



Tutorial

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1 Introduction

1.1 What is easy beat?

easy beat is a music authoring program for the Apple Macintosh. It uses the QuickTime Music Architecture (QTMA) to play songs. If you have QuickTime 3.0 or newer installed, you don't need extra hardware or software to create and play songs with **easy beat**. If you have a MIDI adapter and an external synthesizer, you can take advantage of your special hardware, too.

easy beat was designed to be easy to use (hence the name). Nevertheless, **easy beat** provides enough functionality for composition and scoring. **easy beat** features:

- up to 16 song tracks plus a metronome track
- multiple views of individual tracks: score, keyboard, TAB, drum, chord and controller views
- MIDI import and export as well as export to QuickTime movies and AIFF files
- 128 instruments and nine drum kits (according to the GM standard) plus the GS sounds supported by QuickTime. The range of available instruments can be extended with instrument description files when an external synthesizer is used.
- WYSIWYG editing with a simple modeless point-and-click user interface
- a special tempo controller for tempo changes during a song
- background music (play songs while you edit them or do something else)
- real-time recording (requires a MIDI adapter and a MIDI instrument)
- high-quality score printing with on-screen preview
- stylistic variations (such as shuffle, delay, arpeggio and simulation of human musicians)

easy beat currently does **not** support:

- audio tracks
- lyrics, cue points and other notes
- professional scoring

1.2 System Requirements

To use **easy beat**, you need:

- A Macintosh with a 68020 processor or better (PowerPC is recommended). You can use **easy beat** on slow machines (we even tried it on a Mac II si with 20 MHz), but this is not recommended for songs with more than four or five tracks.
- 2 MB of available memory (4 MB recommended)
- System 7.5 or newer (Mac OS 9.1 is recommended)
- QuickTime 3.0 or newer (QT 4 recommended; available from <http://www.apple.com/quicktime/>)

1.3 Installation and Setup

Installation of **easy beat** is rather straightforward. Just copy the **easy beat** folder to a convenient location on your hard disk. To print scores, you also need to install the EasyNotes font. To do that, simply drop the EasyNotes suitcase file onto the (closed) System folder. When the Finder suggests to move the file into the Fonts folder, click the OK button.

If you already have an older version of EasyNotes installed, remove that copy first: Quit all applications, open the Fonts folder and drag the old EasyNotes suitcase file to the trash.

The next step is to configure QuickTime:

- Open the **QuickTime™ Settings** control panel.
- Select **Music** from the pop-up menu.
- If you wish to use the built-in synthesizer (without extra hardware), make sure that the **QuickTime Music Synthesizer** is enabled. We suggest that you start with this setting when you run **easy beat** for the first time.
- If you wish to use an external synthesizer, you may first need to edit the list of available synthesizers.
- If you wish to use a keyboard or other MIDI instrument for recording, click **Edit List** and select the desired input port for **MIDI Input**.
- Close the **QuickTime™ Settings** control panel.

1.4 Sending a Report

If you wish to report a problem with **easy beat**, select **Send Email Report** from the web menu (the menu with the world icon). **easy beat** will then create an email message for you that already contains some essential information about your installation. Simply complete the report with your comments and send us the message.

In case you cannot even launch **easy beat**, send your report to

easybeat-support@macility.com

1.5 About this Documentation

The **easy beat** documentation consists of two parts. This part is a tutorial that leads you through typical tasks. We recommend that you install **easy beat** and then follow the instructions in the tutorial step by step. Once you have finished that, you will be able to create even complex songs easily.

The second part is the reference manual. It covers all parts of **easy beat** and explains menu commands, dialogs, shortcuts, etc. You don't need to read the reference manual before you start working with **easy beat**, but you may want to consult it later when you have specific questions while you work.

2 Before We Start...

Before you begin with the tutorial, you should install **easy beat** and the EasyNotes font. Even if you have a MIDI interface and an external synthesizer, we recommend that you use the “QuickTime Music Synthesizer” during the tutorial. Some hardware synthesizers are not fully compatible with General MIDI and may therefore produce different results when you play your songs. Later in the tutorial, we will discuss how you can adjust **easy beat** to match almost any MIDI synthesizer.

How can we best show you how **easy beat** works and how you can get the most out of it? We have tried very hard to make **easy beat** easy and intuitive to use, but there are still some details and shortcuts that need explanation. The best way to teach using a program would be to sit next to you and guide you through some typical steps. Since we cannot do that, we have tried the next best thing, so we have set up this tutorial. We’ll create a short song (well, actually only a few measures) from scratch. We will not follow a particular order but rather introduce new elements when needed. During this process, you will get to know every single element of **easy beat**.

We recommend that you follow the tutorial step by step. Most exercises start with the result of the previous step. If you make a mistake or wish to skip some steps, watch out for the miniature document icons:

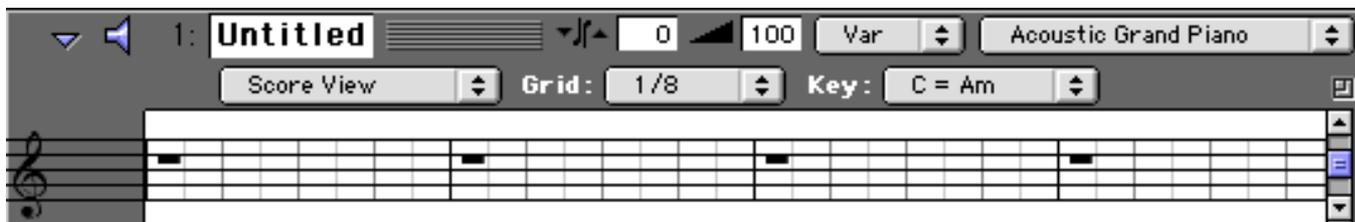


Wherever you see such an icon, you will find a corresponding **easy beat** document in the “Tutorial Files” folder that you can use to continue the tutorial.

Note: The documents in the “Tutorial Files” folder have been marked as *stationery documents*; they will be opened as “Untitled (Txx)”. If you attempt to save such a document, **easy beat** will ask you to give the document a new name, so you cannot inadvertently destroy the tutorial files.

3 The Basics

Now that you have **easy beat** installed and QuickTime set up, you can create your first song. When you double-click the **easy beat** application, it opens a new untitled song window with a “Master” track and one song track. For now, let’s ignore the Master track and take a look at the song track:



The track has a title bar with a couple of control elements. Most of these elements appear in other tracks, too, so it is a good idea to make yourself familiar with them:

- Use the **triangle** at the left side to collapse and expand the track.
- Click the **speaker symbol** to enable or disable the track.
- Next comes the **track number**. Since this is the first and only track, it has the number 1 (the Master track doesn’t count).
- Each track has a **name** (here: “Untitled”). To change the track name, click it and type the new name.
- The symbol ∇/\uparrow marks the **transposition** field (with the initial value 0). To transpose a whole track, enter the number of semitones (in the range -24 to +24). A positive number means that the track should be played higher than noted. To change the transposition, you can also click the ∇/\uparrow symbol and drag the slider up or down.
- The symbol \blacktriangle marks the track’s **volume** (in the range 0 to 100). The volume is preset with the maximum 100. To make the track sound softer, enter a smaller value in the text field or click the \blacktriangle symbol and drag the slider up or down.
- The **Var** pop-up menu is used to apply **variations** to the track. We’ll discuss variations later in this tutorial.
- The pop-up menu at the right side of the track is used for changing the **instrument**. When you click the menu, a hierarchical menu appears that shows all available instruments neatly arranged in categories.
- The second line in the header starts with the **view** pop-up menu. We will see later how you can switch views and even work on a single track in multiple parallel views.
- The **Grid** pop-up menu is initially preset with 1/8. The grid is used for creating new notes as well as for moving notes and adjusting them with the arrow keys on your keyboard.
- The **Key** pop-up menu is preset with “C = Am”. It appears only in the score view.
- The **zoom box** (☐) at the right resizes the height of the score view such that all notes are shown.
- In addition to these items, the score view has a small **scrollbar**. You can use the **handle** (☐) just below the scrollbar to manually change the height of the score view.

Hint 1: If you don't know what an element means or what you can do at a certain location in a song window, just look at the status bar right beneath the menu bar. The message shown there tells you what you can do at that location and often provides additional information about the item you're pointing at.

Hint 2: Watch the mouse pointer changing its appearance while you move it around in a song window. In most cases, the shape of the mouse pointer gives you some kind of information what a click would do. If the normal arrow appears, clicking typically does nothing.

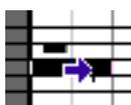
3.1 Creating and Moving Notes

Now let's draw some notes. You will notice that there are no "tools" for creating, selecting, moving, copying and erasing notes. There also is no visible control element for the duration of notes. So how would you draw a quarter "A" note at the beginning of the first measure?

When you move the mouse pointer around in the score area, you will see that it takes the shape of a note head. You will also notice a vertical dotted line following your movement. Well, not quite, as the vertical line always jumps from one grid position to the next. If you watch the status bar while strolling around, you'll see that the message says "Create Note" and also tells you what note you would create and at what position within the song. Now move the note head to the "A" line at the beginning of the first measure. The dotted line should jump to the beginning of the measure, and the status bar should show the following message:

Create Note : A5 @ 1 :0

"A4" stands for "middle A" (440 Hz), and "A5" is one octave higher (880 Hz). "1:0" means that you currently point to the very beginning (offset 0) of measure #1. If you press the mouse button now, the note head changes to . If you release the mouse button again, nothing happens. Try it again, but this time drag the mouse pointer to the right (and make sure you stay within the "A" line). A black bar will appear. Drag until the right side of the bar reaches the end of the first quarter:



Now release the mouse button and watch a red quarter note appear. Note that rests have been inserted to fill the remainder of the measure. The color red means that the note is selected. To deselect it, briefly click anywhere else in the score area (remember that nothing happened when you simply clicked?) or hit the *esc* key on your keyboard. The note now appears in black.

To select the note again, point at it and click. As long as you point at a note, the mouse pointer changes to , indicating that you can move the note. Try it: Press the mouse button and move the note around. You'll see that a black bar follows the mouse pointer. Release the mouse button when the bar appears where you want it. If you didn't want to move the note, move the mouse pointer

outside the score area. The black bar will snap back to the original location. If you release the mouse button now, the note remains where it is.

Hint: When you press the \uparrow key while moving, the note will remain on the same line (i.e., its pitch will be maintained). A \uparrow -move is a convenient way to duplicate parts of a song without transposing them.

3.2 Copying Notes

Notes or entire sequences of notes can often be created more easily by duplicating existing notes. On the Macintosh, the \leftarrow key is typically used for copying things instead of moving them. **easy beat** is no exception. Point at the note, press the \leftarrow key (the mouse pointer changes to \oplus), drag the note to the new location (for example, to B one quarter to the right) and drop the note. The result should look like this:



Now let's try to duplicate both notes and move them to the third and fourth quarters of the measure at C and D. To select multiple notes, you have two choices (in this case three, as you could also use the **Select All** command from the **File** menu):

- You can select the first note and then \uparrow -click all other notes to include them in the selection.
- You can use a range selection. To do that, click at an empty position and then move the mouse pointer to the left or outside the current note line. A selection rectangle will appear. Make the rectangle enclose the desired notes, then release the mouse button:



Now click one of the selected notes, press the \leftarrow key and move both notes to the destination location. The black bar shows the exact position and duration of the note that you clicked on.



3.3 Playing the Song

Now that we have a simple “song”, we can play it. Before we do that, let’s first take a look at the controls in the top left corner of the window:



The “REC” button is used for recording from a keyboard or another MIDI instrument. The button with the green triangle is the “play” button. Click the button to start playing the song from the bar that’s shown in the field next to it. While the song plays, the play button changes to a stop button (with a red square in it). If you don’t do anything, all notes will be played and then the song will automatically stop.

Hint: If you don’t hear anything, please refer to the “Troubleshooting” chapter in the **easy beat** reference document.

The third button is the “loop” button. Click it to repeatedly play the bar range shown in the next two fields (in this case, just the first measure). Then click the play button again. The song will be played again and again until you either turn off the loop or click the stop button.

Hint: While the song plays, try to do other things. For example, you can pull down menus, switch to the Finder, copy files, and so on. No matter what you do, **easy beat** will continue playing the song.

Shortcut: Instead of clicking the play/stop button, you can hit the enter or return keys on the keyboard. To turn the loop on or off, you can also hit the “+” key on the numeric keypad.

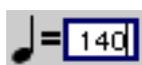
While the first measure plays repeatedly, try to create new notes or move notes around. **easy beat** will immediately update the song and play the new notes. You can even change the track’s instrument.

If the song plays too loud for your taste, pull down the **Music** menu and move the mouse pointer to the **Master Volume** item. Then drag the volume slider to the desired percentage:



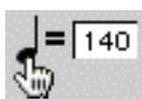
The master volume affects all tracks of a song by turning the total volume down.

While the song plays, you can also change the tempo. To do that, click the tempo field in the top right corner of the window and enter a new value:



The number is the tempo in “BPM” (“beats” or quarters per minute). **easy beat** supports the range from 30 up to 400 BPM.

As an alternate way to change the tempo, point at the note; the mouse pointer changes to a pointing hand and the message “Click Repeatedly to Change the Tempo (1 click = 1/4)” appears in the status bar:



Now click a few times to tell **easy beat** how fast the song should play. Every click represents a quarter note; if you click exactly twice a second, the tempo should therefore change to 120.

Hint 1: **easy beat** counts up to ten clicks and computes the tempo based on the average time between the clicks. If you click more often, the precision increases.

Hint 2: If you press the ⌘ key while clicking, the clicks mean eighths rather than quarters. To set the tempo to 120, you must click four times per second. If you press the ⇧ key instead, every click marks the beginning of a bar. When the time signature is set to 4/4, click every two seconds to set the tempo to 120.

Hint 3: ⌘-clicks are particularly useful to synchronize the tempo with a song while listening to it. ⌘-click for about five bars, and the tempo should be pretty close to that of the original song.

3.4 WYHIWYG (What You HEAR Is What You Get)

While editing, you can verify what you do quite easily. Check the **Play During Edits** item in the **Music** menu. Now select, create and move notes. You get an immediate audible feedback that often makes it easier to get your song right.

Note: As long as a song plays, the **Play During Edits** command has no effect.

If you want to hear a small section of a song, you can select the notes and hit the space bar on your keyboard. The selected notes will play with the correct timing and tempo.

3.5 Deleting Notes

You probably already have found out how notes can be deleted. Just select them and hit the backspace or delete key on the keyboard. Of course, you can always undo the last change just in case you have deleted something inadvertently.

3.6 Changing the Length of Notes

First copy one of the quarter notes to the beginning of the second measure. Now let's change that note into a half note. To do that, point at the note (make sure nothing else is selected) and move the mouse pointer slightly to the right side of the note head until the mouse pointer appears as a horizontal double arrow:



Now click and pull the end of the note to the right until the black line fills the first half of the second measure:

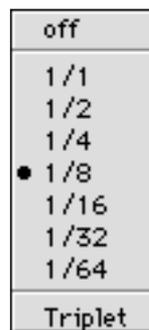


Now release the mouse button. The quarter note is replaced by a half note.

You can change the length of multiple notes in this way. Select all notes you want to change and then pull the right side of one of the notes to the left or right. All selected notes will be shortened or lengthened by the same amount, but they will still begin at the same time within the song.

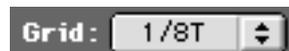
3.7 Using the Grid

Until now, we have played around with quarter and half notes, but what about 1/16, 1/32 notes and triplets? If you wish to create short notes, you first have to change the grid. Click the grid menu and select the resolution of your choice:

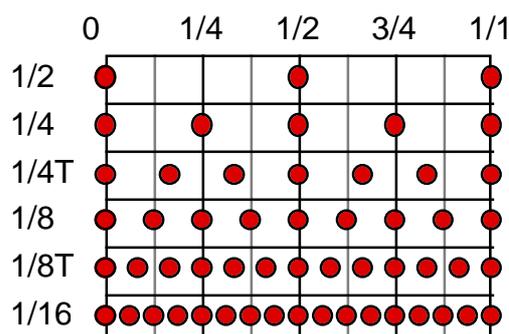


The finest grid setting is 1/64. However, **easy beat** will display 1/64 notes as 1/32 notes, since 1/32 is the finest display resolution.

If you do not want any grid, select “off”. To create triplets, select the desired duration (for example, 1/8) and then check the “Triplet” item. The pop-up menu then shows the letter “T” after the grid setting:



The following figure shows the resulting grid positions for some typical settings:

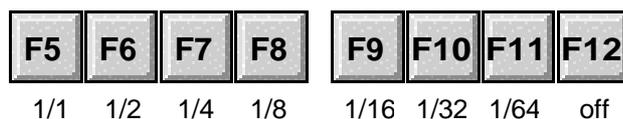


As we have seen, the grid setting applies when new notes are created. In this case, the grid restricts both the starting time and the duration of the note to the selected resolution. The grid also applies when you move or copy notes and when you change the length of notes. In these cases, the grid affects the amount of movement (the “delta”), not the destination position or length. For example,

you can move an entire measure with 1/16 triplets using a 1/2 grid to another measure. The notes will all retain their relative positions; they will not snap to the 1/2 grid, but rather jump in 1/2 steps to the right or left.

You can also align one or multiple existing notes to the current grid position. To do that, select the note(s), make sure the grid pop-up menu shows the desired resolution, and select the **Align To Grid** command from the **Edit** menu. Both the starting and ending time of the selected notes will be adjusted to the nearest grid position.

Shortcut: If you have an extended keyboard, you can use the function keys in the top row to quickly change the grid in the following way:



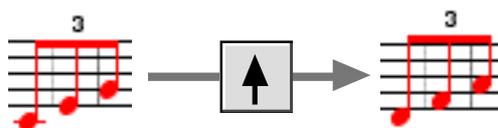
The “T” key toggles the “triplet” setting.

Shortcut: You can temporarily disable the grid while creating, moving or resizing notes by pressing the ⌘ key.

Hint: Every single track (in fact, every view of a track, as we will see later) has its own grid setting. You can use a 1/4 grid for a slow organ part and a 1/32 grid for a lightning-fast guitar solo at the same time.

3.8 Keyboard Editing

You can use the arrow keys and the tabulator key for selecting adjacent notes and for moving notes in small steps. The arrow keys move the selected note(s). Left and right movements use the currently active grid. The up and down arrow keys move the notes up and down the note lines. Note that hitting the up arrow key once doesn’t mean that the selected notes are transposed by one semitone. They rather jump to the next line, as shown in the following illustration:



When moved up one line, the C major triplet becomes a D minor triplet; C advances two semitones and becomes D, whereas E moves up one semitone and becomes F.

To move the selected notes up or down an octave, press the ⇧ key along with the up/down arrow keys.

To change a few notes in a sequence, you can use the tabulator key to step through the notes. If the **Play During Edits** mode is active, you will also hear the notes as you select them. Then use the arrow keys to adjust the note. To go back to a previous note, hold down the ⇧ key while hitting the tabulator key.

There are also keyboard shortcuts for changing the length of selected notes. Select some notes, then hold the ⌘ key while you hit the left or right arrow keys. All selected notes are shortened or lengthened by the current grid setting. For example, set the grid to 1/8. Then create an 1/8 note at the beginning of a measure, select it, press the ⌘ key and hit the right arrow key a few times. The note should change in the following way:



3.9 Out of Key

Until now, we have created notes in C major (or A minor). What if we wish to create notes that don't belong to that key? Let's try that with a fragment in the A blues scale, consisting of six 1/8 notes: A, C, D, D#, E, G. Before we start, first clear the entire track. Choose **Select All** from the **Edit** menu (or type ⌘-A), then hit the backspace key. Make sure the grid is set to 1/8.

The first three notes are easy. We can draw them as usual. Now point at the D line and look at the status bar. It should now show the following message:



Now press the *caps lock* key and look what happens to the status bar display. You'll notice that "D5" changes to "D#5":



That's what we want. Now draw the note as usual and don't forget to release the *caps lock* key afterwards.

Hint 1: On many keyboards, the *caps lock* key already becomes active before it actually locks down. Softly press the key until you feel a resistance. "D" will change to "D#", and if your keyboard has a *caps lock* indicator light, that will go on, too. In this way, you can quickly create out-of-key notes without having to unlock the *caps lock* key again.

Hint 2: If you move the cursor to the B or E line, you will notice that the status bar message doesn't change when you press the *caps lock* key. That's because B# is the same note as C, and E# is the same as F. Pressing the *caps lock* key doesn't mean "up one semitone" but rather generates an "alternate note" on the current line, which usually means adding or removing an accidental. Pressing the *caps lock* key in G major/E minor will turn "F#" (which is now part of the key) into "F".

Now continue with the notes as usual, until you have the following result:



Now select the D# note and move it down one line using the down arrow key. You'll notice that the note became C#; it still has a "#", but one note line further below. Hit the down arrow key again, and you get a B without an accidental (because there is no "alternate note" on this line; B# would be the same as C). If you move the key up again twice using the up arrow key, you will see that it has lost its accidental. It will jump to C, then to D. Now hit the up arrow key again with the *caps lock* key down. The D becomes D# again. When you play around with the up and down arrow keys while pressing the *caps lock* key, you'll notice that the note doesn't jump from line to line, but the note's pitch is incremented or decremented by semitones. This is a handy way to transpose notes by small intervals.

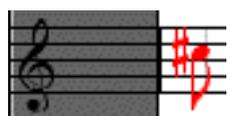
Hint: When you move notes up and down with the cursor keys, the ⌘ key has the same meaning as the *caps lock* key.

You can use the *caps lock* key also when you move notes with the mouse. Select some notes, press the *caps lock* key, and then move the notes up and down. This time, the notes jump to the destination line, and the intervals between the notes are maintained.

Hint: When you use the mouse to move notes by semitones, you *must* use the *caps lock* key because the ⌘ key is already reserved for temporarily disabling the grid.

3.10 Manual Accidentals

easy beat normally translates notes with a given pitch into a standard representation, depending on the current key. For example, the note between C and D appears as C sharp in C major and as D flat in C minor:



C major

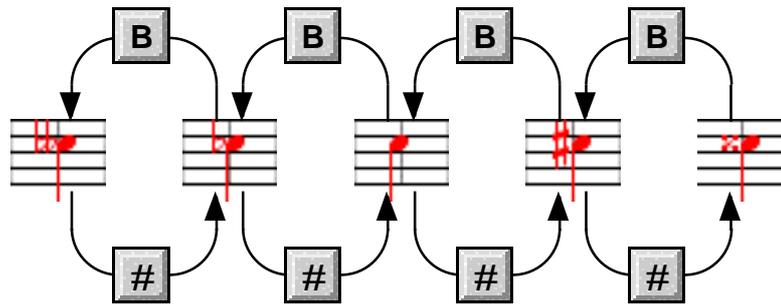


C minor

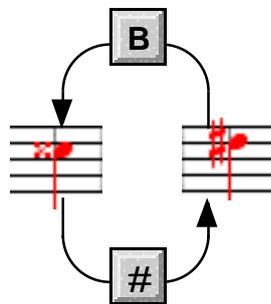
This default notation will not always match your intention. For example, if the "C sharp" in the first example immediately follows a D, you may want to indicate that the note should be lowered by one semitone by putting a "b" in front of a D. You can do this by entering the note D first. While the note is selected, type the letter "B" on the keyboard. The note will remain on the same line but will appear with the desired "manual accidental" in front of it. Of course, the pitch of the note will also be lowered by one semitone, so you can be sure that it sounds right.

If you hit the "#" key instead, the note is prefixed with a "#", as you would expect. The "B" key and the "#" key perform the inverse operation. When you type "B" when a C sharp is selected, the "#" will be removed and vice versa.

You can repeat these steps to create double accidentals. The following illustration shows what happens when you type “B” and “#” repeatedly. The starting point is the note C in the middle.



easy beat does not support triple accidentals. When you type “B” or “#” when the selected note already has the corresponding double accidental, the note will move to the next line and the accidental will be adjusted accordingly, as shown in the following figure:



4 Dynamics and Variations

4.1 Adding Dynamics to the Song

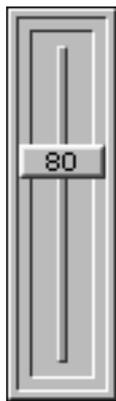
When you’re done with your out-of-key experiments, make sure the first measure looks as in the figure above again. Now complete the measure by adding two more 1/8 notes: D and C. Note that the correct accidental is inserted before the D. The first measure should now look as shown in the following illustration:



 T02

Now set the loop to 1-1, enable the loop, and let the song play. It sounds quite okay, but not very natural. If you played the sequence on a keyboard, you would certainly hit the A and E keys (the first note and the note at the beginning of the third quarter) a bit harder. In MIDI terminology, the term *velocity* means how hard or soft a note is played. The exact meaning and the effect of different velocities depends on the instrument.

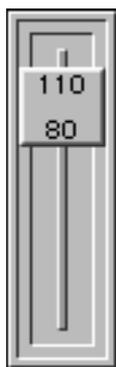
So, how do we change the velocity of individual notes? Hold down the *ctrl* key and click on the first note. The following slider appears as long as you press the mouse button.



The notes have been created with a default velocity of 80. To change that, simply drag the slider up or down. The velocity can vary in the range 1-127, where 1 is almost inaudible and 127 is very loud. Move the slider to 127, then repeat this operation for the fifth note.

The song will now sound more natural. If you feel that the emphasis of the first and fifth note is too strong, you can adjust both of them at the same time. Select both notes (use the \uparrow key to select the second note), then *ctrl*-click one of the selected notes and drag the slider to a moderate velocity between 80 and 127, for example to 110.

Finally, select the entire song and *ctrl*-click one of the notes again. The slider now shows the velocity range from 80 to 110 and lets you increase the velocity of all notes by the same amount:



Hint 1: You can change the default velocity (which is used for newly created notes) by *ctrl*-clicking in an empty space of the score area. In this case, the mouse pointer appears as a miniature slider with the letter “D”. If you want to change the velocity of selected notes, make sure you point exactly at a note such that the letter “D” disappears.

Hint 2: Velocity changes are always relative. If you have notes with the velocities 20–100, you can reduce their velocities to 1–81 or increase them to 47–127. If you wish to change the velocities of all selected notes to the same value, press both the \uparrow and the *ctrl* key when you click at a note. The slider will then show an average value, and the velocities will all change to the selected value when you release the mouse button.



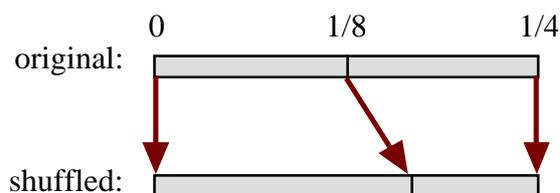
4.2 Adding Variations

Now that we have a straight blues scheme with some emphasis, let us add a variation to the song. Click the **Var** pop-up menu in the track heading and select the **Shuffle** command:

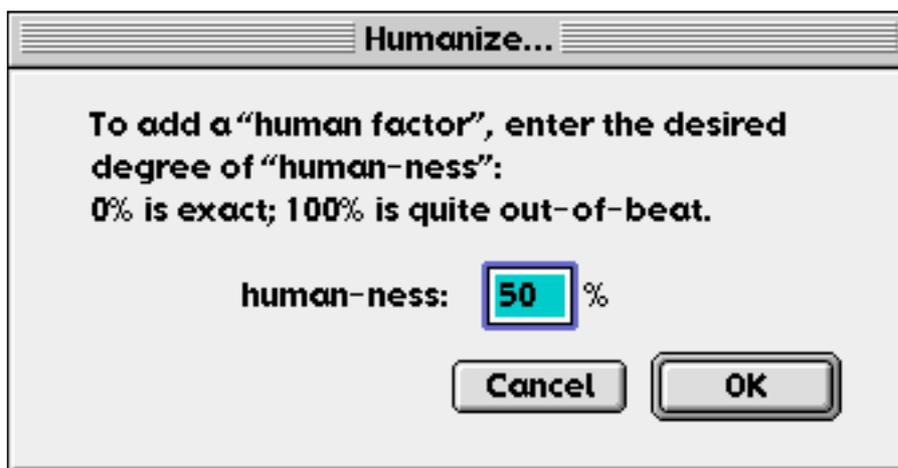


Hear the difference? Although the song now sounds different, the appearance of the notes is still the same. Variations do not affect the notation, only the way how the notes are played. This means you can experiment with variations and switch them on and off without distorting your song.

