored* pattern fields, which are a convenience for editing patterns. These represent the most recent patterns selected.
- There is also a *clipboard* field, but you probably won't need to use it.



## Non-Coupling

- Even though they are stacked one above the other, the bass, chord, and drum columns are not coupled, but rather they are *selected independently*.
- On the other hand, all sub-patterns for percussion instruments in one column are coupled together.
- It is possible that a future version may provide for optional coupling of selected patterns, e.g. bass with drums, bass with chords, etc.

## Coupling and Non-Coupling

	Use	1
Bass Beats		4.0
Bass Weight		46.0
Bass	<input checked="" type="checkbox"/>	B8/3 R8/1
Chord Beats		4.0
Chord Weight		50.0
Chord Path		
Chord	<input checked="" type="checkbox"/>	X2 R8 X8
Drum Beats		4.0
Drum Weight		50.0
Acoustic_Bass_	<input checked="" type="checkbox"/>	X8+32/3
Closed_Hi-Hat	<input checked="" type="checkbox"/>	X8/3 R8/1
Acoustic_Snare	<input checked="" type="checkbox"/>	R4 X8 R4

Not coupled

Coupled as one pattern

## The Use Check-boxes

- Unchecking a Use box, then selecting some other box, will result in that particular instrument row not being saved when the style is saved. The row remains intact for subsequent exploration as long as the editor is open.

	Use	1
Bass Beats		4.0
Bass Weight		46.0
Bass	<input checked="" type="checkbox"/>	B8/3 R8/1
Chord Beats		4.0
Chord Weight		50.0
Chord Path		
Chord	<input checked="" type="checkbox"/>	X2 R8 X8
Drum Beats		4.0
Drum Weight		50.0
Acoustic_Bass_	<input checked="" type="checkbox"/>	X8+32/3
Closed_Hi-Hat	<input checked="" type="checkbox"/>	X8/3 R8/1
Acoustic_Snare	<input checked="" type="checkbox"/>	R4 X8 R4

## Beat Entries

- The Beat fields are computed from the style patterns. They are not editable.
- This provides a convenient way of checking that a pattern is of the length you think it is.
- For drum patterns in a column, the only the longest length is shown.

## Adjusting Column Widths

- Dragging on the border between two column headers will cause the column width to be enlarged or shrunk.

drag here →

	Use	1
Bass Beats		4.0
Bass Weight		46.0
Bass	<input checked="" type="checkbox"/>	B8/3 R8/1
Chord Beats		4.0
Chord Weight		50.0
Chord Path		
Chord	<input checked="" type="checkbox"/>	X2 R8 X8
Drum Beats		4.0
Drum Weight		50.0
Acoustic_Bass_	<input checked="" type="checkbox"/>	X8+32/3
Closed_Hi-Hat	<input checked="" type="checkbox"/>	X8/3 R8/1
Acoustic_Snare	<input checked="" type="checkbox"/>	R4 X8 R4

## Selecting Individual Entries

- Pressing a spreadsheet entry containing a pattern:
  - Plays the pattern.
  - Highlights the pattern.
  - Causes the pattern to be mirrored in the bottom of the three mirror fields.
- The last three patterns selected are the ones that are mirrored, most recent at bottom.

## Playing a Full Drum Pattern

- **Shift-clicking** anywhere in a column will cause the entire drum pattern in that column, if any, to be played.
- That is, all percussion sub-patterns will be played concurrently.
- This is the quickest way to sample the sound of a given drum pattern.

## Editing Individual Entries

- Selecting a spreadsheet entry highlights it.
- It can then be copied, cut, or pasted over. Use the **Cell Edit** icons or the usual editing shortcuts.
- Double-clicking an entry opens an in-place editor for detailed editing, results of which are effective when a different entry is selected.
- Editing can also be done in the Mirror fields. This is usually more convenient for large patterns.

## Editing a Block of Entries

- A rectangular block of entries can be copied, cut, and pasted.
- To select a block, select the cell in one corner, then shift-click the cell in the other corner.
- Use the Cell Edit icons for cutting and pasting.
- To paste, you must **pre-select** the block into which you wish to paste. The copied pattern will not overflow the boundaries.

## Caution: No “Undo” (yet)

- Currently the Style Editor does not have an undo/redo feature.
- If you have not saved your changes, you can reload the style as it was.
- If you have saved, you will need to revert by hand, so please be careful.
- Style files are copied to the user area on the first launch of a given version of Impro-Visor. You can get the original style file by visiting the installation directory, which is not normally changed by a given user.

