MA-3
Authoring Tool
Users Manual
(ATS-MA3 edition)

Version.1.3.1

2003/10/2

YAMAHA CORPORATION

Introduction

MA-3 Authoring Tool is application software which operates on Windows®2000 and Windows®XP for authoring, correcting, and verifying the contents for mobile phones.

Use of this application allows the conversion from SMF (standard MIDI file) into Synthetic Music Mobile Application Format (hereafter called SMAF) which is proposed by YAMAHA, editing of voices, editing of management information, and verification of tone generation using "MA-3 emulator".

Recommended operating environment

The recommended operating environment of this Authoring Tool is described as follows.

OS	Microsoft® Windows® XP Microsoft® Windows® 2000
CPU / Clock	Pentium®, Celeron™, or compatible processor / more than 400MHz
Memory	More than 64MB
Required hard disk space	More than 40MB

[Note]: All names of products presented in this manual are trademarks and registered trademarks of each companies respectively.

Contents

< *Revision History*>

Version	Date	Contents	
1.0.0	11/20/2002	New creation	
1.1.0	4/25/2003	New function	Addition of file Access Log functional. Addition of [TC] at control bar. Addition of [Import from Voice List] and [Export to Voice list] at tool bar. The functional addition which displays Use RAM Size on Voice Assign Map.
		4.2	Figure 4-2 control-strip picture change. Addition of [TC] explanation.
		4.3	Addition of Volume bar items
		4.4.1	Addition of items about RAM size
		4.5	Figure 4-5 tool-bar picture change. Addition of "Import from Voice List" and "Export to Voice list" explanations.
		4.9	Figure 4-13 view menu picture change. Addition of "Volume Bar" and "Report Bar" explanations.
		4.10	Figure 4-14 window menu picture change. Addition of "File Access Log" explanation.
		4.13.1	Corrections of "C" and "Name" explanation.
		4.13.3	A figure 4-21 voice assignment map and Fig. 4-23 Voice Assign Map Copy/Paste picture change. Addition of Fig. 4-24 Voice Assign Map right click menu picture. Addition of "Import from Voice List" "Export to Voice list" explanations.
		4.13.6	Figure 4-33 event DENSHITI window picture change. It changes into a Measure display from a Time display.
		4.13.10	Addition of [File Access Log] items.
		4.13.11	Figure 4-37 preference picture change. Deletions of [Light Emitting Diode Blink control] and [MTR Blink control] explanations. In addition, corrections of [Default of Master Volume] explanations.
		4.13.12	Fig. 4-38 and Fig. 4-39 DVA Checker1.2 picture change.
		4.13.13	Picture change about a Fig. 4-40 Authoring Tool.
		4.14.4	Corrections of [RR] explanations.
		5.3	Corrections of VoiceList "key control judging" explanations.
		5.4.1	An addition / deletion / correction of the error message which comes out at the time of input and output.
		5.4.5	Additions of error message of WaveData.
		5.5.1	An addition/correction of the warning message which comes out at the time of input and output.
		5.5.2	Additions of MIDI-related warning message.
		5.5.5	Additions of the check message which comes out at the time of user operation.
1.2.0	2003/5/14	4.13.13	Picture change about a Fig. 4-40 Authoring Tool.
		5.	“The restriction matter by emulator specification” was added newly.
1.2.1	2003/6/13	4.13.13	Picture change about a Fig. 4-40 Authoring Tool.
1.3.0	2003/8/29	3.1	Picture change about a Fig.3-2 MA-3 Authoring Tool starting screen.
		3.5	Picture change about a Fig.3-21 Stream PCM Assign Map. Picture change about a Fig.3-24 Stream PCM Assign Map II.
		4.1	Picture change about a Fig.4-1 Application window.
		4.3	Picture change about a Fig.4-3 Volume bar. Addition of setting function explanation.
		4.12	Picture change about a Fig.4-15 About menu.
		4.13	Picture change about Fig.4-24, 4-25, 4-27, 4-28, and 4-30 Stream PCM Assign Map. Change of Stream PCM Assign Map explanation. Picture change about a Fig.4-33 STM Size Window.

			Change of Measure explanation. Picture change about a Fig.4-40 about Authoring Tool.
		4.14	Picture change about Fig.4--59 and 4-60. Addition of LP and EP explanation.
		4.14.4.1	Addition of LP and EP Automatic Control Function.
		6.4.5	Addition of error message.
		6.4.6	Addition of error message.
		6.5.3	Addition of error message.
1.3.1	2003/10/2	3.1	Picture change about a Fig.3-2 MA-3 Authoring Tool starting screen
		4.1	Picture change about a Fig.4-1 Application window
		4.2	Picture change about a Fig.4-2 Control Bar Change of TB explanation.
		4.3	Clerical error correction
		4.13.12	Clerical error correction
		413.13	Picture change about a Fig.4-40 about Authoring Tool **エラー! 参照元が見つかりません。** エラーメッセージ追加

1. What is possible with MA-3 Authoring Tool?

◆ Independence of MA-3 Authoring Tool and sequencer

MA-3 Authoring Tool is independent application software that is used together with general-purpose MIDI sequencer. Therefore, the user is allowed to select the most familiar sequencer. All operations up to conversion to SMAF can be made by performing sequence editing by use of your sequence software, and performing the editing of voices and the editing of management information by MA-3 Authoring Tool.

◆ Stream PCM pasting function

The stream PCM file for performing a synchronous performance with a channel sequence can be read and assigned.

◆ Event viewer function

- It read a SMF data, and then an event information is allowed to confirm on the event view screen.
- It allows confirming SMF data on the window of event list or piano roll. During confirmation of the playback, the piano roll advances synchronously.
- It allows editing information of music.

◆ Allows to make various voices

The “MA-3 emulator” adopts two types of synthesizer system; FM synthesizer and PCM synthesizer. (For FM synthesizer and PCM synthesizer, please refer to 80, 6.1 Let’s think about FM synthesizer.”). MA-3 Authoring Tool has FM 16 tone mode and 32 tone mode. The maximum number voices that can be generated synchronously depend upon modes.

- FM 16 tone mode: 4opFM section 16 tones + PCM section 8 tones
- FM 32 tone mode: 2opFM section 32 tones + PCM section 8 tones

On PCM synthesizer, after reading the sound files (AIFF, WAVE) of 16bitPCM (encoded to 4bitPCM or 8bitPCM) or 8bitPCM (encoded to 8bitPCM) and by performing operations, such as frequency change, change of envelope, and setting of loop points, up to eight favorable sounds (the size is limited) are allowed to use.

◆ Realize the real sound easily by using Voice Library

Voice Library (VLF-MA3/VLP-MA3) that contains colorful voice data is attached to this application.

VLF-MA3 is the extended voice library of FM voice, and it allows you to easily extend the sounds in which its effect differs from a default voice and to use.
VLP-MA3 is a PCM voice library, and it is able to realize a different real sound from FM with ease.

By using these voice libraries, multicolored sounds are easily realizable. For details such as the registration method of each voice library, please refer to manuals (VLF-MA3_v***.pdf, VLP-MA3_v***.pdf).

2. Preparation for Operation

2.1 Installation of MA-3 Authoring Tool.

The procedure of MA-3 Authoring Tool installations is shown as follows.

- Installation procedure.

1. Double click the “Setup.exe” icon.

Figure 2-1 Setup.exe

↓

Thereupon, set up wizard dialog appears.

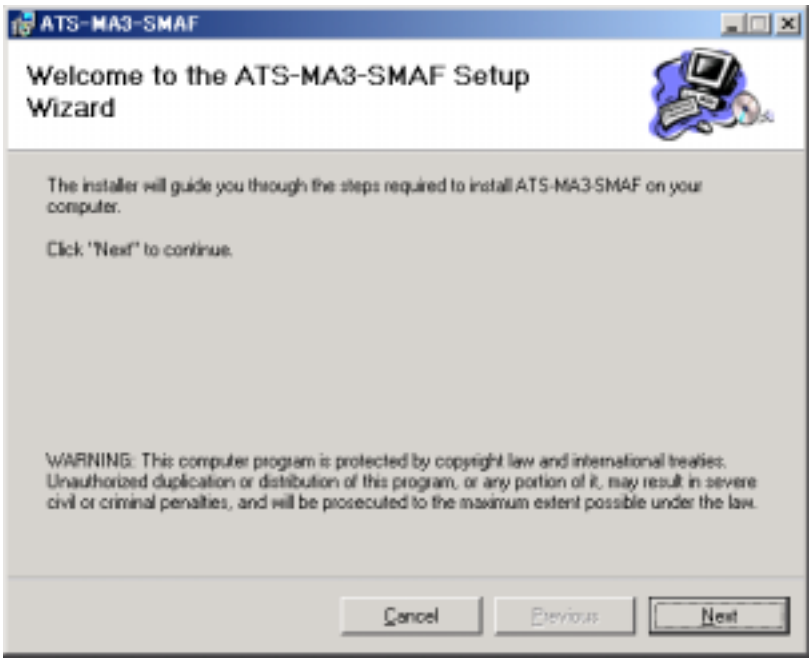


Figure 2-2 Setup wizard dialog

2. Click the “Next” button on the “Setup wizard dialog”.

↓

Then, selection folder dialog appears.

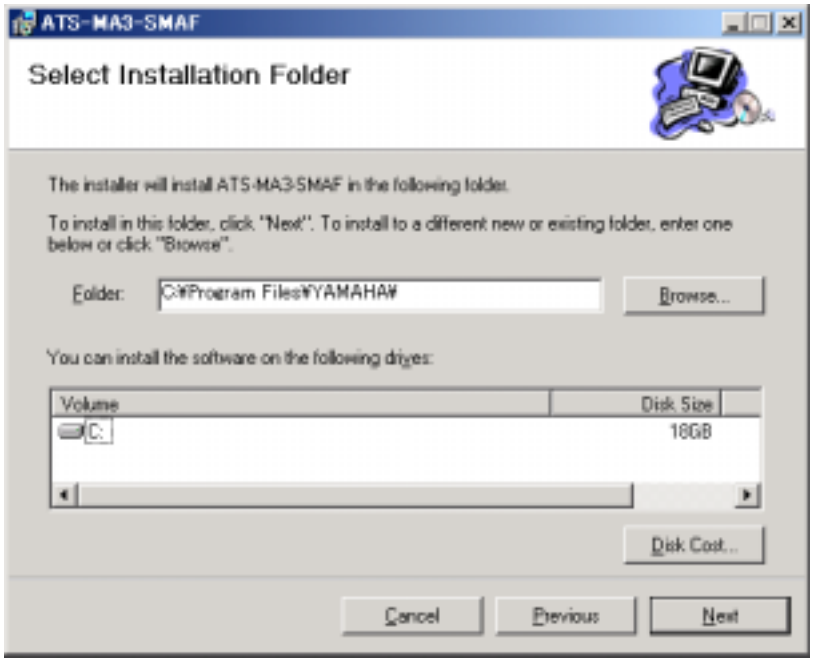


Figure 2-3 Select Installation folder dialog

3. Choosing a folder to be installed, and then click the “NEXT” button.

↓

Then, confirm installation dialog appears on screen.

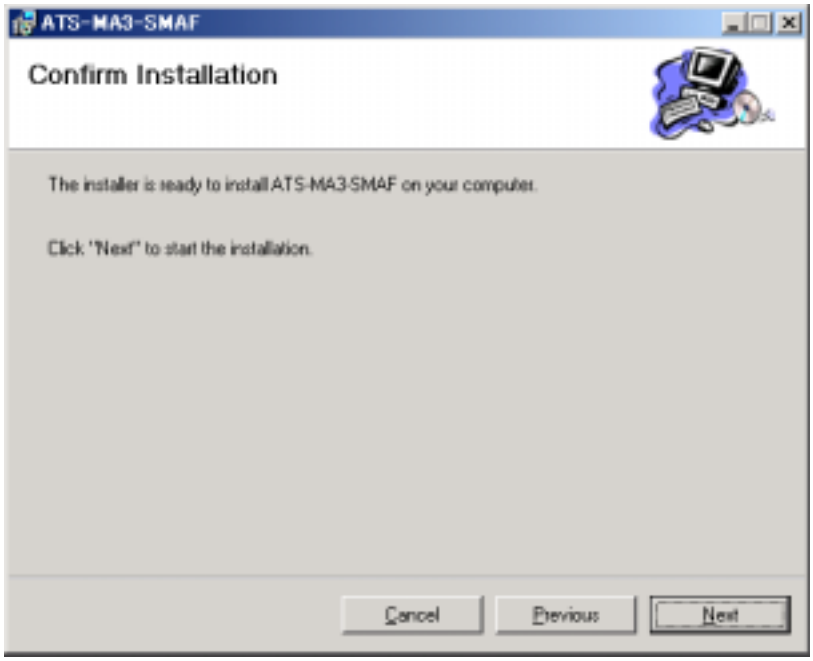


Figure 2-4 Confirm installation dialog

4. Click the “NEXT” button of the confirm installation dialog.

↓

Then, the installation is started, and the completion dialog of installation is displayed.