What exactly does the “Shuffle” variation do? It stretches the first half of each quarter to fill the first $\frac{2}{3}$ of the quarter and squeezes the second half into the remaining third. In other words, it turns the $\frac{1}{8}$ notes into triplets:



Now let's try the “Humanize” variation. As the three periods suggest, selecting **Humanize** brings up a dialog:



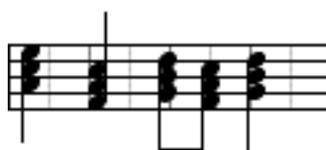
Leave the “human-ness” at the suggested value of 50% and click OK. This variation adds random deviations to the timing to simulate a human player and make the song sound a bit more natural. If you can’t hear the difference, select **Humanize** again and increase the value to 75% or even 100%. Adding a “human factor” to a song is particularly useful when you have multiple tracks. In real life, five or six musicians would hardly be synchronized perfectly. “Humanizing” the song means that notes played at the same time will be slightly offset. When applied carefully, the effect is hardly noticeable except that it lets the song sound less like computer music.

Now that we have added two variations to the track, the variation pop-up menu appears as

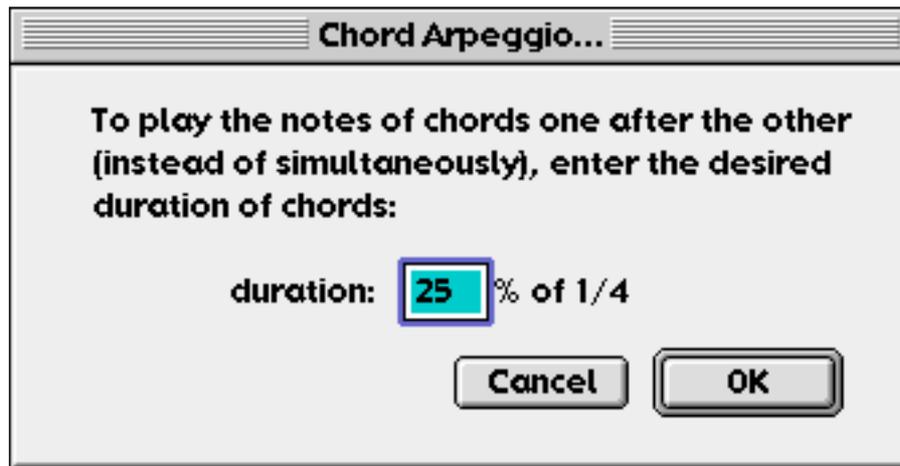


To get rid of the variations, select **Shuffle** again to uncheck it. Then select **Humanize** and click the **Remove** button in the dialog.

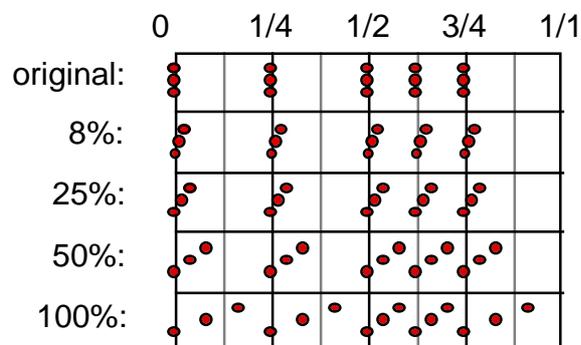
Now let’s try the **Chord Arpeggio** variation. When you apply that to the current song, you will not hear any difference. We first need to add some chords. Add the following notes in the second measure:



Now set the loop to “2-2” and let the song play. All notes of the chords are played at exactly the same time. No human player would do that. To let the notes play slightly one after the other, select **Chord Arpeggio**. The following dialog appears:

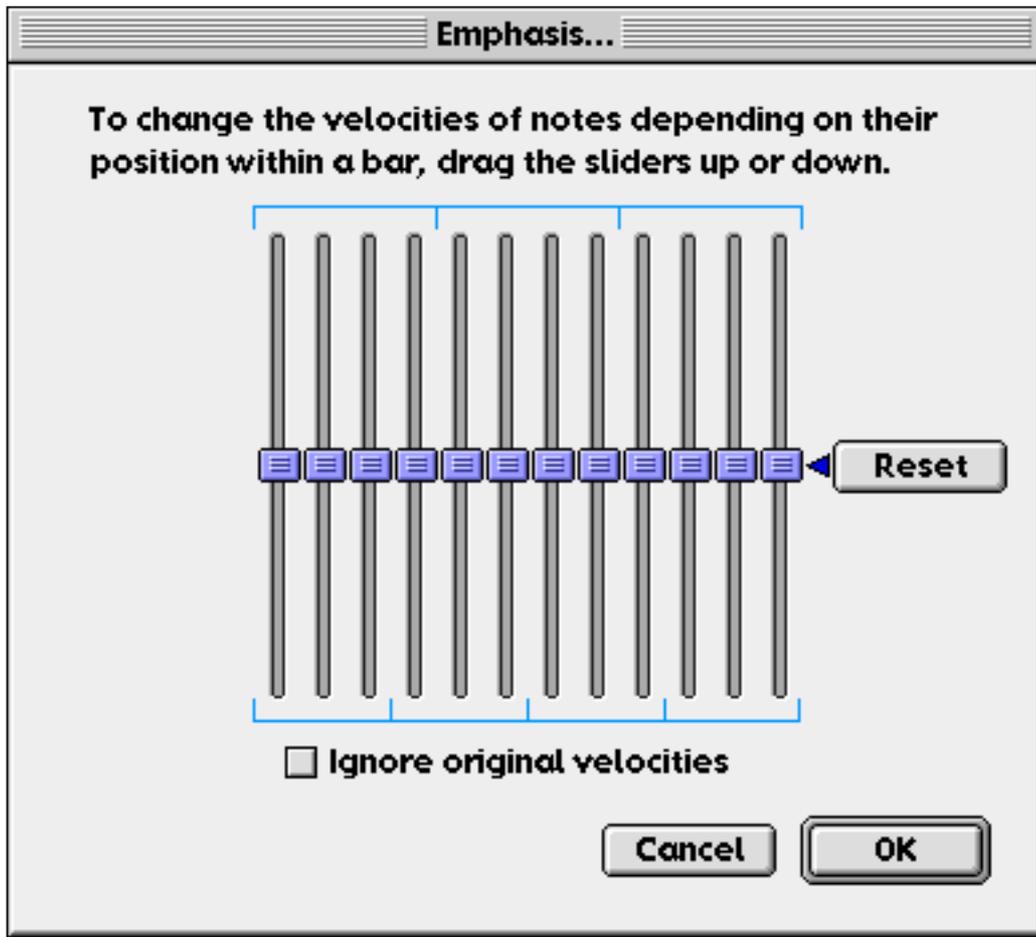


Enter a small value first, for example 8%, and lower the tempo to 60 BPM, so you hear the effect more precisely, then let the second measure repeat over and over. You will hear that the chords now sound as if a human player hit the keys slightly one after the other. The delay between adjacent notes increases as you enter a higher percentage, for example, 25%. Now the chords are clearly separated into individual notes. If you increase the percentage to 50%, the chords will sound as if the notes were played as 1/8 triplets. Since there are three notes in each chord and 50% of a quarter is 1/8, the notes will be distributed equally over 1/8. If you further increase the percentage to the maximum of 100%, the first two and the last chords will be played as quarter triplets, but the eighth chords will still be played as 1/8 triplets. The reason for this is that the separation of chords into individual notes is done in such a way that the order of chords is maintained; no note is allowed to move beyond the next note. The following table shows the effect of the arpeggio with the percentages we tried so far:



Chord arpeggio is a particularly useful variation when used on a guitar track. For example, you can simulate Flamenco style with a chord arpeggio in the range of 8% to 15%. The best setting depends on the number of notes in the chords, the distance between the chords and the tempo at which the song is being played. Just experiment with some settings until you get the desired results (and don't forget that you can change the arpeggio while the song is playing).

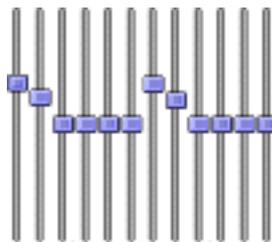
Now let's try what the **Emphasis** variation does. If you select it from the variation pop-up menu, the following dialog appears:



Think of each measure divided into twelve parts of equal length. The first three sliders thus represent the first quarter in 4/4, as indicated by the brackets along the bottom of the sliders. The brackets along the top give you a similar cue for 3/4 and 6/8. To emphasize notes in a certain section of a measure, drag the corresponding slider(s) upwards; to make them sound softer, drag them downwards.

The “Emphasis” variation simply increases or decreases the velocities of notes, depending on their position within a measure. If the notes already have different velocities, the total effect depends on both the original velocities and the slider positions. To avoid confusing results, you may want to enable the checkbox below the sliders. If the checkbox is on, all notes are set to a medium velocity (64) before the slider changes are applied.

To create a similar effect as before (when we increased the velocities of the first and fifth note), click the **Ignore original velocities** checkbox and arrange the sliders in the following pattern:



After you click OK, the first and third quarters will be emphasized. You will notice that this effect not only affects the first measure, but also the chords in the second measure.

Finally, the **Delay** variation can be used to make a track lag behind all other tracks. Since we have only a single track, you will not hear any effect at all. We will try this variation when we have more tracks to play with.

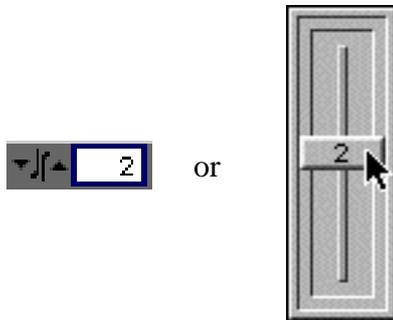
You probably have already noticed that **easy beat** also has a **Variation** pull-down menu in the menu bar which has the same contents as the pop-up menu in the track header. If you use the pull-down menu, the variations are applied to all tracks of the song, so you don't need to "shuffle" or "humanize" all tracks separately.

5 Changing the Key

Before you continue, remove all variations again until the variation pop-up menu shows "Var" and no check marks appear in the **Variation** pull-down menu. Then change the tempo back to 120 BPM.



What you have now is a simple blues fragment in A. Let us now turn that into a blues in B. A simple way to do that is to transpose the track up by two semitones. Enter "2" or "+2" in the transposition field or click on the transposition symbol next to it and drag the slider to the "2" position:

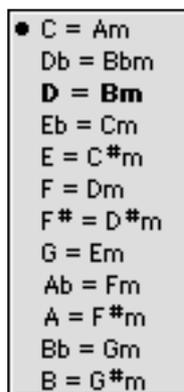


When you play the song, all notes are transposed by two semitones, but the display didn't change. Occasionally, this is exactly what you want (for example, when you create a track for a brass instrument that is played in one key and sounds as if played in another key). If you just want to create a MIDI file or want to check how a track would sound in a different key, transposing the track is usually enough.

However, you will typically want to see the track displayed and printed in the desired key. Change the transposition back to "0", then select all notes, press the ⌘ key and hit the up-arrow key twice. All notes move up by two semitones. When you play the song, the result is the same as if you had transposed it using the slider or transposition field, but the song now has three accidentals because it is still noted in A minor:



The next step therefore is to change the score's key from A minor to B minor. To do that, click the **Key** pop-up menu:



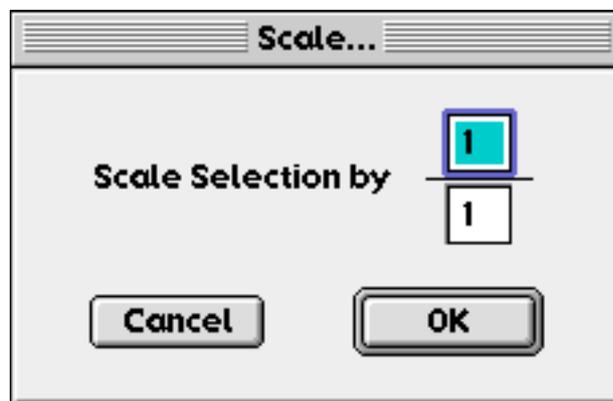
The first entry is marked with a bullet because “C=Am” is the current key. The third entry “D=Bm” is displayed in bold. Whenever you open the **Key** pop-up menu, **easy beat** quickly scans all notes in the current track and suggests the best key(s). In many cases, only a single key will be highlighted, but sometimes multiple keys can appear in bold. For example, if a track contains only the notes A, C and E, the menu will show “C=Am”, “F=Dm” and “G=Em” as possible keys, as all these keys (and no others) contains these three notes. If you start with an empty track, all keys will appear in bold, as **easy beat** cannot yet eliminate impossible keys.

When you select “D=Bm”, the score display changes. The correct key is now shown in the track border, and the accidentals have been corrected. There are still two accidentals, but they cannot be avoided, as they are needed for the “blue note”:



6 Scaling Notes

Now let's try to speed up the second measure only while leaving the first measure intact. Select all notes in the second measure, and then select **Scale...** from the **Edit** menu. The following dialog appears:



Enter the desired fraction and click **OK**. For example, try $1/2$ by entering “2” in the lower text field. The notes in the second measure are all shortened by $1/2$ and squeezed into the first half of the second measure, leaving the second half empty:



Of course, you can also make a section slower by stretching it. For example, select **Scale...** again and enter the fraction “ $2/1$ ”. The notes will then fill the second measure again. If you repeat this step, they will extend over the second and third measures:



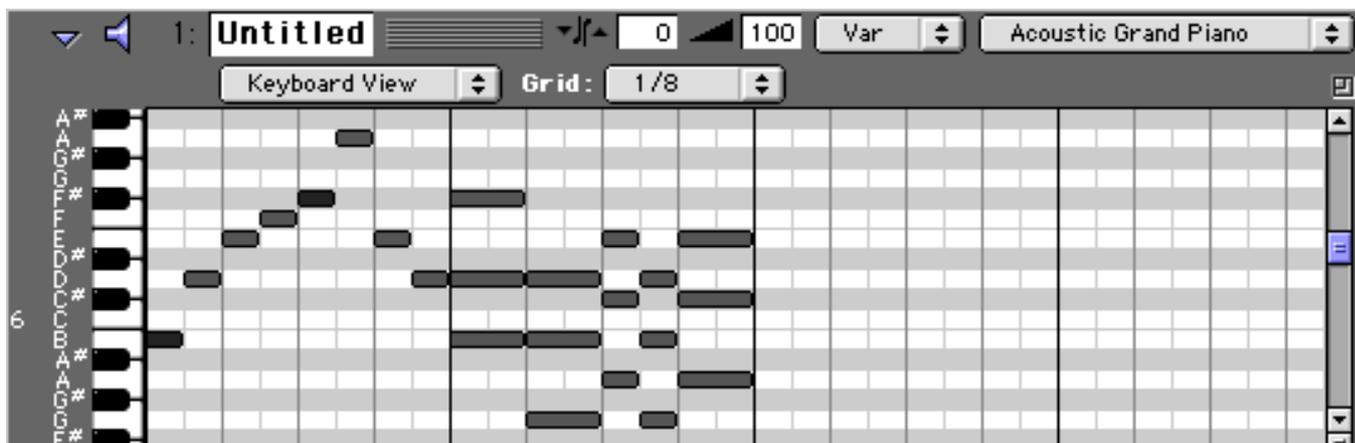
Hint: Scaling a few notes is sometimes quite useful to give them a different feel. For example, you can turn quarter notes into quarter triplets by scaling them by $2/3$.

When you're finished with this exercise, restore the contents of the song to the previous state; to do that, try **Undo** from the **Edit** menu, scale the notes such that they fill the second measure again, or simply go back to the previous tutorial document.



7 Views

Until now, we have done all editing in the score view. Many musicians will probably prefer this view, but editing songs is a bit easier in the keyboard view. Select **Keyboard View** from the **Track** menu (or from track's pop-up menu) or type **⌘-B**. The current track's display will then look as shown in the following screen snapshot:



The notes are now displayed as horizontal bars. The length of the notes indicates their duration, and darker notes have a higher velocity. The key pop-up menu has disappeared, as it is irrelevant in this view.

The horizontal lines correspond to the keys on a piano, where gray lines represent the black keys. The mini-keyboard in the track's border shows how the lines match the keys. You can also click the mini-keyboard to play the notes.

If you switch to the keyboard view, you may not see all notes. Of course, you can use the scrollbar to find hidden keys, but using the zoom box is often more convenient. Click the small zoom box in the track header (🔍), and the keyboard view will expand or shrink vertically such that all notes become visible. You may also need to resize the entire window or click the window's zoom box (🔍) to see the entire track.

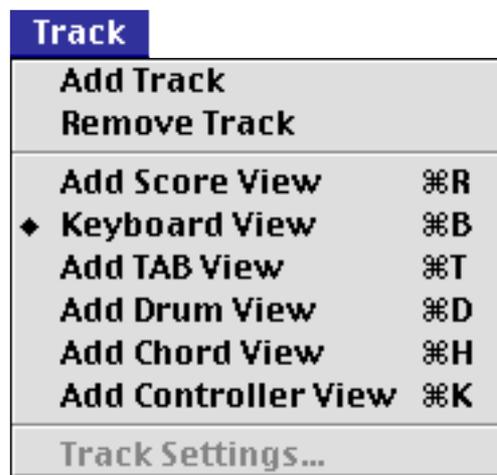
Once you know how to work with the score view, the keyboard view is quite easy to handle. Almost all editing operations work in the same way. You can move notes with either the mouse or the arrow keys, select them and change their velocity. There are only a few differences that you should know:

- When you move notes up or down (no matter if with the mouse or arrow keys), all selected notes move by semitones, not note lines.
- You can change the length of notes by clicking the left border, too:  In this case, the starting time of the note will change, and the ending time will remain the same.
- When you hold the **⌘** key, the left and right arrow keys can be used to change the duration of the note. The **⌘-←** key has a similar effect, but it changes the duration by moving the *starting time* to the left or right.

That's all you need to know about the keyboard view. Experiment with it, and you'll probably use it as your favorite view instead of the score view.

7.1 Multiple Views

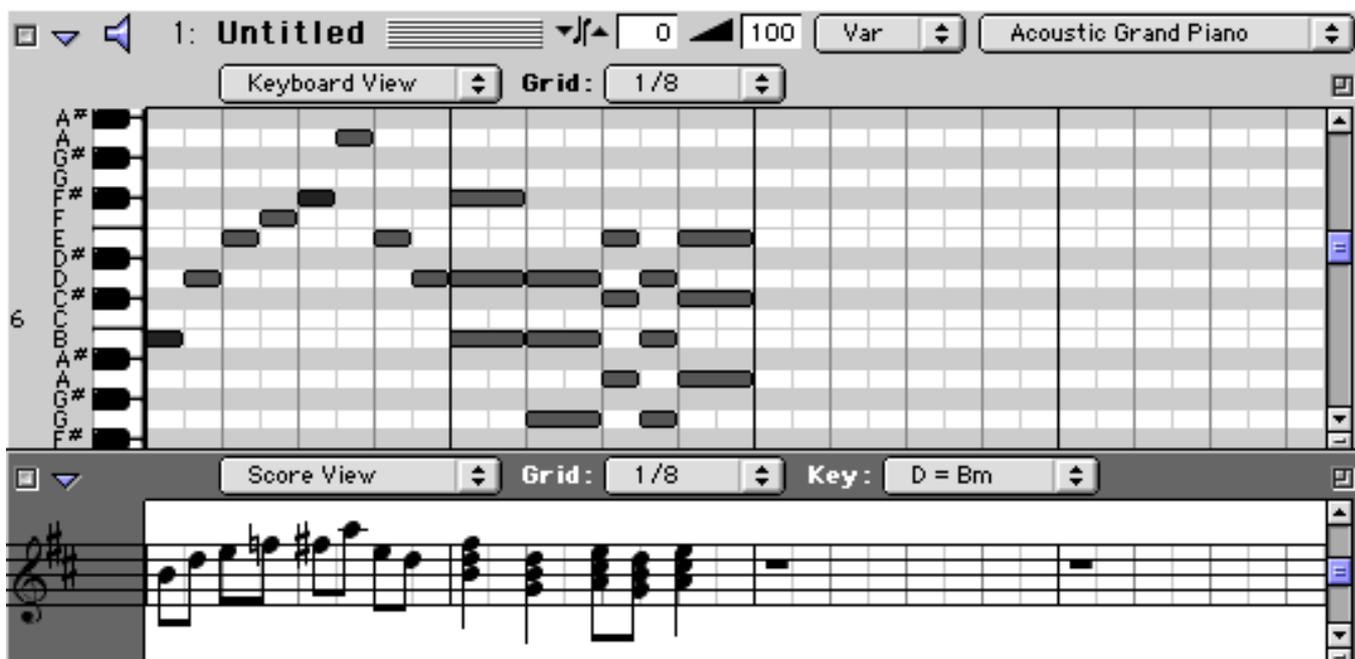
You will sometimes find it convenient to switch back and forth between the keyboard and the score view. Of course, you can always change the current view as needed by typing **⌘-B** for keyboard and **⌘-R** for score. However, you can also have *both* views visible at the same time. To open a second view for the same track, press the **⇧** key and pull down the **Track** menu. If the keyboard view is currently displayed, the menu will have the following contents:



Note that the items for all views except the current one begin with “Add”.

Note: When you press the **⇧** key and click the view pop-up menu in the track header, the verb “Add” will *not* appear. In the remainder of this tutorial, we will therefore always use the **Track** menu in the menu bar to switch or add views.

Select **Add Score View**, and a score view will be inserted below the keyboard view:



T06

The score view is now the active view, and it has the same appearance as before: The key is still Bm, and even the view's height and the position of the scroll bar have been restored. In fact, the score view has not been removed when you switched to the keyboard view, it was rather made invisible and has now reappeared.

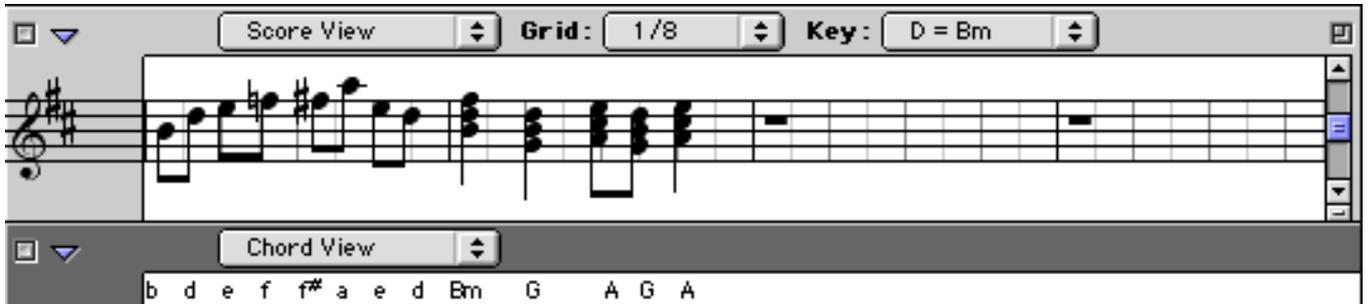
Whenever a track is displayed in multiple views, you'll see the following differences:

- If one view is active (indicated by a dark frame), a dark bar appears across both the keyboard and the score view along the left side of the window. This bar brackets all views that belong to the current track.
- The track title, transposition, variation and instrument are shown in the header of the *first* view only. All other views have smaller headers with only the view-specific controls.
- A small close box appears in the headers of all views belonging to that track. You can hide a view again by clicking the close box. If only a single view remains, its close box disappears, as you cannot hide the one and only view of a track.

If you edit in one view, you'll see that all other views are immediately updated to reflect the changes.

7.2 The Chord View

Now that we have two views, we can add a third one. Press the \uparrow key and select **Add Chord View** from the **Track** menu. A small view appears below the currently selected view:



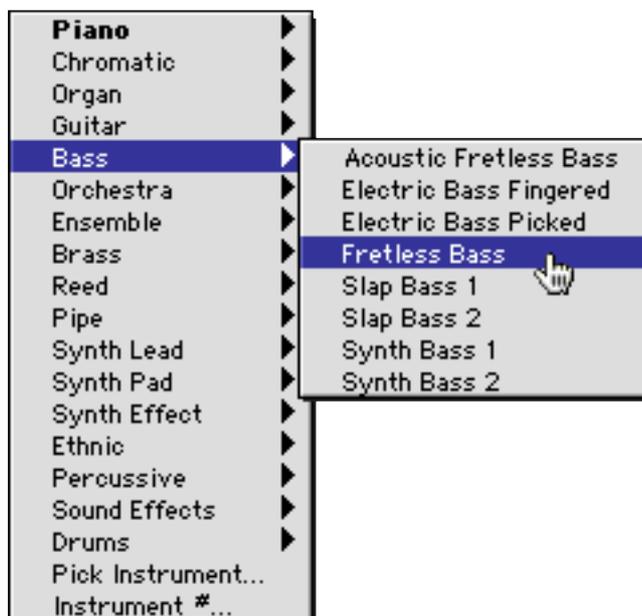
The chord view is not meant for editing; it simply shows the names of chords (capital letters) and individual notes (lower-case letters).

8 Adding More Tracks

Now it's time to add another track for a second instrument. We'll add a simple bass line to the song. Before we do that, let's give the first track a name. Click in the track's title ("Untitled") and type the new name (e.g., "Piano"), then hit the return or enter key to finish editing.

Select **Add Track** from the **Track** menu. Another track appears below the previously selected track. The new track is by default displayed in the score view.

Name the new track "Bass" and select "Fretless Bass" from the "Bass" section in the instrument pop-up menu:



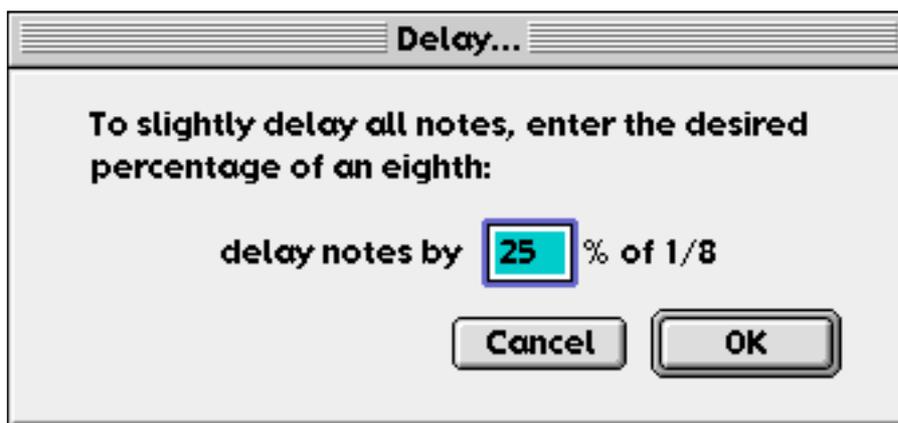
Then change the key to Bm and create four 1/2 notes (B3, A3, G3 and A3), as shown below:



Now play the song. You will probably not hear much of the bass track. That's because the loudness of different instruments can vary considerably. You can compensate that by increasing the velocities of the bass notes (select all of them, then *ctrl*-click one note and drag the slider up to the maximum position). If that still doesn't help, try decreasing the volume of the keyboard track. Remember that you can change all these properties while the song is playing. To adjust the relative loudness of some tracks, set a loop to a few representative measures of the song and let that part play repeatedly while you experiment with various settings.



