

# **Edit Midifiles with PSRUTI**

## **An introduction**

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### **1. What do we learn by this introduction?**

Here, beginners should find the first attempts with PSRUTI easier, but also advanced users, who have already worked with the program, will be given hints for an effective processing of midifiles.

The content of this manual is the editing of the basic and most needed functions using an example. Many other topics, such as lyrics and system-exclusive events (SysEx) are not covered here, as they would go beyond the scope of this manual.

In the manual (file psruti\_germ.pdf) enclosed with the download, all PSRUTI functions are described in detail, but not in the form of a workshop.

### **2. What does PSRUTI do and what doesn't?**

PSRUTI is a freeware program with which all standard midifiles and also karaoke files can be edited in many different ways. PSRUTI essentially takes into account the properties of the XG and XF formats used by all Yamaha keyboards and synthesizers: Standard files are provided with the properties, and files that are already XG/XF are additionally optimized. Editing midifiles for sound generators of other companies is possible, but in most cases not recommended.

PSRUTI is not a sequencer like XGWorks, Cubase, Cakewalk or Logic, but it can perform frequently required standard tasks such as transposing more efficiently than is possible with sequencers.

In contrast to sequencers, PSRUTI does not allow you to insert or change individual events, e.g. notes, in a targeted manner. Instead, one or more midi channels are basically edited simultaneously over the entire course of the midi file. In sequencers you know the display of the event list, a note protocol and copy/paste functions: PSRUTI does not have these possibilities.

If you have higher demands on the processing of midifiles, there is no way around the use of a full-grown sequencer. If, however, the files have been edited with the XG optimization of PSRUTI, a later use of a sequencer is easier.

## The most important functions of PSRUTI

- Language switching German and English
- Conversion of Midifiles from format 1 to format 0
- Conversion of karaoke files to midifiles of format 0
- Transposing notes, key signature and XF chords
- Setting the key
- Change tempo
- Adjusting the volume and other controller events
- Remove or add a counter (Count In)
- Optimize Midifiles for the XG format
- Editing the velocity of notes
- Assign other instrument voices to midi channels (Revoicing)
- Delete, copy and swap midi channels
- Enter or change song title, composer, lyricist, copyright
- Insert XF events for Quickstart and Score channel
- System Exclusive (SysEx) for editing readout and read-in
- Calculate chords from the notes, log them and insert them as XF events
- Various functions for editing chords
- Various functions for inserting, reading and editing lyrics
- Playback of Midifiles with synchronous display of lyrics and chords
- Changing the playback speed, positioning in the file, transposed playback
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### 3. How is PSRUTI installed?

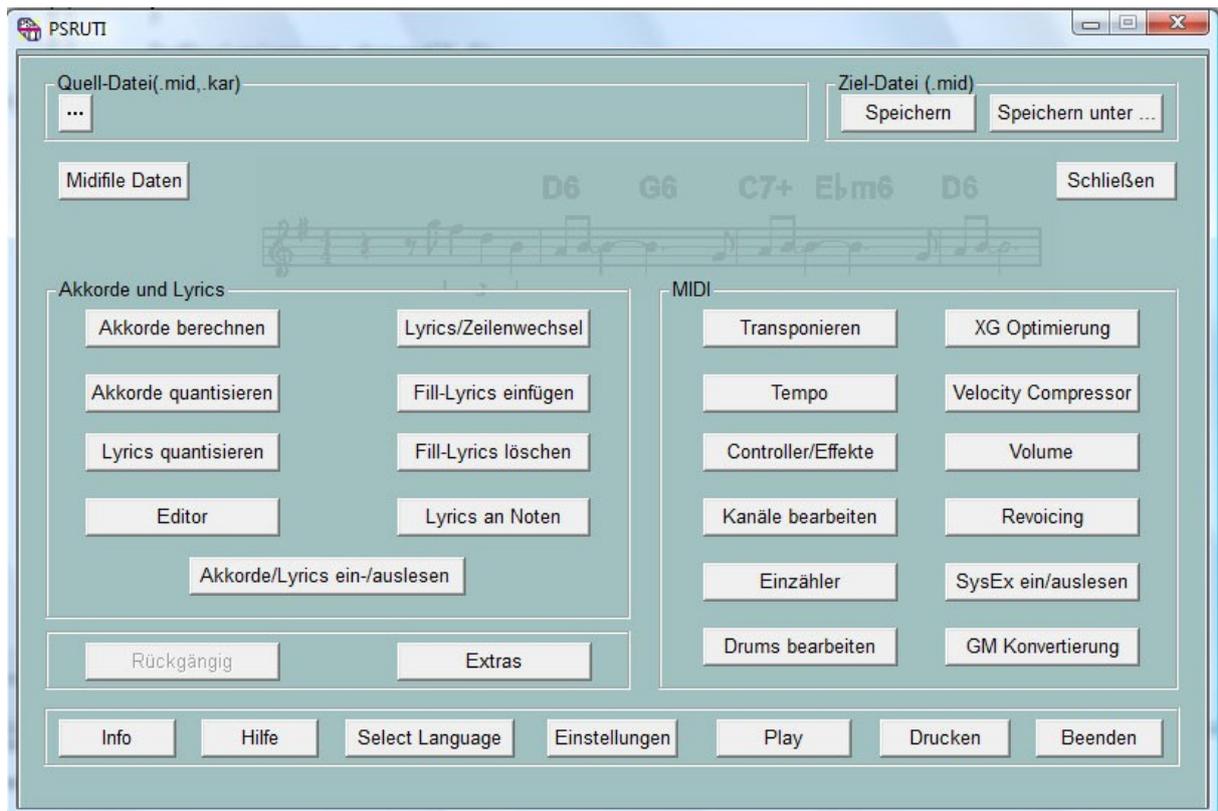
From the homepage hpmusic: [www.heikoplate.de/mambo](http://www.heikoplate.de/mambo) (Downloads-PSRUTI) you can download the program. Put the file "psrutixx.zip" in a folder of your choice, e.g. on the desktop. Then click twice briefly on "psrutixx\_setup.zip" and unpack the zip file. xx are two numbers that indicate the program version: 84, for example, stands for PSRUTI(8.4). You will get the setup file "psrutixx\_setup.exe". You should also download the German manual. It is recommended that you print out the documentation.