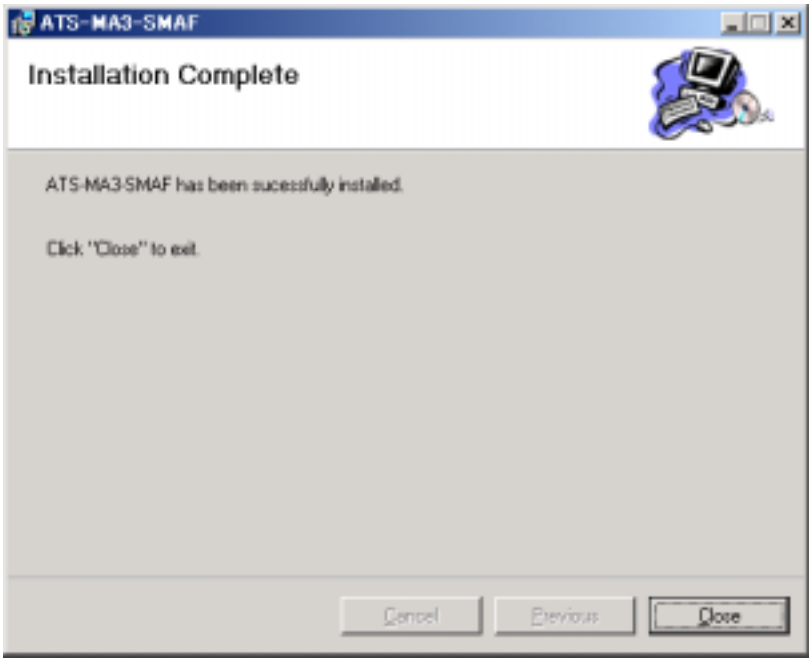


Figure 2-5 Installation Complete dialog

5. Click the “Close” button of the installation complete dialog.

Installation is completed, and the shortcut of ATS-MA3-SMAF is created on the desktop.

Figure 2-6 Short cut of ATS-MA3-SMAF

[Note]: Installation of MA-3 Authoring Tool installs "MA-3 emulator" into the installation folder of MA-3 Authoring Tool automatically.

3. Let's use MA-3 Authoring Tool.

At this point, a standard MIDI file is read, and after a playback check, after carrying out voice edit of a musical piece, a series of flows of saved as a SMAF file are explained.

3.1 Let's start MA-3 Authoring Tool.

After installing MA-3 Authoring Tool, it starts by the following operations.

1. Double-click the "ATS-MA3-SMAF" on a desktop.

Figure 3-1 a short cut of ATS-MA3-SMAF

2. Then, MA-3 Authoring Tool opens

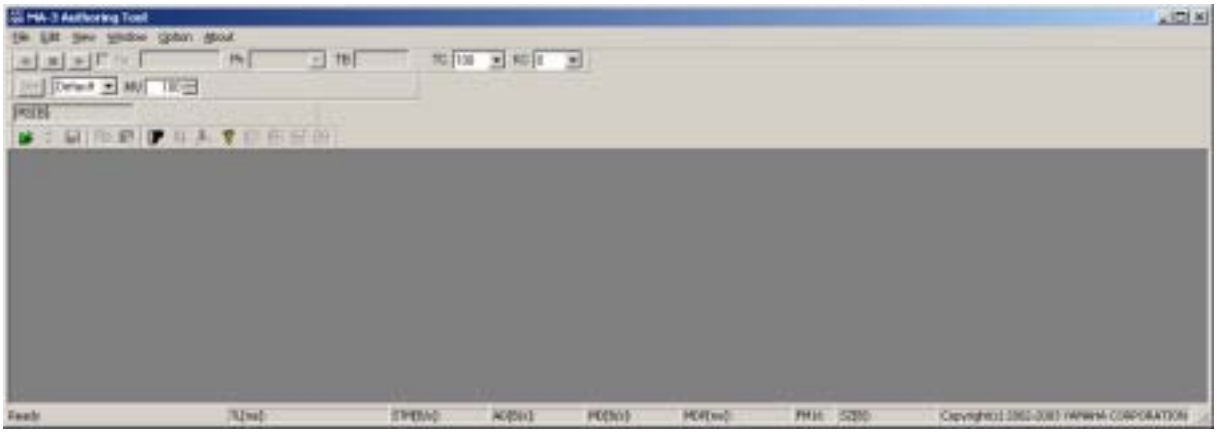


Figure 3-2 MA-3 Authoring Tool starting screen

3.2 Let's read SMF.

◆ About the MIDI file which can be read by MA-3 Authoring Tool

At first, making "SMF Authoring Guideline For MA-3 Authoring Tool" reference and by using your software create a MIDI file you wish to make editing by using a MA-3 Authoring Tool, and save it by SMF Format0 (a standard MIDI file format zero). The edit becomes possible on MA-3 Authoring Tool from the “File” menu which explains this file later by “Import from SMF”.

◆ What is SMF?

It is a common format not depending on sequence software. Format0 that has no concept of multi-track could be called the highest format of compatibility between the commercial sequence software

1. From the “Option” menu, choose the “Preference”.

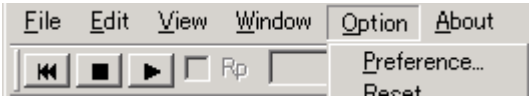


Figure 3-3 Option menu

2. Set up an arbitrary FM mode at Mode Setting.
(More details about FM mode, please refer to “4.13.11 Preference”.)

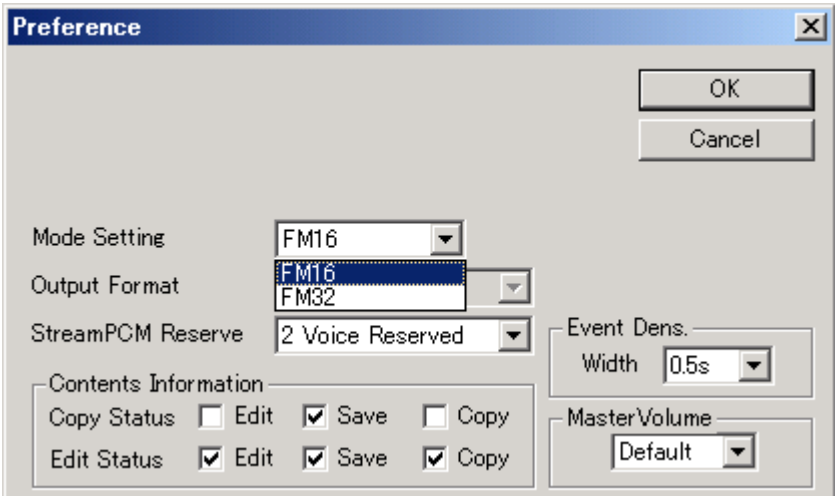


Figure 3-4 Preference / Mode Setting

[Note]: FM mode cannot be changed when music data is being read on the authoring tool. Please change FM mode after closing music data.

3. Please click the “import from SMF” button of an application window, or chose the “Import from SMF” from the “File” menu of a menu bar.

Figure 3-5 Import from SMF button

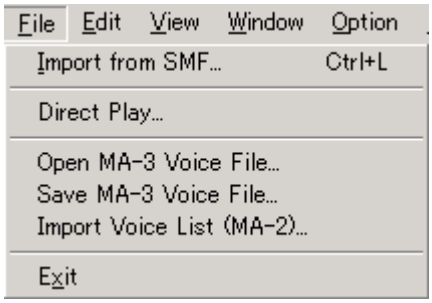


Figure 3-6 File menu / Import from SMF

↓

Then, an “Import from SMF” dialog is displayed.

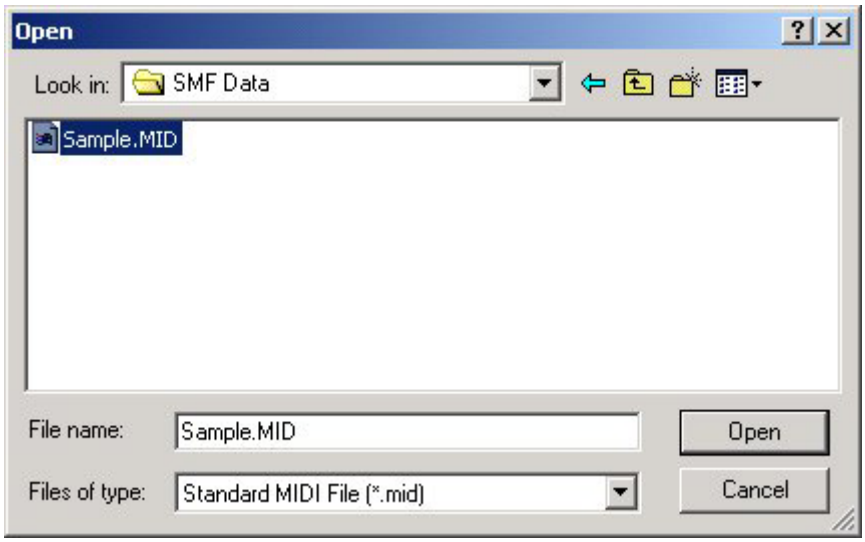


Figure 3-7 Import from SMF dialog

4. Please choose the “SMF” and then click the “Open” button.

↓

Then it is converted...

Figure 3-8 Now Converting

↓

It is read into “Score Window”.

Figure 3-9 Now M3N Importing

A score window will be displayed if SMF is read completely.

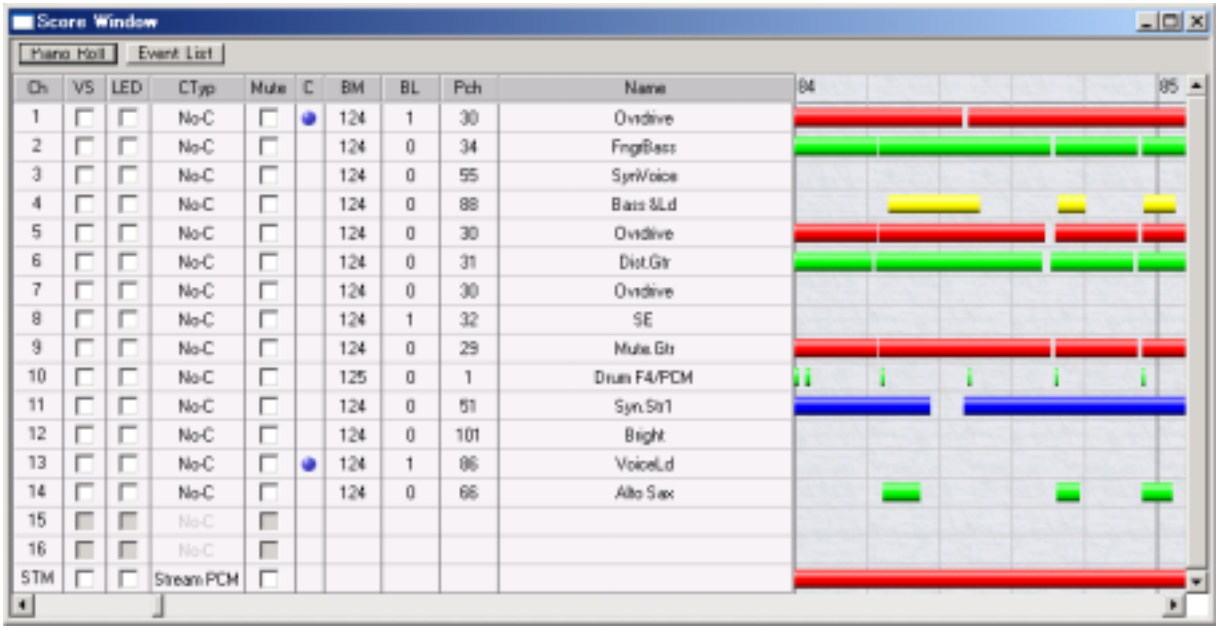


Figure 3-10 Score Window

[Note]: When music data is opened, the voice in a voice list is read, and it is assigned on a score window.