Now it's time to take a look at the **Delay** variation, which was mentioned earlier in section 4.2. Activate the bass track and select **Delay...** from the variation pop-up menu. The following dialog appears:



Leave the delay setting at 25% and click OK. If you play the song now, the bass notes lag behind the piano notes by 1/32 (25% of 1/8). If you choose a small percentage, the effect will be very subtle but nevertheless audible. If you increase the percentage, the song will probably sound terrible, as if a human player were completely out of beat. When you create an arrangement for multiple instruments, different small delays in all tracks can make the song sound more natural, as notes from different tracks will start playing with a slight offset.

Now let's try it the other way round: Select **Delay...** again from the bass track's pop-up menu and click the **Remove** button. Then add a 25% delay to the piano track. The effect will be more pronounced now.

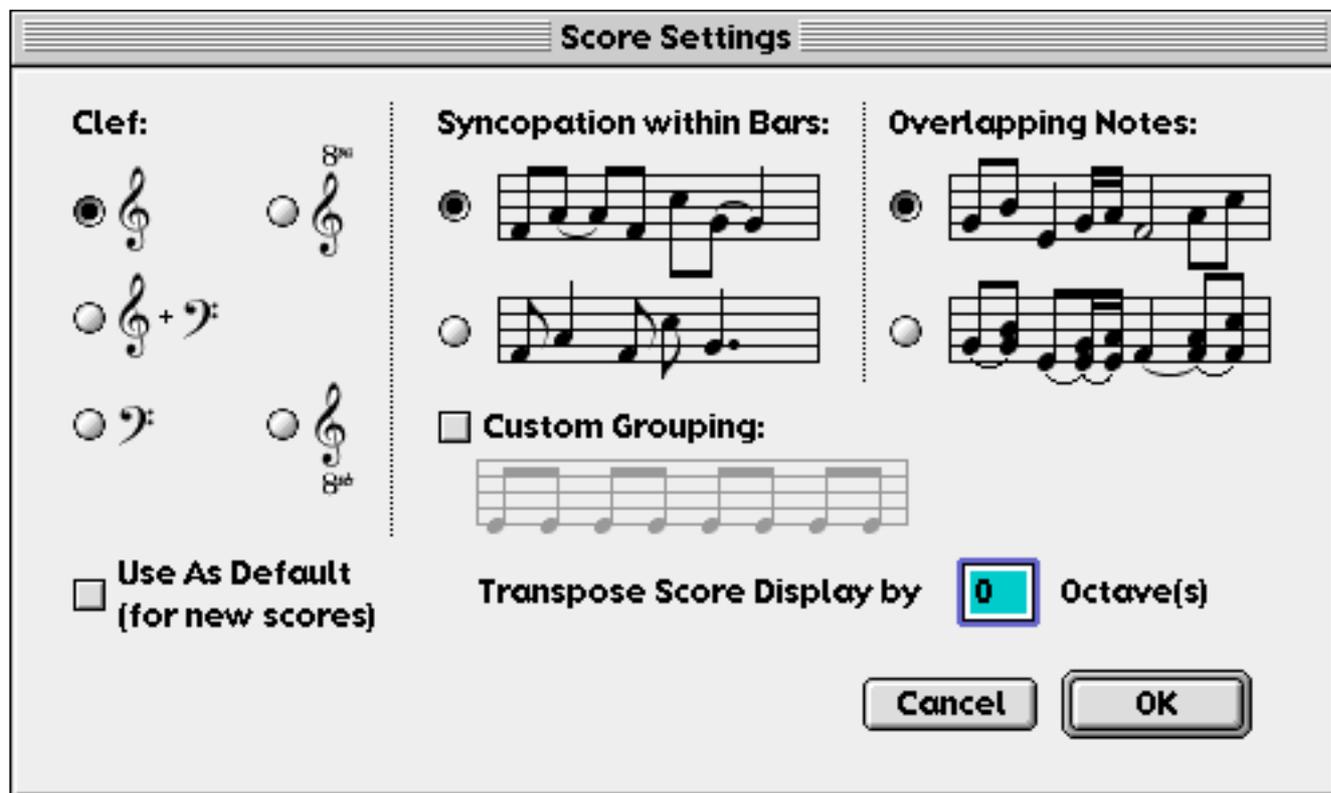
Hint: When musicians talk about "delay", they usually mean that delayed notes are **added** to the original notes (thus creating an echo effect), whereas "delay" here means that the original notes are just delayed, not doubled. To create an echo effect, you can add another track, copy all notes from an existing track and then apply the delay variation to one of the copies. Make sure that the delayed track uses the same instrument as the original track and make it sound softer by reducing its volume.

When you're done experimenting with various delay setting, turn them all off again.



8.1 Changing the Score Display

Of course, nobody would write a bass part with a violin clef. To switch to a bass clef, activate the bass track and select **Score Settings...** from the **Track** menu. The following dialog appears:



Shortcut: To open the **Score Settings** dialog, you can also double-click the clef in the track's border.

You can choose among five different clefs. You can select the violin clef, the bass clef or display both of them in the same view. You can also use a violin clef with the “8va” or “8vb” notation, where “8va” above the violin clef means that the notes should be played one octave higher than written, and “8vb” below the clef means that the notes should be transposed down by one octave.

The center column of the dialog gives you two choices for the treatment of syncopes within a measure. When the first option is selected, **easy beat** makes sure that all notes have even positions. For example, a quarter note can only appear at a quarter position. If this is not the case, the note is split in two tied eighth notes. Likewise, a dotted quarter note that begins at an eighth position appears as an eighth note in front of a quarter note. Similar rules apply to 1/2, 1/8, 1/16 notes and triplets.

The second option relaxes these restrictions. Notes always appear with their correct values as long as they fit entirely within a measure. “True syncopes” (notes that begin in one measure and end in the next) will still be displayed as separate tied notes.

Whereas the first style better reflects the rhythmic character of a piece, the second style is often easier to read. It is primarily a matter of taste which style you prefer.

The next setting, **Overlapping Notes**, defines how long notes should be treated when they overlap with following notes. The first option displays the notes as if no overlapping occurred. Some notes will appear with a wrong duration, and even the sum of all notes may be wrong, but this type of display is easier to work with in the score view. The second option splits the long notes into shorter tied notes. The representation is accurate, but it generates many notes and may thus be hard to edit.

The **Custom Grouping** option lets you define which groups of eighth notes within a measure should be beamed together with horizontal bars. By default, **easy beat** divides each measure into quarters, which may leave an extra eighth at the end when the time signature is $x/8$ where x is an odd number. To override this default grouping, enable the **Custom Grouping** checkbox. The notes below will then turn black. Now click between the notes to make or break connections. For example, you could leave the first two notes as they are and arrange the remaining six notes in two groups of three eighth notes. The following illustration shows how you can create this custom grouping with just three clicks:



To revert back to the default grouping, simply turn the **Custom Grouping** checkbox off. The notes will turn gray and revert to the default arrangement.

Finally, you can transpose the score display by up to two octaves up or down. The following illustration shows the effect for the first measure of the piano track:



transpose by -1 octave



no transposition



transpose by +1 octave

As you can see, transposing the score display actually means that the note lines are drawn in different positions; the notes themselves remain the same. Transposing the score display is quite different from the effect of the playback transposition field in the track header:

A score transposition of +1 makes the notes *appear* one octave higher in score views, but they will sound as before.

A playback transposition of +12 makes the notes *sound* one octave higher but doesn't affect the display of the notes in any view.

Score transposition is typically used to adjust the score display for different instruments. For example, you would use “+1 octave” for a guitar score.

If you enable the **Use As Default** check box, the current score settings (except the grouping) will be automatically used whenever you create a new track.

Select the bass clef, leave the transposition at 0, click **OK**, and then click the small zoom box of the bass track to make all notes visible. The display should then appear as follows:



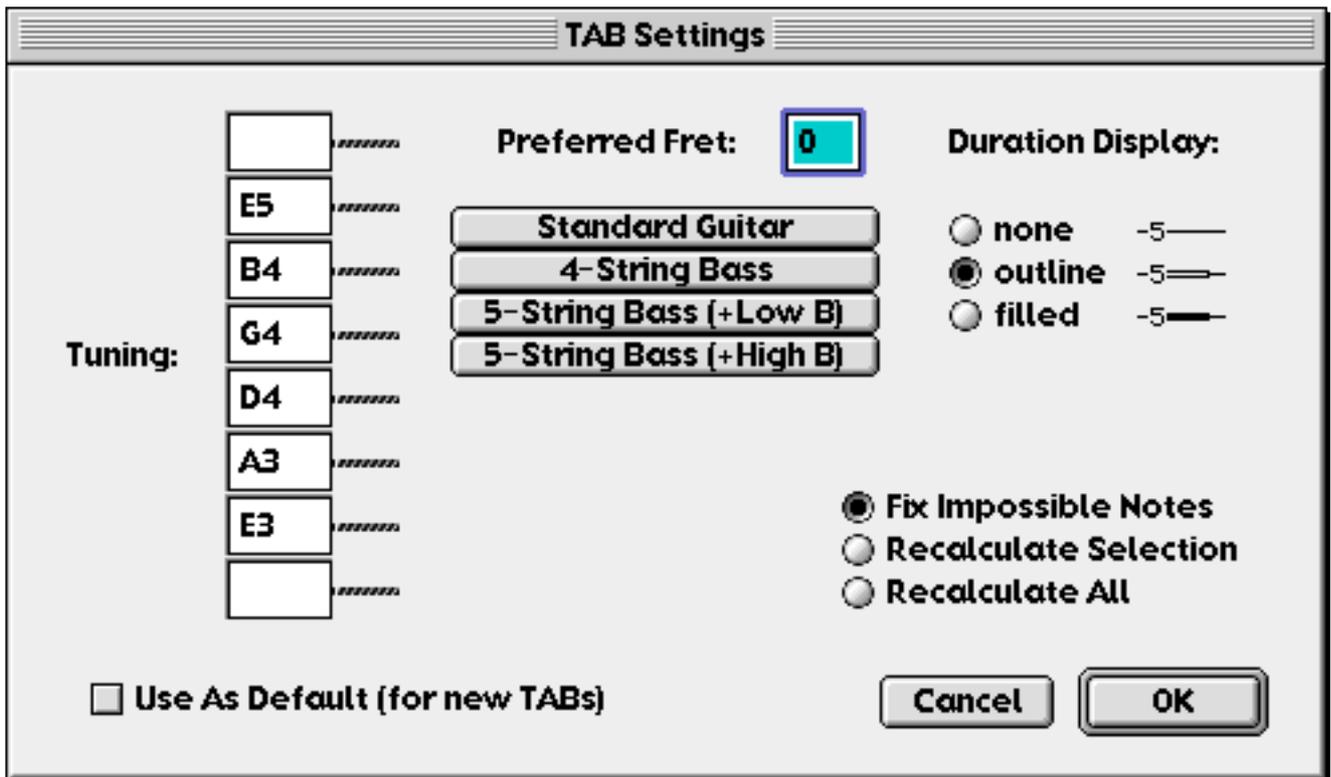
9 Guitar Tablature

Now let's look at a unique feature of **easy beat**: While the bass track's score view is active, press the \uparrow key and select **Add TAB View** from the **Track** menu. A guitar tablature will be inserted below the score:

The screenshot shows the software interface for a Bass track. The track is named "2: Bass" and is set to "Fretless Bass". The score view shows a bass line with four quarter notes. The TAB view shows a 6-string guitar neck with fret numbers 7, 0, 3, and 0 on the strings.

The default TAB view shows how the song would be played on a 6-string guitar in standard tuning. The lines represent the strings. Imagine the TAB view as a view of a guitar neck when you look at it from above while you play. The numbers are the fret numbers and the double lines indicate the lengths of the notes.

As this is a bass track, we need to change the TAB display to that of a bass guitar of our choice. To do that, select **TAB Settings...** from the **Track** menu:



Shortcut: Instead of selecting the **TAB Settings...** command from the **Track** menu, you can also double-click the gray border to the left of the TAB view.

The TAB Settings dialog supports instruments with up to 8 strings. Enter the desired tuning in the appropriate fields. The numbers after the note names represent the octave, where A4 is standard A (440 Hz). To set up the TAB view for open E tuning, replace “A3” with “B3”, “D4” with “E4” and “G4” with “G#4”.

You can also use the buttons for some frequently used tunings. In our example, we’d like to use a regular 4-string bass guitar. Click the corresponding button, and the tuning will change immediately.

When you change the tuning, **easy beat** tries to repair all notes such that they can be played with the new tuning. In addition to that, you can use the radio buttons **Recalculate Selection** and **Recalculate All** to force **easy beat** to find the best string/fret combination for all or just the selected notes. In this case, **easy beat** uses the **Preferred Fret** field to find the strings that allow to play the notes as close to the specified fret as possible.

Finally, you can specify how the duration should be displayed. Again, the current settings are remembered for newly created TAB views when you click **OK** while the **Use As Default** check box is enabled.

All we need to do is click the **4-String Bass** button and confirm the dialog with the **OK** button. The TAB display will then change its appearance as follows:



As we told **easy beat** just to “fix impossible notes”, the notes will still be played on the same strings as before. But because we changed the tuning of these strings (down one octave), the fret positions have moved up by 12. It’s still possible to play the song like that, but many bass players would prefer a different position around to the 8th fret. To force a recalculation of the string/fret combinations, open the **TAB Settings** dialog again, leave the tuning as it is, enter “8” as the **Preferred Fret**, push the **Recalculate All** radio button and click **OK**. Now the TAB view looks as follows:

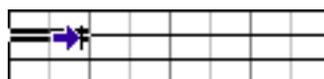


9.1 Editing in the TAB View

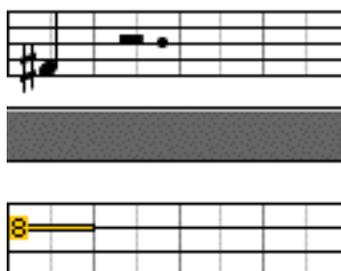
Whereas a line in the score and keyboard views uniquely identifies a certain pitch and a given pitch can be shown in exactly one line, a string alone (without a fret) does not yet mean a pitch in the TAB view, and a given note can often be played on several strings. Editing in the TAB view is therefore a bit different from the other views:

- When you create a note in another view and then look at it in the TAB view, you’ll find that **easy beat** positioned the fret as close as possible to the **Preferred Fret** and automatically chose the best string for that. This is done for all new notes; when you open a TAB view of a track for the first time, **easy beat** automatically positions *all* notes in this way.
- You can draw new notes in the TAB view as usual, but the fret will always be the **Preferred Fret** as specified in the **TAB Settings** dialog.

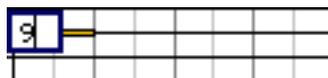
For example, add another note in the third measure. Draw a quarter note on the D string:



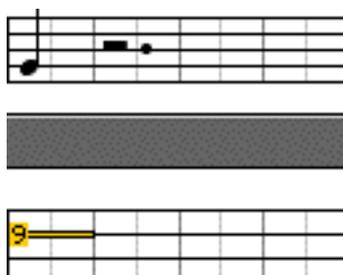
As soon as you release the mouse button, the fret number “8” appears in the TAB view, and the note A# is added to the score view:



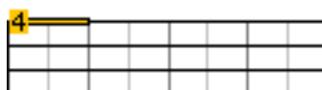
The new note is now highlighted in yellow in the TAB view. To change the fret, simply type the desired fret number, for example, “9”:



Now hit the return or enter key and watch the note change to B in the score view:



As usual, you can drag selected notes to new positions or use the arrow keys on the keyboard to move them. If you move a note to a different string, the fret remains the same. That may be convenient in some cases, for example, when you grab a note on the 7th fret and copy it to another string by moving it with the \leftarrow key held down. In other cases, you may wish to drag the notes to another string while maintaining their pitch. To do that, press the *caps lock* key while moving the note or hold down the ⌘ key while moving it with the up or down arrow keys. For example, typing ⌘ + “up arrow” in the above situation moves the note B to the 4th fret on the G string:



If these editing procedures sound too complicated for you, you’re not alone. That’s why **easy beat** provides a more convenient way to edit in the TAB view:

9.2 Editing with the Fretboard

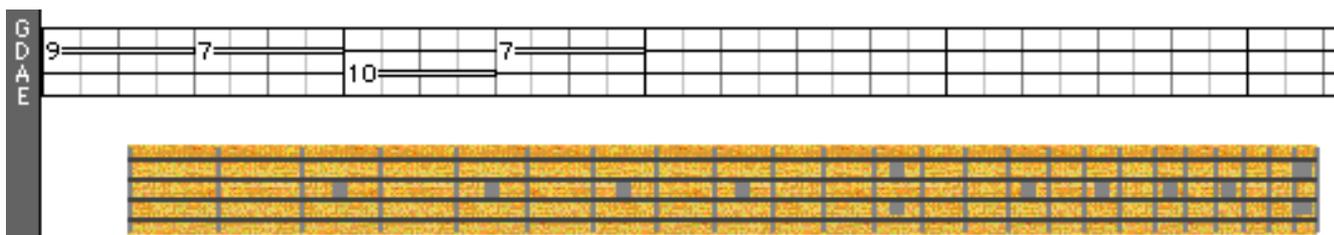
Before you proceed, remove the B again. The following section assumes that the TAB view contains only the initial four notes in the first two measures.



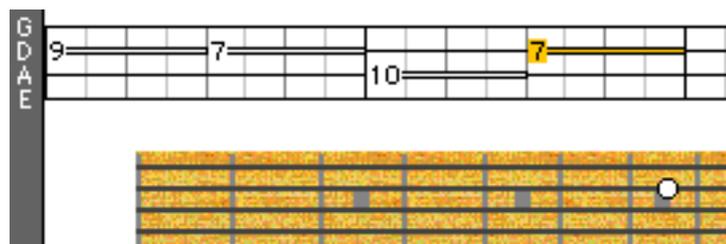
The header of the TAB view contains a rectangle that looks like a section of a fretboard:



Click the rectangle, and a fretboard appears just below the TAB display:



Whenever you select a note, it appears in yellow in the TAB display and the corresponding position is shown on the fretboard as well:



Now you can move the selected note to any other position on the fretboard. The TAB display and, of course, all other views will immediately reflect the change.

As long as only a single note is selected, it doesn't matter if you click on the circle in the fretboard and drag it to the new position or simply click on the fretboard where you want the note to be played.

When you select multiple notes, the positions of *all* selected notes are shown on the fretboard. To try that, select all notes in the TAB view. The fretboard now looks as follows, showing the complete pattern:



Again, you can drag individual notes to new positions, but this time you must point at them. When the mouse pointer is exactly over a note, it changes to a hand:



When you try that with the note on the 7th fret (as shown above), both A notes will change, as a fretboard position stands for *all* selected notes that are played here.

When you click anywhere else (when the mouse pointer looks like a finger pattern), you can pick up the entire pattern and move it to another position:



If you wish to preserve the notes but want to play them in a different fret position, press the  key while moving a single note or all selected notes. Again, clicking a circle on the fretboard moves only this note, and clicking in an empty space moves all selected notes. When you press the  key, the mouse pointer appears with a blue horizontal arrow ( or .

Try that with the notes in the bass tabulature: select all of them, then click an empty space in the fretboard with the  key down.



While you move the mouse to the left or right, the selected notes are moved to the best string that allows playing the notes near the fret that you point at.

Hint 1: As usual, you can cancel a move within the fretboard by moving the mouse pointer outside the fretboard before you release the mouse button.

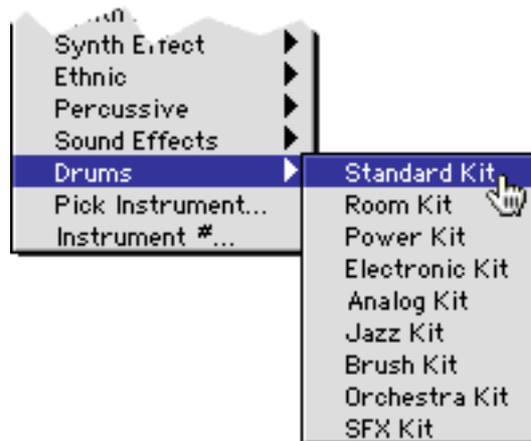
Hint 2: The -moving technique is most useful with guitar solos. Select all notes in a track and -move them to the location where you prefer to play them. While you drag the notes to the left or right, you will see the pattern required for playing the song. When the pattern and the fret position matches your preferred playing style, release the mouse button.

Before you proceed, feel free to experiment with the fretboard and then return to the previous state:

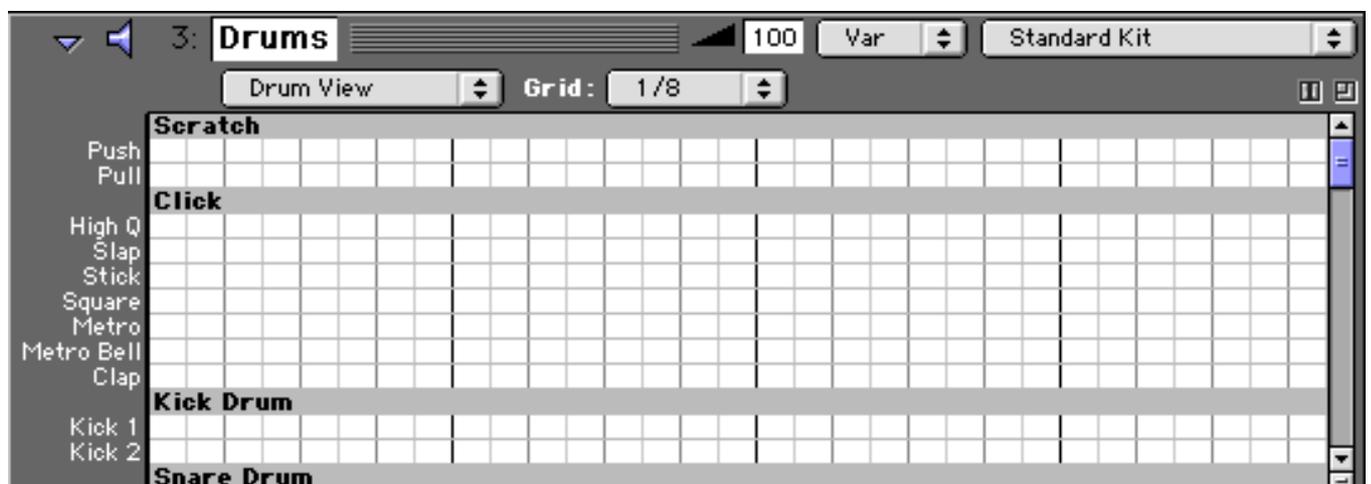


10 Drum Tracks

The next exercise is to add a drum track. Activate any view of the bass track and select **Add Track** from the **Track** menu. Rename the new track to “Drums” and then select the “Standard Kit” from the “Drum” section of the instrument pop-up menu:



In a drum track, every note corresponds to a certain instrument. For example, middle C is played as a “high congo”. You could now start editing the drum track by adding notes in the score view as usual, but that’s rather inconvenient as you would need to know exactly which note corresponds to which instrument. To make life easier for you, **easy beat** provides a special “Drum View”. If you select that from the **Track** menu, the track’s view changes to a scrollable list of drum instruments.



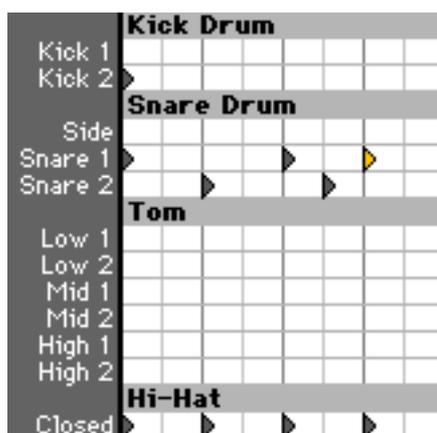
T12

The list is divided into sections with gray headers, and the sidebar identifies the individual instruments within a section. If you scroll through the list using the narrow scroll bar, you will see that the drum view contains 59 instruments, including scratches, clicks and castanets.

Hint: You can try the various drum instruments by clicking their names in the track's border.

Let us now create a simple drum pattern that consists of closed hi-hat hits at every quarter, a kick drum at the beginning of the measure, and two different snare drums. In the drum view, the mouse pointer appears as a triangle (▶). Move the triangle to the desired instrument and click at the position where the hit should take place. Drum notes have a fixed duration of 1/64, so you don't need to specify the duration by dragging the mouse pointer to the right; just click, and the note will appear as a triangle.

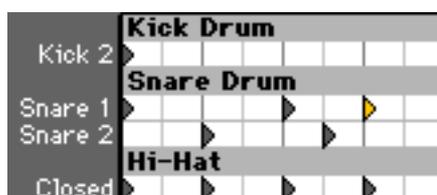
Add a few hits to the first measure until the track looks as shown in the following snapshot:



 T13

The yellow triangle was added last, so it is still selected. If the track's view isn't wide enough to show all instruments at the same time, you can extend it by dragging the track's grow handle (☐) down.

In most cases, the actually used instruments will be separated by empty lines of unused instruments. Once you have added notes for all relevant instruments in your drum track, you can reduce the size of the display by hiding all unused instruments. To do that, click the optimization box (☐) in the track header. The track view should now appear as shown in the following figure:



 T14

If you wish to add new notes for one of the hidden instruments, click the optimization box (which is now displayed with a horizontal bar: ☐) a second time, add the desired notes and then hide the unused instruments again.

When you play the song now, you will notice that the kick drum sounds rather quiet. To make it louder, increase it's velocity using a *ctrl*-click. The interior of the triangle will then appear darker. If you set the velocity to the maximum of 127, the triangle becomes black.

That's all you need to know about editing a drum track. Of course, you can still use all techniques that you have learned so far:

- Click in an empty space (or in one of the gray headings) and draw a rectangle to select multiple notes.
- Click on notes to select them; click and drag to move them.
- \uparrow -click to select multiple disjoint notes.
- Press the \leftarrow key to copy notes instead of moving them.
- *Ctrl*-click in an empty space to change the default velocity for new notes.
- Use the arrow key to move selected notes.

There is, however, one difference that you should take care of: You cannot deselect all currently selected notes with a brief click in a drum track as such clicks would create new notes. To deselect all notes, hit the *esc* key on your keyboard, click in one of the gray header lines or click and drag a small selection rectangle in an empty space of the drum track.

11 Rearranging Tracks

Now that we have three tracks, we can try to change their order. For example, let's move the drum track between the piano and the bass track. To do that, move the mouse pointer into some empty space in the drum track's header. The mouse pointer will change to a hand, which means that you can grab the track to move it:



Now click and drag the drum track up. As soon as you point somewhere between the piano and the bass track, a thick dark line will appear there:



Now release the mouse button. The tracks will be reordered.

When you move a track up or down, you will notice that the thick line appears only between tracks, but never between different views of a track. This restriction ensures that all views of a track always stick together.

If you try to move the drum track further up, you will see that it can be moved between the Master and the piano track, but you cannot move it above the Master track. The Master track is a special case; it doesn't have a track number, doesn't count in the 16-track limit of **easy beat**, and it must always be the first track.

12 Printing

Now it's time to print the song. First, make sure that the editing window shows all those tracks and views that you want to print. If you want to omit a view, hide it using the close box or collapse it using the triangle (▾). In our case, arrange the tracks in the original order (i.e., Piano, Bass, then Drum), then hide or collapse all views except the score view for the piano track, the score and TAB views for the bass track and the drum track.