You start the installation with a double click on the setup file. The recommended installation is carried out with the "OK" , "Next >" and "Install" buttons, which must be pressed in succession. It is recommended that you create an icon on the desktop. Finish the installation by clicking "Finish".

PSRUTI can now be started by double-clicking on the icon created on the desktop.

With a new PSRUTI version an existing version is automatically uninstalled.

## 4. The PSRUTI main window



With the two upper buttons "..." the Midifile to be edited is loaded and after making changes it is saved with the button "Save" or "Save as". The keys in the lowest row have administrative tasks and allow the playback of the Midifile in the current editing state. Except for an additional function under Play, no changes are made to the Midi file.

With the "Undo" button the last change of the midifile is undone.

The buttons in the middle of the window are arranged in two groups.

"Chords and Lyrics" refers to functions that allow you to enter, delete and change lyrics and chords. Here and under "Print" in the bottom line you can print lyrics and chords to a text file.

The keys within the "MIDI" frame are used to trigger further functions for making changes in the Midifile.

### We start with a standard task.

You own a midifile (e.g. cha cha mosquito.mid) whose sound is not satisfactory when played on your Yamaha keyboard. The midifile is too loud as a whole. In relation to the other instruments the bass and the piano is also too loud. You could also try to use the better quality instrument voices of the keyboard.

Start PSRUTI and load the Midifile with the button "... source file (.mid)". After successful loading the normally shortened path of the file is displayed.

## 5. The XG Optimization

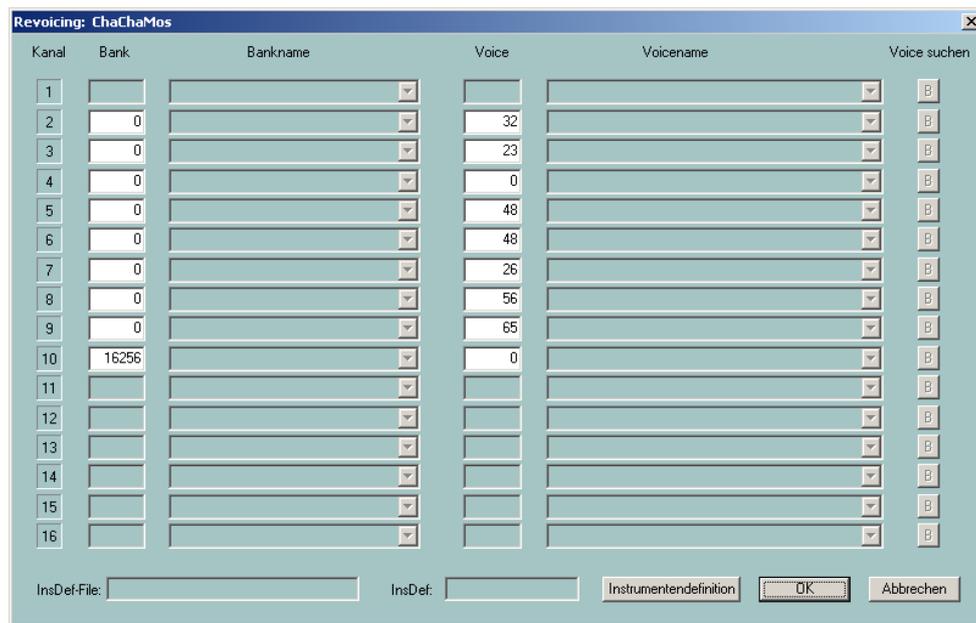
Since you want to use the midifile on your Yamaha keyboard and now you first do the "XG optimization". Among other things, unnecessary events are removed and the remaining ones are efficiently stored. Additionally, if not already existing, events are inserted, which are necessary for the

Midifile format XG. The file size can be reduced up to 30% without any loss of quality. Although some Midifiles, which did not produce sound on the keyboard before, are repaired with the XG optimization in almost all cases, this function has no influence on the sound at first.

## 6. Revoicing

Almost all midifiles from the Internet or from manufacturers use "instruments" (voices) of the GM (General MIDI) midi standard, which has been in existence for many years. Yamaha keyboards can also play these Voices, but the playback quality is quite good in most cases. But with the keyboards we have access to a lot of additional Voices of very high quality, which we can adjust with the "Revoicing" button.