3.3 Let's Playback a Read Music and Stop it.

1. Please click the “Play” button of a control bar in an application window.

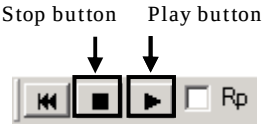


Figure 3-11 Control Bar, Play / Stop button

↓

Then, it’s exporting.

Figure 3-12 Now M3N Exporting.

↓

Check

Figure 3-13 Now Checking

↓

Converting

Figure 3-14 Now Converting

↓

Transmit to MA-3 emulator

Figure 3-15 Now Sending

The read music is played, and the playback bar that shows a playback position is displayed on a score window.

2. Please click the “Stop” button on the control bar of an application window, then music stops.

[Note]: Playback / stop are possible with a shortcut key “Space”.

3.4 Let's Edit FM Voice.

3. After reading a data to edit a voice, choose the “Voice List” from the “Window” menu, and then open a voice list.

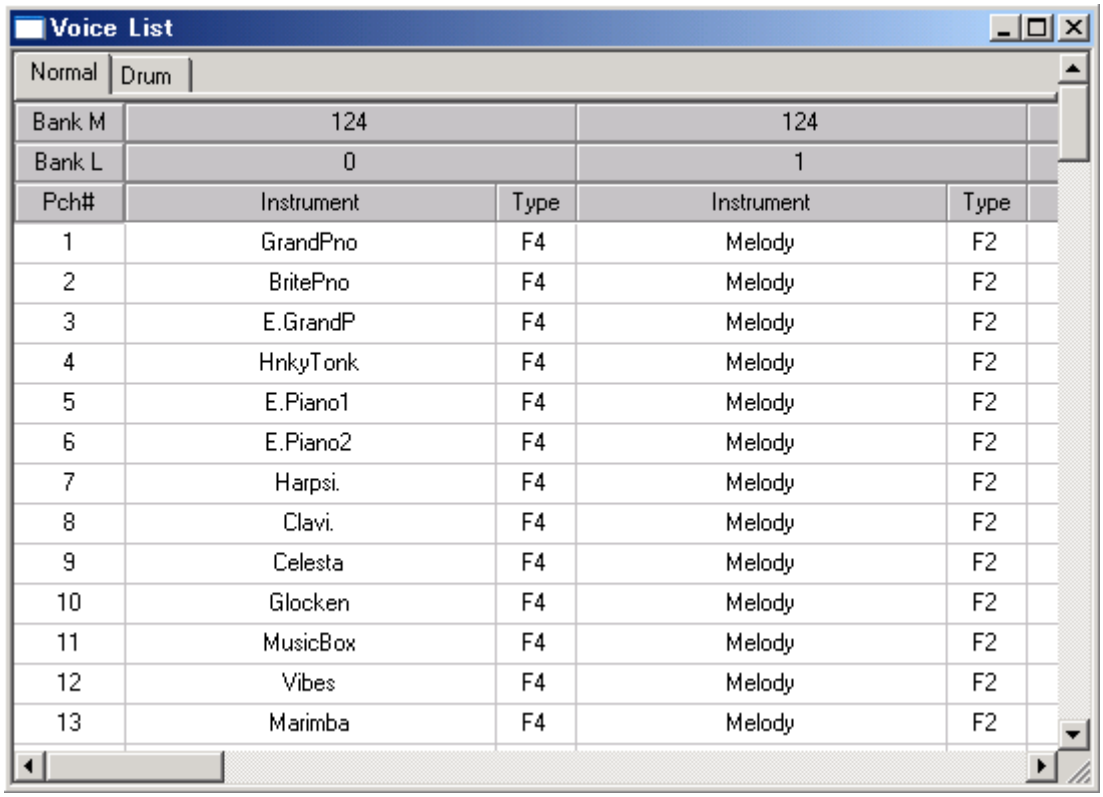


Figure 3-16 Voice List

4. Move a mouse onto a pre-sets voice to use and chose the “Copy” using right click of the mouse.

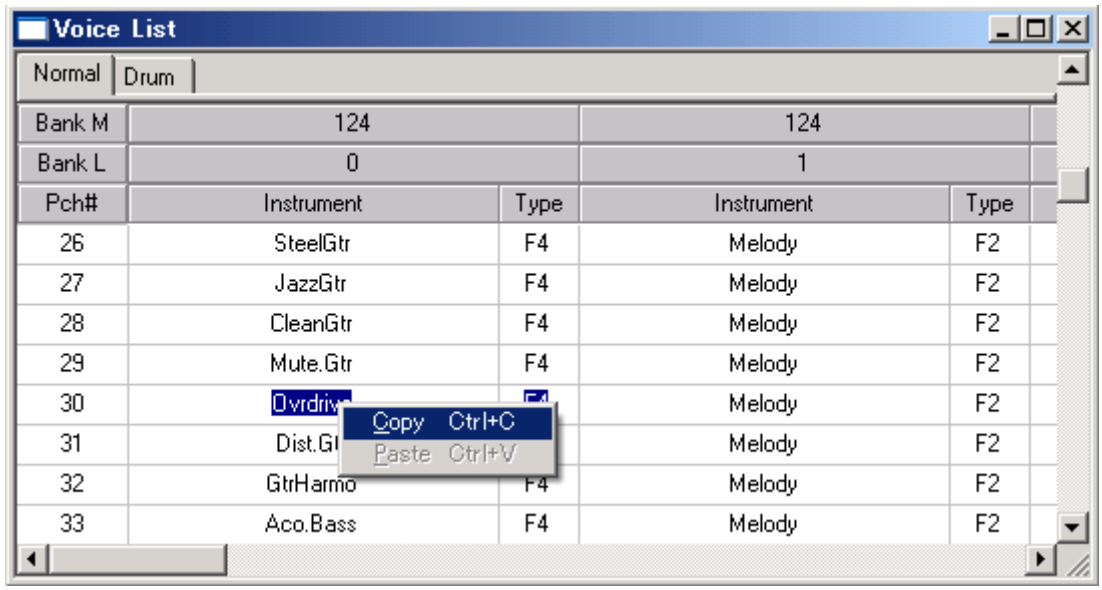


Figure 3-17 Voice List / Copy

5. Choose “Voice Assign Map” from the “Window” menu, and then the voice assignment map is opened.

6. Right click the voice name, and then choose "Paste". After that, paint the voice which copied at the point.

[Note]: It needs to choose a voice to be edited from any voices other than a pre-sets voice beforehand. In the case of a normal voice, BankSelectMSB 124 and BankSelectLSB 1to 9 are user voice banks. Moreover, in case of a drum voice, BankSelectMSB 125, BankSelectLSB 0, and ProgramChange 2 to 9 are user voice banks.

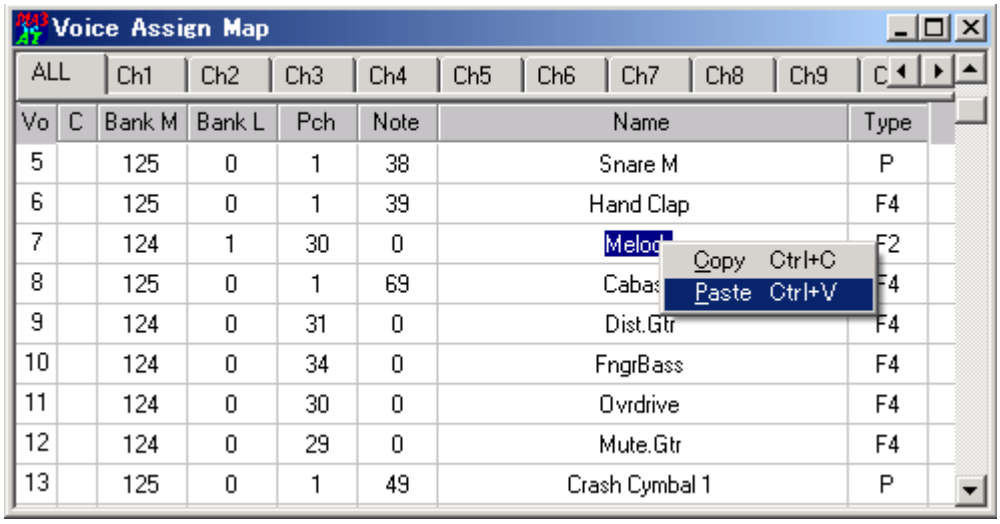


Figure 3-18 Voice Assign Map

7. Display a “Score Window”, and make double-click the “Name” of the voice that pasted at previous point.

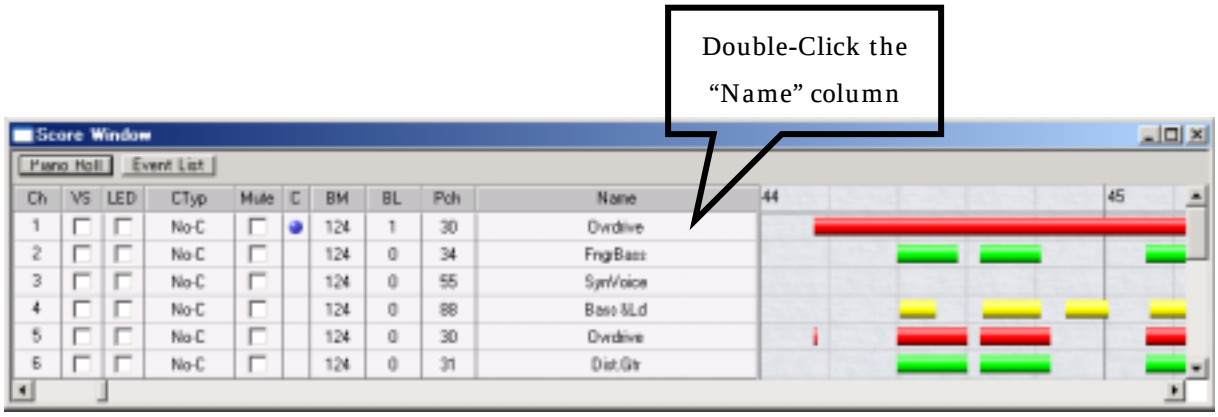


Figure 3-19 Score Window

↓

Then, a voice-editing screen opens.