T15

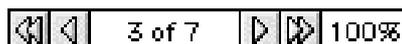
Before you print a song, it is generally a good idea to take a look at a preview to verify that the print-out matches your expectations. When you select **Printing Preview** from the **File** menu, a new window appears that shows what will get printed:



If that's what you expected, go ahead and print the document. You can select **Print...** from the **File** menu while the preview window is open, or you can close the preview window again and print from the song window. The result will be the same in both cases.

Hint: As long as the preview window is open, its contents will be updated whenever you make a change to the song. That may be acceptable while you are preparing a song for printing, but it will cause irritating delays and flickering of the preview window during normal editing operations. We therefore recommend that you close the preview window when you don't need it.

In our simple example, only a single page will print, as shown by the page number "1 of 1" in the bottom left corner of the preview window. If the song is long enough to print on multiple pages, you will see navigation buttons in this area:

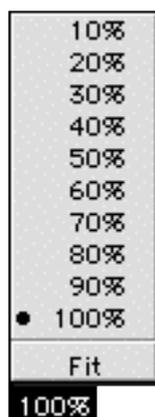


Click the single arrows (◀ and ▶) to jump to the previous or next page; use the double arrows (◀◀ and ▶▶) to jump to the first or last page. If you click the page number, a dialog appears that lets you go to an arbitrary page:



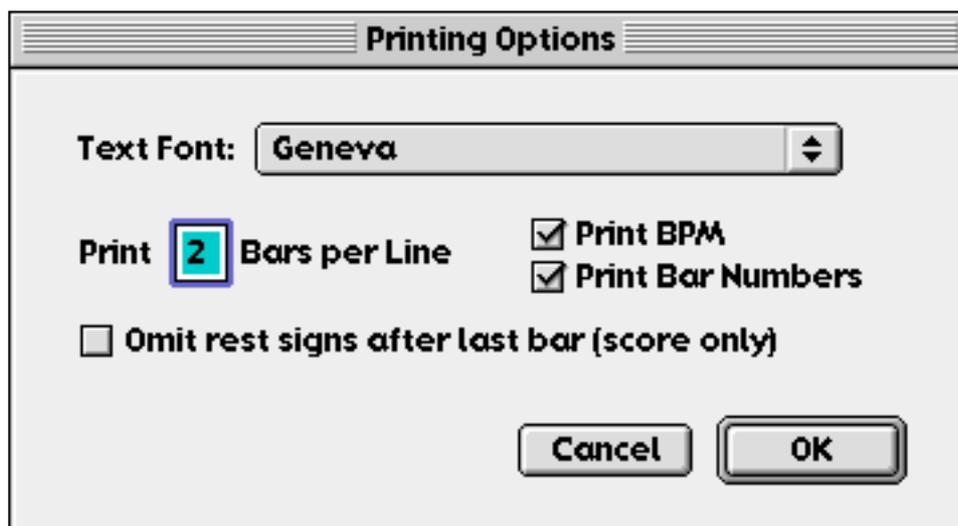
Hint: Normally, printing stops after the measure containing the last note. However, if you set the end of the loop range to a higher bar number, empty measures will print at the end of the song. To see the above navigation buttons, enter “25” as the end of the loop range. In most cases, however, you should set the loop range to reasonable bar numbers within the song to print only those measures that contain notes.

The printing preview initially shows the printed page in full size (100%). Depending on the size of your monitor, you may need to use the scrollbars to see the entire page. To see an overview of the whole page, you can reduce the size of the preview. Click the percentage field and select the desired scaling factor from the pop-up menu:



If you select **Fit** from the menu, the preview is reduced to fit entirely in the window. If you resize the window, the preview is immediately scaled to match the new window size.

If you look at the preview, you see that the tempo of the song and bar numbers appear above the note lines. You can remove these items and vary a few other aspects in the printing options dialog (select **Printing Options** from the **File** menu):



The **Text Font** pop-up menu affects the heading, the BPM display, the track names and the bar numbers. All other text fragments (such as track and chord names and fret numbers) are always printed in Geneva.

The **Bars per Line** field tells **easy beat** how dense you wish to print the song. The default setting is 2, but often 3 or even 4 bars per line will look better.

Hint: When you print on a LaserWriter, try to scale the printout in the **Page Setup** dialog. Use a scale factor of 70% or 75% and set the number of bars to 4.

The **Omit rest signs...** check box affects the printout of score tracks only. If the check box is off, rest signs will be printed after the last note. When a score track contains fewer notes than other tracks, all remaining measures will be filled with rest signs. These signs are a bit disturbing when you are working on a song. For example, you might want to print an unfinished version of a song and continue composing with pencil and paper. In that case, turn the **Omit rest signs...** option on and increase the end of the loop range to print empty measures after the last note of each score track.

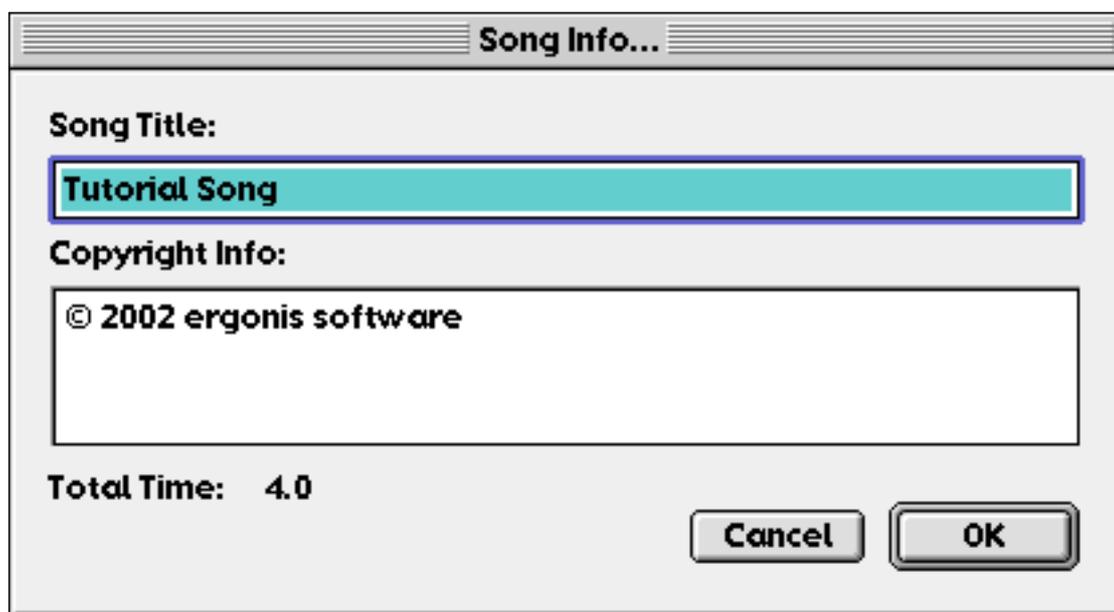
Hint: When you select **Printing Options** while a preview window is open, all changes in the options dialog are immediately reflected in the preview.

12.1 Changing the Song Title

As you can see in the preview window, the title on the printed page matches the file name of the song document. In many cases (in particular when you are used to give your documents meaningful file names), this will be what you want. If you want to give your song a different title, select **Get Song Info...** from the **File** menu or click the “i” symbol in the song header:



In the resulting dialog, you can enter the desired title and a copyright statement:



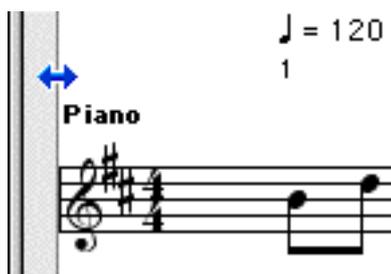
As long as you leave the song title empty, the file name is used as the title in the printed document. Any text you enter here overrides the file name. The copyright statement doesn't appear in the print-out or in any other display; it is, however, included in the resulting file when you save your song as a MIDI file.

- Hint 1:** If you don't want any title to appear in the printout, enter an empty song title consisting of one or more space characters.
- Hint 2:** The "Empty Score Sheet" document in the "Examples" folder contains an empty song with an empty title. To print a score sheet for working with pencil and paper, print that document.
- Hint 3:** To improve the portability of MIDI files, the MIDI standard suggests to use only printable ASCII symbols (i.e., no accented letters and special characters such as "ñ" and "Δ") in the track names, the song title and the copyright statement. **easy beat** translates the symbol "©" in the copyright statement into "(C)" when the document is saved as a MIDI file.
- Hint 4:** To generate the copyright symbol "©", simply use our famous PopChar Pro control panel. You don't have PopChar Pro? What a pity! In that case, try **⌘-G** on the keyboard.

12.2 Changing the Printing Margins

When printing, **easy beat** tries to use as much of the available printing area as possible. Many printers cannot use the entire sheet of paper, but rather leave some empty space along the edges (shown as gray borders in the preview window). These margins are often too small for an aesthetic page layout and for binding the pages.

To change the page margins, open the Printing Preview window and drag the margins inward:



When you save your document, **easy beat** remembers these margins along with the **Page Setup** and **Printing Options** settings. When you later change the page size (for example, by switching to a different paper size or changing the scale factor), the margins are adjusted accordingly.

If you point somewhere within the printable area of the preview window, a crosshair cursor appears. You can now click and draw a selection rectangle around an area of the preview:



When you choose **Copy** from the **Edit** menu, the selected area is copied to the clipboard as a picture. You can then paste this picture into a word processing document.

Note: The selected part is copied as a picture that uses the EasyNotes font for notes. If you do not have this font installed, strange symbols will appear in the word processing document.

To fine-tune the selected area, you can point near its border to expand or shrink the selection.



13 Header Items

13.1 Bar and Time

Now let's experiment with a few elements in the window's header. At the beginning of each measure, the header contains a tick mark, the bar number and the time since the beginning of the song (using the current tempo). A closer inspection shows that the second bar appears a bit different:



Instead of the time since the beginning of the song, the time signature appears above the bar number, and both the bar number and the time signature are displayed in embossed boxes. As you can guess, this means that you can do something with these items. If you click the bar number, a dotted line appears across all tracks. Drag the line to the left or right to change the display width of measures. During dragging, the status bar shows the width of a measure in pixels.

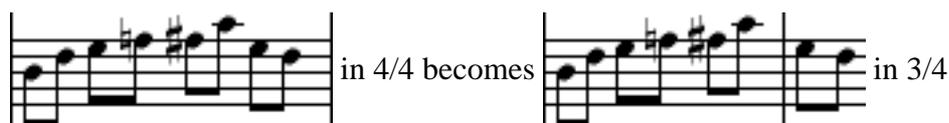
The default width is 120; that's OK for many simple songs, especially in the keyboard and drum views. In the score view, however, 120 pixels will sometimes lead to overlapping notes that are difficult to edit. Extending the bar width can make editing much easier.

Hint: The bar width affects only the on-screen display. When the song is printed, the bar width is determined by the available page width (as specified in the Page Setup dialog), the printing margins and the number of bars per line (as specified in the Printing Options dialog).

You can also drag the time signature box to the left or right. In this case, you change the time signature in 1/8 steps in the range from 2/8 to 8/4. When you drag the box to an odd position, the signature changes from $x/4$ to $x/8$.

While you drag the box slowly to the left, you will notice that the time signature changes in this order: $4/4 \Rightarrow 7/8 \Rightarrow 3/4 \Rightarrow 5/8 \Rightarrow 2/4$. If you wish to express $3/4$ (or any other signature that's given in quarters) in terms of eighths, press the \blacktriangleleft key. $3/4$ will then appear as $6/8$, and $2/4$ will be shown as $4/8$. This subtle difference affects only the display of the time signature in the window's header and in the printed score; it doesn't change the way in which you edit your song.

When you change the time signature, the notes all maintain their absolute positions within the song. For example, changing our song from $4/4$ to $3/4$ moves the last two $1/8$ notes from the first measure to the second measure:



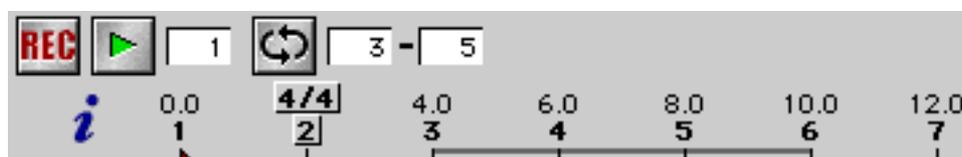
It is generally a good idea to set the time signature before you begin editing your song. However, changing the signature of a complete song can be quite useful when you import a MIDI file that contains a wrong time signature.

After playing around with the bar width and the time signature, revert the song to 4/4 and a bar width of approximately 120 pixels.

13.2 Start Bar and Loop Range



The start bar (where a song will begin playing) and the loop range are shown in the window's header. The following figure shows a section of a header with a small bar width:



A small red triangle marks the start bar, and a horizontal gray line indicates the loop range. The loop range is shown as a black line when the loop is active. You can easily change these elements without having to enter numbers in the corresponding fields.

Point at a tick mark, and the mouse pointer will change to a red triangle:



Click once to set the start bar to the new position. If you double-click at a tick mark, the song will immediately begin playing at this bar.

Point at a measure (somewhere between two adjacent tick marks), and the mouse pointer will change to a loop symbol:



Click once to set the loop to this measure, or click and drag to the left or right to define a loop range that covers a few measures.

Another quick way to change the start bar is by hitting the “-” key on the numeric keypad. The “-” key moves the start bar to the first bar of the song; if it's already there, the start bar will jump to the beginning of the loop range. The “-” key is particularly convenient when you edit a long song. Here is a typical editing procedure:

- Set the loop range to the part you wish to modify. Edit the song and play the loop to hear what you're doing.
- When you are satisfied with the result and want to hear the entire song, hit “-” to jump to the beginning, hit “+” on the numeric keypad to disable the loop and then hit the enter key to play the song.
- If you wish to return to the part being edited, hit “-” and “+” again and continue editing the loop.

13.3 Playing Position

While a song plays, a red line will appear at the currently playing measure, and a white marker within the red line shows the exact playing position:



In addition to these indicators, a vertical line shows the playing position within the current track:



Once you start playing a song, it will continue to play whatever you do, even while you pull down menus or switch to other applications. **easy beat** updates the playing position whenever possible, but that may not be frequently enough in some cases. Consequently, the position indicator may still appear within the fourth measure when the song already has advanced to the fifth measure. However, when **easy beat** is the frontmost application and you just sit there watching the song play, the playing position should be quite exact.

When you play a long song, the playing position will eventually reach the right border of the window and then disappear. When the playing position is out of sight, a red arrow is shown in the window's header:



To make the playing position visible, click the arrow, and the song will scroll to the currently playing measure.

Shortcut: You can also use the “=” key on the numeric keypad to scroll to the playing position.

As an alternative, you can also enable the **Follow Song** option in the **Music** menu. When **Follow Song** is active, the playing position will automatically scroll into view while a song plays.

Hint: When you edit a song while it plays, the **Follow Song** option will automatically be disabled to avoid editing a “moving target” with notes jumping out of reach while you aim at them.

14 The Metronome View

Every **easy beat** document begins with a Master track that contains a metronome view and a tempo view. We’ll take a look at the metronome in this section; the tempo view will be discussed later.

The metronome track looks like a drum track, but it works differently:

- You cannot change the metronome’s instrument. The metronome will always play using a drum set.
- You cannot change the metronome’s view. It’s always shown in the drum view.
- The metronome doesn’t have a track number; you cannot delete it or move it below another track.

When you create a new **easy beat** document, the metronome track is preset with four “Metro” clicks at each quarter of the first measure. The first click has a velocity of 80, and the remaining three clicks play with a velocity of 60.

When you enable the metronome by turning the Master track’s speaker symbol on, the metronome will sound during the entire song, not just the first measure. You can think of the metronome track as being an endless repetition of the first measure’s contents. You can put further clicks in other measures, but they will never play.

The metronome is quite handy when you start a new song from scratch. First set the time signature to whatever you want, and then fill the first measure of the metronome track with clicks or drum hits of your choice. If a certain drum pattern is to be played over the entire song, you can enter that in the metronome track and don’t have to bother with filling the drum track with a repeating pattern.

Of course, you can also use the metronome for practicing. Preset the first measure to your liking, enter the desired tempo, set a loop over the first measure and let it play. Remember that you can set the tempo by clicking the note to the left of the tempo field a few times.

15 Default and Stationery Songs

15.1 Creating Default Documents

Whenever you create a new **easy beat** document using the **New** command from the **File** menu, you get an untitled window with an untitled piano track and the mandatory metronome track. If you often create songs that have similar arrangements, you can set up a default arrangement once and save it as your “default song”.

The “Examples” folder contains a stationery document “Arrangement for Em”. When you open this document, you get an empty song with five tracks for piano, organ, guitar, bass and drums. All score views have been preset to Em, and the page setup settings and the printing options and printing margins have been preset for a convenient layout with a binding margin.

When that document is in front, select the **Save Default** command from the **File** menu. **easy beat** will not ask you any questions but simply remember the entire contents of the current song. Now close the document (don’t save any changes you might have made) and select **New** from the **File** menu. You get a new untitled document with the same contents as the “Arrangement for Em”.

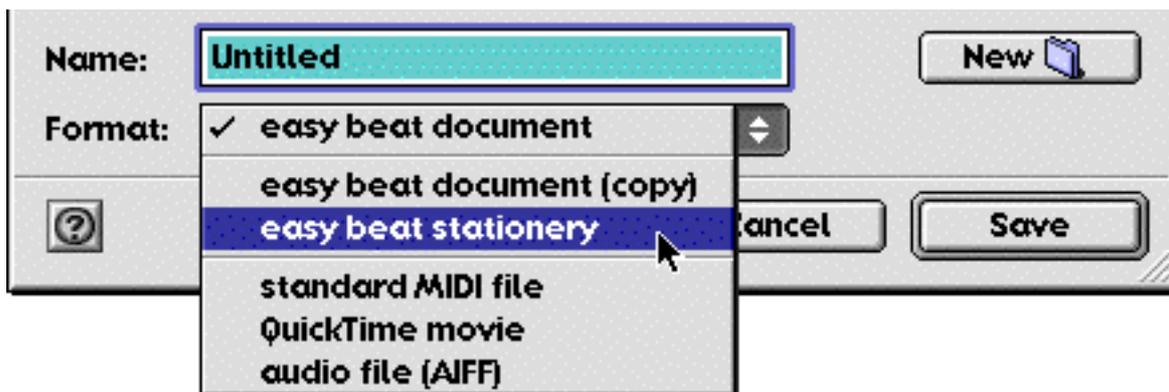
You can repeat this process any time you want. If you want to modify your default document, open a new song (which will open a copy of your current default document), make the desired modifications and select **Save Default** to overwrite your previous default document.

Hint 1: If you occasionally want to start with a new song from scratch, you can create an empty song by pressing the  key while you select **New** from the **File** menu.

Hint 2: **easy beat** stores the default document in the “Preferences” folder within your system folder. If you ever want **easy beat** to forget your default document, simply remove the document “easy beat Default” from the “Preferences” folder.

15.2 Creating Stationery Documents

If you often work with various different arrangements, you can also set up your own stationery documents (just like the “Arrangement for Em”). Once you have a (usually empty) song that meets your expectations, select **Save As...** from the **File** menu. The “save file” dialog looks as usual, except that it has a pop-up menu at the bottom that lets you choose from six file formats:



The default format is **easy beat document**.

The second choice, **easy beat document (copy)** lets you save a copy of the current document under a different name but leaves the original document intact and active, so you can continue working with it.

easy beat stationery is similar to **easy beat document (copy)**, but sets the “stationery” flag in the saved document. When you look at the resulting document’s icon, you’ll see that a “normal” document has the usual dog’s ear in the upper-right corner, and a “stationery” document appears as a stationery pad with a dog’s ear in the bottom-right corner:



When you double-click a stationery document, say, “Big Band”, **easy beat** opens it as “Untitled (Big Band)”. When you edit that document and later save your changes, **easy beat** will always ask for a file name, thus preventing you from accidentally overwriting the original file.

Hint: You can also turn regular into stationery documents and vice versa in the Finder: Select a document, choose the “Get Info” menu command and check or uncheck the **Stationery Pad** check box below the comment field.

16 Export to Other Formats

While we are at it, let’s take a look at the remaining three choices in the **Save As...** dialog:

standard MIDI file converts the current song into the widely supported platform-independent MIDI file format. The MIDI format is ideal for the following purposes:

- MIDI files can be read by most sequencer programs. Simply save an **easy beat** song as a MIDI file if you want to give it to a fellow musician who doesn’t have **easy beat**.

- The platform-independent nature of the MIDI file format even allows you to give MIDI files to PC users. In this case, you should make sure that the file name ends with “.mid” or “.MID”, otherwise the file might not be recognized as a MIDI file on the PC side.
- If you run a WWW server, you can publish MIDI files on the web (see the “MIDI on the Internet” document for details).

Important: Although all audible information (notes, instruments, controller settings, etc.) is properly converted into MIDI format, some **easy beat**-specific information gets lost when you save a song in MIDI format. You should therefore not use MIDI files as your preferred file format for storing your songs, as you cannot expect that everything remains as it was when you later import the MIDI file into **easy beat** again. For details, please refer to the chapter “Import and Export of MIDI Files” in the **easy beat** Reference document.

QuickTime movie converts the song into a format that can be opened with Apple’s QuickTime Player (or MoviePlayer, if you still have QuickTime 3). If you want to embed a music track in a QuickTime movie, this file format is the best choice.

audio file (AIFF) converts the song into the “Audio Interchange File Format”, as defined by Apple. Whereas MIDI files and QuickTime movies are rather compact (they only contain the relevant information, such as when and how to play which notes), AIFF files contain the sampled song in CD quality (16 bit stereo with a resolution of 44.1 kHz). For example, the tutorial song “T16” occupies 1432 bytes on disk; it’s about the same size when you save it as a QuickTime Movie (1425 bytes), and the corresponding MIDI file requires merely 392 bytes. In contrast, you end up with 1 MByte (!) when you save the song in AIFF format. A longer song can easily take up 30 or even more MBytes. Anyway, AIFF files are high-quality audio files; they can be used for making audio CDs, so the “wasted space” may sometimes be justified.

17 Importing MIDI Files

The MIDI file format is not only great for giving your **easy beat** songs to other musicians; you can also import MIDI files into **easy beat** and thus work with songs from many sources. The “Examples” folder contains three MIDI files to play with. The file “Menuet.mid” has been created with **easy beat** (as you can see from the icon), and the files “MenuetPC.mid” and “MenuetXY.mid” were created with another sequencer.

If you double-click “Menuet.mid”, **easy beat** will immediately convert it and open it as “Menuet.mid Conv”. When you save the song, **easy beat** will ask for a new file name, so you cannot accidentally overwrite the original MIDI file.

As the file “MenuetPC.mid” was not created with **easy beat**, it appears with a simple document icon, and when you double-click it, the Finder will complain that it doesn’t know with which application to open the document. If you have “Macintosh Easy Open” or “File Exchange” installed, a dialog with a list of suggested applications will appear. **easy beat** should be among these applications; select it and click **OK** to open the document. You can also grab the “MenuetPC.mid” file icon in the Finder

and drop it onto the **easy beat** icon. In either case, you will end up with a window containing the converted song.

On the Macintosh, MIDI files are identified by the file type “Midi”. If you receive a MIDI file from someone who doesn’t have a Macintosh, chances are that the file has a wrong type. The file “MenuetXY.mid” is an example for such an unknown file. You cannot open it with **easy beat**. Whenever you stumble across such a misbehaving MIDI file, drop it onto the “MIDI->easy beat” application (which you find in the “Extras” folder). This small utility program gives unknown MIDI files the proper file type, so they can be opened with **easy beat**.

Note: To prevent accidental modification of non-MIDI files, the “MIDI->easy beat” application works only for files whose names end with “.mid” or which already have the file type “Midi”. If “MIDI->easy beat” refuses to process a MIDI file, simply add “.mid” to its file name and try again.

Hint: The “MIDI->easy beat” application can transform multiple files in one step. If you have a bunch of MIDI files that appear with the wrong icon, select all of them and drop them onto the “MIDI->easy beat” icon.

By the way, **easy beat** can also import QuickTime movies containing MIDI tracks, but most of the work is done automatically by QuickTime’s translation: If you drop a QuickTime movie on the **easy beat** application’s icon or open it from within **easy beat**, QuickTime first translates the document into a temporary MIDI file, which is subsequently imported by **easy beat**.

17.1 MIDI Files on the WWW

You can find tons of MIDI files on the Internet. Take a look at the “MIDI on the Internet” document for configuration tips and a few web links.

If you use your web browser to download songs in MIDI format from the Internet, the resulting files will sometimes not have the correct file type. To fix that, simply use the “MIDI->easy beat” application as described above.

However, **easy beat** provides a much easier way to download songs from the Internet. We will take a look at this feature later in this tutorial (see chapter 26).

18 Global Changes

If you haven’t done that already, import the MIDI file “Menuet.mid” now. It will appear as two collapsed tracks (for harpsichord and tambourine) plus the mandatory Master track. Expand the two regular tracks. You will find that the tambourine track actually is a drum track, but only the tambourine is used. Click the collapse box (■) in the drum track’s header to hide all other instruments.

The harpsichord is noted as “C=Am”, but the song is actually in D. Change the key to “D=Bm”.



18.1 Inserting, Deleting and Duplicating Bars

Now let's assume we want to insert a measure with a pre-count at the beginning of the song. It's quite easy to do that. All you have to do is to select all notes of the harpsichord track and move them one bar to the right and then repeat that for the tambourine track. In order not to transpose the notes, you should press the \uparrow key while moving to maintain the pitch of all notes.

Inserting a bar into two tracks is rather easy, but it can become quite cumbersome and error-prone when you have a song with 10 or more tracks. Fortunately, **easy beat** provides an easier way to do that. Before we proceed, make sure you have moved the notes to the left again.



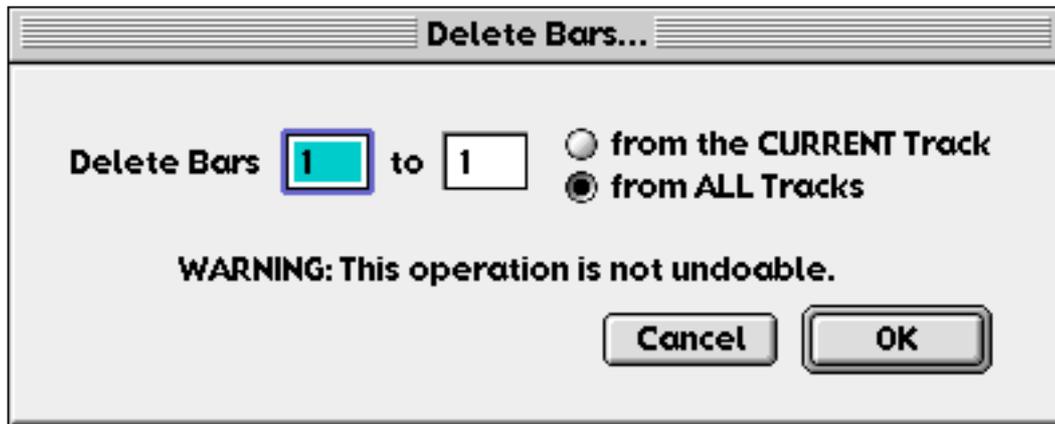
Now select the **Insert Bars...** command from the **Edit** menu. The following dialog will appear:



easy beat already suggests to insert one measure before bar 1. All we have to do is confirm the dialog with the OK button. All notes and tambourine hits will move one measure to the right, leaving an empty measure at the beginning of the song. Now simply copy the first three tambourine hits from the second measure to the first, and you're done.

Why, you might think, is there an option to insert bars just in the *current* track? Well, try to manually insert a bar in the middle of a long song (with 100 bars or so), and you'll know why. In addition to that, a track can contain controller messages (we will discuss those later). When you manually move the notes, the controller messages remain where they are, whereas the **Insert Bars...** command moves *everything* in the affected measures of the current track, not just the notes.

