MULTI TRACK QUANTIZING

WITH

BEATQUANTIZER

VERSION 0.55

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1. INTRODUCTION

1.1 What is BeatQuantizer?

BeatQuantizer (BQ) is a single and multi-track rhythm analysis and conforming software, designed to tighten the performance of drums and other instruments with well-defined transients.

BQ is also a sample editor, built on the foundation of BeatCreator (BC), a loop based sample editor. BQ can do everything BC can do and more. In short BQ has more and more advanced audio quantizing tools and more multi-track tools than BC. More general information as well as free demo versions is available at:
http://www.beatcreator.com

Just to avoid misunderstandings, note that BeatQuantizer is not a DAW, a real-time instrument, a plug or a multi track audio sequencer.

1.2 BeatQuantizer File Formats

BeatQuantizer can both import and export a variety of file formats. We recommend you to work with wav files when importing and exporting tracks between BQ and your DAW. Most wav file formats are supported (16, 24, 32 floating points etc). We recommend zgr files (native Zero-X Groove file format) for saving the slice marker positions and for importing grooves to other sessions.

Other supported file formats are for instance rex, rx2, acidized wav including slice/stretch markers, sf2, rcy, midi, lm4, trk, aif, map, raw etc.

2. CONCEPTS

To make sure you have an idea of what we are talking about.

2.1 If you are coming from Beat Detective

Most of the features in Beat Detective are also available in BeatQuantizer. They are just named a bit differently.

Beat Detective	BeatQuantizer
Trigger Pad	Pre-Cut
Sync point, Beat Trigger	Slice/Event marker
Conform	Quantize
Conform: Strength	Quantize: Power
Conform: Standard	Quantize: Static
Edit Smoothing	Finalize
Collection Mode	The tracks are always sliced up individually. But by using the Master Track as a collection pool, you can easily merge/mix the slice markers in any tracks and create the collection. This is described in detail later on.

2.2 Slices

BQ is capable of slicing up the audio tracks in several ways. Either you can slice them up based on auto detected events (also known as transients) or you can slice them up based on a given note length (also known as a "click track"). After slicing up, a slice marker will mark the beginning of each slice. Each slice marker has a number and can also be given an individual name. The slice markers can be moved, added and deleted.
A Slice starts from its slice marker and ends precisely before the following slice marker.
See help file for more information.

2.3 Grid

The collection of all slices in a track, is called a Grid. The grid is also called a Groove as it can for instance be used as a groove template when quantizing. If you slice the track based on a given note length, the grid is called a static grid.
See help file for more information.

2.4 Master Track

The Master Track can be used for several things. You can use it as a pool for collecting unique slice markers from multiple tracks, you can use it to perform operations that will affect all tracks, you can use it for making a master selection that will control what bars in all tracks that will be sliced and quantized and much more.

As soon as you have loaded your tracks, it's recommended to create a master track.
You can either convert a specific track, or create an empty master track or create the master track as a mono mix of all tracks. It's mostly a matter of taste if you go for an empty or a mono mix. Converting a track into master track is an advanced option and will also rename the track to "Master Track".

2.5 Master Grid

The grid in the master track is called the master grid.

3. MULTI TRACK IN SHORT

Going thru the menu items in the Multi Track menu very briefly.

Most options are also available from the Multi Track toolbar.

3.1 Multi Track Mode

Toggles between multi track and single track mode. When it is checked, all tracks will be lined up vertically and the multi track tools are enabled.

You cannot edit the order of the lined up tracks vertically (in v1.0). The Master track, if present, is always at the top.

3.2 Create Master Track

Creates a master track. Either as a mono mix of all tracks, or by converting the current track or by creating a silent one. For more information, see "Master Track".

3.3 Play Mixed

When checked, "Play" will mix all tracks but the master track, in real-time.

3.4 Gain

Sets the individual gain for each track when played mixed and when creating a mono mixed master track.

3.5 Master Selection

When checked, the selection in the Master Track will be snapped to bars/measures and will be referred to as the Master Selection.

The master selection controls where in the tracks the slicing and multi track quantizing will be performed.

For instance if you want to quantize bars 3-6 in your tracks, then first make sure master selection is enabled and then mark bars 3-6 in the master track. Now when you slice up any of the tracks, only bar 3-6 will be sliced up. When you select the multi track quantizer, its titlebar will say "Bar(s) 3-6".

3.6 Sync Scroll & Zoom (Windows)

When checked, the zooming and scrolling of all tracks will be synchronized.

3.7 Clear Grids

Removes all slice markers from all tracks.

3.8 Locate Events

Performs an individual event/transient based slice on all tracks.