### The Revoicing Window



The Revoicing window essentially consists of the four table columns Bank, Bank Name, Voice and Voice Name. Each column contains 16 fields that are assigned to the 16 midi channels.

What is a midi channel? When playing midifiles, no more than 16 voices can sound at any one time, because midifiles provide a maximum of 16 channels. In the example above, only channels 2 to 10 are occupied. Channels 1, 11, 12, 13, 14, 15, 16 do not contain notes, so they are unused.

In the above example, you will only see numbers under Bank and Voice, but not readable names.

What do the numbers Bank and Voice mean?

With the Yamaha XG there are a number of so-called voicebanks. Under each bank there can be up to 128 different voices.

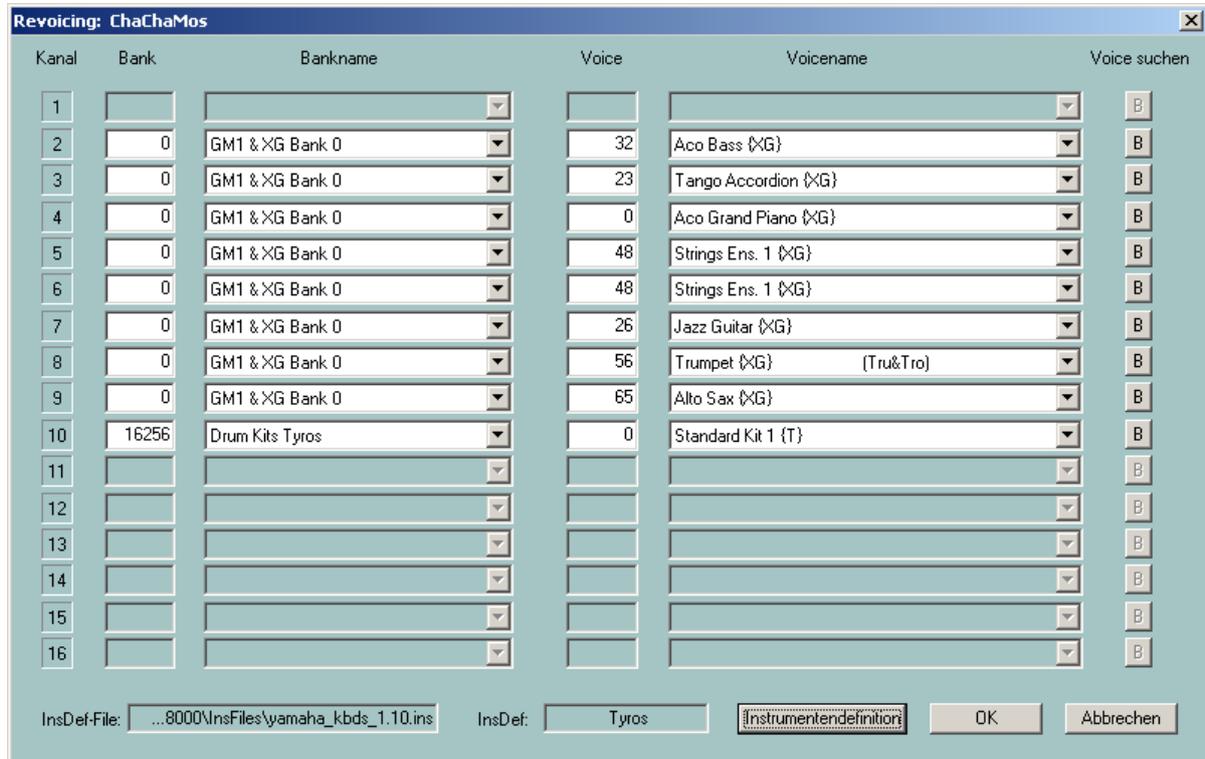
For initiates: The bank numbers used in PSRUTI are calculated from MSB (most significant byte) and LSB (least significant byte) by the formula "Bank equals 128 times MSB plus LSB".

With the help of the voice list from the manuals, it is possible to enter the numbers for bank and voice in the above window so that the desired voice is used.

Using a so-called instrument definition file of the sequencer Cakewalk/Sonar, which is intended for the available keyboard, the names of the bank and the voices also appear in the table. For the keyboards PSR-9000 and PSR-8000 and others you can download the file "yamaha\_kbds.ins" from the PSRUTI homepage (Downloads - CW Ins-Files). The file tyros\_kbds.ins contains the instrument definitions of the Tyros models. In the internet you can also find instrument definition files for the other Yamaha keyboards.

Copy the file intended for your keyboard into a folder (it is advisable but not into the program folder of PSRUTI) and connect PSRUTI via Settings - Instrument Definition with the definition intended for your keyboard. This selected definition is then also preset for later starts.

### The revoicing window after selecting an instrument definition



What can be read from the table?

With the exception of bank 10 (Drum Kits Tyros), bank 0 (GM1 & XG Bank 0) is always used. Since Yamaha keyboards use the melody voices of bank 0 to play GM (General MIDI), it is reasonable to assume that the midifile is of type GM. If we want to use higher quality voices, we need to use other banks and select the appropriate voices from these. The high quality melody voices, also called panel voices, can be found starting with bank number 112.

There are two methods to find out suitable voices.