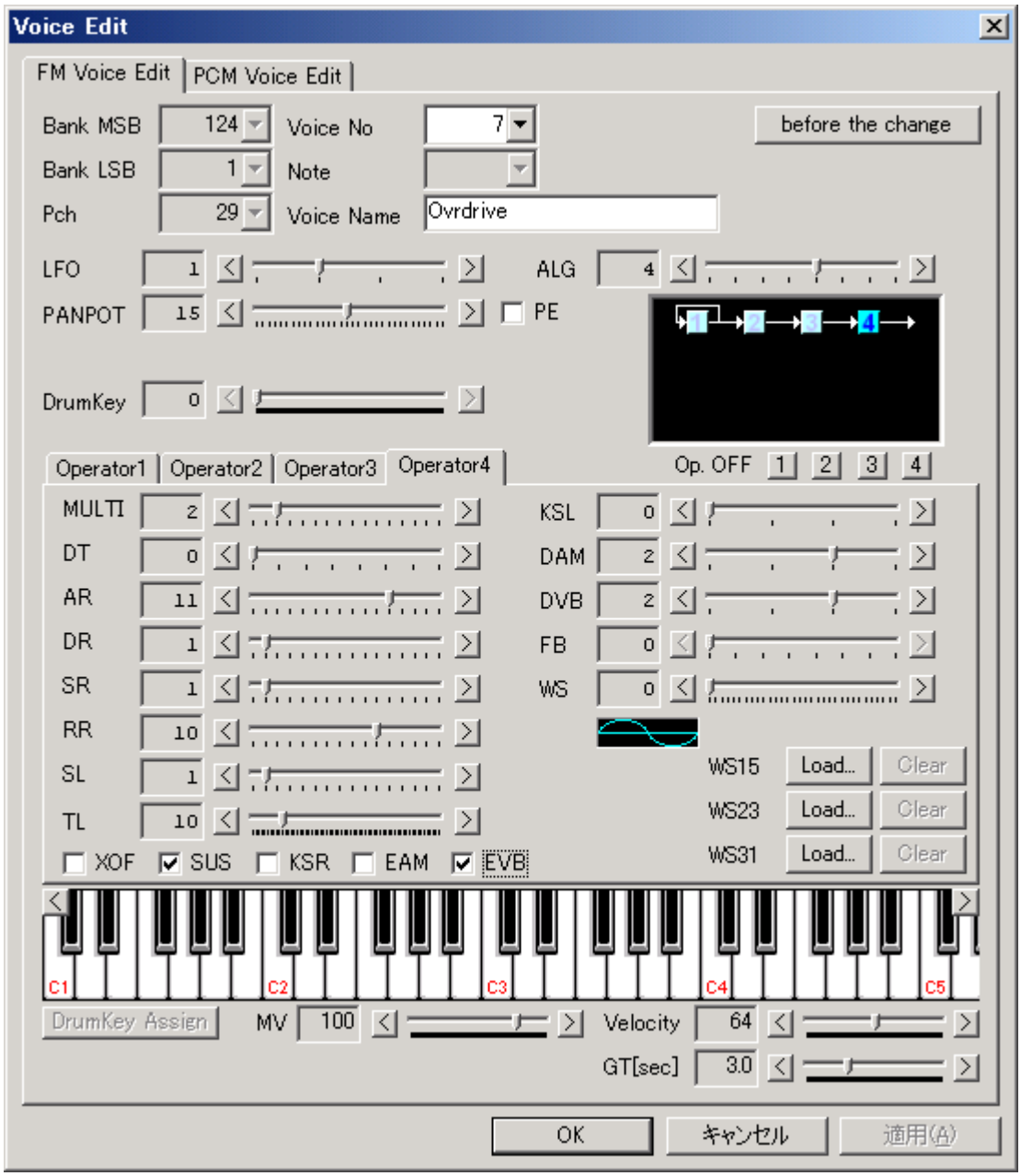


Figure 3-20 Voice edit display

8. It confirms a voice changes with making change of a parameter.
   (Please refer to 60 “4.14.3 FM Synthesizer Edit Parameter” for more details about a parameter.).

It is possible to confirm a voice by means of the following steps, move a cursor onto a keyboard on the voice edit window, and then click each keyboard one by one using with a mouse.

3.5 Procedure to Stream PCM Playback

In this section, how to playback the cry of animals and the loop of a drum by which digital recording was carried out is explained.

1. Read SMF making P13 "3.2 Let's read SMF." reference.

In order to use Stream PCM, it is necessary to set up a bank selection and a note number beforehand. About the creation method of data, please refer to another document "SMF Authoring Guideline For MA-3 Authoring Tool".

2. Choose the “Stream PCM Assign Map” from the “Window” menu of a menu bar.

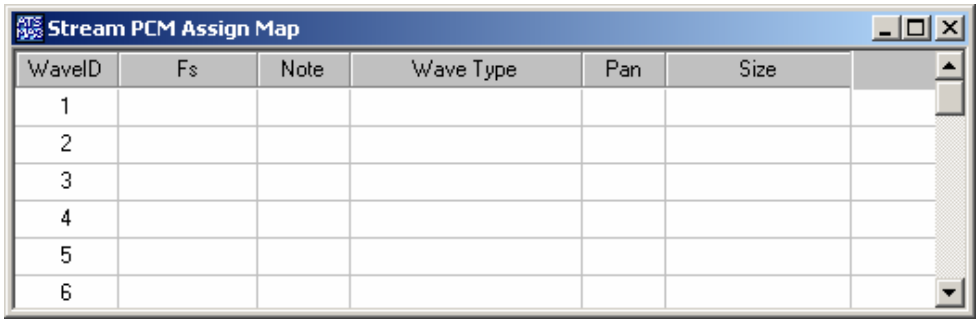


Figure 3-21 Stream PCM Assign Map

3. Right click on a sequence which "WaveID" and "Fs" are written, and a dialog that will be opened if the “New” is chosen.

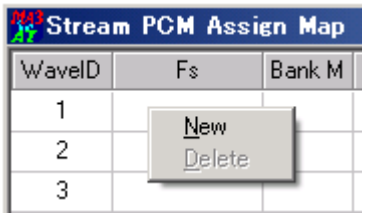


Figure 3-22 Right Click menu

↓

Then, both “Stream PCM Assign Map” and “Opened dialog” is displayed.

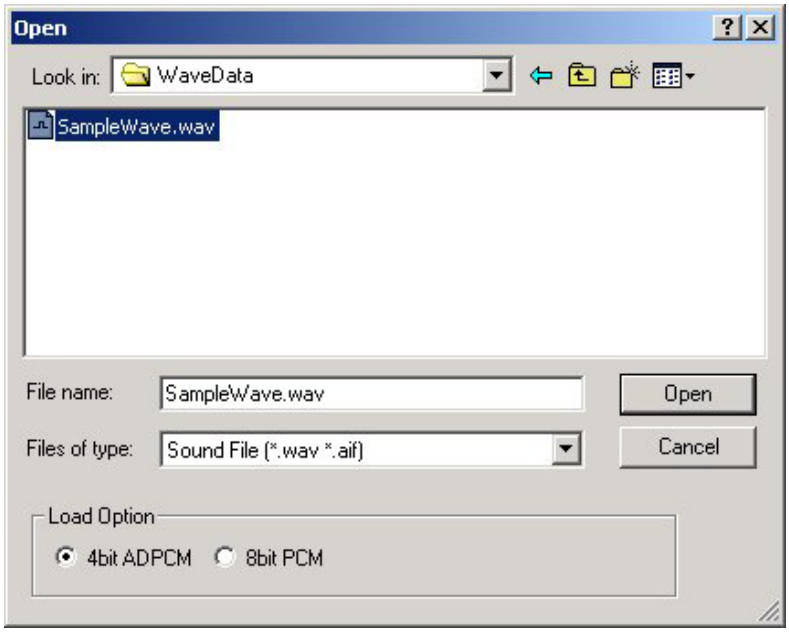


Figure 3-23 Stream PCM Assign Map / Opened dialog

4. Choose the “Sound File”, and then click “Open”.

The sound file to be registered is necessary to be saved in 8 bits or 16 bits.

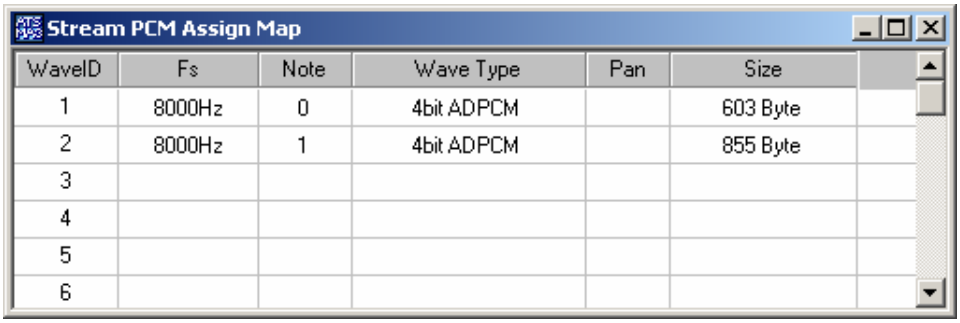
In MA-3 Authoring Tool, these sound files are encoded into 4bitADPCM or 8bitPCM and are read.

When reading a 16-bit sound file, 4bitADPCM or 8bitPCM can be chosen by Load Option of the dialog “Open”.

When reading an 8-bit sound file, 8bitPCM can be chosen by Load Option of the dialog "Open". (When 4bitADPCM is chosen, an error message is displayed and a sound file cannot be opened.)

↓

Then, Waves read into the stream PCM assignment map are displayed.



WaveID	Fs	Note	Wave Type	Pan	Size
1	8000Hz	0	4bit ADPCM		603 Byte
2	8000Hz	1	4bit ADPCM		855 Byte
3					
4					
5					
6					

Figure 3-24 Stream PCM Assign Map II

5. Click a “Play” button of control bar in an application window.

Then, the sound file read is played.

[Note]: If the sequence data using FM voice and the PCM voice is inputted into another channel, Stream PCM, FM voice, and a PCM voice can be played simultaneously.

3.6 Let's Save in Mobile Phone File (SMAF) Form

1. Please choose “Save As” from a “file” menu in a menu bar.

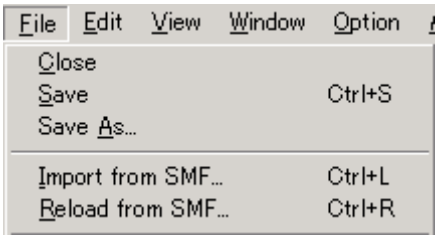


Figure 3-25 File menu / Save As

↓

Then, the dialog "which names and saves a name" opens.

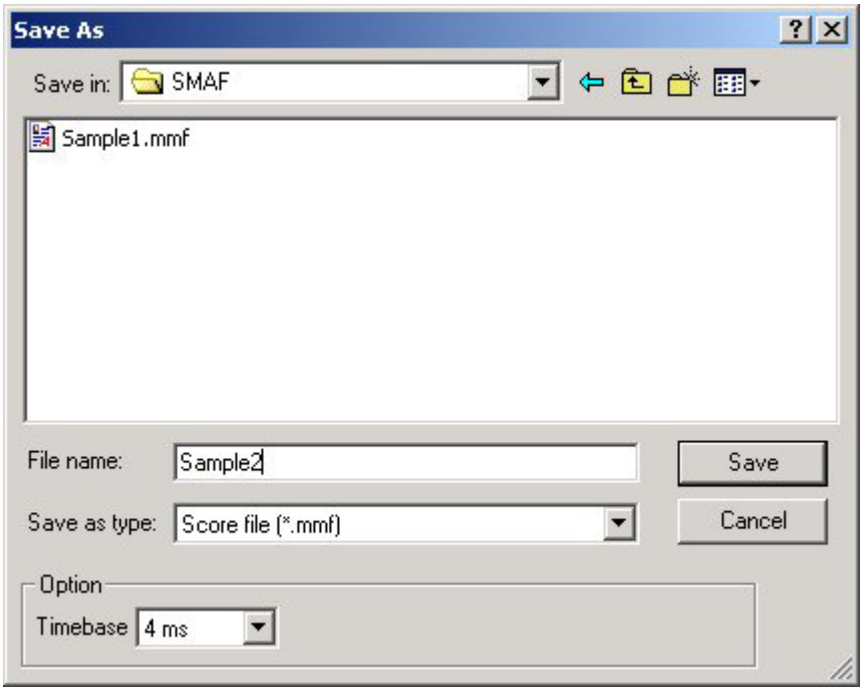


Figure 3-26 “Save As” dialog

2. Input a file name.

3. Click a “save” button.

Then, it is saved as SMAF format.

◆ Option

It is able to select “Timebase” from 4ms, 5msm 10ms, and 20ms and save it.

3.7 Let's use a sequencer and MA-3 Authoring Tool simultaneously

By starting the sequencer and MA-3 Authoring Tool simultaneously, the edited data can be played and checked quickly by MA-3 emulator.

[Note]: In order to carry out a playback confirmation by the sequencer, please prepare a MIDI sound source separately.

1. Starting up both MA-3 Authoring Tool and sequencer.
2. MA-3 Authoring Tool and the same data as a sequencer are read.

[Note]: MA-3 Authoring Tool and the screen change of a sequencer becomes convenient if using with the "Alt+Tab key."

3. Editing a data by using the sequencer.
4. The data that is edited by the sequencer is saved in SMF Format0 form.

Please do not change a saved place and a file name at this time.
[Example]: When saving by XGWorks

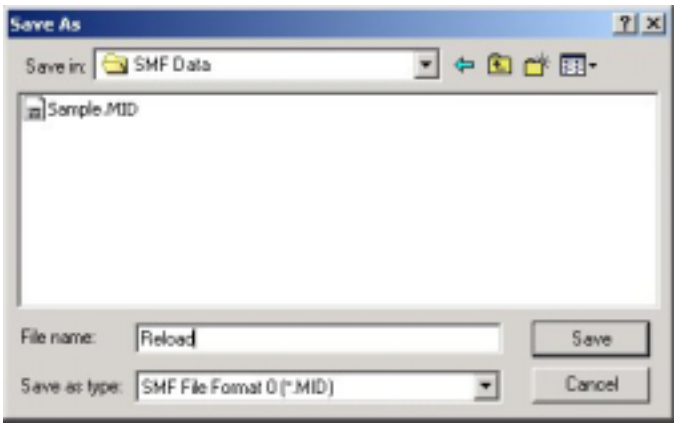


Figure 3-27 Save by XGWorks

5. Perform a way by clicking the “Reload from SMF” button of an application window or a way by selecting the “Reload from SMF” from the “File” menu of a menu bar.