Now let's remove the first measure again. To do that, select **Delete Bars...** from the **Edit** menu.

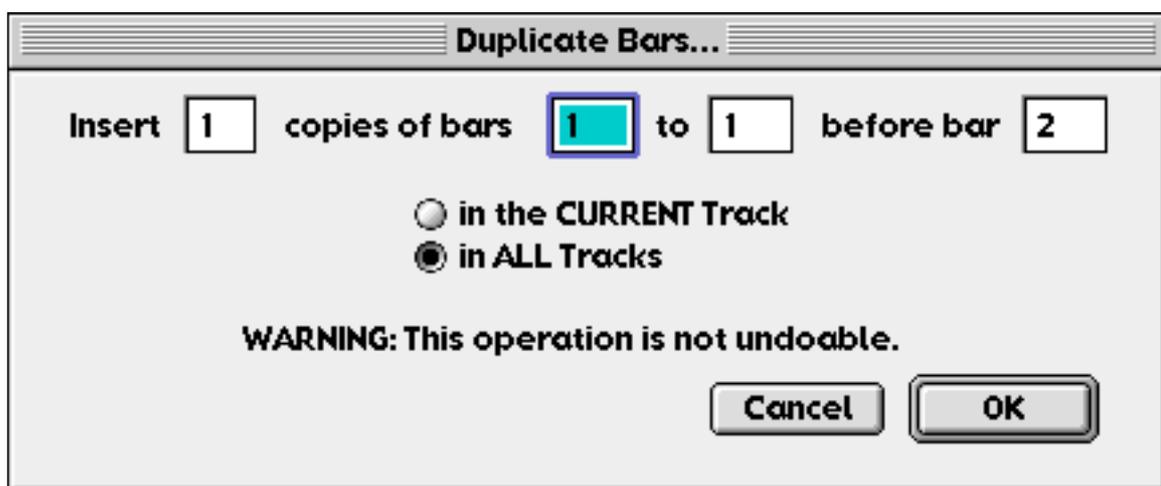


The bar numbers are already what we want. Click **OK**, and the first measure is removed again.

Warning: **Insert Bars...** is a harmless operation; although you cannot use the **Undo** command afterwards, you can use **Delete Bars...** to get rid of the just inserted measures again. On the other hand, **Delete Bars...** is potentially dangerous as it removes all notes from all affected tracks. It's a good idea to double-check that you delete what you want and nothing else or to save the file first. That's what the "WARNING" message tries to tell you.



Another useful command in the **Edit** menu is **Duplicate Bars...**, which opens the following dialog:



The fields should be quite self-explaining. For example, you can specify that the bar range 1 through 8 be repeated three times. To do that, enter a repetition count and bar numbers such that the sentence reads "Insert 2 copies of bars 1 to 8 before bar 9 in ALL tracks" (or "...before bar 1"), then click OK.

Hint: Before you create a repetition of a section, verify that the specified bar range is correct. In our case, set a loop from bar 1 to bar 8, enable the loop and listen to it. There should be a seamless transition from the end of measure 8 to measure 1. If you select **Duplicate**

Bars... afterwards, you will notice that the correct bar numbers already appear in the dialog.

To get rid of the repetition again, simply select the **Delete Bars...** command and remove measures 1 to 16 from all tracks.



18.2 Modifying Multiple Similar Notes

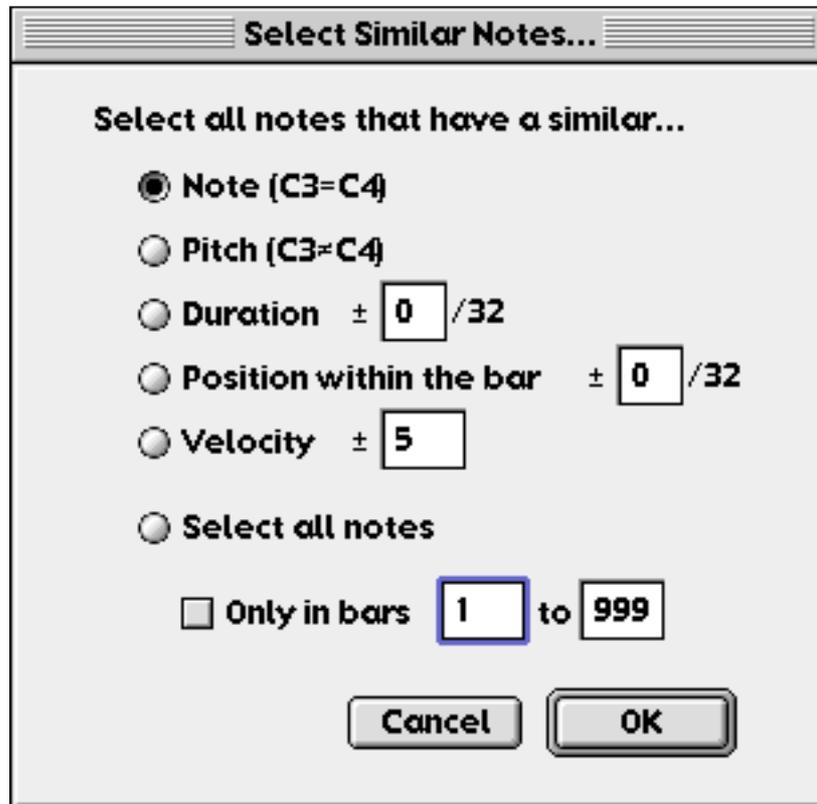
Now that we're back at the original imported song, let's listen to it. You will hear that the harpsichord is played with a distinct emphasis at the beginning of each measure. If you *ctrl*-click the first few notes, you'll see that the notes at the beginning of the measure have a velocity of 123 whereas the remaining two notes have velocities of 95 and 84. When you check a few notes in other measures, you'll see that this pattern is repeated almost over the entire song.

A velocity of 123 is too much of a good thing, so we'd better make these notes a bit softer. We could, of course, go through all notes at the beginning of all measures and reduce their velocities one by one. However, **easy beat** lets you do that in a much more convenient way.

Select the dotted D note at the beginning of the first measure and make sure that nothing else is selected:



Now use the **Select Notes...** command from the **Edit** menu. The following dialog appears:



Shortcut: You can also double-click a note to open the **Select Notes...** dialog.

We want to reduce the velocity of loud notes, so **Velocity** is what we want. But before we do that, let's first experiment with the other choices. We recommend that you try all of them with the D note selected, as shown above. If you make a mistake or inadvertently modify the selected notes, return to the tutorial document T17 before proceeding.

If you leave the radio buttons in their initial state (**Note**) and click the OK button, all notes with the same name will be selected; since we started with a D, all other Ds will be selected, too; the octave doesn't matter:



If you select **Pitch**, all Ds within the same octave will be selected:



These two choices can sometimes be quite handy. For example, to transform a piece from E minor to E harmonic minor you would have to transpose every single occurrence of D to D#. All you have to

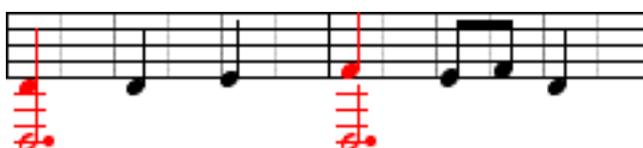
do is find any D, use **Select Notes...** with the **Note** option and transpose all selected notes up one semitone using the up-arrow key while pressing the \sharp key.

The next choice, **Duration**, selects all notes with the same duration and lets you specify how close the duration must be to that of the original note. For example, you could select a quarter note and enter “4” in the text field. Since $4/32 = 1/8$, this setting would select all eighth, quarter and dotted quarter notes.

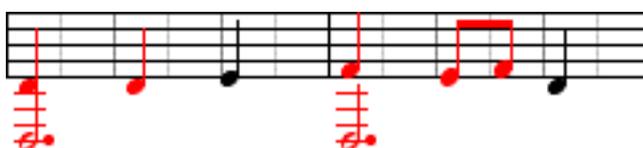
If you leave the tolerance at 0 and try the **Duration** setting with the dotted half note, you end up with all dotted half notes selected.

Note: When you try this on a song that has been recorded rather than manually entered, you will notice that **easy beat** selects only a few notes with the same duration or maybe none at all. That’s because the lengths of the notes may vary slightly, so only a few notes will have *exactly* the same duration. If that happens, set the tolerance to $1/32$ and try again.

If you select **Position within the bar**, **easy beat** selects all notes that start at the same relative time within the bar. In our case, the notes at the beginning of all measures would get selected:



The tolerance lets you specify how exact the match should be. If you want to select all notes that begin within the first two quarters of each measure, enter “15” in the tolerance field. $16/32$ corresponds to $1/2$ or two quarters, but that would select the notes starting at the third quarter, too, since they are exactly a half note away from the beginning of the measure. Reducing the tolerance to 15 excludes these notes, so you should end up with the following selection:



The **Position within the bar** setting is ideal for globally changing the emphasis of a track. For example, you can manually create a song and leave all notes at their default velocity. When you’re finished with the song, select the first notes of all measures and increase their velocities. In fact, the menuet in this example was created in this way.

The last choice, **Select all notes**, doesn’t pay attention to the selected note(s) at all. It simply selects all notes. This choice is useful in combination with the **Only in bars...** option. Selecting a wide bar range in a long song (for example, bars 20 to 50 in a song with 100 measures) would otherwise be quite difficult. You would have to scroll through the song and \uparrow -select a few measures each time.

Of course, you can use the **Only in bars...** option with the other choices, too. For example, you could transpose all Ds to D# only in the prelude of a song. To do that, double-click any D, select the **Note** option, check **Only in bars...** and enter the appropriate bar range.



Finally, the **Velocity** setting lets you find notes with a similar velocity. To find the loudest notes in the current track, select the D (which has a velocity of 123) and leave the tolerance at 5. Now scroll through the song to verify that the loudest notes are indeed at the beginning of each measure. Then *ctrl*-click one of these notes and drag the velocity slider down to a moderate value, say, 105.



You can also select *multiple notes* and then use **Select Notes...** (or double-click one of the selected notes) to find the notes matching *all selected notes* at once. Depending on which type of “similarity” you select, **Select Notes...** has the effect illustrated in the following examples:

- **Note:** If you select a D and a G, all Ds and Gs are selected in all octaves.
- **Pitch:** If you select a D5 and a G4, all D5s and G4s are selected.
- **Duration:** If you select a quarter note and a half note, all notes whose duration is *between and including* 1/4 and 1/2 (including dotted quarters) will get selected.
- **Position within the bar:** If you select a note at the beginning of a bar and a note at the second quarter, all notes at these positions *and between* will get selected.
- **Velocity:** If you select two notes with velocities 80 and 100, all notes whose velocity is in the range 80 to 100 will get selected.

To summarize: In the case of **Note** and **Pitch**, all notes are treated separately; If you select a D and an E, no D# note will get selected. In the case of **Duration**, **Position** and **Velocity**, the minimum and maximum of the selected notes determines the range of notes to be selected.

It’s quite easy to remember when multiple selected notes define a range and when not: All choices that have a tolerance use a range between the minimum and the maximum of the selected notes; in all other cases, **easy beat** performs an exact search based on all selected notes individually.

Hint: The **Select Notes...** command uses the “search by example” principle. Instead of looking for a sample note that matches the desired criteria, it is often easier to create one or more temporary notes that have the properties you’re looking for. However, don’t forget to remove these notes again when you’re done with the selection. It’s generally a good idea to include an empty measure at the beginning of a song. If you always create the auxiliary notes in the first measure, you can easily identify such temporary notes and remove them.

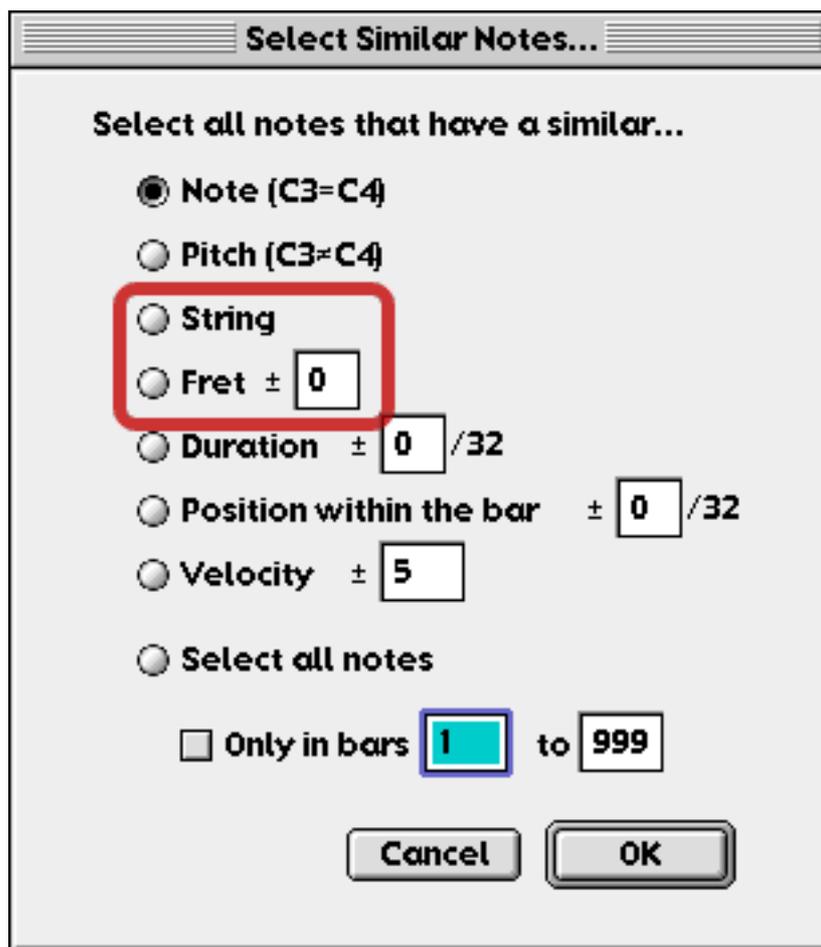
If no notes are selected, the similarity options become meaningless. In this case, **easy beat** displays the following simplified dialog when you choose **Select Notes...**:



Shortcut: To quickly open the above dialog, simply double-click in an empty area of a keyboard, score or TAB view.

18.3 “Select Notes...” in a TAB View

When you switch the harpsichord track to the keyboard view, **Select Notes...** works exactly as described above, but when you switch to the TAB view, you get two additional choices, as shown in the following figure:

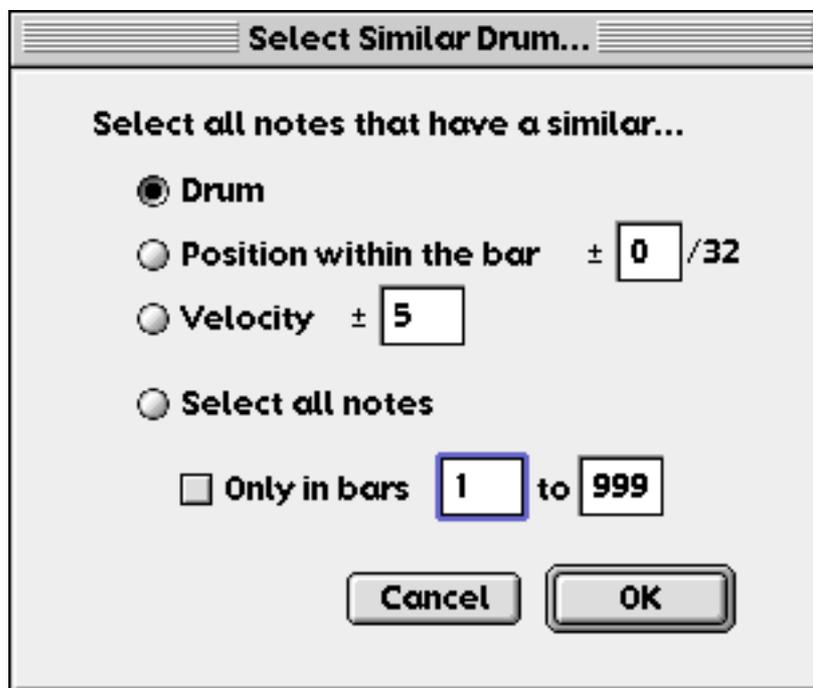


Once you know how **Select Notes...** works, the new choices are pretty easy to understand. The only thing that requires explanation is what happens when multiple notes are selected:

- **String:** If you select two notes on the A and G strings, all notes that are played on exactly these strings are selected. The D string between A and G is not considered in this case.
- **Fret:** If you select a note on the third and another on the seventh fret, all notes from the third up to the seventh fret are selected. If you enter “1” in the tolerance field, the selection covers everything from the second to the eighth fret.

18.4 “Select Notes...” in a Drum View

When you try **Select Notes...** in a drum view, you get the following simplified dialog:



Note and **Pitch** are useless here, so they are replaced with the single choice **Drum**. Since all drum hits have the same duration, the **Duration** option is unavailable, too.

19 The Inspector

How can you determine how many notes were found by **Select Notes...**? Of course, you could scroll through a song and search for highlighted notes, but that is not very practical for long songs. For example, select the first D in the menu again and try **Select Notes...** with the **Note** option.

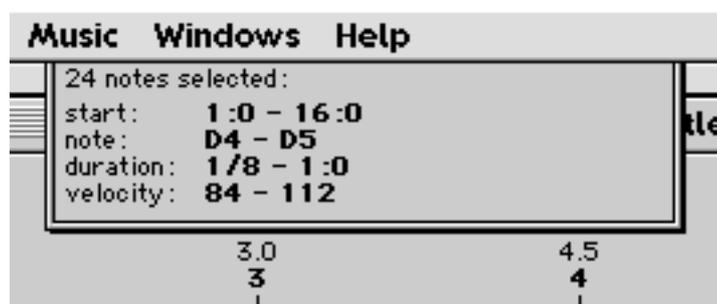


Now select **Show Inspector** from the **Windows** menu to open the following floating window:



Shortcut: The *help* key also shows/hides the inspector window.

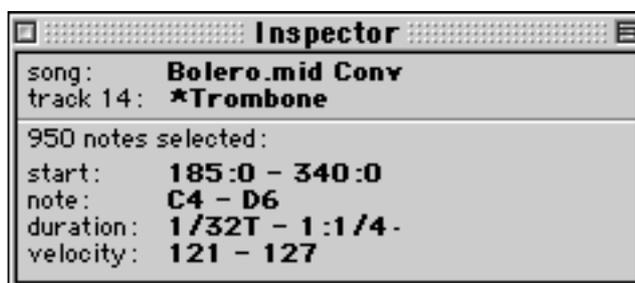
You can move the window to a convenient location on the screen by clicking anywhere within the window. **easy beat** remembers the window position and reopens the inspector window in the same place the next time. You can even move the window to the very top of the screen and tuck the top part under the menu bar:



The information shown in the inspector varies, depending on the type of the current track and the contents of the selection. In our example, the starting positions, notes, durations and velocities of the selected notes are shown. **Select Notes...** found 24 D notes in two octaves in measures 1 through 16. The shortest note is an eighth, the longest is a whole note and the velocities range from 84 to 112.

If “1 note selected” had appeared in the inspector window after the **Select Notes...** command, you would have known that no other notes have the same property as the selected note.

The inspector is a convenient way to investigate whole tracks of imported songs. When you select all notes of a track, the inspector displays a summary of the track that gives you some idea what happens in a track, as shown in the following example:



Track 14 of this imported MIDI file contains 950 notes, where the first note appears in measure 185, and the trombone plays rather loud, as the softest note has a velocity of 121.

20 Controllers

In addition to notes, the MIDI standard also defines a set of so-called *controllers* for varying the way in which notes sound. You can think of controllers as sliders or knobs on an effect processor. For example, there are controllers for adjusting the volume, the reverb and the panning of a track, but there are also controllers that correspond to particular features of certain instruments, such as the sustain pedal of a piano and the whammy bar of an electric guitar.

During a live performance, you would adjust the controllers in real-time. In contrast, creating a song in **easy beat** is more like pre-programming a performance, so we need a way to specify in advance when and how to change which controller. In **easy beat**, all this is done in a graphical notation, as if you were using a pencil and a ruler to sketch how a controller's value should change over time.

Before we start with the basics of editing controllers, let's return to our sample song.

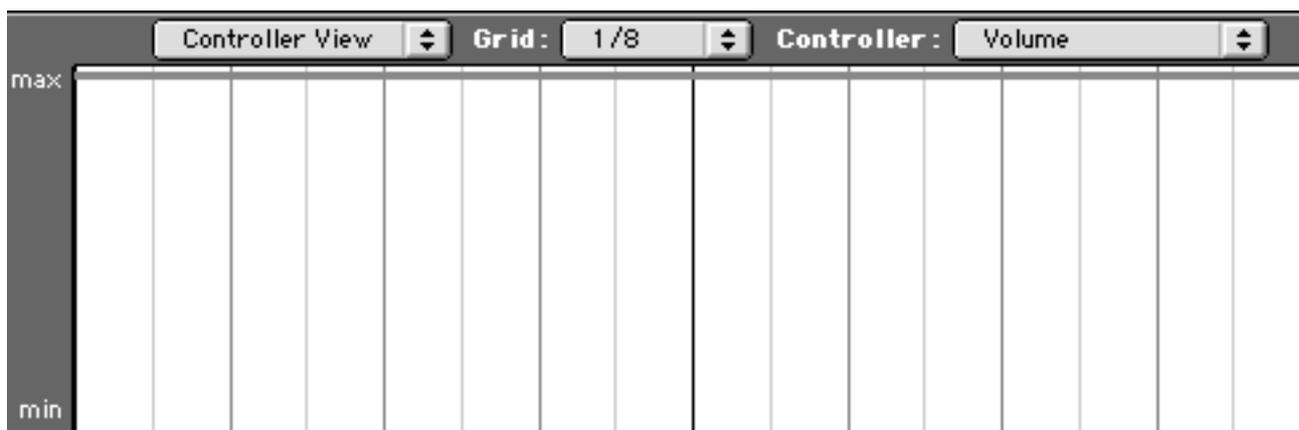


We will concentrate on the piano track, so it's a good idea to get rid of all unneeded views (such as the chord view and the TAB view) and to collapse all views except the piano. When editing controllers, we need to know exactly when which notes are being played. The keyboard view gives an excellent overview of the exact timing of a track, so you should switch the piano track to the keyboard view. To further improve the precision of the timing display, increase the bar width to about 230 pixels. Finally, mute all other tracks by disabling their speaker icons (or -click the piano track's speaker icon to make it the only playing track).

20.1 Adding a Controller View

When you have done that, make sure the piano track is activated, press the  key and select **Add Controller View** from the **Track** menu.

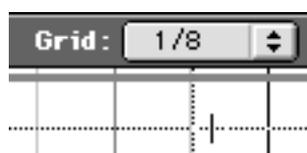




As usual, the controller view has a **Grid** pop-up menu. Further to the right you find another pop-up menu that lets you choose which controller to edit. Leave this menu at “Volume”, as we will use this controller to explain the basic editing operations.

The controller view is initially almost empty. There is only a gray line along the top of the view. All settings that you add will appear in black. The initial value up to the first change of the controller is always shown in gray. Since there are no controller changes yet, the gray line extends over the entire track.

When you move the mouse pointer into the controller view, you’ll see the usual dotted vertical line jumping from grid position to grid position. In addition to that, you also see a dotted horizontal line that indicates the controller value you’re pointing at:



If you watch the status bar, you’ll see a display like this:

1 : 7/8 : 100% -> 74%

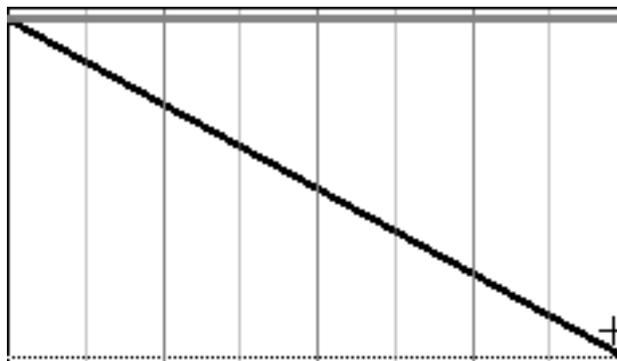
At the beginning, there is the time position (currently at the last eighth of the first measure). After that, the current controller value (100%) and the value pointed at (74%) are shown. Most controllers have a range from 0 to 100%. In this case, the volume obviously has been preset with the maximum value.

Note: In MIDI, controller values are specified as numbers in the range 0 to 127, but **easy beat** displays them in a more convenient way as a percentage of the maximum value.

The \uparrow key is typically used to constrain mouse movement. Within a controller view, the \uparrow key lets the controller’s value snap to certain convenient values, depending on the type of controller. In case of the volume, the \uparrow key lets the value jump between the extreme values 0% and 100%. We’ll use that in our next exercise.

20.2 Drawing Controllers

Let's fade out the second measure by turning the volume continuously down from 100 to 0. To do that, press the \uparrow key, point near the top at the beginning of the second measure, click, then move to the bottom at the end of the second measure until the status bar display reads "3:0: 0%" (beginning of measure 3, controller value 0).



Now release the mouse button while you still press the \uparrow key. The gray line now stops at the end of the first measure, where it turns black, goes down until it reaches the bottom and then remains at the value 0:



 T20

Now play the song. It fades out, but the effect is not very natural, as the fade-out is a bit too fast. We'll deal with that later, but let's for now take a closer look what actually happened to the song when we added a downward slope in the controller view:

Controller values are changed in MIDI by means of *controller events* that can occur anywhere within a song (even in the middle of a note). When a song starts with a volume of 100%, a single controller event could turn the volume down to 0 at a certain point. From then on, no notes would be heard because the controller value remains at 0 until it is changed again. As single MIDI controller events abruptly change the controller value, **easy beat** has to insert multiple events to create a smooth transition from 127 to 0. It does that by creating a controller event every 1/128 note. In our example, 127 controller events were created, thus creating the illusion of a continuous change. At the current tempo of 120 BPM, this means that the controller events appear about 8 milliseconds apart.

The volume controller has absolutely nothing to do with the velocity of the notes. In the case of a piano, notes with a high velocity and a low volume will still be played hard, but they will sound as if heard from a distance. Furthermore, the velocity only has an effect at the beginning of a note, whereas the volume controller can change the loudness of a note after it started playing.

Now let's try to change the volume of the entire first measure to a value of about 80%. Point at the beginning of the first measure until the status bar shows "1:0: 100% -> 78.7%". Then press the mouse button.



As long as you move the mouse pointer strictly vertically (that is, within the limits of the current grid setting), the mouse pointer takes the shape of a vertical double arrow, indicating that you can change the value of the current controller event, or, in this case, the initial controller value. A horizontal line appears and extends to the right up to the next controller event. Release the mouse button, and the volume will be at the constant value 78.7% during the entire first measure, then jump up to the maximum and fade out in the second measure:



 T21

This way of changing a controller value is particularly useful when you want to make a global change to a controller that differs from the default value. Let's try that with the reverb of the piano track: Use the "Controller" pop-up menu to switch to the "Reverb" controller. This time, the gray line appears at the bottom of the view, as the reverb of a track is by default turned off. Now click at the beginning of the first measure near the top of the controller view (where the status bar reads "1:0: 0% > 100%") and immediately release the mouse button again. Since there are no other reverb controller events in this track, the new initial value 100% will extend over the entire song.

Note: We will later see how such global controller changes can be made more easily without needing to scroll to the first measure.

 T22

If you listen to the song, the piano should now sound as if it was played in a large hall. If you don't hear the change, your equipment (external synthesizer and/or speakers) may not be able to reproduce the reverb effect.

In many cases, such global changes of controller values will be exactly what you want, in particular with the volume, balance, pan, reverb, chorus, celeste and phaser controllers. In real-world situations, these settings hardly change in the middle of a performance.