#### 1. the search of the voices via bank numbers

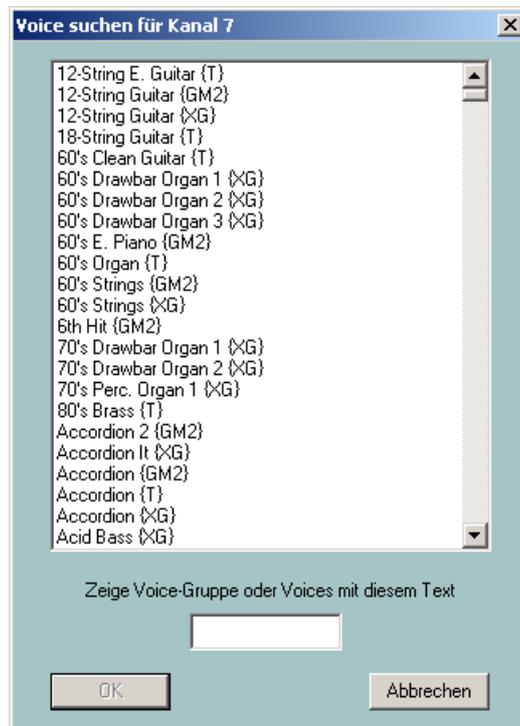
With this method, it is advisable to first change the bank number and then select a suitable voice under Voice Name. If a voice name is only represented by a number, then this voice is not available on the keyboard. Although the keyboard switches to the corresponding voice of bank 0, it is recommended to use only those voices that have a name and no number.

Yamaha XG has all drums (drum types) under bank 16256. Under Voicename you can choose another drum kit.

## 2. searching with the voice browser

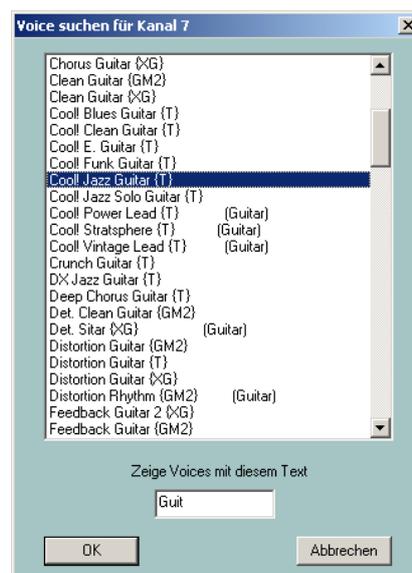
We want to play through this method on channel 7, where the original GM-Voice Jazz Guitar{XG} is located.

The Browse button B to the right of the Channel 7 line opens the Browse window.



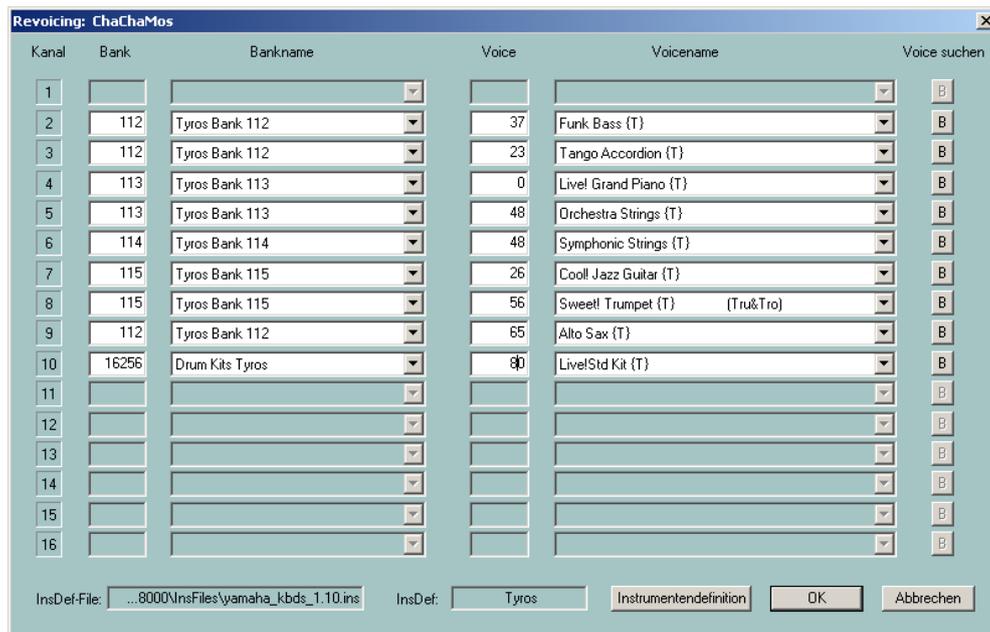
The list contains all voice names provided by the keyboard in alphabetical order. You can now select an instrument from this list and click on it. The list can be reduced by entering a search criterion. Since we want to stay like a guitar, we enter the string "Guit" below with a list containing only the names that contain the string "Guit". By sliding down the right bar we can view all guitar voices.

We decide on the "Cool Jazz Guitar {T}", click on the name and initiate the nickname with OK.



In the following illustration, all channels were revoiced to the keyboard's own voices.

## Revoicing to keyboard-own voices



Only after confirmation with the OK button in the Revoicing window the new voices are taken over into the Midifile.