3.9 Copy Master Start/End markers to all tracks

Copies the loop start/end markers in Master Track to all other tracks. So, that all tracks end up having their loop/track markers identically set.

3.10 Copy Master Grid to all Tracks

Copies the grid (i.e. all slice markers) from the master track to all other tracks.
Replaces whatever grid may be present in the other tracks.

3.11 Copy Grid to all Tracks

Copies the current grid (i.e. all slice markers) and pastes it to all other tracks.
Replaces whatever grid may be present in any of the other tracks.

3.12 Copy Grid to Master Grid

Copies the current grid (i.e. all slice markers) to the Master Track.
Replaces whatever grid may be present in the master track.

3.13 Merge With Master Grid

Merges the current grid (i.e. all slice markers in the selected track) with the grid in the master track.
I.e. the current grid in the master is not replaced but merged/mixed with the current grid. If there is no grid in the master track, a new grid will be created (instead of merged) in the Master Track based on the current grid.

3.14 Quantize

Quantizes all tracks based on the selected quantizing options.
See Multi Track Quantizing chapter.

3.15 Quantize Finalizer

Fills the gaps and deals with the overlap caused by the multi track quantizing.
See Quantize Finalizer chapter.

3.16 Batch MTQ

Makes it possible to batch run multi track quantize and finalize based on the result of a multi track quantize/finalize session. If you for instance have more tracks than your RAM can deal with, Batch MTQ could be a life saver.
Bring up the dialog and Help/F1 for details about the settings, and see the Batch MTQ chapter further into the manual for a guide on how to use this tool.

3.17 Time Stretch

Time Stretches all tracks to a common tempo. See help file for more information.

4. MULTI TRACK QUANTIZING

Finally we are getting to the point! What took you so long?

4.1 Overview

For information about all settings in the multi track quantizing dialog, see help file.

4.2 How To

Here is a basic step by step guide on how to quantize multiple tracks. Note that there is more than one way of doing this, so we are just giving you some hints of how to get started. The tools in BQ are very modular, letting you do multi track quantizing in a variety of ways.

4.2.1 Brief Introduction

First a brief introduction for those of you already familiar with multi track quantizing or just want to get an overview of how to do mtq. After this we will go into detail.

1. Make sure the tracks start and end at a full bar. Close your DAW.
2. Make a copy of the tracks to a unique folder.
3. Open the copy of the tracks, i.e. wav files.
4. Create a mixed master track.
5. If needed, alter track start/end marker to make sure it starts and ends at a full bar. Do it in the Master Track (and all tracks will follow).
6. Set tempo and number of bars.
   Do it in the Master Track and all tracks will follow.
   You may need to use the Tools: "Set Loop Start to Tempo" or "Set Loop End to Tempo".
7. Create Master grid based upon the kick and snare track.
   I.e. slice up those tracks individually and merge their slice markers together in the Master Track/Master Grid.
8. Copy Master Grid to all tracks.
9. Select Multi Track Quantize. Make sure the pre-cut is set to 5-10 ms. Apply.
10. Check "sync slices and slice markers" and if needed, manually quantize some slices by entering Quantize mode and then dragging the slice marker.
11. Select Multi Track Quantize Finalizer.
    Set Fill Gaps to either PolyStretcher or Xfade and Overlap to PolyStretcher or No processing.
    Make sure the Pre-Cut Xfade is set to 5-10 ms and, if selected, the Fill Gaps Xfade is set to 5-10ms.
    Apply.
12. To hear what the result sounds like, check "Play mixed", click on the ruler in any track but the master track and press play. Now all tracks (but the master track) are played together real-time mixed.
13. Save back the tracks to disk, for instance using Save All.
14. Open the tracks in your DAW.

Done!

So as you can see, as soon as you have loaded the tracks and setup the timing info, there are only two main step. Quantize and Finalize. You may be OK with the default settings or you may want to fiddle with each setting, fine tune the slice markers and manually quantize the slices to perfection. BeatQuantizer offers lots of alternatives.

Lets start all over again but this time slowly and surely!

4.2.2 Prepare the Tracks in your DAW

Only work with **wav** files.

It is recommended that the tracks are of the same length and required that they have the same tempo, time signature and sample rate.

It is strongly recommended that the tracks start and end on a full bar. If they don't, there are ways to adjust this in BQ but it requires some extra work. It is strongly recommended to record a click track along with the other tracks. Otherwise it is hard to know exactly where the first bar starts.
You can also "bounce", copy parts of the tracks to a new file;
Snap to bars, range the whole area of the tracks in your DAW and bounce.