Figure 3-28 Reload from SMF button

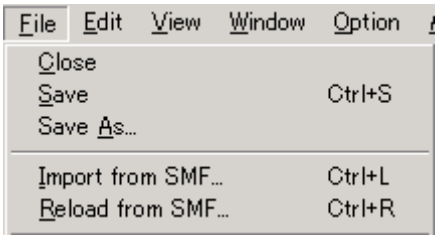


Figure 3-29 File menu / Reload from SMF

6. Click the play button of MA-3 Authoring Tool, and then it is played and checked.

4. Reference

4.1 Application Window

Each editing window is opened on this application window. The menu bar and control bar, the volume bar, the report bar, the tool bar, and the status bar are prepared for the application window. These can be used in common with all editing windows. Each of a menu bar / volume bars / tool bars, and control bar is used to select and perform various functions by a clicking or the drugging. Moreover, a report bar and a status bar display the present state etc.

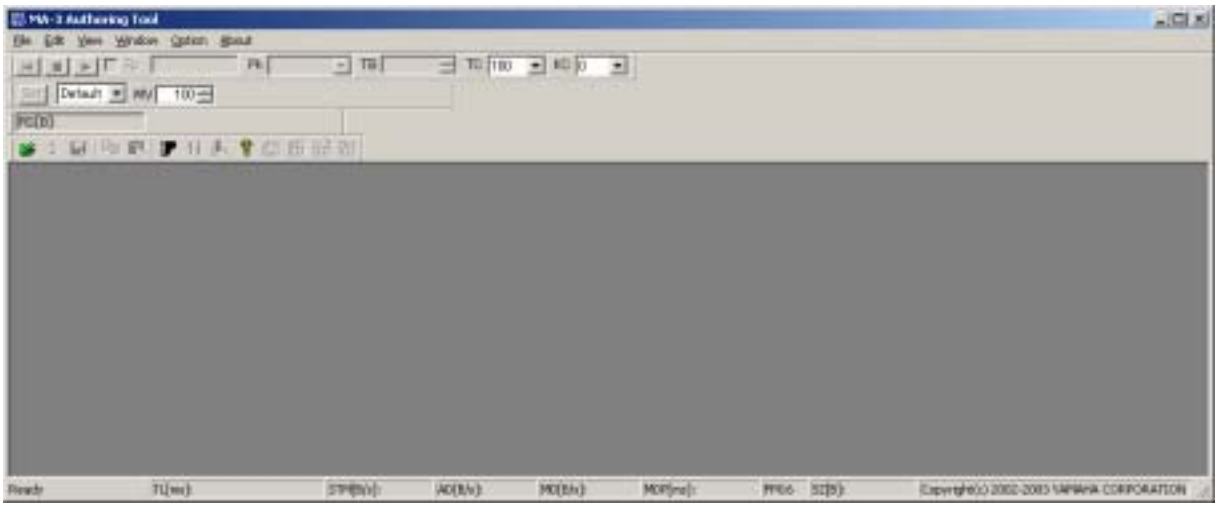


Figure 4-1 Application window

[Note]: A control bar, a volume bar, a report bar, a tool bar, and a status bar can be displayed or hidden if needed. A click of the “View” menu of a menu bar makes a pull down menu display. If “Control Bar”, “Volume Bar”, “Report Bar”, “Toolbar”, and “Status Bar” are clicked out of a list and a check mark is attached, a control bar, a volume bar, a report bar, a tool bar, and a status bar will be displayed. Moreover, if “Control Bar”, “Volume Bar”, “Report Bar”, “Toolbar”, and “Status Bar” to which the check mark was conversely attached out of the pull down menu are clicked and checks are removed, it will no longer be displayed on the application menu.

4.2 Control bar

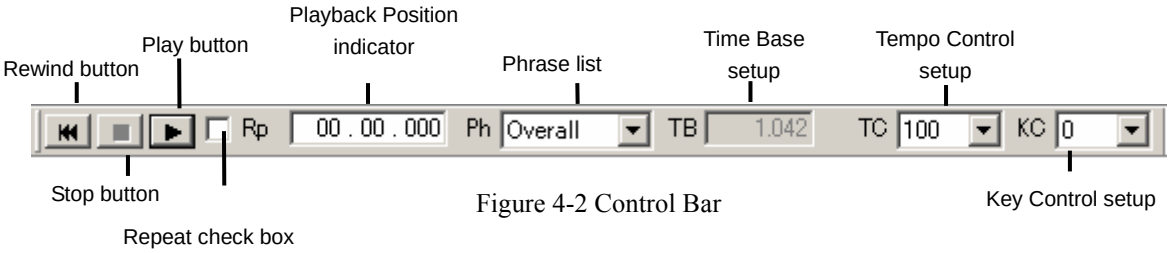


Figure 4-2 Control Bar

Rewind button	A playback bar is moved to the head of music.
Stop button	Playback of music is stopped.
Play button	Music is played.
Repeat check box (Rp)	A repeat is specified.
Playback Position indicator	A playback position is displayed. Arbitrary values can be inputted directly. A displayed unit is ms.
Phrase List (Ph)	The phrase list used as the candidate for playback is chosen
Time Base display (TB)	A time base is displayed.
Tempo Control setup (TC)	Tempo control is displayed. It is possible to change the tempo value at a rate of 70% - 130%, and play.
Key control set up (KC)	Key control is displayed. It can be changed from +12 to -12. Only the channel which uses the voice of a normal bank receives key control. The channel which uses the voice of a drum bank does not receive key control.

[Note]: A setup of a repeat, the playback mode change of a phrase list, a tempo control setup, and a key control setup only become effective at the use of an authoring tool, and are not reflected in a SMAF file.

[Note]: At the Time-base, time per Tick is displayed in milliseconds.

4.3 Volume Bar

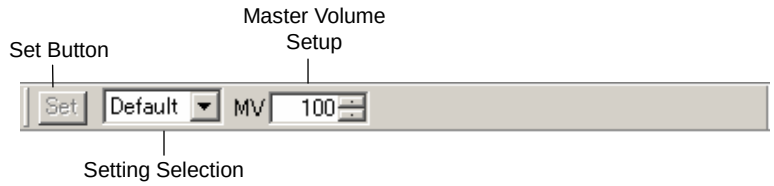


Figure 4-3 Volume bar

Set Button	Master volume values can be memorized to five sets. If this button is clicked in the state where either of name of a memory domain [A] - [E] is displayed on the setting selection box, the present setting value will be memorized to the domain. [Default] is fixed to MV=100. And it cannot be made to memorize a different value.
Setting selection	A memory domain is selected. The master volume value which have been memorized by the set are set up at once.
Master Volume setup (MA)	The master volume value inputted into the head of music is displayed. When Import/Reload “master volume non-set up SMF “, "Master Volume" of Preference is set as data. Arbitrary values can be inputted directly. (For details, see the “MasterVolume” of Preference)

4.4 Report bar

Figure 4-4 RAM Size

RS[B]: RAM Size [Byte]	The total RAM size of the data under edit is displayed.

◆ Check timing of RAM size is as follows.

- ♦ At the time of "O.K." button is clicked in a “Voice Edit” dialog.
- ♦ At the time of “SMF Import”.
- ♦ At the time of “SMF Relased”.
- ♦ At the time of “Voice Paste” to “Voice Assign Map”.
- ♦ At the time of “O.K.” selection in Preference.

4.4.1 RAM size

The total RAM size of MA-3 is 8176 bytes, and if this is exceeded, it cannot play a musical piece. In MA-3 Authoring Tool, RAM size for a musical piece is calculated and if 8176 bytes is exceeded, an error message is outputted. Size is calculated from the following sums.

◆ Lists of Size

1. Registrations of voice parameter
   - ♦ FM2op : 16 byte / 1 tone
   - ♦ FM4op: 30 byte / 1 tone
   - ♦ PCM : 14 byte / 1 tone

2. Registration of PCM voice waveform
   - ♦ The number of bytes of a data portion (1 byte will be added when in odd) /1 waveform.

3. Registration of FM basic waveform
   - ♦ 2048 byte / 1 waveform

4. Registration of Stream PCM waveform
   - ♦ At the time of non-use（No Reserved） / 0 byte.
   - ♦ At the time of the one maximum pronunciation（1 Voice Reserved） / 1024 byte.
   - ♦ At the time of the two maximum pronunciation（2 Voice Reserved） / 2048 byte.

4.5 Toolbar

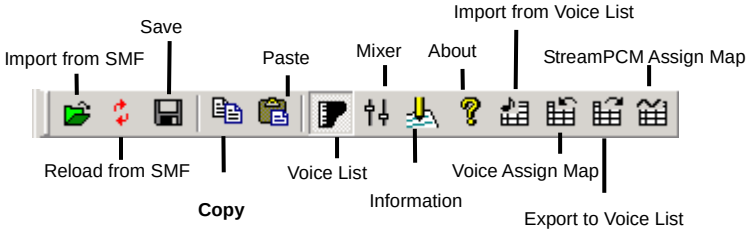


Figure 4-5 Toolbar

Import form SMF	SMF is imported
Reload from SMF	SMF is reloaded.
SAVE	SMF is saved.
Copy	Voice data is copied.
Paste	Voice data is pasted.
Voice List	A voice list window is displayed.
Mixer	A mixer window is displayed.
Information	An information window is displayed.
About	Version information is displayed.
Voice Assign Map	A voice assignment map is displayed.
Import from Voice List	The voice of the same bank number of a voice list and a voice number is read into a voice assignment map.
Export to Voice list	The voice of the same bank number of a voice list and a voice number is written out from a voice assignment map.
Stream PCM Assign Map	A stream PCM assignment map is displayed.

4.6 Status bar

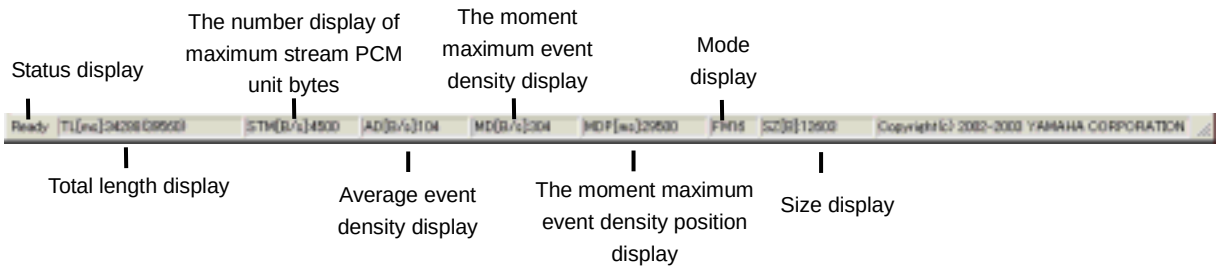


Figure 4-6 Status bar

Status display	Explanation and state about the button and the function at current mouse position are displayed.
Total length display	"The actual playback total time (the last position)" in the read music is displayed. Unit [ms]. The time from Start point to Stop Point comes in actual playback total time. The time from the head of SMF to the last comes in the last position.
The number display of maximum stream PCM unit bytes	The number of the maximum unit bytes of Stream PCM is displayed. Refer to Note in the next page.
Average event density display	The average event density through the read music is displayed. Unit [byte/sec]. (It counts as 6 bytes per note.) Refer to the following Note.
The moment maximum event density display	The instantaneous maximum event density through the read music is displayed. Unit [byte/sec]. Refer to the following Note.
The moment maximum event density position display	The position that has an instantaneous maximum event density through the read music is displayed. Unit [msec].
Mode display	FM mode set up in the preference is displayed.
Size display	The size of SMAF is displayed when saved in SMAF form.

[Note]: Event density is calculated by a note event (6 bytes), a program change (2 bytes), a Control Change (3 bytes), Pitch Bend (3 bytes), and the Exclusive Message (byte and 2(F0, F7) byte of the data section).