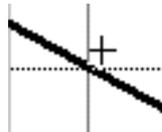
Note: To make a global change to the *volume* of a track, you can use both the volume controller and the volume field (or slider) in the track header. If no volume controller events are present, the setting of the volume field is used for the entire song. If volume

controller events are present, all of them are scaled by the percentage specified in the volume field.

Now let's return to the volume controller to play around with other ways to edit controllers. When you click the "Controller" pop-up menu, you will notice that the current controller "Reverb" has a bullet and "Volume" is marked with a dash. Dashes in front of controller names let you know which controller events are present in a track, so you don't have to look at them all to find out which controllers are actually used.

Back at the volume controller, let's try the controller grid. We have already seen that the \uparrow key constrained the controller value to the minimum and maximum values when we created the fade-out. Now press both the \uparrow key and the ⌘ key (which temporarily disables the time grid, remember?). Move the mouse pointer to the left and right and roughly follow the controller value. When you are close enough to the line, the controller value will snap to the current value instead of the minimum or maximum. This feature is quite convenient if you want to straighten a section of the graph.

Let's try it: Press the \uparrow key, release the ⌘ key and point at the diagonal line near the center of the second measure. The dotted horizontal line should snap to the intersection of the diagonal line with the time grid, and the status bar should read "2:2/4: 50% -> 50%":



Now press the mouse button and move the mouse pointer around in the controller view. Press and release the \uparrow and ⌘ keys to see where the end point of the line will snap to. While you do that, you will also realize that the end point snaps to the origin of the line when you press the \uparrow key and move the pointer close enough to the value that corresponds to the click position.

Now let's connect the center of the second measure with the end of the first measure. Release the ⌘ key, press the \uparrow key and point near the sharp edge at the end of the first measure. The status bar will show "2:0: 78.7%"



Now release the mouse button, and the newly drawn line will replace the abrupt controller change and create a linear transition from the beginning to the middle of the second measure:





20.3 Deleting Controllers

Now let's try to remove the controller events from the last quarter of the second measure. There are two ways to do that. You can point at the line near the third quarter with the \uparrow key down, click and drag the line horizontally to the right. Make sure that you draw the line beyond the end of the second measure. When you release the mouse button, the controller transition should now end with a flat line at the value 25.8% that extends into infinity:



Before we look at the second possibility, select **Undo Controller Change** from the **Edit** menu or go back to the previous tutorial file:



Again, point at the beginning of the last quarter of the second measure, but this time press the \leftarrow key. The mouse pointer changes to the shape you normally see in text editors:



This cursor shape means that you can select a portion of the controller area. Click and drag the mouse pointer to the right until the last quarter of the second measure is highlighted, then release the mouse button.



You can now perform various operations on the selected selection. In this exercise, simply hit the backspace or delete keys or select **Clear** or **Cut** from the **Edit** menu. The result will be the same as above; as all controller events have been removed from the selected area, the value of the last controller event remains active. To deselect the highlighted area again, click once with the \leftarrow key down or hit the *esc* key on your keyboard.



20.4 Copying and Pasting Controllers

What else can we do with a selected controller range? Of course, we can copy and paste sections. For example, select the first two measures and choose **Copy** from the **Edit** menu. Then select the third measure and paste the controller range. The copied graph will get scaled to fit in the third measure:



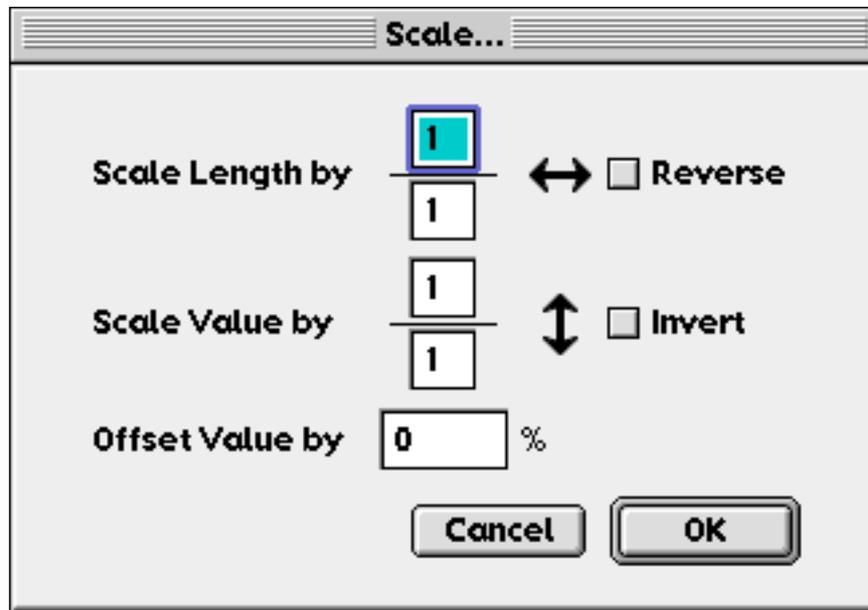
Copying and pasting controllers is particularly useful between tracks. For example, you can edit the volume controller of one track to create a fade-out effect at the end of the song. When the result pleases you, simply copy the entire volume controller view to all other tracks that need to fade out. To do that, perform the following steps:

- Select the entire volume controller view of the source track (**Select All** or **⌘-A**).
- Copy the entire controller range to the clipboard (**Copy** or **⌘-C**).
- For each destination track:
 - Activate the volume controller view.
 - Select the entire contents.
 - Paste the controller events.

Note: When you paste a controller transition over an existing range, the previous controller events of the same type within this range are lost.

20.5 Scaling Controllers

With the third measure still selected, select the **Scale...** command from the **Edit** menu. Whereas scaling notes affected only the time axis, you can now change both the time and the controller value, as shown in the following dialog:



The first part (**Scale Length**) affects the duration of a selected controller section. The check box to the right lets you revert the order of the controller events; when applied to our example, it simply flips the controller transition horizontally, i.e., it turns the fade-out into a fade-in:



When you shorten a selected controller section, the last value is used to fill the remaining space, as shown in the following example:



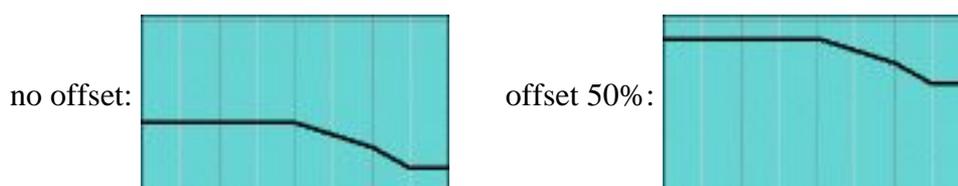
When you stretch a controller section, it extends over other parts that follow and overwrites them:



The second section (**Scale Value**) affects the value. If you check the **Invert** option, the selection is turned upside down:



The third part (**Offset**) adds a fixed amount to the controller value after it has been scaled. The value you enter in this field is a percentage of the entire controller range. For example, the following figure shows what happens when you scale the third measure of our example by 1/2 without and with an additional offset:



20.6 The Controllers and Their Meaning

Everyone knows what “Volume” and “Reverb” mean, but some of the other controller types are not quite as clear. Let’s briefly summarize what they are for:

Aftertouch: Typically used for keyboard instruments; determines how strong a key is being pressed after hitting it.

Balance: The balance between the left and right channels for stereo instruments.

Breath: Determines how strong the player blows a brass or similar instrument during a note.

Celeste: A slight detune effect.

Chorus: A subtle effect that gives many instruments more “body”.

Expression: A secondary volume controller (typically used for brief and small changes).

Foot Pedal: Whatever the foot pedal does for certain instruments (typically used for keyboard); often used to alter the intensity of notes.

Modulation: A periodic change to the volume and/or pitch of the sound, typically a vibrato effect.

Pan: The balance between the left and right channels for mono instruments.

Phaser: A continuous swooshing effect.

Pitch Bend: A change in the pitch of notes; corresponds to the pitch wheel of a keyboard or the whammy bar of an electric guitar.

Portamento Time: The time to change the pitch from one note to the next; gives a slurring effect.

Reverb: Adds a reverb effect as if the instrument were played in a hall.

Soft Pedal: Lowers the volume or intensity of notes being played.

Sostenuto: Similar to Sustain, but holds only notes being played when Sostenuto is activated. Notes starting later (when Sostenuto is already on) are not affected.

Sustain: Lets notes continue to play after their “official” duration; corresponds to the hold pedal of a piano. The notes stop sounding when the sustain is reset to 0. (0 means “off”, any other value means “on”).

Tremolo: A periodic change to the volume, sometimes similar to Modulation.

Volume: The loudness.

The effect of a certain controller depends on the instrument as well as on the synthesizer being used. For example, Aftertouch, Foot Pedal and Breath often have similar effects. Breath is for a flute what Aftertouch is for an organ.

No matter which controller you edit, the editing operations are always the same. You will, however, notice a few differences. For example, the values of the Pan controller range from -100% (left) to +100% (right), where 0 means “center”. When you press the \uparrow key, the value snaps to the extreme left and right and to the center.

When you work with the Pitch Bend controller, the values shown are semitones (+ is up, – is down). The value snaps to half semitones when you press the \uparrow key. The visible range of the Pitch Bend controller initially goes from -2 to +2 semitones, but you can change that by selecting the **Pitch Bend Range...** command from the **Track** menu, which opens the following dialog:



If you change the range to, say, ± 4 semitones, the visible range will extend from -4 to +4. If you then use the full range and later set the pitch bend range back to ± 2 semitones, all values beyond +2 and -2 will disappear from the controller view. The values will still be there, you just won't see them.

Note: A pitch bend range of ± 2 semitones (the default value as defined in the MIDI standard) is usually enough for expressing string bends on a guitar. The pitch bend wheel on many keyboards also limits the pitch bend range to ± 2 semitones. If a wider range is used, some synthesizers may fail to reproduce the effect correctly. Even QuickTime (as of version 3.0) has problems in such cases: If you save a song with a wide pitch bend range in MIDI format and then play it with Apple's MoviePlayer, the pitch bend range will be reduced to ± 2 semitones.

Now let's try using controllers to create a few amazing effects. Before you continue with the following exercises, clear all volume controller events from the piano track: Select all of them and then hit the delete key. You should now see the gray default line along the top of the controller view again. Close the piano's controller view, switch the piano track back to the score view, then open the drum track and copy the contents of the first measure to the second measure: Use **Select All** and then drag the notes one bar to the right with the  key down (or use the **Duplicate Bars...** command). Finally, enable all tracks by activating their speaker icons (or -click any speaker icon of one of the tracks 1 to 3).



20.7 Exercise 1: Guitar Lick

In this exercise, we will create a simple guitar lick with a few effects. First insert a new track below the piano track, name it "Guitar", change the instrument to "Overdriven Guitar" and set the key to "D=Bm". Then select the **Score Settings...** command and enter "+1" for the score display transposition.

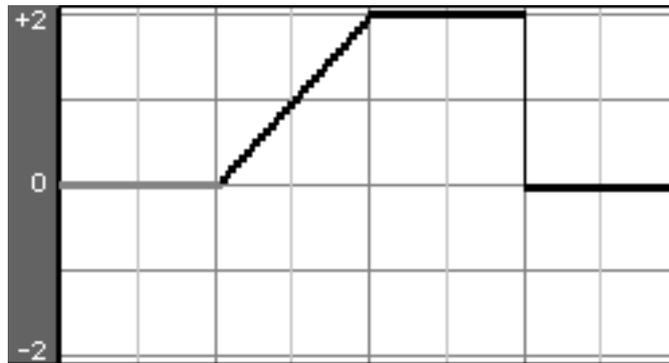


Now insert the following notes and change the velocity of all notes to 110.



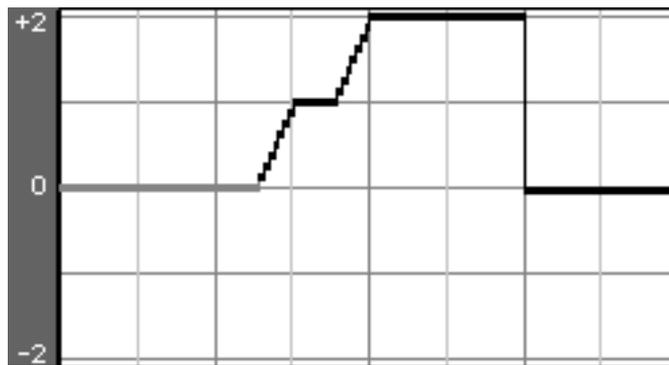
When you play the song now, it doesn't sound very impressive. In particular, the E in the first measure is out of tune, as it doesn't follow the F and F# played by the piano. A guitar player would either play a legato using hammer-ons or slowly bend the string from E to F#. We will simulate the latter by inserting the corresponding pitch bend events. To do that, add a controller view and select "Pitch Bend" from the pop-up menu. Then raise the pitch from 0 to +2 in the second quarter by

drawing a straight line. Finally, set the pitch back to 0 at the beginning of the fourth quarter. The result should look like this:



 T29

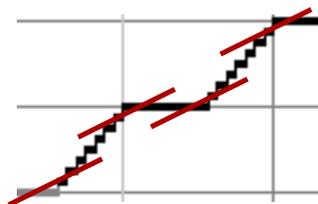
If you play the song now, it sounds better, but not very natural; no human guitar player would bend a string like this. In reality, the string bend would start a bit later (such that the clean E sounds for a short while), then bend up to F# with a slight pause at F. To simulate that, set the grid to 1/16 and replace the slope with the following shape:



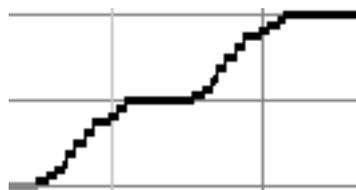
 T30

Remember that you can use the  key to make the intermediate horizontal line snap at +1 and to set the maximum value to exactly +2.

It's much better now, but the exact linear rise is still a bit unnatural. We can improve that by cutting the sharp edges. Before you do that, make the bar display wider (450 pixels is a good size). We will try to replace the edges with short slopes, as shown in the following figure:

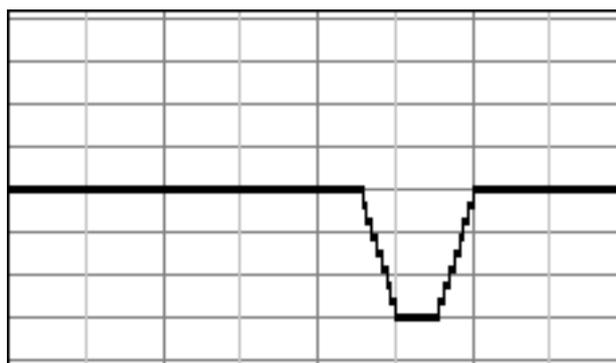


To make sure that the new lines start and end exactly on the original line, switch the grid off (or press the \mathbb{E} key to temporarily disable the grid) and press the \uparrow key while drawing the lines. The result should then look like this:

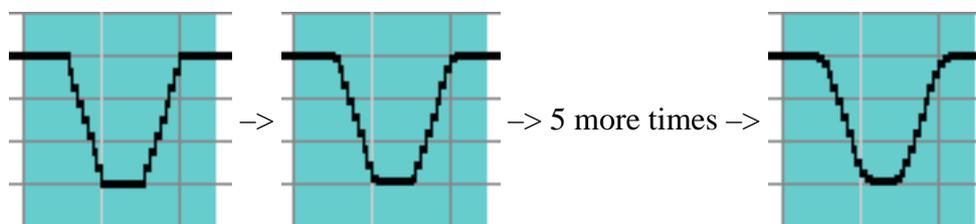


 T31

That's OK for now, so let's now turn our attention to the half note F# in the second measure. During this note, the piano plays F#, D and F#. A guitar player would, for example, use the whammy bar to lower the pitch of the F# by a third and then release the whammy bar again. We can simulate this effect, too. However, the pitch bend view currently shows only two semitones, but we need a range of three semitones. Select the **Pitch Bend Range...** command from the **Track** menu and enter "4" as the new range. Then draw a few straight lines to simulate the desired effect, as shown in the following figure:



Again, we should smooth the edges to make the song sound more natural. Select the controller change and include some of the straight parts to the left and right, then select the **Smooth** command from the **Edit** menu or type \mathbb{E} -M. The sharp edges will get rounded. To increase the smoothness, simply repeat this step. Type \mathbb{E} -M five more times and you will end up with the following controller transition:



Hint: The **Undo** command works slightly different after a **Smooth** operation. It normally reverts the last operation only, but multiple consecutive invocations of **Smooth** count as

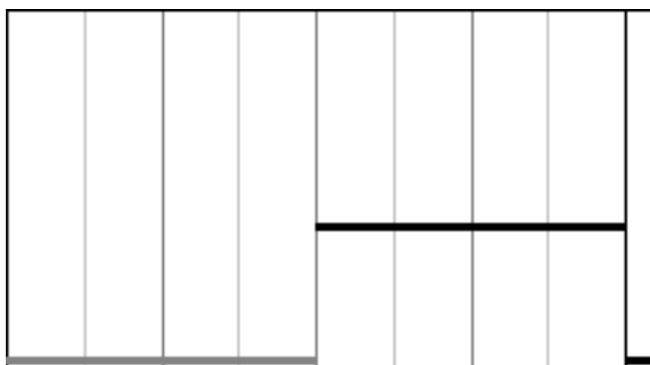
one operation. If you typed **⌘-M** too often, you can easily revert to the original state by typing **⌘-Z** or F1.

We will see later how typical controller sequences can be inserted more easily.



To make a (distorted) guitar sound better, you can apply a few other changes. For example, try adding a reverb (e.g. with a value of about 55%) and a chorus (e.g., 80%) effect. To make these changes for the entire track, click near the beginning of measure 1 and drag the horizontal line up to the desired value.

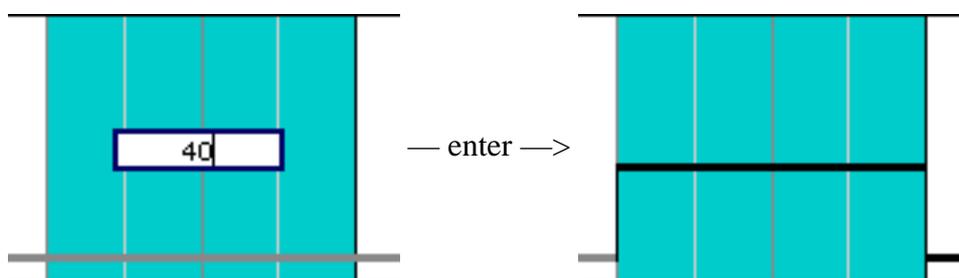
Another way to add a subtle effect to long notes is to apply a small amount of modulation to it. Try this with the last note; set the modulation to about 40% over the entire duration of the note and turn it back to 0 afterwards:



Instead of drawing a horizontal line, you can also select a range and simply type the new controller value. Let's try that with the modulation controller. First clear the entire modulation controller using **Select All** and hitting the backspace key.

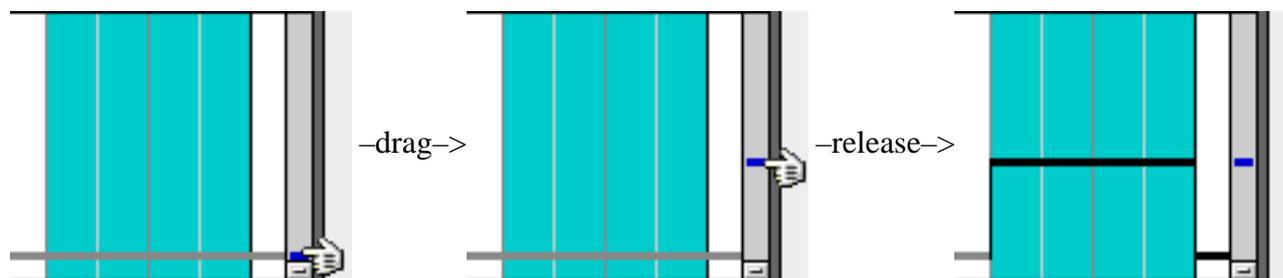


Now select the second half of the second measure with the **⌘** key and type "40". An editable field appears in the middle of the selected area. Finally hit the enter or return key to create a horizontal line that extends over the selected part:

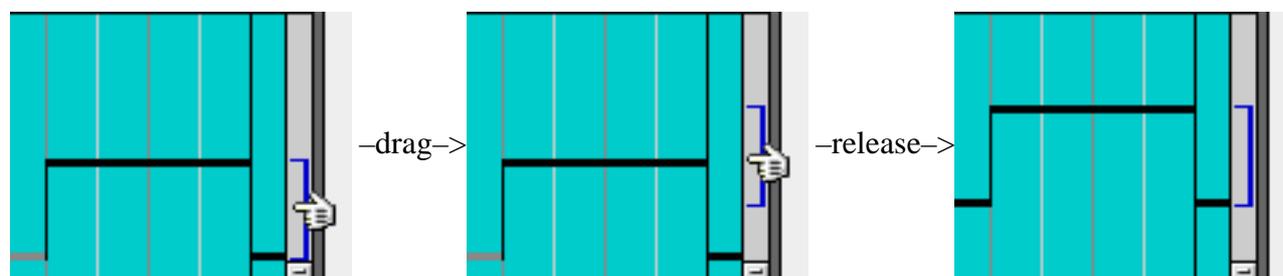


Now let's try yet another way to achieve the same result. Undo the change to restore the original flat line and leave the selection at the second half of the second measure. You will notice that the right

border of the controller view contains a blue line that indicates the controller's value within the selected range. Point at that line (the mouse pointer appears as ) , click and drag the blue line to about 40%:



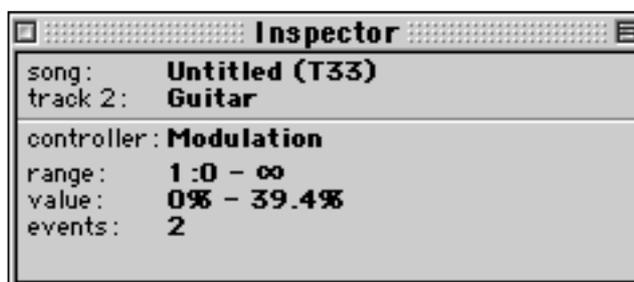
Both techniques are great for global changes to controller transitions. For example, use **Select All** to hilite the entire modulation controller of the guitar track. The track border now displays a blue bracket instead of the single line. The bracket shows the minimum and maximum controller values within the selected range. You can now pick up the entire bracket to move the controller transition up or down by an arbitrary offset:



Instead of using the **Scale...** menu command, you can also drag the upper and lower limits of the bracket up and down. If you point at one of the limits, the mouse pointer appears as  . In this way, you can easily shrink or expand the entire range of the modulation controller.

Another way to scale a selected part of a controller view is by *typing* the desired scaling factor. For example, typing “*1.5” or “*3/2” increases the selected controller values by 50%. If you type “*.5” or “/2”, you can scale the controller values down by 50%.

If you need to know the exact minimum and maximum values of a selected range, open the Inspector window. When a controller view is active, the Inspector shows the length of the selected range, the minimum and maximum controller values within the range, and the number of controller events:

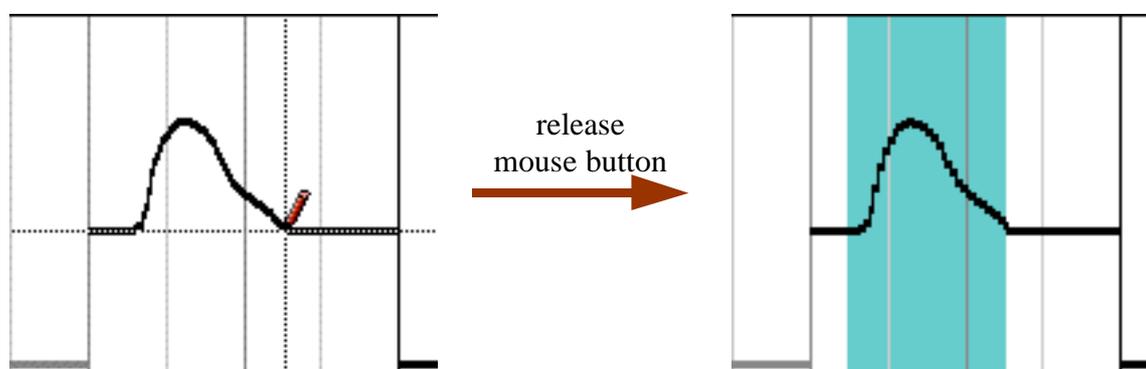


When applied to a guitar, “modulation” means a slight vibrato effect. The abrupt change in the controller value doesn’t hurt in this case, but it is nevertheless often better to begin with a softer modulation and slowly increase it over the duration of the note.

Before you proceed, reduce the velocity of the guitar to 80. The value of 110 was great for editing the controllers because we could hear the effects better, but 80 make the guitar sound less dominant.

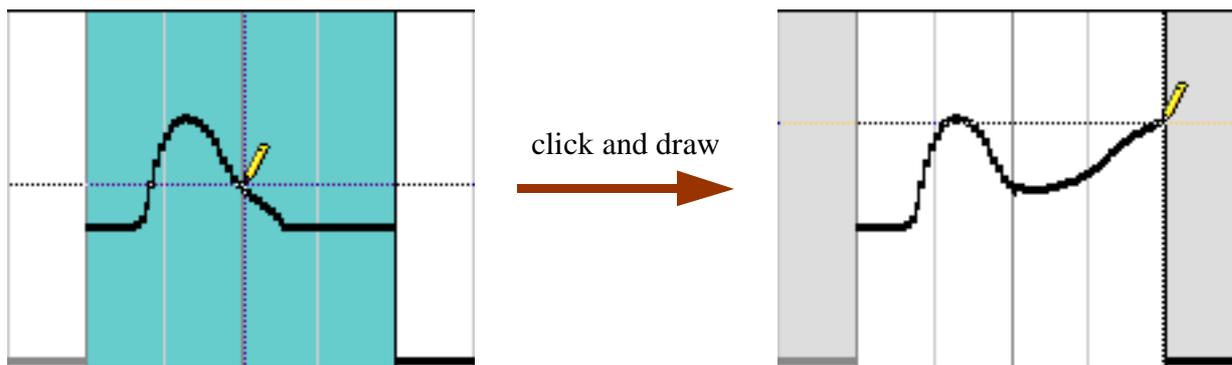


Now let’s try to make an arbitrary change to the modulation controller. For example, you might wish to temporarily increase the modulation in an irregular way. Creating such transitions by drawing straight lines would be a bit cumbersome. To easily create controller transitions of arbitrary shape, **easy beat** lets you draw them “by hand”. Make sure that nothing is selected in the controller view (if necessary, hit the *escape* key to remove the selection), then press the *ctrl* key. The mouse pointer will take the shape of a pen, and the grid will be disabled. Now click in the controller’s area and draw a “bump”, as shown in the following illustration:



When you release the mouse button, the newly drawn controller transition will become selected, and small steps appear in the controller transition. When you draw a controller transition with the pen, the curve will closely follow the mouse movements and many controller events will be generated. This is often undesirable because a rapid succession of events can be too fast to be processed by a synthesizer. Besides, the human ear is not able to recognize small and fast changes of controller values. **easy beat** therefore removes unnecessary events that would not be audible when you play the song; the resulting transition consists of controller events that are at least 1/128 note apart. The original shape is approximated, but the data rate becomes low enough to allow playback at high speed without overloading the synthesizer.

As the grid is turned off when you draw controller transitions with the pen, you can easily slip and change parts that should remain as they are. To help you avoid such inadvertent changes, **easy beat** lets you restrict freehand drawing to the current selection. To try that, select the second half of the second measure, then point into the selected area (the pen will turn yellow) and start drawing. Everything outside the selected range will appear with a gray background, and drawing will be restricted to the white area:



If you play the song with these changes in modulation, you will probably not hear any difference. You should therefore go back to the original straight line when you're through with your freehand experiments.