BQ is RAM based so, if you are low on ram, have tons of tracks or work with very high sample rates you may have to work on your project in sections. At least 1GB RAM is recommended, but it all depends on the size and the amount of files. You may get along with much less ram, or you may need even more. There is an "MTQ Batch" tool in BQ that may come in handy when working on more and longer tracks than your ram can handle. This is described in another chapter below.

As long as you have enough RAM you should be able to open the raw wav files that you recorded/created in your DAW (Nuendo/SX/Sonar etc) directly. In that case you do not need to specifically export the tracks from your DAW but can simply open the recorded tracks.

If you want to work directly on the tracks recorded in your DAW, you mostly have to close the DAW before you open them in BeatQuantizer. This is because the DAW often holds the files.

Closing the DAW is recommended anyway as BeatQuantizer needs as much ram as it can get.
Still, if you have enough RAM left, if your DAW doesn't hold the files or if you export or bounce new tracks, then you may very well keep your DAW up and running while quantizing the tracks in BeatQuantizer.

4.2.3 Open the Tracks

OK, it's time to start up BeatQuantizer and get dirty!

Make sure Multi Track mode is selected.
It is recommended to uncheck the setting: "Settings – Open – Locate Events", before you open the tracks.

You can drag in the tracks from your file explorer or simply use menu item: "File – Open".
In BQ's file open dialog you can preview and multi select the tracks you want to open. (using the shift or control key).

4.2.4 Create a Master Track

Select: "Multi Track – Create Master Track – Mixed"
This will create a master track as a simple mono mix of all tracks.
Note that the, per track, Gain setting can be used to control the mixed volume of individual tracks.

4.2.5 Set Track Start and End

It is very important to set the track start and end markers so that the start marker marks the beginning of the first full bar and the end marker marks the end of the last full bar. If you fail doing this, quantizing will fail.

The track start and end track markers are also referred to as the loop markers. They are set to the beginning and end of the tracks unless the wav file contains information to set them differently.

If your tracks are already edited to start and end on a full bar, then you are all set and you can jump to next step.

If not, double click the ruler of the master track to maximize it, as moving the loop/tracks markers in the master track will synchronise the loop/track markers in all other tracks. Then read the following sub steps carefully.

4.2.5.1 Set Track Start

In the Master Track, drag loop start marker to the first beat of the first full bar.

Make sure you set it carefully. Zoom in horizontally to sample level 1:1 and maybe also zoom in vertically. You can for instance use the key up for zoom in horizontally and page up to zoom in vertically.

Look and listen carefully to make sure you find the exact position.

You can toggle between viewing loop start and loop end marker by pressing [Tab] key.

If you are sure about the loop/track end marker's position and the tempo of the track, but unsure about the loop/track start position, then you can get help from a tool in the Tools menu called "Set Loop Start to Tempo". For more info, see the help file.

4.2.5.2 Set Track End

Do accordingly for track end marker as you did for track start marker above.

If you are sure about the loop/track start marker's position and the tempo of the track, but unsure about the loop/track end position, then you can get help from a tool in the Tools menu called "Set Loop End to Tempo". For more info, see the help file.

4.2.6 Set Tempo

If the master track is maximized after setting the start/end markers, simply double click its ruler to get it back in line.

After setting up the track start and end markers we have to setup the tempo for the tracks.
Make sure the Master track is selected (if not, just single click its ruler). Altering the tempo and measures in the Master Track will synchronise the tempo and measure in all tracks.

Look at the tempo setting in the Slicing Control toolbar. If it's correct, you can skip to next step.
If it is not, click on the tempo edit box and enter the correct tempo. Now, the number of bars (in the same toolbar) have automatically been adjusted.

If you enter an invalid tempo (based on the size of the track), the tempo will have been auto adjusted to the closest valid tempo.

If you just cannot get it right, then you surely have not set up the track start and/or track end markers (or your memory is failing you).

If the size of the tracks can't fit the correct tempo (maybe it's just a tiny bit missing) then you can use the resize option in the Tools "Set Loop Start to Tempo" and "Set Loop End to Tempo" to add silence to the beginning or end of the tracks.

4.2.7 Deciding what to Quantize

If you have come this far, your tracks are ready to be processed and it's now the real fun begins!

Below we will show you one way of doing multi track quantizing. But there are tons of other ways of doing it too. In any case, all prior steps up to this point are required.

Our goal is to quantize all tracks identically. This is very important as it will keep the phasing of the mic leakage between the tracks to a minimum.
This means that we can't quantize all tracks individually. Instead we must create a common grid that we apply to all tracks and then quantize from (not to!).