### 7. Sound sample with the newly set voices

At this point it is useful to check the sound of the modified midifile.

For this purpose, it is essential that PSRUTI use the keyboard as a sound generator, since only here the new voices are available. Therefore it is necessary that either

- the Midi output of the sound card (usually game port) with the MIDI input of the keyboard or
- the keyboard is connected to the PC via USB after installing the Yamaha MIDI USB driver.

If the key Settings - MIDI of PSRUTI is selected, the port to the keyboard can be identified either under MPU-401 or MIDI Out and in case of USB/MIDI coupling as "Digital Workstation 1". Select the port available to you. The setting will be available the next time you start PSRUTI.

Now test your changes with the Play button. Control is easier when the changed channels are played solo one by one. How to do this?

## The Play window



The button with the black triangle starts playback, can be interrupted with the same button (now two vertical lines) and ended with the black square.

The reached position (bar:beat) in the midifile is displayed in the left field and the end position in the right field below.

After starting, correct the volume on the keyboard or with the "Volume" slider bar.

The top line below the black karaoke window indicates the channels that sound during playback. Deleting checkmarks mutes the channels. If only one channel has a checkmark, this channel will be played solo. All" mutes or switches on all channels.

Slide bars allow you to change the playback at a different time, play at a different tempo and play at a different transposition level.

The original setting of tempo and transposition can be reset with the "100%" and "0" buttons.

The changes of the Tempo, Transpose and Volume sliders are only effective for playback; they are not transferred to the Midifile.

You will have to repeat the hearing test after each change.

### 8. A "little something": The song name

In the large, black-shaded area of the Play window, some information that belongs to the song is displayed. These are - if available -

- The song name
- Copyright text
- The name of the composer
- The name of the lyricist

In our example, instead of "Cha Cha Mosquito", the unsightly name ChaChaMos appears here. In this case we only know the name of the interpreter and the music publisher.

We now close the Play window.

With the button "Extras" a window opens where we can enter the song name, composer and lyricist as well as a copyright. After that the play window looks much more attractive.



In this case I wasn't sure if the interpreter of the song "Fred Miggins" was also the composer, but let's assume so. All these entries are also displayed with similar layout in the lyric windows of the keyboards.

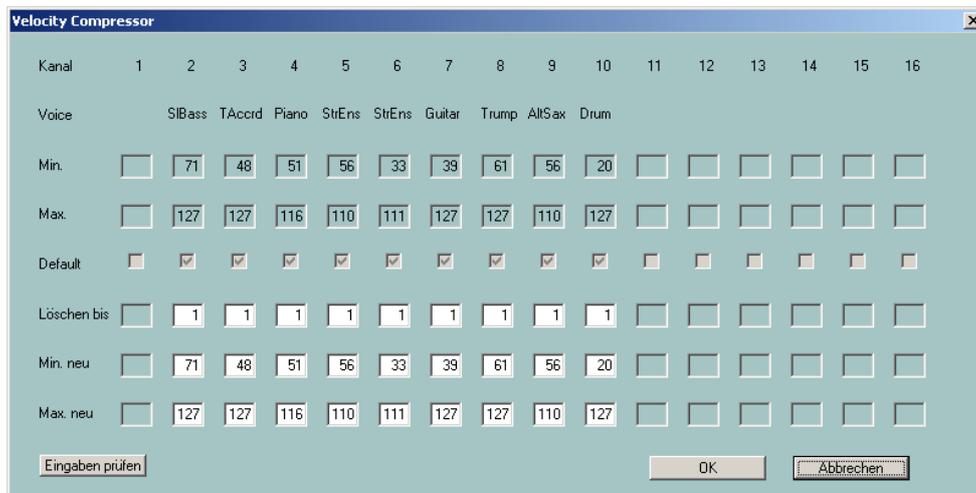
A listening test with the new Voices has shown that some instrument sounds occasionally sound "overwound": The guitar rattles and the trumpet blows.

For example, if you set a flute on the keyboard to Right 1, you will notice that the flute will sound soft and gentle when the keys are gently touched. When you strike the keys hard, not only the volume but also the sound character changes. You can even make the flute sound "overblown".

We observe this behavior especially with the Live! voices, which produce these effects at high velocities, which can be used very well when playing live, but are usually not intended when converting midfiles. So we will edit the velocities.

## 9. The processing of the velocities with the "Velocity Compressor"

Press the "Velocity Compressor" button to open the assigned window.



The "Min." and "Max." lines indicate the minimum and maximum velocity value for each channel, which you can change in the "Min. new" and "Max. new" input fields.

Numbers between 1 127 can be specified for the stop values. Notes with a velocity below 25 are not audible in practice. With "Delete to" you can have these notes removed. In this example, practically all notes are above this.

After revoicing non-proprietary midfiles to keyboard-own voices, it is almost always recommended to lower the high velocities of 127 so that the above mentioned effects are not generated. Here I suggest to lower all values 127 to 110 except for the drums. The drums usually have a wide range of velocities, which is the intention.

By changing "Min. new" and "Max. new", all velocities in between are also changed, i.e. the bandwidth is compressed. This preserves the dynamics.