## Correcting Errors

- If you make an error in specifying a pattern, the cell(s) in question will become **red**.
- In order to use the pattern, you must correct it.
- In the worst case, delete the whole pattern and re-enter, although in many cases, you can salvage part of the pattern text from the cell or some other cell.

## Assigning Weights

- Once you have entered a pattern, you should assign it a weight.
- The purpose of weights is described earlier in this document. Remember that weights apply within all patterns of a given length.
- Failure to assign a proper weight may result in a pattern being played too frequently or too seldom.

## Swing Values

- There are two swing values in the meta-data:
  - Melody swing is used to interpret the melody. It doesn't matter for the style patterns themselves.
  - Comp swing applies to the style patterns.
- Swing is only used in interpreting eighth note durations.
  - A value of 0.5 means consecutive eighth notes will be given the same duration, each 0.5 of a beat.
  - A value of 0.67 means the eighth note on the beat will be given about 2/3 of a beat duration, and the eighth note off the beat will be given 1/3.
  - Sometimes I use 0.55 to mean just a very slight swing.

## Range Attributes

- The Bass and Chord ranges are used to select ranges for the bass notes and chord voicings.
- Each setting is a combination of a pitch and an octave.
  - Octave \* means the octave just above middle C.
  - Octave - means the octave below that, -- the one below that, etc.

## Chord Voicing Attribute

- Possible chord voicings for each chord are specified in the vocabulary file.
- Each voicing has a specified type, currently one of {open, closed, quartal, and shout}.
- Specifying one of these types in the style will cause voicings of that type to be chosen.
- Typically "open" will be your best choice, for a full sound.
- Selecting "any" means to choose any type of voicing. This probably is not advised, as mixing voicings may sound strange in playback.

## Chord Played over Pattern

- The sound of both Chord and Bass patterns will depend on the type of chord and root note.
- Using the "Chord Played over Pattern" menu you can select the type of chord this is while editing the style. (This also gives a quick way to sample different chord qualities that Impro-Visor can provide.)
- This selection has no effect on the patterns that are saved.

## Playing a Saved Style

- In order to test how a style sounds with a particular leadsheet, we provide co-located convenience buttons for saving and playback.
- Note that you must select the same style in the leadsheet in order for this to work.
- Press Save to save the entire style, then play to pay the leadsheet from which the Style Editor was opened.

## Selecting Percussion Instruments

- The labels at the beginning of the percussion instrument rows can be changed by pressing down on the label.
- Select a percussion instrument from the 2-level popup menu.



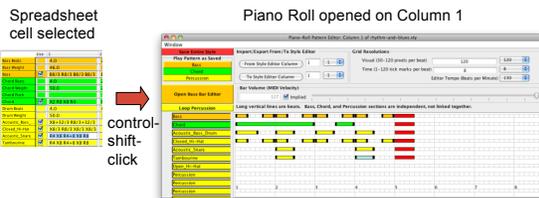
## Using the Piano Roll Editor

- The Piano Roll Editor is a separate window that provides visual editing of one column of the spreadsheet at a time.
- Using it, you don't need to know what all the pattern symbols stand for.
- However, it does not always provide the fastest way to edit a given style.

## Opening the Piano Roll

- Preferably select one cell in the spreadsheet, the column of which is to be examined or edited.
- Either control-shift-click the cell, or select "Use Piano Roll Editor" from the Edit drop-down menu.

## Opening the Piano Roll



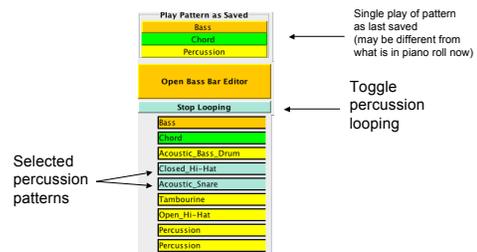
## Piano Roll Contents

- The piano roll is a visual representation of the style patterns in a given column.
- Each row corresponds to one instrument.
- The bars on the row correspond to notes played.
- The length of the bar is the time the note is on.
- Gaps between bars represent rests.
- The red bars on the right are "stops" indicating the end of the pattern (which could end with a rest).

## Playing from the Piano Roll

- Clicking any of the instrument labels on the left will play the corresponding pattern or sub-pattern.
- Bass and Chord are played once. Percussion will loop.
- In the case of percussion, only the selected instruments will be played, all together.
- Toggling the Loop Percussion button can start and stop play of the selected percussion instruments.