20.8 Exercise 2: Helicopter

In the second exercise, we try something completely different. Let's simulate the noise of a helicopter that passes by. Create a new empty song and set the instrument of track 1 to "Helicopter" (in the "Sound Effects" section of the instrument pop-up menu). Then create a whole A note with velocity 127 in the first measure, set the bar width to 450 pixels, and reduce the tempo to 30 BPM. The "note" will then play for 8 seconds.



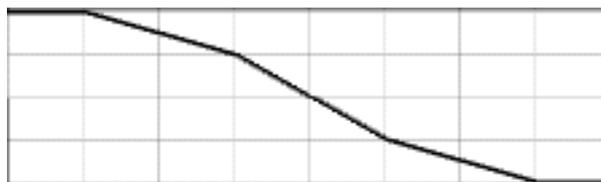
If you listen to the "song" now, you will notice that the helicopter sound fades in at the beginning but ends quite suddenly. Let's first create an "envelope" with the volume controller that makes the sound fade in and out. Switch to the controller view. You don't need to *add* a controller view, as we don't need to see the whole note while we edit the controllers. Then create rising and falling slopes, as shown in the following figure:



You can, of course, create these slopes by drawing a series of straight lines, but **easy beat** also lets you create such linear transitions by typing. To achieve the same result as above, select a range, then

type the starting and ending values, separated by a dash, such as “0-50” for the first eighth, “50-100” for the second and third eighths, and so on.

The sound now becomes louder and softer, but we do not yet have the impression of a helicopter flying by. When a moving sound source gets closer in reality, we hear the sound in a higher pitch. Conversely, if the sound source moves away, it sounds deeper. This change in frequency is known as the “Doppler effect”. To simulate this effect, we need to adjust the pitch bend controller such that the frequency decreases as the helicopter passes by. Start with +2 over the first eighth, then reduce the pitch to +1 after 3/8, to -1 after 5/8, and finally to -2 after 7/8:



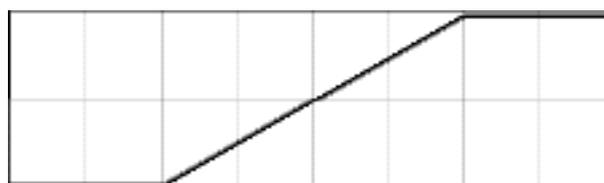
 T36

If you prefer creating this transition by typing, select the ranges that you want to change and type the number of semitones. The following table shows what you should type for which eighths to create the above transition:

eighths	entry
1	2
2-3	2-1
4-5	1- -1
6-7	-1- -2
8	-2

Note that double dashes are needed if the second value is negative; one for “to”, and one for the sign of the second number. For example, “-1- -2” means “minus 1 to minus 2”.

Finally, add a “Pan” controller transition that begins with “left” and advances to “right” over the second and third quarters.



 T37

Now listen to the “song”. Amazing, isn’t it?

Note: To hear the sound move from left to right, you need: 1) a stereo synthesizer (such as QuickDraw’s built-in synthesizer), 2) stereo speakers or a stereo headphone, 3) a Macintosh with stereo support (unless you use an external synthesizer).

21 Tempo Changes



T33

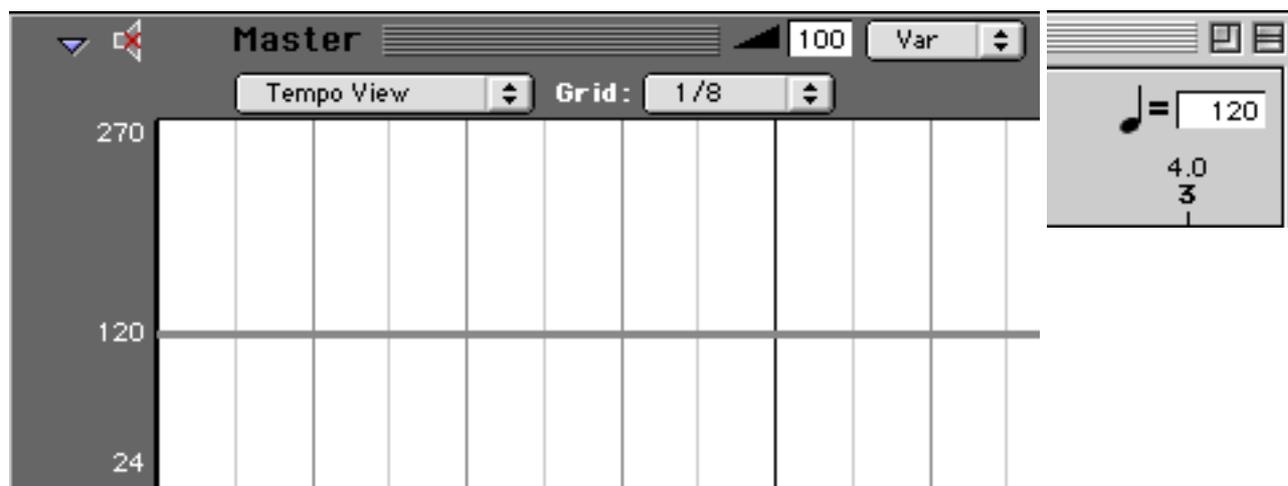
When you look at the Master track, you'll find that only two view types are available here:



“Metronome View” is just another name for the metronome’s drum view. The “Tempo View” is a special controller view that lets you vary the song’s tempo.

Note: You can type **⌘-D** (for “drum”) to switch to the metronome and **⌘-K** (for “controller”) to switch to the tempo view if the Master track is hilited. You can also press the **⌘** key when you pull down the Track menu or press **⌘-⌘-D** or **⌘-⌘-K** to display both the metronome and the tempo view.

The tempo view initially contains a gray horizontal line at the tempo that you entered in the song header:



T38

The global tempo in the song header is the “nominal tempo”; all changes in the tempo view are relative to this value. The permitted range of tempo changes is from about 20% to 225% of the nominal tempo. In our example, you can vary the tempo from 24 to 270 BPM.

Once you know how to edit controllers, you will immediately be able to change the tempo of a song. Just draw lines or select ranges and type the new tempo values.

Here are a few examples of what you can do with the tempo controller:

21.1 Mixing Tempos within a Song

If a song should consist of separate sections, each with its own tempo, just click at the beginning of a section and drag the tempo line vertically to the desired value. For example, try increasing the tempo of the second measure to about 135.

Hint 1: If the tempo value jumps in too coarse steps (such as 133, 135, 137), increase the height of the tempo view by dragging the grow handle in the bottom right corner of the tempo view downwards.

Hint 2: If you're done with the tempo changes and wish to revert the entire song to the nominal tempo, just type ⌘-A to select the entire tempo controller and hit the backspace key.

Alternatively, you can select a section and type the new tempo. For example, let's assume that the first measure were an intro that should be played with a slightly lower tempo. Select the first measure with the ⌘ key, then type "100".

We suggest that you set the nominal value to the tempo that's typical for the main sections of a song. Use the tempo controller only for those parts that should deviate from the nominal tempo.

21.2 Decelerando

Some songs end with a "decelerando". The last measure slows down slightly. You can simulate that by creating a downward slope at the end of a song. For example, clear the whole tempo controller, then select the last measure and type "120-80" to let the tempo decrease from 120 to 80.

21.3 Shortening or Extending Individual Measures

You may sometimes want to insert an extra quarter in a measure. Since **easy beat** does not support multiple time signatures within a song, you can use the following trick:

Select the last quarter of a measure (try that with the last quarter of the first measure in the tutorial song) and type "/2" (or "*0.5") to reduce the tempo to half of the current tempo (in our case, 60). The last quarter will then play twice as long, and the entire measure will appear to be in 5/4.



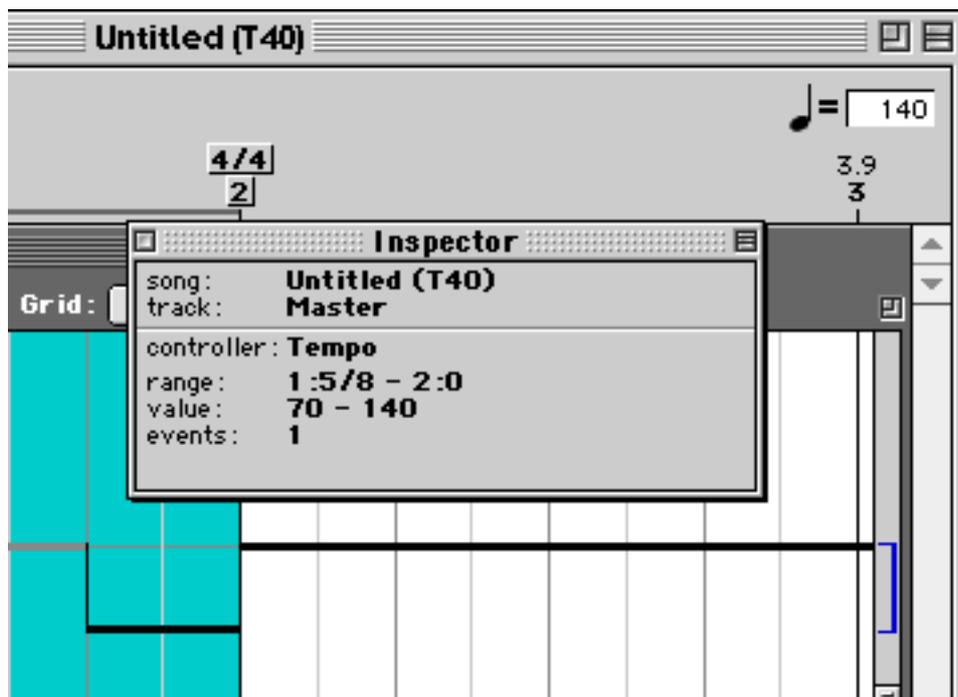
Since all notes within the last quarter will now play twice as long, you will need to insert 1/8 notes as 1/16 notes. For example, if the drum should continue to play with the same perceived tempo, you'll need to add extra beats in the middle of the last quarter.



You can use the same technique to insert breaks of arbitrary length between sections of a song. Just insert an empty measure between adjacent sections and adjust the tempo such that the break takes as long as you want. If necessary, insert multiple measures for longer breaks.

21.4 Changing the Nominal Tempo

If you change the nominal tempo when you have already made changes to the tempo controller, the tempo changes will become relative to the new tempo. For example, if you change the nominal tempo of T40 to 140 BPM, the last quarter of the first measure will play at 70 BPM, as shown in the following illustration:



The song will still “feel the same”, it will just play faster.

You will also notice that the labels in the tempo controller’s left border now read 315, 140, and 28. The middle value (from which the unchanged gray line starts) now has the nominal value 140, and the limits have been adjusted to 28 and 315 (again about 20% and 225% of the nominal tempo).

22 Templates

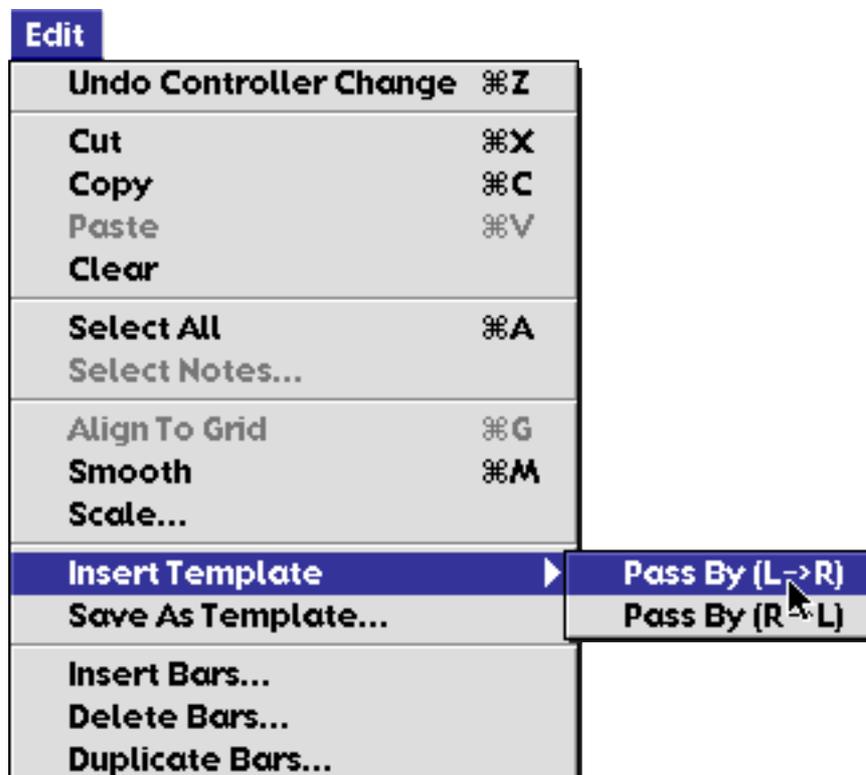
As we have seen in the controller editing examples, creating smooth and natural controller transitions can be quite challenging. In some cases, even abrupt changes do not matter much. For example, you will hardly notice a sudden change of the “Chorus” controller value from 50% to 70%. On the other hand, the “Volume” and “Pitch Bend” controllers (to name just two critical examples) often need fine tuning to sound good.

22.1 Applying Templates

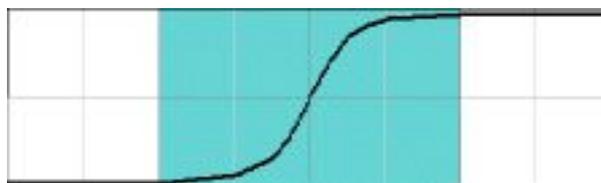


T37

When you manually edit controllers, you will often need the same or similar transitions again and again. **easy beat** lets you save such controller transitions as “templates” that are always available. If your copy of **easy beat** was correctly installed, you should have a “Templates” folder in the same folder as the **easy beat** application. This folder contains a few predefined templates for various purposes. For example, the “Pass By (L→R)” template creates a transition from left to right. To try it, select the slope in the “Pan” controller view of the helicopter example (remember to press the **⌘** key for selecting a controller range). Then pull down the **Edit** menu and select the template from the **Insert Template** submenu:



When you select the “Pass By (L→R)” template, the selection in the current controller view is replaced with the template’s contents, in this case a smooth transition that begins slowly and advances faster around the “center” position:



 T41

Even though the strictly linear transition was already quite acceptable, the template makes the helicopter sound much more natural.

You’ll notice that only two templates are listed in the submenu, whereas many more are installed in the “Templates” folder. This is not a bug, but a feature: **easy beat** displays only those templates that make sense in the current context. As we currently work with a “Pan” controller view, only “Pan” templates will be available in the menu. The “Pan” and “Pitch Bend” controllers are special cases, as their ranges differ from all other controllers. It is, for example, not possible to insert a fade out transition (such as “Down Slow”, which was originally meant for a “Volume” controller) in a “Pan” or “Pitch Bend” view.

The remaining controller types do not have this restriction because they share the same minimum and maximum values. You can, for example, apply the “Down Slow” template to “Volume”, “Modulation” or “Chorus”.

Hint: If a template’s contents do not exactly satisfy your needs, you can often achieve the desired results with the **Scale...** command after inserting the template or by typing a scaling factor. For example, you can insert a “Semitone Smear Bend” in a Pitch Bend controller range and then type “*2” to extend the range to two semitones. You can even enter a negative scaling factor (such as “*-1”) to turn a Pitch Bend or Pan template upside down. As an alternative, you can scale or move an inserted template using the blue bracket in the controller view’s right border.

22.2 Creating Templates

To create your own template, select a portion of a controller transition and choose **Save As Template...** from the **Edit** menu. **easy beat** will ask you to enter the template’s name and store the new template in the “Templates” folder. The new template will immediately appear in the **Edit** menu.

To remove a template, drag the template file out of the “Templates” folder. To give an existing template a new name, rename the file in the Finder.

22.3 Note Templates

You can create templates not only for controller transitions, but also for notes. In this case, notes and drum hits are treated separately: You cannot insert a note template in a drum track and vice versa.

Drum templates are particularly useful. You can, for example, create your own set of frequently used drum patterns and insert them in new songs whenever you need them.

You will hardly ever need note templates. They can, however, be useful in the case of guitar chords. When you manually create a chord, you will sometimes need to edit the fret positions and adjust the velocities of the individual notes. If you often need the same chords, templates can save you a lot of work.

Note: When you insert note or drum templates, they always appear in the first visible measure. To insert a template in a certain position within a song, scroll to the desired measure, select the template from the **Insert Template** submenu and – if necessary – move the now highlighted notes to their final position. An easier method to specify the destination location of a note template is described in the following chapter.

23 Range Selection

The range selection technique using -clicks also works in other views, not just in a controller view. To see how this works, let's return to our sample song. Collapse the piano track and switch the guitar's controller view to the pitch bend controller.



Now select the last note in the guitar track and copy it to the beginning of the third measure: drag the note to the third measure while pressing the  key. If you play the song, you will hear that the pitch bend controller transition got lost. When you move, copy or delete notes in a score, keyboard, drum or TAB view, only the notes are affected; the controller messages remain where they are.

23.1 Copying a Range

To copy an entire range of notes including all controller events, you must use a range selection. Point at an empty space in the score view near the center of the second measure and press the  key. Make sure the selection cursor appears. The status bar should now show the message “Select Range: 2:2/4”. Now click and drag to the end of the measure to select the second half of the second measure. The selected range now appears highlighted, as shown in the following snapshot:

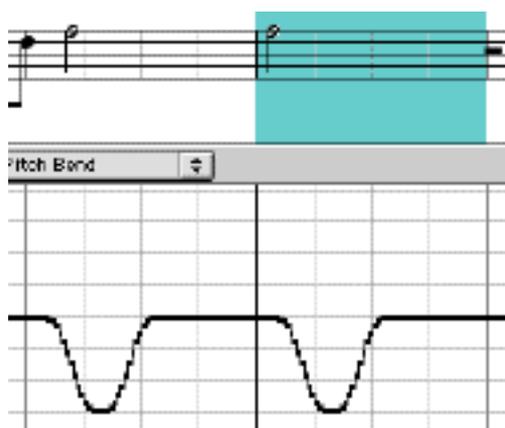


The selection now covers everything that falls into this range:

- All notes that *start* within the limits of the selection.
- All controller events in this range.

Note that the last note of the second triplet appears as if it were part of the selection, but this is not the case. **easy beat** rearranges notes in the score view to achieve an aesthetically pleasing result. When it does that, the widths of notes, rest signs and accidentals are considered. As a consequence, notes do not always appear at the correct positions within a measure. To avoid confusion, you may find it easier to make such range selections in the keyboard view. To verify what is part of the selection, you can also hit the space bar to play the contents of the selection.

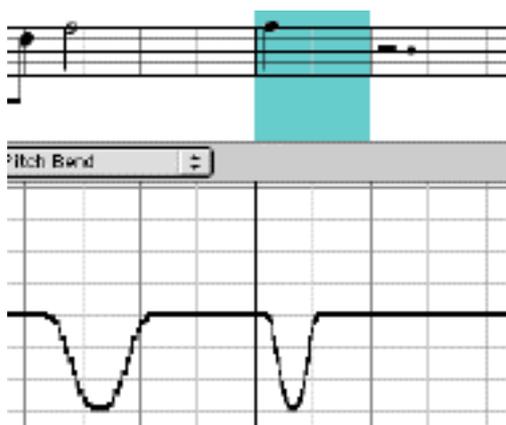
Now that the range is selected, select **Copy** from the **Edit** menu or type F3 or ⌘-C. Then select the first half of the third measure in the same way and select **Paste** or type F4 or ⌘-V. You will see that not only the note but also the pitch bend controller transition was copied to the third measure:



23.2 Scaling a Range

It is important that the length of the source range (which you copy) is the same as the length of the destination range (into which you paste). If that is not the case, **easy beat** scales the range. This will sometimes produce terrible results (for example, when you copy seven eighths into a whole measure) but can also be used deliberately to speed up or slow down a section of a song. For example, remove the copy just made: leave the selection at the first half of the second measure and hit the delete or backspace key. Both the note and the controller transition will be removed.

Now select the first quarter of the third measure and paste the contents of the clipboard into this shorter range. The half note will be shortened to a quarter, and the controller transition will also be scaled:



23.3 Copying Entire Tracks

Range selection is particularly useful if you wish to copy whole tracks within a song or from one song to another. Let's use this feature to create an echo of the guitar track. First remove the copied range again or go back to the previous tutorial file.



Now add another track (select **Add Track** from the **Track** menu), name the new track "Guitar Echo" and set the instrument to "Overdriven Guitar" to match the original track. Finally, change the key to "D=Bm" and set the score display transposition to +1 in the **Score Settings...** dialog.



Then activate the score view of the original guitar track and choose **Select All** from the **Edit** menu while pressing the \uparrow key (or type $\text{⌘}-\uparrow-\text{A}$). Without the \uparrow key, the selection would just include all notes, but with the \uparrow key, the entire track is selected as a range.

Now copy the whole track to the clipboard and then activate the score view of the "Guitar Echo" track (make sure the track's header appears in dark gray). Select **Paste** from the **Edit** menu or type $\text{⌘}-\text{V}$. Nothing happens? That's because you can paste a range only into another range. Select the entire destination track using the $\text{⌘}-\uparrow-\text{A}$ key combination and try again. All notes will appear in the track. If you switch to the controller view and check the **Controller** pop-up menu, you will see that the Modulation, Pitch Bend, Reverb and Chorus messages are all there.



If you play the song now, you will hear the guitar track slightly louder than before, as if two guitars played the same tune at exactly the same time.

Now let's apply the Delay variation to the new track. Select **Delay...** from the track's variation pop-up menu and enter a high value (such as 75% or 100%) in the dialog. Then reduce the track's volume to 80%. The result will be a typical delay as produced by an effect processor.



Hint: If you want to add an echo to a song in this way, we recommend that you perform these steps when you are finished with the original track. If you change the original track later, you will have to Copy/Paste the entire track again, but you do not need to adjust the echo track's volume and delay.

23.4 Range Templates

You can also save a selected range as a template. For example, try this with the half note in our example. Select the second half of the second measure in the score view and then use the **Save as Template...** command in the **Edit** menu to create a new template "Test". When you deselect the range, you will notice that the new template is not listed in the **Insert Template** submenu. That's because you can insert a "range template" only into a selected range. This restriction is important because inserting a range template overwrites the controller events at the destination position. It is therefore necessary to define the destination range before you insert the template: Select the entire third measure and choose the "Test" template from the **Insert Template** submenu. A whole note will appear, and the volume controller transition was stretched to fill the entire measure.

You will notice that the **Insert Template** submenu contains the "4 Notes" template no matter if there is a range selection or not. "4 Notes" is a simple jingle consisting of four eighth notes. It is a "note template" (as described in the previous chapter), not a "range template". These two kinds of templates differ in the following aspects:

- A note template consists of notes only. When inserted, highlighted notes appear in the track. These notes have a fixed duration and spacing.
- A range template consists of notes and controller events and has a "reference duration". When inserted in a selected range, the notes and controller events are scaled to fit the destination range.

Now try the following: Select the first eighth of the fourth measure and then insert the "4 Notes" template. The notes will get inserted relative to the beginning of the selected range. The length of the range doesn't matter. Using this technique, you can easily insert note templates at an arbitrary position in a song (instead of the first visible measure). If you want, you can use the **Scale...** menu command afterwards to change the duration of the inserted fragment.

Hint: This trick also works when you copy selected notes: Just select a short range before you paste the notes to specify where the notes should appear.

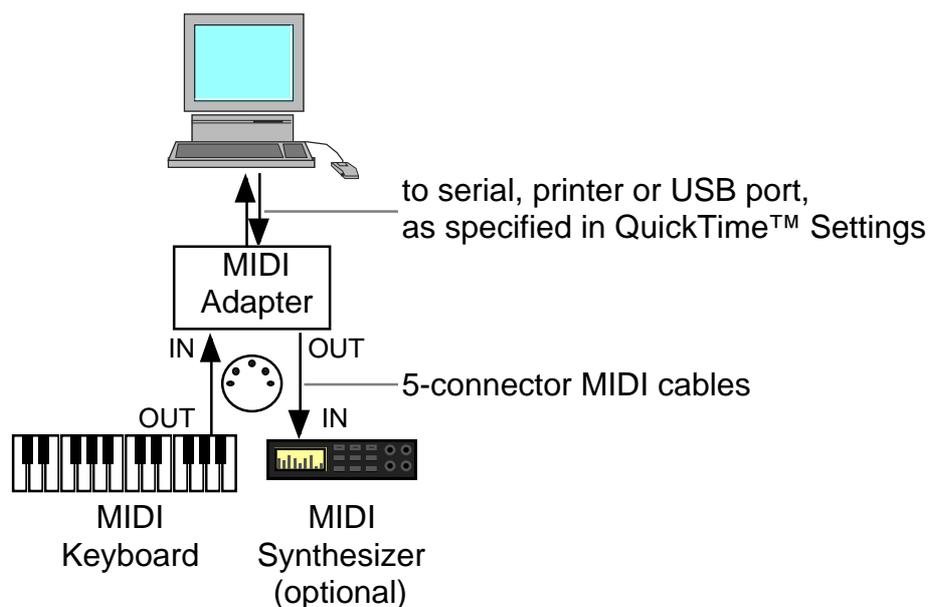
24 Recording

As you have seen by now, you can create amazing results with **easy beat**, but you need to enter the notes manually one by one. If you have the appropriate equipment, you can also record songs with a musical instrument.

24.1 Requirements and Configuration

All you need is an instrument with MIDI output (such as a keyboard or a MIDI guitar) and a MIDI adapter (such as the Opcode MIDI Translator). The MIDI adapter is usually connected to the computer's modem, printer or USB port. To use the adapter, you need additional software (such as OMS or FreeMIDI) that must be configured first. To use **easy beat**'s recording feature, you must also configure QuickTime such that the correct port (as defined in OMS or FreeMIDI) is used for MIDI input. Open the QuickTime™ Settings control panel and click the **Edit List...** button, then select the correct input port from the **MIDI Input** pop-up menu.

The following diagram shows the correct setup for recording with an instrument:



If you do not have an external MIDI synthesizer, you will still need a MIDI adapter to connect your MIDI instrument. Once you have correctly set up and connected your instrument, launch **easy beat** with a new empty document. If you play your instrument now, you should hear it as an "Acoustic Piano" (the default instrument of the first and only track).

easy beat recognizes the notes you play and passes them to the QuickTime music software, which in turn either plays the notes through your computer's speakers or sends them to the external synthesizer.

If you change the instrument of track #1 with the instrument pop-up menu, the sound will change immediately.

Note: **easy beat** ignores the MIDI channel of your instrument, but simply routes all received notes to the currently active track.

24.2 Recording into a Track

To record into a track of an existing song, activate the desired track and click the “REC” button. The song will start to play, and **easy beat** will add the notes you play to the active track. However, if the end of the song is reached, **easy beat** will stop both playing and recording. To add extra notes to the end of a song, set the end of the loop range to a high value, such as 200. **easy beat** will then continue to play the empty measures at the end of the song and let you record new notes into them.

Shortcut: Instead of clicking the “REC” button, you can also hit the “*” key on the numeric keypad.

When you record into a track, **easy beat** uses the track’s instrument, but ignores the grid setting. Recorded notes appear in the current track at the exact position when they were played; they do not snap to the grid. You can, however, use the **Align To Grid** menu command later to snap recorded notes to the grid of your choice.

24.3 Correcting Timing Errors

The recorded notes will appear very close to the position when you played them, but since your timing cannot be absolutely perfect, there will be small deviations between the exact metronome ticks and the recorded notes. To eliminate these errors, try the **Smart Align** command in the **Edit** menu.