When the value of Average Density exceeds "500 byte/s", warning is displayed and the "AD" column of a status bar blinks in red. When the value of Max Density exceeds "1000 byte/s", warning is displayed and the "MD" column of a status bar and the "MDP" column blink in red. While "AD", "MD" or, and "MDP" is blinking in red, it cannot be saved at a SMAF file.

[Note]: As for the number of maximum stream PCM unit bytes, it is displayed on the status bar only saved as a SMAF form. It cannot be saved, if the number of maximum stream PCM unit bytes exceeds 8 Kbytes. Refer to the following example for the calculation method of the number of unit bytes.

In case a sound file is used as Stream PCM data, it is necessary to restrict the number of maximum stream PCM unit bytes (the amount of data per second) to 8 Kbyte/s. Therefore, please convert the sampling frequency of a sound file into the number of stream PCM unit bytes of 1 KHz = 1 K byte/s, and use a sound file to be within 8 Kbyte/s.

Example: when Fs=6kHz 4bitADPCM(s) and Fs=6kHz 8bitPCM(s) are used

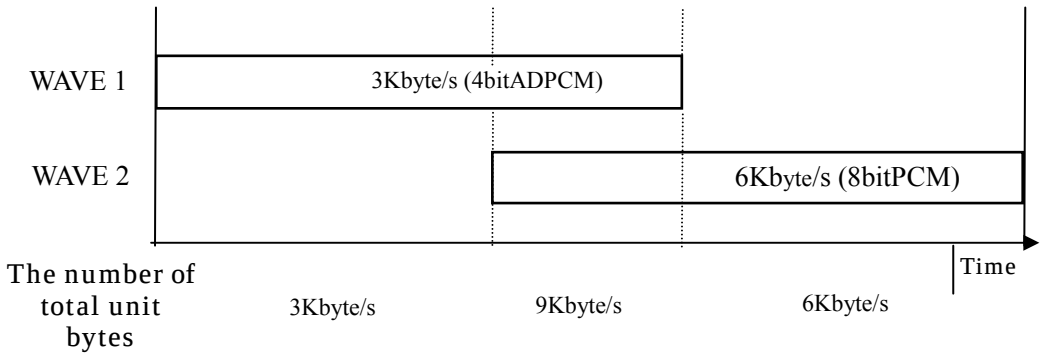


Figure 4-7 Number display of maximum stream PCM unit bytes

- The number of unit bytes of the waveform of 4bit ADPCM [Kbyte/s] ← sampling frequency Fs [kHz] / 2
- The number of unit bytes of the waveform of 8bit PCM [Kbyte/s] ← sampling frequency Fs [kHz].

In the above example, during the time zone when playback of two waveforms has overlapped, since it is set to 9 [Kbyte/s], it cannot be saved.

4.7 File menu

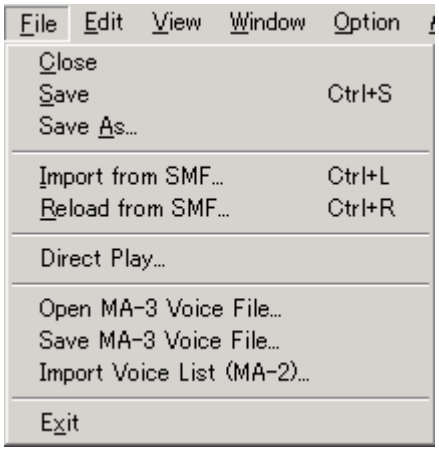


Figure 4-8 File menu

Close	A file is closed.
Save	It is saved in SMAF file format.
Save As	It is newly saved in SMAF file format.
Import from SMF	SMF is read.
Reload from SMF	SMF is reloaded.
Direct Play	SMAF is played direct.
Open MA-3 Voice File	A MA-3 voice file is opened.
Save MA-3 Voice File	A MA-3 voice file is saved.
Exit	MA-3 Authoring Tool is ended.

4.7.1 Direct PlaySMAF is played direct.

SMAF is directly played.

1. "Direct Play" out of the "File" menu of a menu bar Selection displays the dialog [open].

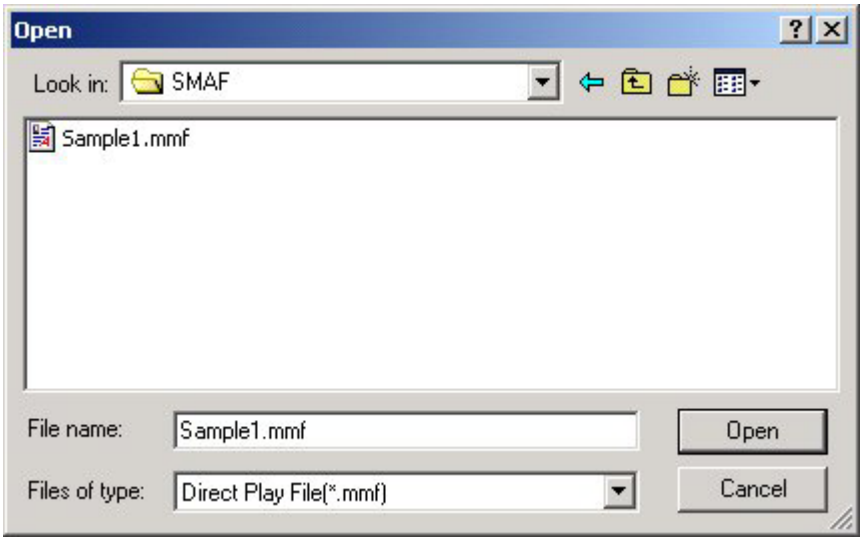


Figure 4-9 The dialog which opens a file

2. If a file is opened, a Direct Play will open.

Figure 4-10 Direct Play

3. The play/stop on the control panel are clicked, and playback and a stop are carried out.

4.8 Edit menu

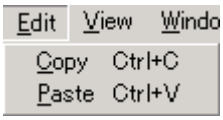


Figure 4-11 Edit menu

Copy	Selected contents are copied. When nothing is chosen, it is displayed in gray.
Paste	The copied contents are pasted

4.9 View menu

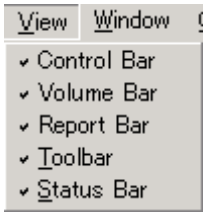


Figure 4-12 View menu

Control bar	Display a control bar.
Volume bar	Display a volume bar.
Report bar	Display a report bar.
Tool bar	Display a tool bar.
Status bar	Display a status bar.

4.10 Window menu

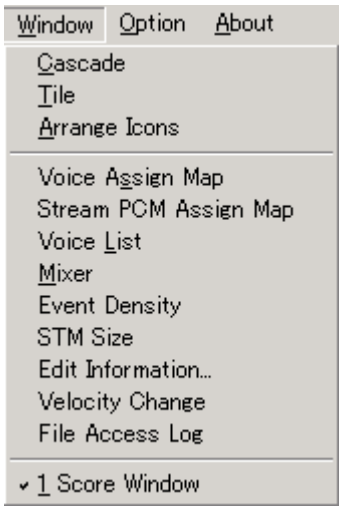


Figure 4-13 Window menu

Cascade	Display windows in piles.
Tile	Display windows side by side.
Arrange Icons	The iconized window is aligned in the lower part of an application window.
Voice Assign Map	Display a voice assign map.
Stream PCM Assign Map	Display a stream PCM assign map.
Voice List	Display a voice list.
Mixer	Display a mixer window.
Event Density	Display a event density window.
STM Size	Display a stream PCM size window.
Edit Information	Display an edit management information dialog.
Velocity Change	Display a velocity change dialog.
File Access Log	Display a file access window.

4.11 Option menu

Figure 4-14 option menu

Preference	Open a preference dialog
Reset	Transmit a MA-3 native reset message.
DVA checker	It opens a DVA checker window, and then it makes it possible to check the number of the maximum pronunciation in data.

4.12 About menu

Figure 4-15 About menu

about MA-3 Authoring Tool	Display about MA-3 Authoring Tool.
SMAF Official Website (Global)	Access to SMAF official website (Global) with browser.

4.13 Explanation of each Windows

4.13.1 Score Window

It displays a content of read SMF data.

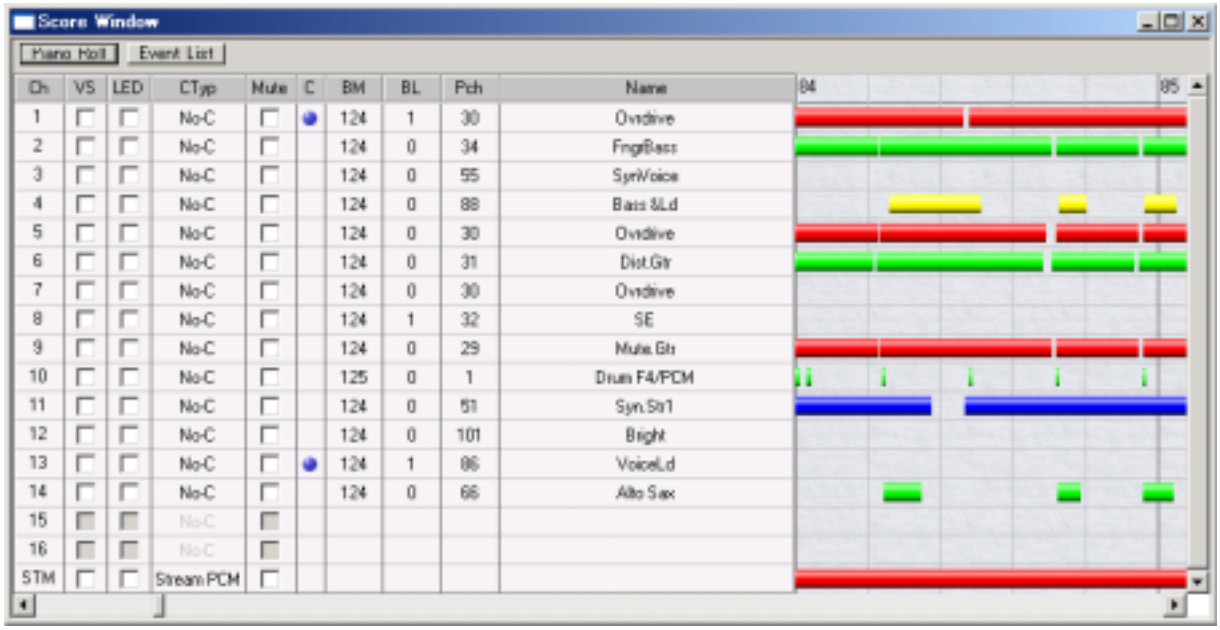


Figure 4-16 Score Window

◆ Ch

It displays channel numbers.

◆ VS (Vibration Status)

Synchronizing with the data in the correspondent channel, it specifies whether vibration is performed or not. Vibration becomes effective by putting a check into a box. Please refer to the following clause "Set up of VS and LED of Stream PCM " about VS setup of Stream PCM.

◆ LED

Synchronizing with the data in the correspondent channel, it specifies whether LED is controlled. LED becomes effective by putting a check into a box. Please refer to the following clause "Set up of VS and LED of Stream PCM" about a LED setup of Stream PCM.

◆ Set up of VS and LED of Stream PCM

A “Channel Status” window is displayed by clicking the check box of “VS” or “LED” of the STM column on a score window.

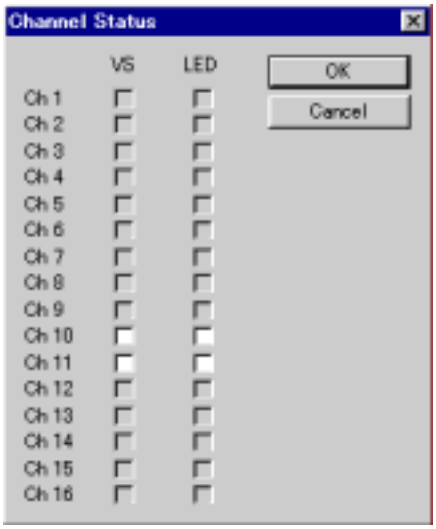


Figure 4-17 Channel Status Window

It is able to set up both “VS” and “LED” into a channel in which the note for playing Stream PCM is being inputted.

◆ Ctyp (Channel Type)

It specifies a Channel Type to a correspondent channel. When the Ctyp column of each channel is clicked, it can be changed in order of No-C, Melo, No-M, and Rhy.

◆ Mute

The channel is muted by putting a check into a correspondent channel. It is not reflected to SMAF file.