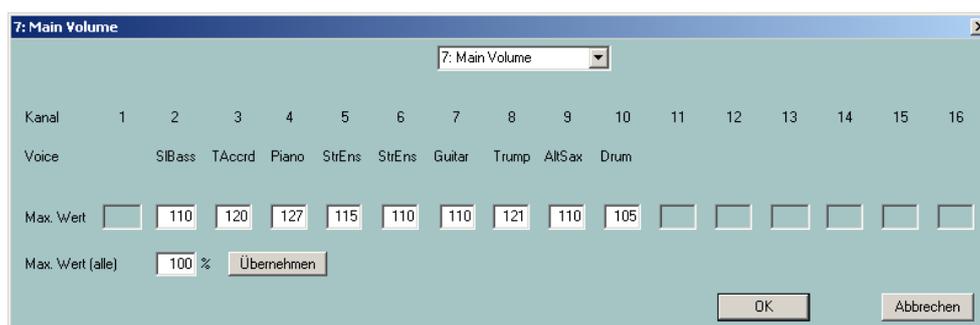
I would only put up "Min. new" if you think that some sounds are too soft, but others come through properly.

So let's replace the 127 values of "Max new" for channels 2, 3, 7 and 8 with 110 each and confirm the change with OK and do a hearing test.

## 10. Adjust the volume in the controller window

As mentioned at the beginning, we want to make the midfile quieter overall, and the bass and piano parts even quieter in relation to the others. As we noticed, by lowering the maximum velocity, not only the unwanted effects are gone, but also the volumes of the changed channels are lower. As the volume behaviour still does not meet our expectations, we now press the "Controller" button. The following window opens:

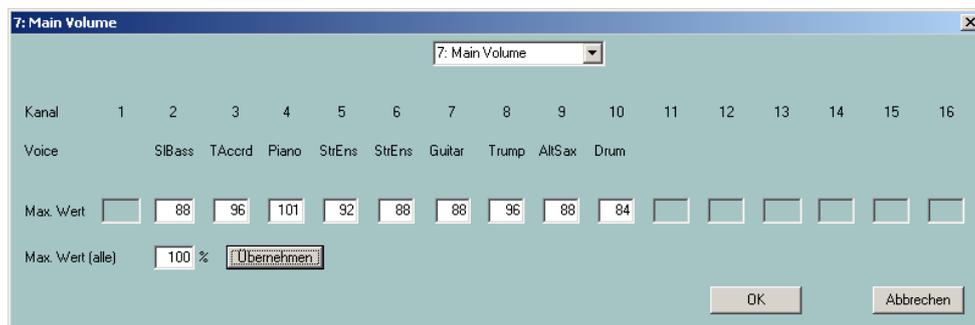
**The Controller Window**



Controllers are a group of instructions (events) in the midifile that influence the playback of notes. Each controller type is determined by a number and has a certain effect. Controller No. 7: Main Volume, which is set in the picture, is responsible for the volume. The values of the controllers, here it is the volume, are determined by numbers between 0 (here: mute) and 127 (here: louder is not possible).

In most cases, the volume of a channel is only adjusted before the first note of that channel. But often the volume is also changed over time to create a so-called fade out or fade in. However, only the maximum values are displayed in the controller window. With the value 110 for channel 2, it is quite possible that the volume will fluctuate between 70 and 110, for example. If, for example, the value 110 for channel 2 is reduced to 100 in the controller window, all other controller values for channel 2 are reduced by about 10%: The volume would then fluctuate between 63 and 100. Thus the volume dynamics are maintained.

The whole file is too loud for us? "Max. Value (all)" we set to 80%, press Apply and thus reduce the overall volume by 20%.



(After acceptance "Max value (all)" was set to 100% again).

We don't leave the window, but enter smaller values for the bass on channel 2 and for the piano, e.g. Bass: 80 and Piano: 90. With OK the changes are accepted and can then be checked with Play. With the "Undo" button the volume change could be reset to the original level.

What other controllers can be set and what do they do? The next section is reserved for advanced midifile connoisseurs. The others may skip it.

## 11. Even more about the controller window

When adjusting the volume in the controller window, the focus was on Controller 7: Main Volume. But it is also possible to change other controllers and additionally the non-controller event "Channel Aftertouch". As with "Main Volume", only the maximum values of one channel can be changed here over the entire course of the Midifile. Thereby all events for the channel with other (smaller) values are changed in relation to them.

### Controller 1: Modulation

Modulation controls the vibrato effect.

### Controller 5: Portamento Time

Portamento Time is used to set the intensity of a sliding effect between two consecutive notes.

### Controller 10: Panorama

This controller is used to change the stereo effect: With the value 64 both speakers are driven equally, with 0 only the left one and with 127 only the right one. With intermediate values the apparent sound position shifts.

### Controller 11: Expression

Expression reduces the effective portion of the volume set with Controller 7.

**Controller 71: Harmonic Content**

Harmonic Content changes the resonance value of the sound, i.e. the volume near the maximum output frequency.

**Controller 72: Release Time**

This sets the time for the sound to decay after the key is released (Note Off)

**Controller 73: Attack Time**

This affects the time between pressing the key (Note On) and reaching the maximum volume.

**Controller 74: Brightness**

Brightness influences the so-called "filter cutoff frequencies", i.e. the frequency bandwidth of the sound. High values result in a sharper sound.