We can't create a common grid that is based on all events in all tracks, as it would simply slice the tracks into too many and too small pieces and turning the quantizing into an inferno. In short, it will sound very bad.
Instead we decide that the snare and the kick events are the ones that will form the common grid. This means that anything in between a kick and a snare will not be quantized. It will keep its relative groove to the surrounding kick and snare. But the kick and the snare will be quantized according to the quantize template we pick.

It's very important that you fully understand this. If not, please read it all over a couple of more times. If you still don't get it, ask a friend who is used to multi track quantizing, perhaps using Beat Detective. If that doesn't help, well you are of course welcome to e-mail us and we will try to sort it out for you (see www.beatquantizer.com for an e-mail support address).

Now, it's about time we show you how, don't you think?

4.2.8 Master Grid

As you know by now, the grid in the master track is called the master grid.

Our first goal is to create a common grid based on the detected events in the kick and snare track.
So, we will start by slicing up the kick track and the snare track. Then we merge the grids together and apply it to all tracks. The master grid will be the pool to store and merge the grids.

4.2.9 Slice up the Tracks and Create the Master Grid

Let's start by detecting the events in the kick track.

Locate the kick track, double click its ruler to maximize it. Make sure the Slice Mode is set to Events and press the SLICE button. This brings up the Slicing Control. Press F1/Help and read about it's controls and how to best detect the events on the track.
Close the dialog and zoom in 1:1. Use the arrow keys (left/right) and examine the start/end position of each slice and make sure they are perfectly positioned. You may have to bring up the Slicing Control and tune the settings some more. Or you can manually move, add and delete slice markers. See the help file for more details on how to adjust the slice markers.

When the kick track is perfectly sliced up, we copy the grid to the master track. Make sure the kick track is still current and simply select "Copy Grid to Master Grid" from the multi track menu or from the popup menu you get when you right click the "hat" of a slice marker in the kick track.

Continue by doing the same with the Snare track (locate, slice it up, examine, fine tune etc), but instead of selecting "Copy Grid to Master grid", select "Merge Grid with Master Grid" from the multi track menu. This will copy the unique slice markers of the snare track to the master grid.

Now the master grid contains all slice markers in the kick and the snare track.

Finally Select "Copy Master Grid to all tracks" (from the Multi Track menu or from the slice marker popup menu) so that all tracks are sliced up identically.

Check/enable "Sync Slices and Markers". Now if you move a slice marker in one track, all other tracks will follow.

4.2.10 Quantize

Start by reading about Quantize in the Help file. Simply bring up the Multi Track Quantizing dialog and press Help or F1. It contains lots of details about the settings in the dialog.

The Quantize dialog tool controls the actual quantizing of the slices. I.e. where to move each slice in each track.

Make sure you select the Quantize tool from the Multi track menu and not the beat menu.

As we want to quantize all bars, make sure the title bar says "All Bars". If it doesn't, exit the dialog, double click in the master track to selected all bars and enter the dialog again.

A very important setting for getting good results is the Pre-Cut. It controls how many ms before the slice marker the slice will be cut. The slice marker still controls the quantizing from and to position. The pre-cut only preserves the attack of the slice by doing the actual cut a little bit before. Even if you think that you have sliced the track perfectly, first remember that the same slice marker also exits in all other tracks and perhaps one drum was played just a little bit before. Then the slice marker will cut off the attack of that slice. The pre-cut area is also used for finalizing (more of that later on).

Use the default settings, 16th, no swing, 100% power, 5 ms (or try 10 ms) Pre-Cut. Do NOT check Finalize.

Press Apply!

Now all tracks are being quantized, one by one, to the closest 16th position. When it's done, you can listen to each track individually or all of them together (check "Play Mixed").

If you are not happy with the new positions of some of the slices, you can manually quantize them.
First make sure "Sync Slices & Markers" is checked. Then enter Quantize Mode by clicking the Q button in the main toolbar. Finally drag any slice to its desired position. As you can see, not only the slice marker but the whole slice will move. All tracks will follow. Repeat for all slices you want to move to new positions.

After quantizing there will be gaps between some slices and other slices will overlap. As you may have noticed, this doesn't sound very good so fortunately there are powerful tools available to solve this.

4.2.11 Finalize

The Finalizer fills/masks the gaps and smooths the overlaps caused by automatic and/or manual quantizing. It provides several state of the art time stretching and xfade tools for this.

In the Multi track menu, select Finalize. Begin with pressing the Help button and read about its settings.
Here is just some brief information about a few of its settings.