◆ C (Change Flag)

When it differs as compared with the voice of the same bank number of a voice list, and a voice number, a blue round mark is displayed. When the number of voices which are different from the voice list in the correspondent channel is one or more, a blue round mark is displayed.

◆ BM (Bank Select MSB)

It displays a bank select MSB.

◆ BL (Bank Select LSB)

It displays a bank select LSB.

◆ Pch (Program Change)

It displays a program change number.

◆ Name

It displays a voice name. When a voice name is double-clicked, a Voice Edit window will open. (The Voice Edit window of a built-in ROM voice cannot be opened.)

◆ Piano Roll button

It displays a content that is read into the score window, on a piano roll window.

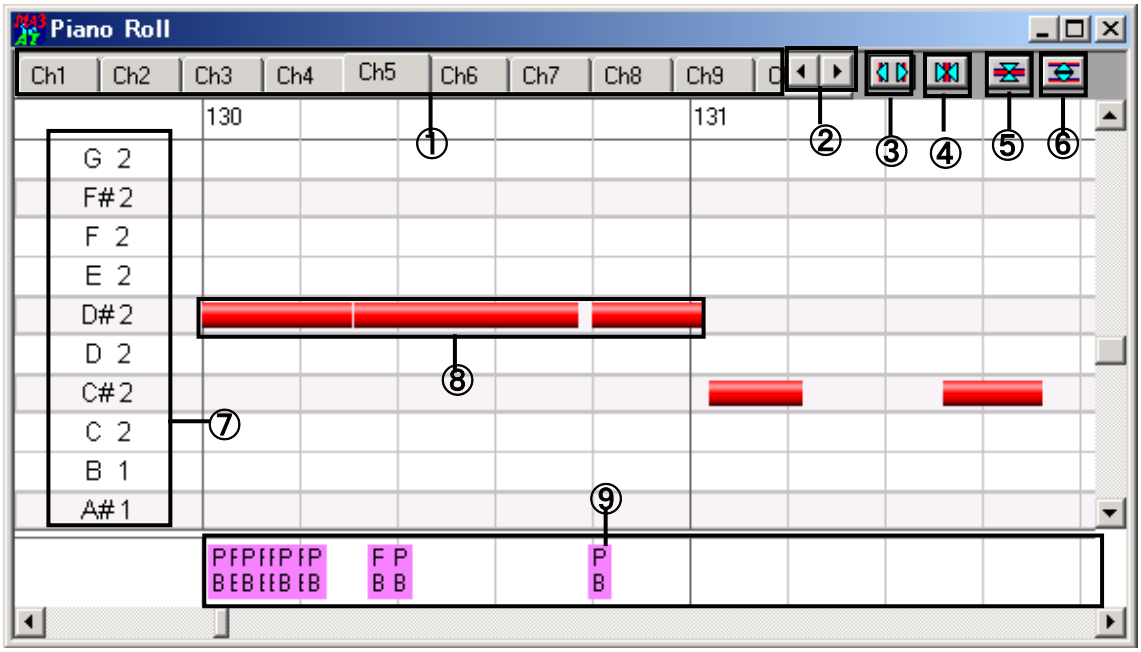


Figure 4-18 Piano Roll Window

① [Ch1~16] [Stream PCM] Part tub

By clicking each tab, the part that is displayed on a piano roll window can be changed.

② Scroll button

A part tab scrolls right and left. The part tab which is not displayed can be displayed.

③ Horizontal zoom-in button

By clicking it, the display size of a window is horizontally expandable.

④ Horizontal zoom-out button

By clicking it, the display size of a window is horizontally reducible.

⑤ Perpendicular zoom-in button

By clicking it, the display size of a window is vertically expandable.

⑥ Perpendicular zoom-out button

By clicking it, the display size of a window is vertically reducible.

⑦ Pitch display

The pitch of a piano roll window is displayed.

⑧ Note bar

The pitch of each MIDI note and a gate time are displayed.

⑨ Controller display

The control change and pitch bend which are inputted into each part are displayed.

Event List button

The contents read into the score window are displayed on the event list window.

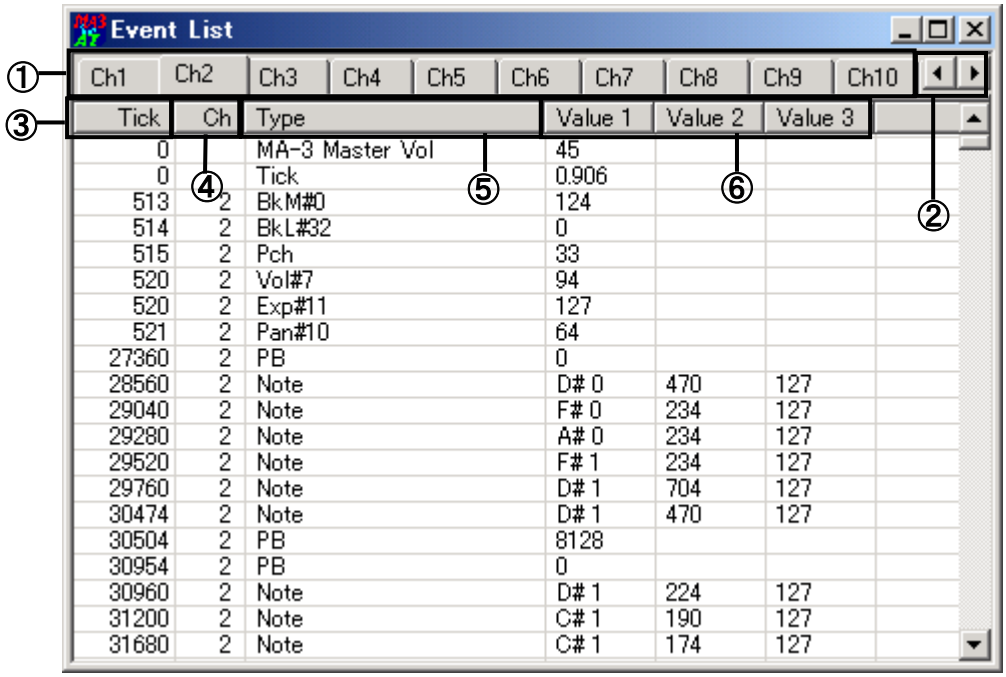


Figure 4-19 Event List Window

① [Ch1 to 16], [Stream PCM], and [All] Part tub

By clicking each tab, a part that is displayed on the event list window can be changed.

② Scroll Bar

A part tab scrolls right and left. The part tab that is not displayed can be displayed.

③ Tick (Location)

The location of each event is displayed per Tick.

④ Ch (Channel)

The channel of each event is displayed.

⑤ Type

The kind of each event is displayed.

⑥ Value 1

ControlChange...	Display a data value.
PitchBend...	Display a pitch bend.
Note...	Display a note number.
StreamPCM...	Display a WaveID.

Value 2

Note...	Display a game time of note.
StreamPCM...	Display a game time of StreamPCM

Value 3

Note...	Display a velocity of a note.
StreamPCM...	Display a velocity of StreamPCM.

4.13.2 Voice List

It displays a voice map.

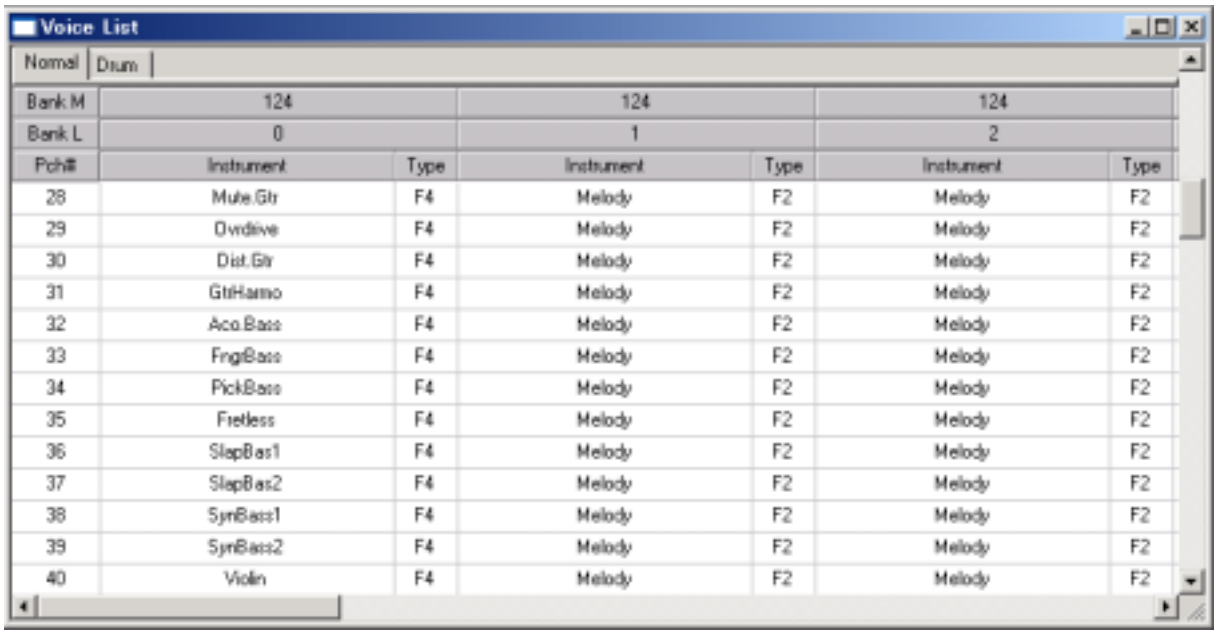


Figure 4-20 Voice List Window

◆ Normal tub

A normal voice is displayed.

◆ Drum tub

The drum voice and PCM voice are displayed.

◆ Bank M (BankSelectMSB)

The bank selection MSB is displayed.

◆ Bank L (BankSelectLSB)

The bank selection LSB is displayed.

◆ Pch # (ProgramChange#)

The voice number is displayed.

◆ Instrument

It displays a voice name. If a voice name is double-clicked, a “Voice Edit window” will open.

◆ Type

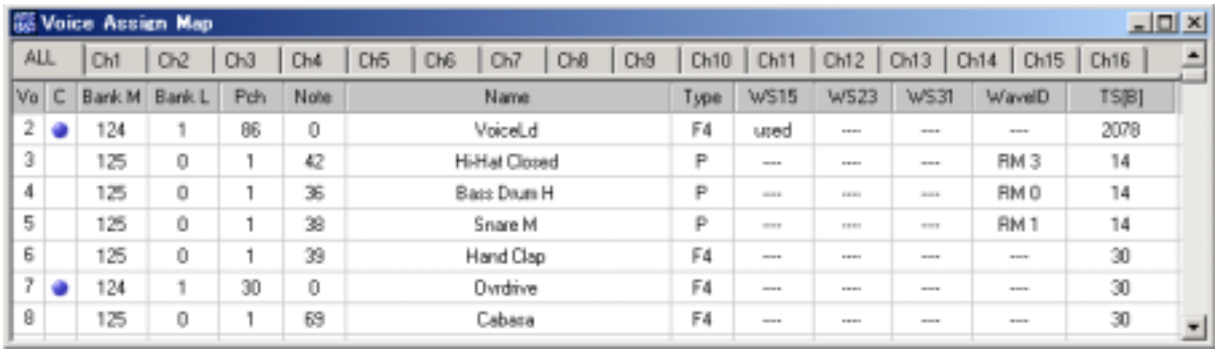
A use voice type is displayed. F4 : 4 operator setup and F2 : 2 operator setup, and P: PCM setup

4.13.3 Voice Assign Map

The voice currently used in each channel is displayed for every channel. A voice can be displayed up to 128 in all channels. (The data which is using the voice exceeding 128 pieces cannot be read.)

[Note]: The voice which is using the voice in a Built-in ROM is displayed in blue.

(Please refer to P87 MA-3 GM Level1 Normal Voice MAP (built-in ROM voice) and P88 MA-3 GM Level1 Drum Instrument MAP (built-in ROM voice) about a built-in ROM voice.)