**Controller 75: Decay Time**

Each tone reaches its maximum volume after a settling time (attack time) and settles down to a lower value after the so-called decay time. This time period can be influenced here.

**Controller 76: Vibrato Rate**

This sets the frequency of the vibrato.

**Controller 77: Vibrato Depth**

This sets the strength (amplitude) of the vibrato.

**Controller 78: Vibrato Delay**

Use to set the delay when the vibrato starts after Note On.

**Controller 84: Portamento Control**

Portamento Control improves the transition from the change of one note to the next.

**Controller 91: Reverb Send Level**

This sets the intensity of the reverb effect.

**Controller 93: Chorus Send Level**

This sets the intensity of the Chorus effect.

**Controller 94: Variation Send Level**

This determines the intensity of the set System Effect Variation.

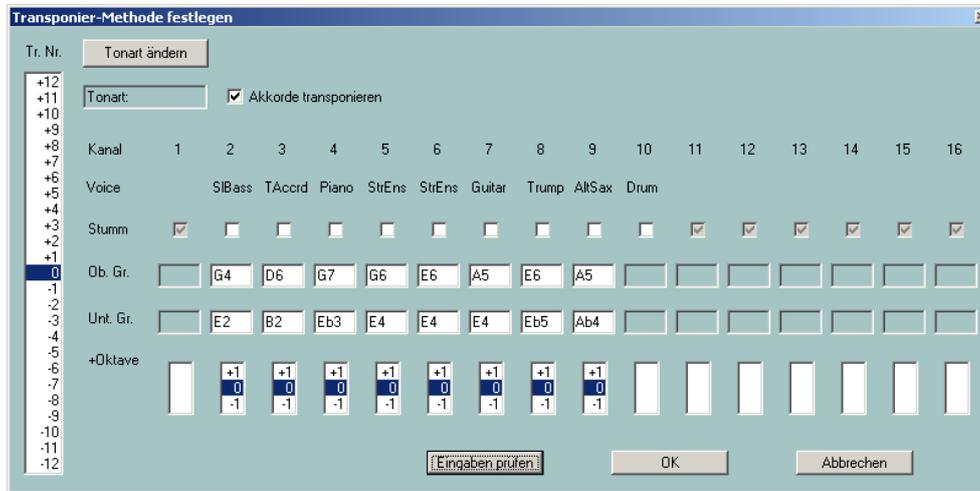
**Midievent Channel Aftertouch**

Midifiles occasionally contain too strong fluctuations of the channel aftertouch events. This is especially the case with files created for and with the keyboards PSR-8000 and PSR-9000. This can be used to reduce the fluctuation without losing dynamics.

## 12. Transposing midfiles and changing the key

In many cases midfiles do not have an ideal pitch for live playing or singing. With the "Transpose" button you can make changes here.

### The Transpose Window



Let's start in the upper left-hand corner. In the field "Key: C" a key is given. This means that the midfile contains a key event for the key of C. We now click on "Change key".



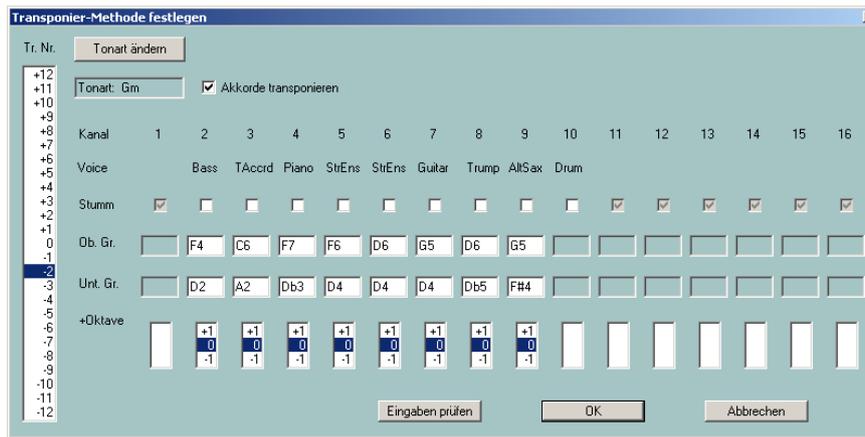
In the upper field the key that PSRUTI has derived from the last chord of the midfile is indicated and suggests this key. If you listen carefully, you can recognize this key. Therefore we can immediately initiate the transfer with OK. On the other hand you can also select another key in the lower fields.

In the notation, however, A min is identical with C maj: neither crosses nor B's. How to change the key: It has no effect on the sound and no notes are transposed.

Let's move on to the actual transposition:

With the left column "Tr. No." is used to specify the number of semitones used for transposition: +12 means one octave up, -12 one octave down. So if we want to transpose the key from Am to Gm, we have to mark -2 here.

We'll do this once:



Marking -2 immediately changes the key to Gm. On the other hand, under "Ob. Gr." and "Unt. Gr." the maximum and minimum note values used are shifted down by two semitones each.

The note values "Ob. Gr." and "Unt. Gr." can also be changed. This is useful, for example, if the bass would become too low after transposition. With "Check inputs" PSRUTI checks whether the newly specified intervals are sufficient to accommodate all notes.

With "+octave", in addition to all inputs, the notes of individual channels can be transposed up or down by one octave.

In practice, the marking of the desired transposition under "Tr. No." will be sufficient.