For filling out the gaps there are four alternatives:

1. **MonoStretcher**
   Uses time stretching to stretch the slice to fill the gap.
   An excellent time stretcher for monophonic samples (bass guitar, saxophone, vocals, mono synth etc).
2. **PolyStretcher**
   Uses time stretching to stretch the slice to fill the gap.
   An excellent time stretcher for polyphonic samples and percussions (music, dru ms, chords played by any instrument).
3. **Generate Tail**
   Generates a tail based on the information in the slice to fill the gap. Only works with percussion samples (drums and noise). Often succeeds when other fails to fill a very large gap.
   The main benefit is that the slice is not processed by any time stretcher.
4. **Xfade**
   Very similar to the Xfade in Beat Detective. Uses Xfade to fill the gap.
   When the gaps are not too large the result is often very good. Especially on drums and percussion.
   The main benefit is that the slice is not processed by any time stretcher and left as raw audio.

For solving the overlapping slices there are three alternatives:

1. **MonoStretcher**
   Uses time stretching to compress the slice to solve the overlap.
2. **PolyStretcher**
   Uses time stretching to compress the slice to solve the overlap.
3. **Unprocessed**
   Xfades the overlap in the pre-cut area.

All fill gaps and overlap options uses xFade to get ultra smooth transitions between the slices.

In our example we will go for the default settings, i.e. Poly Stretcher for both fill gaps and overlaps and set the Xfade Pre-Cut to 65%.

As a very good alternative, especially for drums, you can try the Fill Gaps "XFade". Set the Fill Gaps Xfade to 5-10 ms. Use No Processing for overlaps and set Xfade Pre-Cut to 65%.

Press Apply.

That's it!
Now all gaps have been filled out and all overlaps have been solved.
Listen to the result of each track individually or mixed (play mixed).

There are of course tons of details that we have left out that may improve the end result, but we hope that this document will get you started and inspired to experiment on your own.

4.3 Batch MTQ

Well I know we were supposed to be done with the quantizing by now, but if your RAM wasn't able to load and work with all your tracks in the multi track recording, then this is what you have been waiting for.

In short, Batch MTQ can perform multi track quantize and finalize on tracks based on the results on other tracks.

We presume you have read the manual and fully understood it up to this point. If not, please go back and review the chapters you feel unsure about.

The idea is to save two states of the quantizing. First the state after slicing and setting up all slice markers and creating a common grid for all track, but before quantizing. Then the after both automatic and manual quantizing. The state is stored in groove files (*.zgr). OK, let us show you how.

You must be able to load the tracks that you want to use for creating the common grid. If you don't have ram enough to do that, then you need to upgrade you ram or work with shorted bits of your tracks. We presume you are able to load these tracks on way or another.

Batch MTQ is very similar to the MTQ process we have described earlier in the manual, but requires a few extra steps.

1. Load only the few tracks you plan to use for creating the master/common grid (e.g. the kick and the snare track).
2. By using techniques we have described earlier in the manual, Create the common grid and apply it to all tracks. Export the groove (grid) to file. For instance by pressing the "ZGR" icon in the toolbar or by using the menu: "File – Export – Groove – Slice markers".
   Name the file "Pre Quantize.zgr".
3. Multi track quantize your tracks.
   If needed, do some manual quantizing too, but note that the "Sync Slices & Markers" must be checked so that the edit will be done to all tracks.
4. Click the ruler on one of the tracks (not the master track) and Export the groove (grid) to file.
   Name the file "Post Quantize.zgr"
5. Multi track Finalize, Save and Close all tracks.
6. Select Batch MTQ from the Master Track menu.
   Press F1 and read about its settings.
7. Select the newly created "Pre Quantize.zgr" as well as "Post Quantize.zgr" files.
8. Multi select the tracks in your multi track recording that are NOT yet quantized.
9. Check Finalize.
10. Press MTQ and each track one by one will automatically be loaded, quantized, finalized and re-saved exactly in the same way as your other tracks were.
    If you don't your original tracks to be overwritten, make a backup copy of them first.

That's it!

Hints

- It's important that you do NOT after step 5, close the application or alter any settings in the quantize and finalize dialog. Because if you do, then the Batch MTQ wont quantize the rest of the tracks identically.
- Currently you can only quantize the whole tracks, not parts of it (unless you manually create small parts of the tracks) with Batch MTQ.

5. FINAL NOTE.

We plan to constantly improve this document with more information and especially lots of images that better shows the principles of multi track quantizing. Please email us with any suggestion for how to improve this document.

Thanks for listening and happy multi track quantizing!

The BeatQuantizer team.
www.beatquantizer.com