## Playing from the Piano Roll



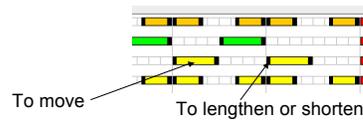
## Loading/Saving from the Piano Roll

- One column of the spreadsheet is edited at a time.
- You can save to a different column than the original, e.g. to an empty column.
- Press the corresponding buttons to save or reload.
- If you do not save, your changes will not be recorded in the Style Editor.



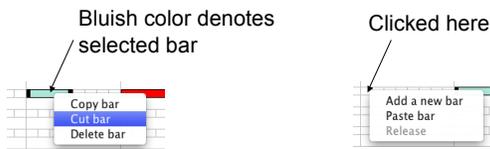
## Adjusting Bars

- Bars can be lengthened or shortened by dragging on the blue tabs at either end.
- Bars can be moved by dragging from the middle of the bar.



## Cutting and Pasting Bars

- Clicking on a bar will pop up a menu offering to copy, cut, or delete.
- Clicking on space will offer to add or paste.



## Adjusting Volume (MIDI Velocity)

- Each bar represents a note and can have its velocity set independently.
- In a style pattern, setting the volume will have that effect on all following notes, up until the next volume setting.
- In the style editor, these settings can be entered by inserting  $Vn$  before a strike, where  $n$  is a number from 0 to 127.

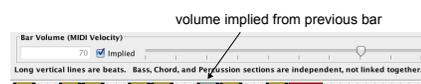
## Adjusting Volume in the Piano Roll

- To adjust volumes using the piano roll, first select a bar.
- The slider and text field will indicate the volume for that bar.



## Implied vs. Set Volumes

- For any note, the volume can either be:
  - Set explicitly
  - Implied, as the same as volume of the previous note(s).
- The checkbox determines which case for the selected note.
- The volume can only be changed when implied is unchecked, as shown in the previous slide.

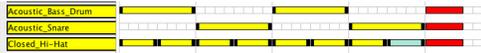


## Drum Example Using Piano Roll

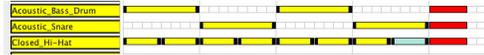
- Suppose we want to enter this drum pattern (from [http://en.wikipedia.org/wiki/Drum\\_tablature](http://en.wikipedia.org/wiki/Drum_tablature))



- Using commands described previously, we can get this result:



## Drum Example



- In the Style Editor, we would see these patterns in the mirror fields as:

Row	Column	Beats	
Acoustic_Bass_Drum	1	4.0	X4 R4 X4 R4
Acoustic_Snare	1	4.0	R4 X4 R4 X4
Closed_Hi-Hat	1	4.0	X8 X8 X8 X8 X8 X8 X8 X8

- In the textual notation of the style file, we would have:

```
(drum-pattern
 (drum Acoustic_Bass_Drum X4 R4 X4 R4)
 (drum Acoustic_Snare R4 X4 R4 X4)
 (drum Closed_Hi-Hat X8 X8 X8 X8 X8 X8 X8 X8)
 (weight 10.0)
)
```

## Adjusting Bass Notes

- Because bass notes have the most options, there is a separate helper editor provided, which is opened by the button "Open Bass Bar Editor".

Open Bass Bar Editor

- This dialog reveals the pattern element attached to each bass bar.
- By changing the settings in the dialog, then pressing Set, the pattern element is set.

## Bass Note Dialog

Select one of 6 categories (exclude Next for now).

These buttons are only meaningful when Pitch is selected. 1-7 represent scale degrees, b and # represent flat and #, Direction is direction to this note.

These three fields are generated for you, for reference.

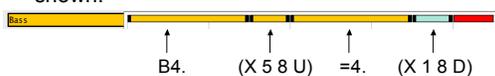
Selection becomes effective only when Set is pressed.

## Bass Example Using Piano Roll

- Suppose we want to enter this bass pattern (from "Song for My Father", by Horace Silver).



- Due to its repetitive nature, it can be achieved by the following 1-measure pattern, where the bass bar contents were individually edited as shown:



## Bass Example Using Piano Roll

- Here is a recap of what the elements of this style pattern mean:
  - B4.** means the bass note of the chord, held for the duration of a dotted quarter note.
  - (X 5 8 U)** means the fifth scale degree, held as an eighth note, and forced to go *Up* from the previous note.
  - =4.** is the same pitch as the previous note, but with a duration of a dotted quarter note.
  - (X 1 8 D)** is the root of the chord (scale degree 1), with a duration of an eighth note, forced to go *Down* from the previous note.