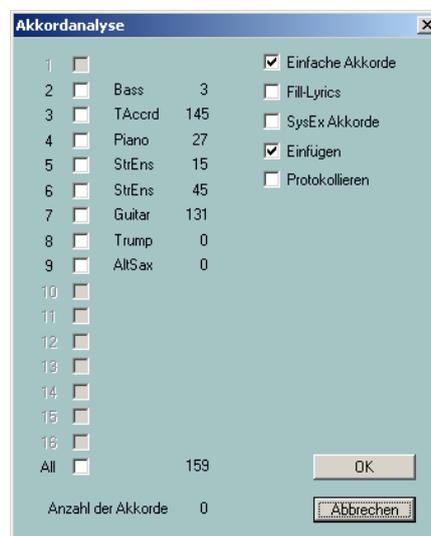
By default, "Transpose chords" is marked with a check mark. This means that notes and key as well as the chord events - if present - will be transposed.

### 13. Calculate chords

Many manufacturers now deliver midifiles with lyrics and chords that are displayed on the keyboards and also in the karaoke window of PSRUTI when playing. If a midifile does not contain chord events, you can have them entered by PSRUTI.

With PSRUTI a harmony analysis of the midifile can be performed. It tries to determine from the notes the chords that are needed for live playing with the automatic accompaniment. Not every midifile is suitable for this, occasionally chords are found that are not suitable and others are not identified when changing harmonies. The found chords are inserted into the Midifile as so-called chord events and are visible when playing with Play and also on the keyboard.

So let's press the "Calculate Chords" button.



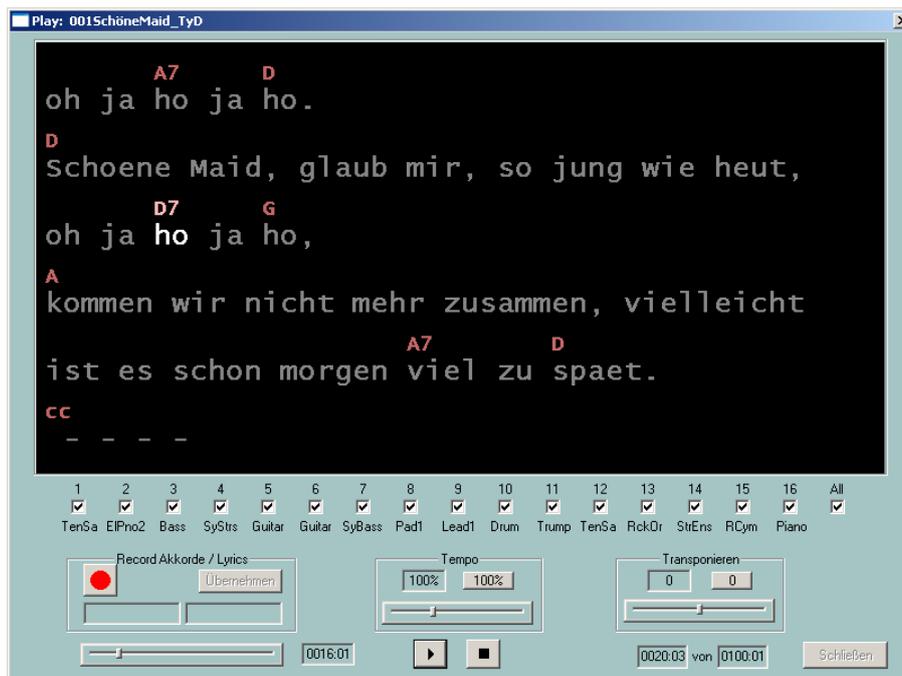


The first beat of bar 10 (0010:01) is currently being played. This includes the chord Em and the first fill lyric in the karaoke window, both of which are highlighted. With each beat the highlighting changes to the next fill lyric.

## 14. About lyrics in Midifiles

PSRUTI has a number of options for entering and editing lyrics. However, it would go beyond the scope of this introduction if the technology were to be discussed here. I refer to the PSRUTI manual psruti\_germ.pdf, which also contains examples.

For demonstration a PSRUTI snapshot of the Midifile "Schöne Maid" of the company d-o-o.



In the third beat of bar 20 the syllable "ho" is active. The also highlighted chord D7 has just become valid at this point.

These files can also be edited. With Transpose the chords are also transposed.

## 15. Concluding remarks

If you have followed all of these sections, you have already learned a lot about PSRUTI and I think that the manual psruti\_germ.pdf will be sufficient for the further PSRUTI functions. There are some services that have not been discussed here, but are still easy to use.

Tempo:	To change the tempo
Extras – Score Kanal:	Selection of a midi channel to display notes on the tyros
Extras – Quickstart:	Midifiles are started faster with a registered Quickstart.
Einzähler:	To enter or delete the counter (Beat In)
Expr.-M. Volume:	To replace controller 11 with controller 7 and vice versa.
Kanäle bearbeiten:	To delete, copy and swap channels

Others are again more difficult to handle: For example, all the possibilities concerning reading, changing and entering lyrics, chords and SysEx. The procedure is explained in detail in the standard documentation.

**Good luck with PSRUTI**

**Heiko Plate**

**in May 2005**

**(revised May 2012)**

**<http://www.heikoplate.de/mambo>**