To see what **Smart Align** does, open the “Smart Test” document in the “Examples” folder. It contains manually created tracks for bass, strings and drums. The first track was recorded using an electric guitar with a MIDI pickup.

As you can see in the keyboard view of the guitar track, the recorded notes are not exact at all. Nevertheless, the song sounds quite acceptable, as we usually don’t pay attention to such small differences. For example, the first note occurs after a delay of more than 1/32. If you listen carefully, you will notice the delay, but it almost sounds as if the delay was deliberate.

To get rid of the deviations, select the notes in the first measure and choose **Smart Align** from the **Edit** menu (or type ⌘-M). You will see that all notes are aligned to reasonable nearby positions. The song will sound more exact now.

You could also select all notes from the track and align all of them at once. However, we suggest that you try the **Smart Align** command measure by measure to see what actually happens. After an alignment operation, type F1 or ⌘-Z (for **Undo**) a few times to see the notes jump back and forth between their original and new positions.

How does it work? **Smart Align** tries to guess the desired positions of all selected notes. It starts with long notes (with a duration of 1/4 and more), as the correct positions of these notes are easier to estimate, and then proceeds with the shorter notes between them. When **Smart Align** aligns the notes, it tries to guess if the notes are straight ones or triplets. When all notes have their correct positions, their durations are adjusted. In particular, small gaps or overlaps are eliminated by making notes longer or shorter.

When no notes are selected in the current track, the **Smart Align** command becomes **Clean Up Notes**. This command can be quite useful to correct certain errors that may have crept into a track. For example, it is possible to create two notes of equal pitch which partially or completely overlap. Since MIDI (and QuickTime) cannot properly handle such notes, overlapping notes can abruptly cut off too early or “hang” indefinitely (i.e., they don’t stop playing). If you ever come across such an unwanted effect, deselect all notes of the affected track and select **Clean Up Notes**.

24.4 Recording Tips

The following tips and tricks can make life easier when you record new notes into a song:

- Start with simple background voices (for example, a simple bass line or slow chords).
- Turn the metronome track on. This is particularly useful when you do not yet have a drum track.
- Turn off all variations. Record a “straight” song and add variations afterwards.
- If the first notes should occur at the very beginning of the song, insert an empty measure at the beginning. The precount of the metronome will give you a cue when to start playing.
- Reduce the tempo to a reasonable value. If you want to record a song that should be played at 120 BPM, try recording at 90 BPM, but do not exaggerate: If you record at 60 BPM, the song will “feel different”, and you will hardly get it right.
- Break the song into small sections. Record a few measures at a time and continue when you’re satisfied with the result. Repeat the following steps for each section:
 - Set a loop that covers the entire section plus one additional measure before and afterwards; enable the loop.
 - Hit the *esc* key to deselect all notes.
 - Click the REC button or hit the “*” key on the numeric keypad.
 - Play your MIDI instrument to record new notes into the track.
 - When the end of the section is reached, the new notes will be selected in the track.
 - When the section is repeated, listen to it. If you have made a mistake, hit the delete key to remove the selected notes, wait until the loop repeats again and record the section once again.
 - If the recorded notes lag behind other tracks, turn the grid off and move them to the left with the arrow keys.
 - Experiment with **Smart Align** and **Align to Grid**; remember that you can always undo the most recent change.

- When you're satisfied with the result, hit the *esc* key to deselect the recorded notes, save your song and advance to the next section.

24.5 Restrictions

easy beat's recording feature currently has two restrictions:

- Controller changes (such as pitch bend, modulation or soft pedal) are ignored.
- All recording is done in the active track, and the MIDI channel of the received notes is ignored. You can therefore not record the individual instruments of an entire band into separate tracks.

These restrictions will very likely be removed in future releases.

24.6 Recording Options

easy beat lets you specify how notes received from a MIDI instrument should be treated during recording. The **Recording Options...** command in the Music menu provides a variety of options that you can apply separately to each MIDI channel. For details, please see the **easy beat** Reference manual.

25 External Synthesizers

easy beat was designed to conform to the General MIDI (GM) specification that was defined by the MIDI Manufacturers Association to enhance compatibility between synthesizers of different brands. Most external synthesizers conform to General MIDI, as does QuickTime's built-in synthesizer. General MIDI thus is the "common denominator" that can be expected to be supported by both QuickTime and almost all external synthesizer models.

25.1 Non-GM Synthesizers

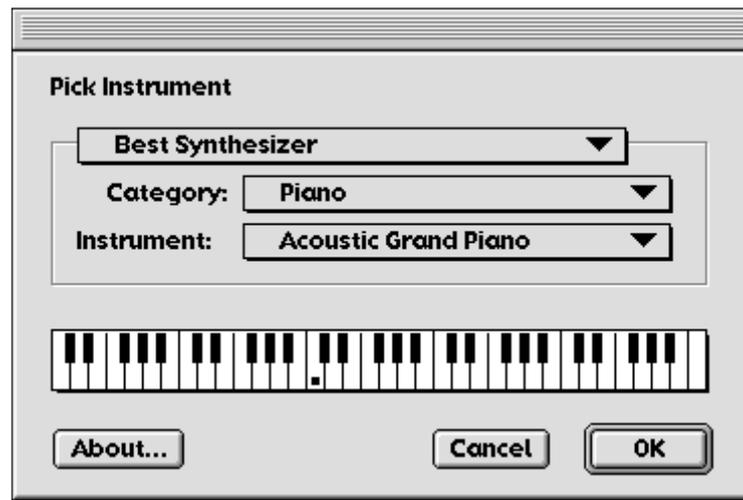
If you have an older synthesizer model that does not yet conform to General MIDI, it will very likely play wrong instruments instead of those that you assigned to your song's tracks. That's because older synthesizers often use arbitrary assignments of instruments to "program numbers". You can correct this error by creating a "MIDI Mapping" file that tells **easy beat** how the built-in General MIDI instruments should be selected on your external synthesizer. The procedure for setting up such a mapping is described in detail in the "MIDI Mapping" section in the "Music Menu" chapter of the **easy beat** Reference manual.

25.2 Synthesizers with Extensions over GM

If you have a synthesizer that supports more instruments than those defined by General MIDI, you can select additional instruments with the last two items in a track's instrument pop-up menu:



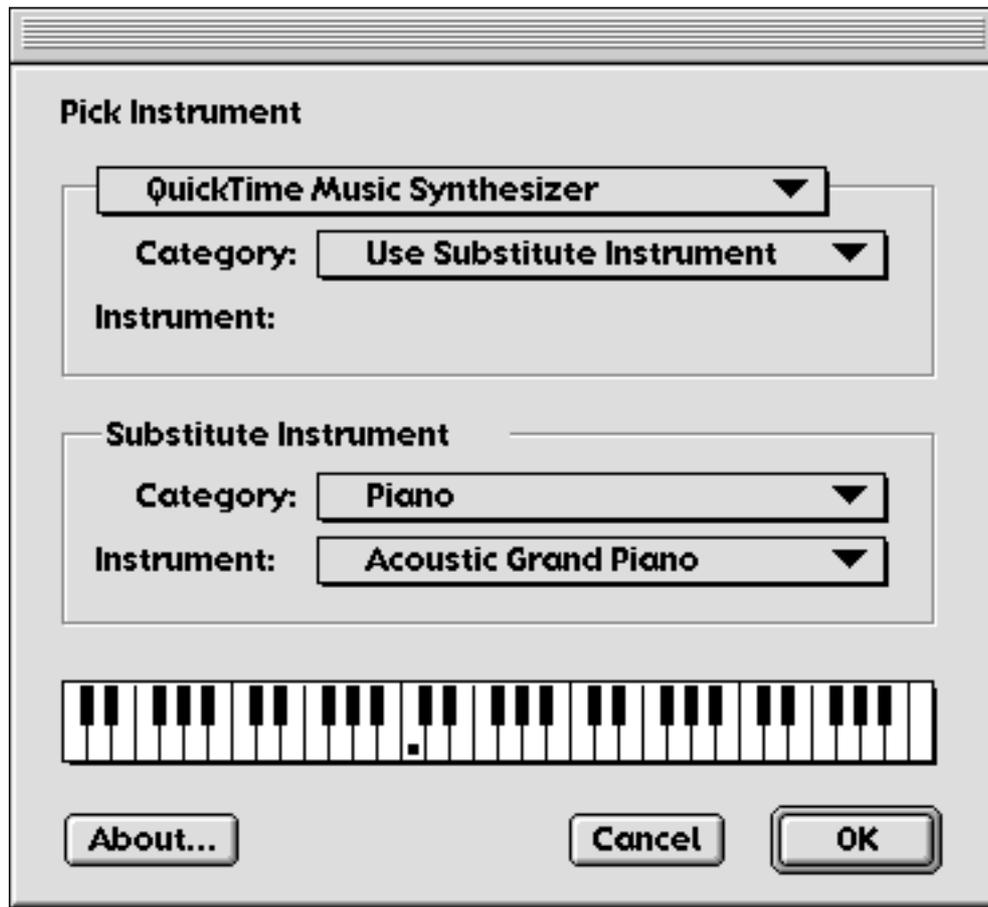
Pick Instrument... opens QuickTime's instrument picker dialog:



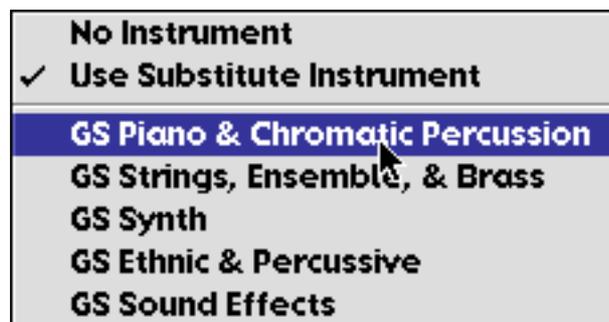
Shortcut: Instead of selecting “Pick Instrument...”, you can also click the Instrument menu while pressing the **⌘** key.

When the first pop-up menu displays “Best Synthesizer”, you can use the menus below to select one of the General MIDI instruments. As these instruments are also available in **easy beat**'s Instrument menu, you will rarely need to use the dialog in this mode.

If you switch the first pop-up menu to “QuickTime Music Synthesizer”, the dialog is enlarged:



You can now use the first Category pop-up menu to select a group of GS instruments:



Once a GS category is selected, you can use the Instrument menu below to select the desired instrument, such as the “Detuned Electric Piano 1”:



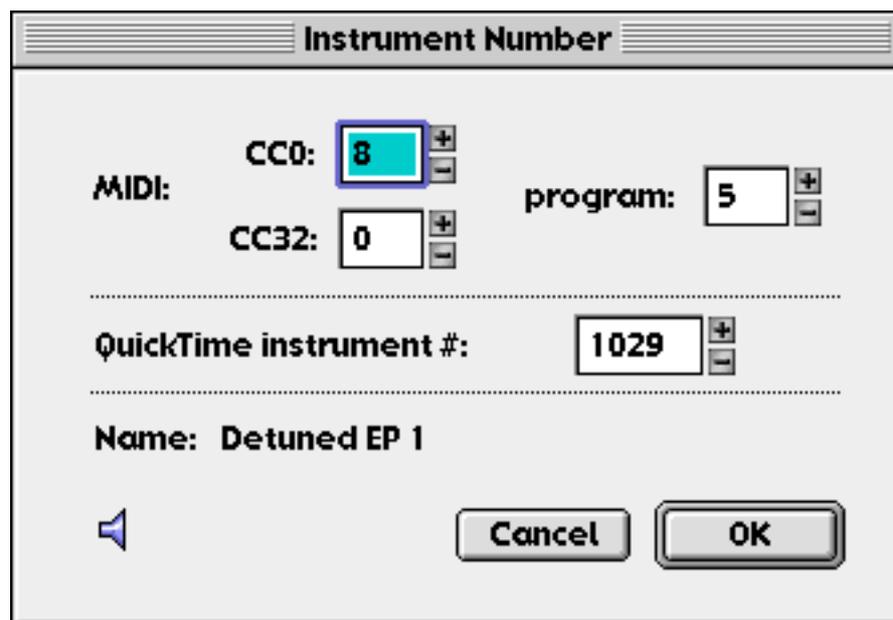
After you confirm the new instrument by clicking the OK button, **easy beat** displays the instrument's name in italic in the Instrument pop-up menu:



The italic style is used whenever a non-General-MIDI instrument is used. You should take that as a warning that the instrument may not play properly on some external synthesizers.

GS is an extension to General MIDI by Roland Corporation. QuickTime 3.0 and newer can play all these instruments using the built-in software synthesizer. If you use an external synthesizer that conforms to the GS standard, it will be able to reproduce these sounds, too. If an external synthesizer does not support the GS sound set, it will very likely play the wrong instrument. If you are lucky, it will at least use a similar instrument (such as the “Electric Piano” from the General MIDI set instead of the “Detuned EP 1”).

The last item in the Instrument menu (**Instrument #...**) lets you specify instruments by their bank and program numbers. You can use this dialog to switch to an arbitrary instrument that is not supported by QuickTime. You will need this dialog only if you use an external synthesizer.



Shortcut: Instead of selecting “Instrument #...”, you can also click the Instrument menu while pressing the \mathfrak{K} key.

The first section lets you specify the bank and program numbers where the desired instrument will be found on your synthesizer. Please see your synthesizer’s manual for details.

To activate an instrument, **easy beat** sends the bank number with controller change (CC) events #0 and #32. The MIDI Specification defines that bank and program numbers are in the range 1–128. **easy beat** follows this convention only in the case of the program number. Bank numbers start with 0. This numbering scheme conforms to common practice, as most synthesizer vendors specify the bank numbers in terms of the MIDI controller values, which are in the range 0–127.

It is possible that banks are numbered 1–128 or programs are numbered 0–127 in your synthesizer’s manual. If that is the case, you need to add or subtract 1 when you enter the numbers in **easy beat**.

Note: To specify a drum instrument, enter 0 for CC32 and the pseudo bank number 128 for CC0.

To check how an instrument sounds, click the speaker icon in the lower left corner.

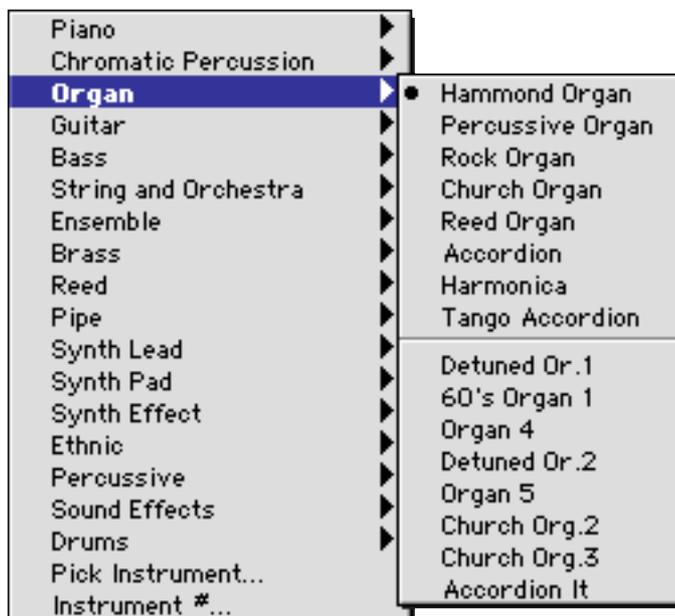
25.3 Customizing the Instrument Menu

Selecting a non-General-MIDI instrument by its bank/program numbers is a rather inconvenient procedure, as you have to look up the correct numbers in your synthesizer’s manual. To let you easily access all instruments that are supported by your synthesizer, **easy beat** lets you customize the contents of the instrument pop-up menu. The Extras folder contains a few text files that you can copy into the “MIDI Maps” folder.

- If you use the built-in **QuickTime** synthesizer or an external synthesizer that conforms to the **GS** standard, put the files “(General MIDI)”, “(GS)” and “(default)” into the MIDI Maps folder.

- If you use a synthesizer that conforms to **XG** (Yamaha's extension of General MIDI), put the files "(General MIDI)", "(XG)" and "(default)" into the MIDI Maps folder

The next time you launch **easy beat**, the instrument menu will contain the usual General MIDI instruments plus the additional GS or XG instruments. For example, the following snapshot shows the instruments in the "Organ" group of the GS instrument set:



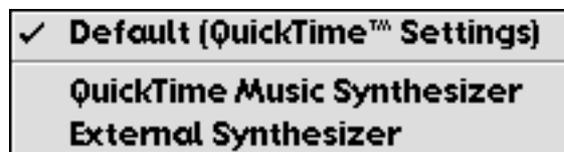
If your synthesizer conforms to neither GS or XG or if it has more instruments than GS or XG, you can set up an instrument file that describes all available instruments. For details, please see the chapter *Extending the Instrument Set* in the **easy beat** reference manual.

25.4 Playback Options

If you use an external synthesizer, it may also be necessary to make a few adjustments. The **Playback Options...** submenu within the **Music** menu lets you specify a playback delay and a MIDI message for initializing your synthesizer. See the *Playback Options...* section in the *Music Menu* chapter of the **easy beat** reference manual for details.

25.5 Switching Synthesizers

You will already have noticed that the **Music** menu contains a **Synthesizer** submenu with the following entries:



When you run **easy beat** for the first time, it uses the **Default** synthesizer as specified in the QuickTime™ Settings control panel. If you do not have an external synthesizer, leave this item checked.

If you have an external synthesizer, you may want to select the **External Synthesizer**. If you do this, **easy beat** will always use your external synthesizer, no matter what synthesizer is selected in the QuickTime™ Settings control panel. This is, for example, convenient when your external synthesizer is usually turned off. You can then select the QuickTime Music Synthesizer in the QuickTime™ Settings control panel, and movies with MIDI tracks and web pages with MIDI contents will still play using QuickTime's built-in software synthesizer. To work with **easy beat**, turn your external synthesizer on before you launch **easy beat**. Your synthesizer will then be used by **easy beat**, no matter which synthesizer is selected in the QuickTime™ Settings control panel.

Furthermore, **easy beat** remembers the MIDI mapping, the **Master Volume** and the **Playback Options** separately for each item in the **Synthesizer** menu. This is particularly convenient when your synthesizer is not compatible with the General MIDI standard. You can then select **External Synthesizer** and choose the right MIDI mapping and playback options. When you switch back to the QuickTime Music Synthesizer, the original settings will be used.

26 Searching the Internet for Songs

The Internet is a great source for almost everything – including MIDI files. You can use your favorite web browser to search for songs, download them and open and play them with **easy beat**. However, **easy beat** makes it much easier for you to search the Internet for songs, as it has a built-in search and download tool.

Note: To try the following steps, you need an active Internet connection. If you have a dial-up Internet connection, you can connect to the Internet while **easy beat** is running; you don't need to quit and re-launch **easy beat**.

Let's assume you're looking for the song "Stairway to Heaven" by Led Zeppelin. Pull down the "web" menu (the menu with the world icon) and select **Find Song**:



This menu command opens a new dialog window, as shown below:



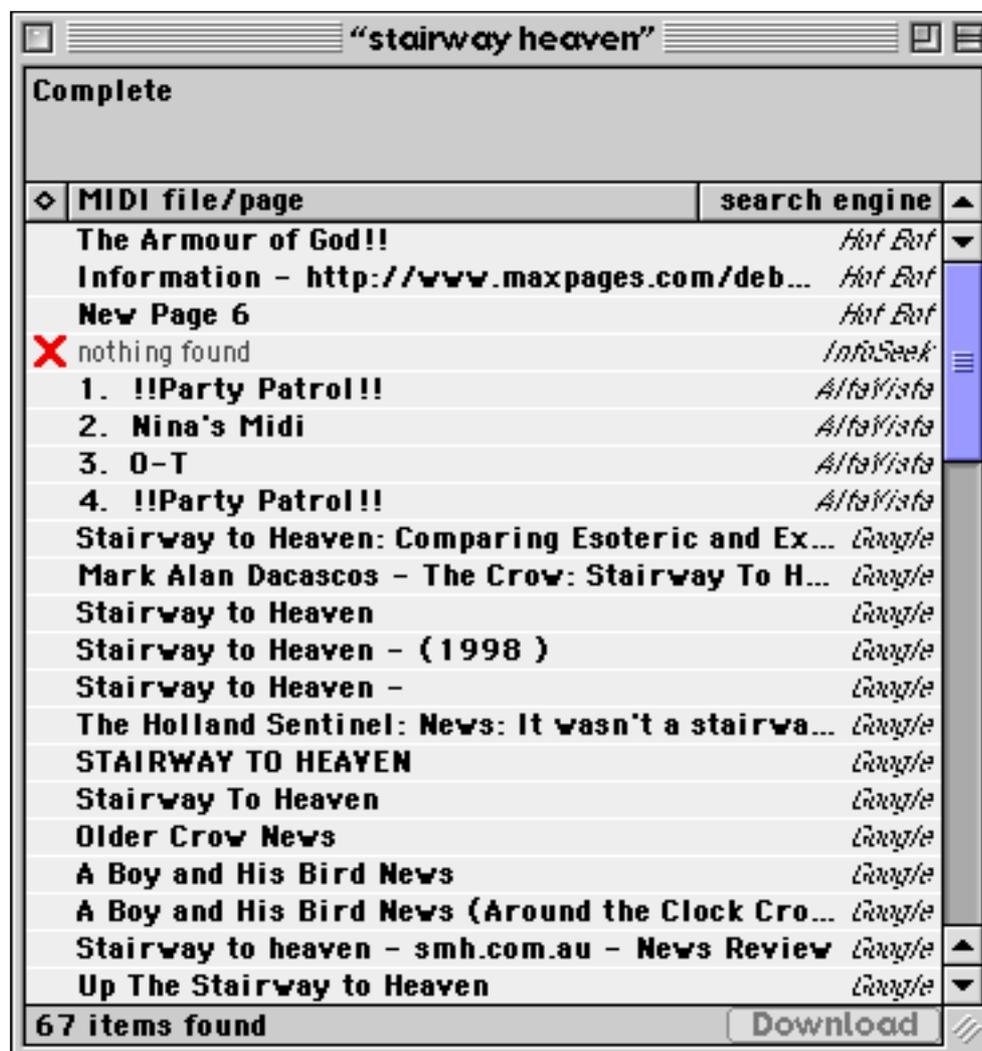
easy beat can use eight public search engines for finding songs. The first two engines in the list, Music Robot and Scour, are specialized search engines for songs and therefore often deliver better results.

If you click the underlined blue links in this window, **easy beat** launches your favorite web browser and takes you directly to the main page of the search engine.

To start a search, type the name of the song or just a few relevant words. In our example, you can omit the word “to” and type “stairway heaven”. Then click the **Find** button.

The dialog window will go away and a new window will display the search results as they are received. As it takes a while to submit the search requests and to collect the results, the window will initially be empty, and information about the search in progress will be shown in the window header. If you're connected to the Internet via a slow modem, it may take about a minute before the first items appear in the window. You will notice that some search engines (such as Music Robot) return many results at once, whereas others (such as Scour and AltaVista) deliver separate smaller groups of results. As new items are always added at the bottom of the list, the results from the latter engines

may be scattered over the entire list. The following screen snapshot shows the result after all search engines have returned their replies:



The list of found items will contain many lines that at least contain the word “stairway”, but there are often irrelevant results. For example, Scour (not shown in this screen snapshot) lists a couple of other songs by Led Zeppelin, probably because it finds the words “stairway” and “heaven” close to a link to a different MIDI file.

Even worse, the general-purpose search engines sometimes return some absolutely useless links, but you will usually be able to guess from the titles which items are worth a download.

A further advantage of the specialized music search engines is that they also report the size of the MIDI files (as shown below). This is often a good indicator of a MIDI file’s quality; as a rule of thumb, larger MIDI files typically sound better.

Select one of the items in the list and click the **Download** button in the lower-right corner of the window. **easy beat** immediately starts the download; the item will appear in red, and you will see a progress indicator in the first column. In most cases, a blue indicator (🔵) will appear first. This

means that the found link refers to an HTML page that is supposed to contain a link to the actual MIDI file. In this case, **easy beat** first downloads this page, scans it for the MIDI link, and finally downloads the MIDI file itself. During the second phase, the progress indicator will appear green (🟢), as shown in the following illustration:



If you select a downloading item, the button in the bottom-right corner is labeled “**Cancel**”. Click the button (or press ⌘-“.”) to stop the download. The item will then appear with the symbol 🚫.

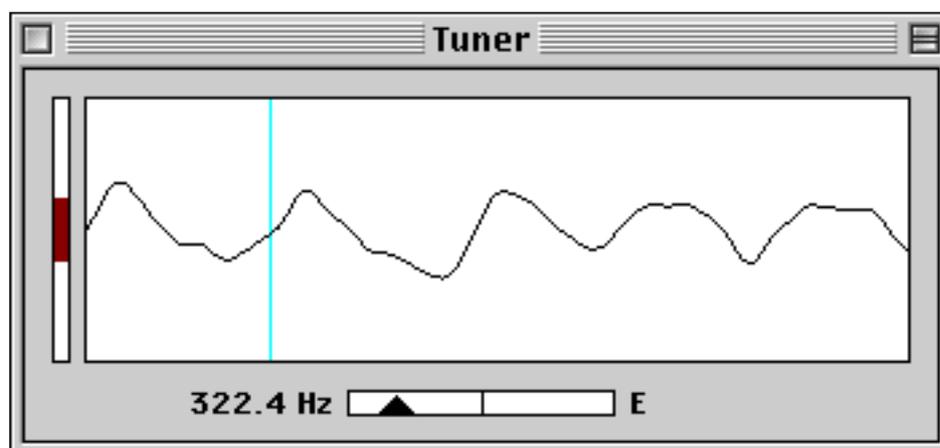
When the download of a MIDI file completes, **easy beat** immediately opens the song in a new window and the symbol 🟢 appears in the left column of the downloaded item. You can immediately play the song and save it as an **easy beat** document.

- Tips:**
- You can select multiple items in the list by clicking and dragging or by clicking multiple items while pressing the ⌘ key.
 - When you click Download while multiple items are selected, **easy beat** downloads all these items simultaneously.
 - You can click the titles “🔹”, “**MIDI file/page**” and “**search engine**” in the window header to sort the list. The diamond mark sorts the items by their current state. Completed items appear at the top, followed by downloading items, items that failed and finally all untouched items.
 - You can also try to search songs by the artist’s or composer’s name. For example, you can enter “Peter Gabriel” instead of the song title.

27 Guitar Tuner

If you are a guitar player, you can use **easy beat** to tune your instrument, but you must first make sure that **easy beat** can “hear” the strings that you play on your guitar. If your Mac has an internal microphone or you have an external microphone connected, select that in the Monitors & Sound control panel. If you have an electric guitar and your Mac is equipped with “line in” sockets, you can also use an adapter cable to connect your guitar directly with the Mac. In this case, select “RCA In” as your sound input source.

If you then select the **Show Tuner** command from the **Music** menu, the following window appears:



The large area shows the waveform of the sound; the blue line marks the end of the first complete wave. The red bar to the left indicates the current amplitude. The measured frequency and the corresponding note are shown below. The black triangle should appear in the middle of the horizontal bar, as close to the center line as possible. In this example, the E string was played, but the pitch is too low.

For best results, pick the string loud enough and let it sound for a few seconds. The tuner window refreshes about twice a second, which may cause the triangle jump to the left and right a few pixels. Wait until the position of the triangle becomes relatively stable before you correct the tuning of the string.

28 Have Fun!

Finally, we're through with the tutorial. If you followed all the steps, you should know everything you need to work with **easy beat**. Now it's time to start jamming. Be creative and have fun! If you have any specific questions, we recommend that you look for answers in the **easy beat** Reference document.

And if you have created a song that you are proud of, please let us know. We're always looking for good examples that we can present on our web pages.