Vo	C	Bank M	Bank L	Pch	Note	Name	Type	WS15	WS23	WS31	WaveID	TS[B]
2	●	124	1	86	0	VoiceLd	F4	used	---	---	---	2078
3		125	0	1	42	Hi-Hat Closed	P	---	---	---	RM 3	14
4		125	0	1	36	Bass Drum H	P	---	---	---	RM 0	14
5		125	0	1	38	Snare M	P	---	---	---	RM 1	14
6		125	0	1	39	Hand Clap	F4	---	---	---	---	30
7	●	124	1	30	0	Ovrdrive	F4	---	---	---	---	30
8		125	0	1	69	Cabasa	F4	---	---	---	---	30

Figure 4-21 Voice Assign Map

◆ ALL

All voices currently used are displayed.

◆ Ch1 to Ch 16

All voices currently used are displayed for every channels.

◆ Vo

The number of the voices currently used is displayed.

◆ C (Change Flag)

As compared with the voice of the same bank number of a voice list, and a voice number, if it differs, a blue round mark will be displayed.

◆ Bank M (BankSelectMSB)

The bank selection MSB is displayed.

◆ Bank L (BankSelectLSB)

The bank selection LSB is displayed.

◆ Pch (ProgramChange)

A program change number is displayed.

◆ Note

A note number is displayed.

◆ Type

A use voice type is displayed. F4 : 4 operator setup and F2 : 2 operator setup, and P: PCM setup

◆ WS15/23/31 [Wave 15/23/31]

When the voice currently used is using WS15/23/31 in FM voice, it is displayed as “used”

◆ WaveID

The WaveID is displayed when the voice currently used is using the RAM voice by PCM. When the Drum voice “RM” of ROM is being used, it is displayed as “RM 0-6”.

◆ TS[B] (Total Size)

The RAM size of the voice currently used is displayed. Unit [byte]. Please refer to P26 “4.4.1 RAM size” about RAM size.

If the right click of the voice name of Voice Assign Map is carried out, copy/paste menu will be displayed.

Figure 4-22 Voice Assign Map Copy / Paste

◆ Copy

A voice can be copied.

◆ Paste

A voice can be pasted.

If the right click of the status, such as [BankM], is carried out, a Voice Assign Map right click menu will be displayed.

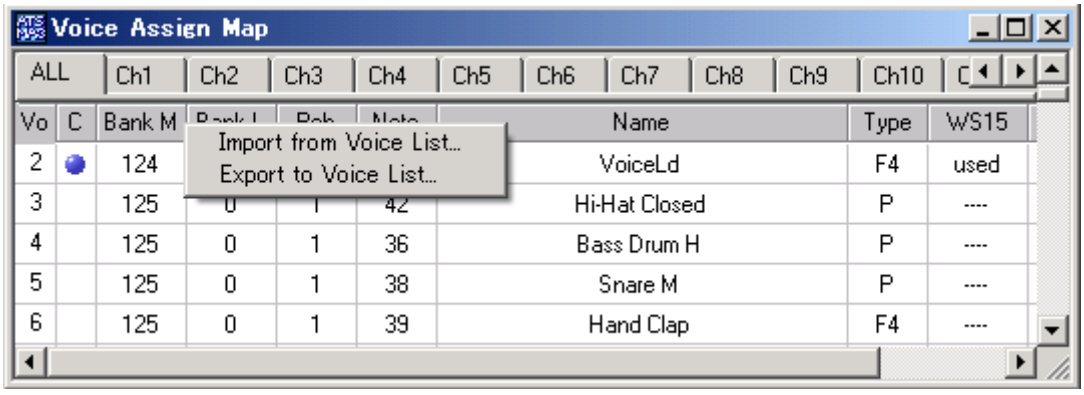


Figure 4-23 Voice Assign Map right click menu

◆ Import from Voice List

The voice of the same bank number of a voice list and a voice number is read into a voice assignment map. The work same as the [Import from Voice List] button of a tool bar can be done.

◆ Export to Voice List

The voice of the same bank number of a voice list and a voice number is written out from a voice assignment map. The work same as the [Export to Voice List] button of a tool bar can be done.

4.13.4 Stream PCM Assign Map

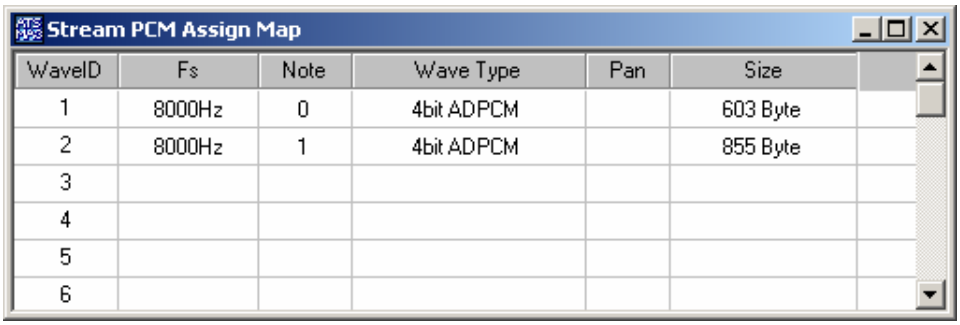


Figure 4-24 Stream PCM Assign Map

◆ WaveID

Wave ID is displayed. It corresponds to NoteNo. It can register a maximum of 32 waving.

[Note]: The wave format which can be used by Stream PCM is up to 8,000Hz in 8-bit wave, and is up to 16,000Hz in 4bits wave.

Fs

The frequency of a wave is displayed.

◆ Note

A note number is displayed. (0-12, 92-110)

◆ Wave Type

A wave type is displayed.

◆ Pan

The Pan of a wave is displayed.

◆ Size

The size of the read wave data is displayed.

A New/Delete menu will be displayed if the right click of the inside of a Stream PCM Assign Map window is carried out.

◆ New

A sound file can be read.

The sound file to register should use the sound file in WAVE (16 bits and 8 bits) or the sound file saved in AIFF form.

The sampling frequency of the sound file to register is restricted from 4kHz to 16kHz.

◆ When encoding to 4bitADPCM, the sound file from 4kHz to 16kHz can be registered.

◆ When encoding to 8bitPCM, sound file from 4kHz to 8kHz can be registered.

[Note]: It is possible to read about 350 Kbytes at the maximum.

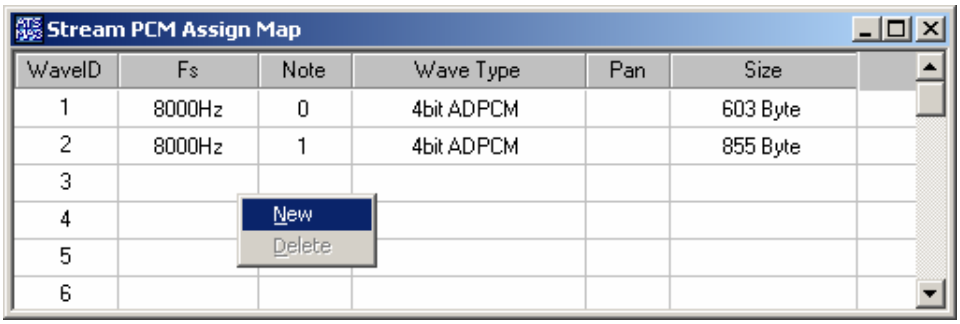


Figure 4-25 Stream PCM Assign Map/New

The dialog to open is displayed by choosing “New”.

↓

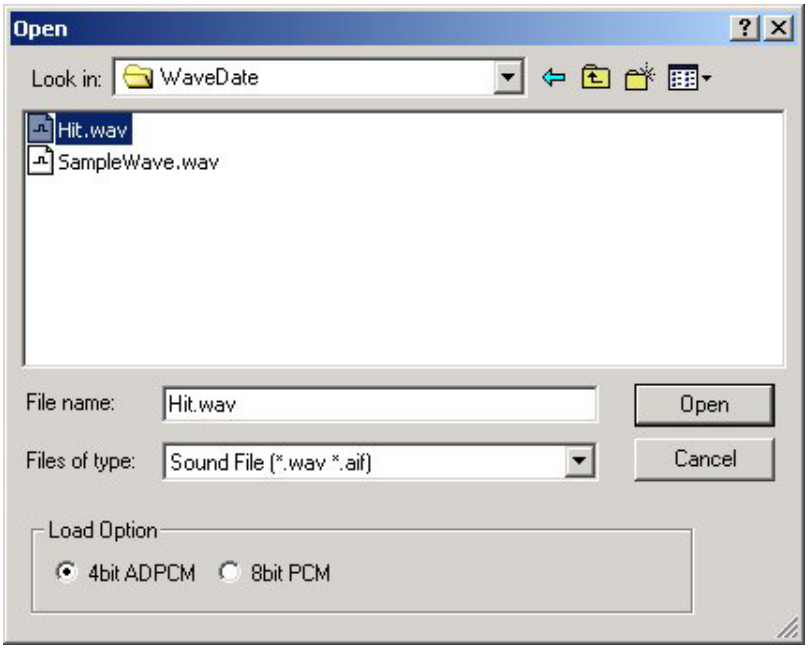


Figure 4-26 Opening Stream PCM

◆ LoadOption

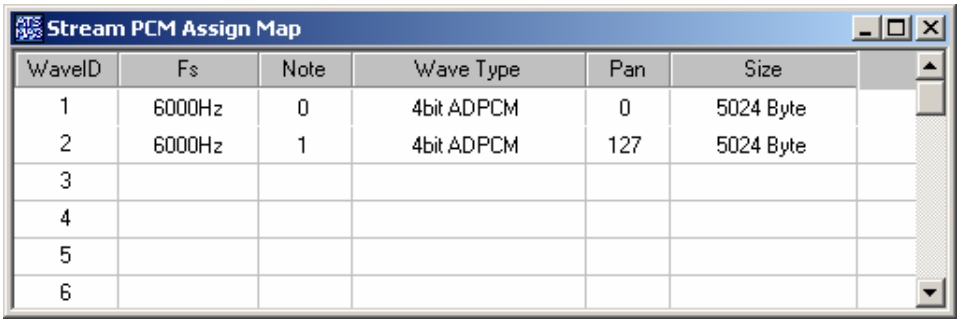
The encoded processing method of the read sound file is chosen.

A sound file is encoded and read into 4bitADPCM or 8bitPCM in MA-3 Authoring Tool.

When reading a 16-bit sound file, 4bitADPCM or 8bitPCM can be chosen.

8bitPCM can be chosen when reading an 8-bit sound file. (A sound file cannot be read at the time of 4bitADPCM selection.)

When a stereo sound file is read, it is registered using two WaveID. Under the present circumstances, in order to show that it is a stereo sound file, the ruled line between WaveID is eliminated.



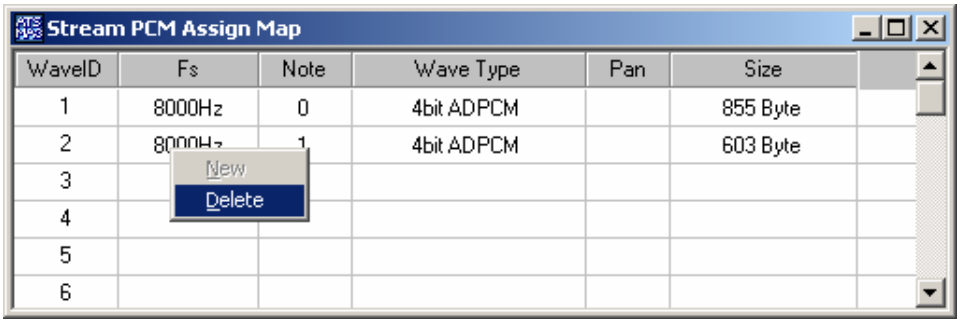
WaveID	Fs	Note	Wave Type	Pan	Size
1	6000Hz	0	4bit ADPCM	0	5024 Byte
2	6000Hz	1	4bit ADPCM	127	5024 Byte
3					
4					
5					
6					

Figure 4-27 Stereo Sound File

[Note]: If a stereo sound file is read, the "StreamPCM Pair" event will be automatically inserted into the head of music. Please refer to another document "SMF Authoring Guideline For MA-3 Authoring Tool" about "StreamPCM Pair."

◆ Delete

The wave data assigned can be deleted.



WaveID	Fs	Note	Wave Type	Pan	Size
1	8000Hz	0	4bit ADPCM		855 Byte
2	8000Hz	1	4bit ADPCM		603 Byte
3					
4					
5					
6					

Figure 4-28 Stream PCM Assign Map/Delete

◆ StreamPCM Wave Panpot

If the Panpot display column is double-clicked, the "StreamPCM Wave Panpot" dialog can open, and Panpot can be set up.

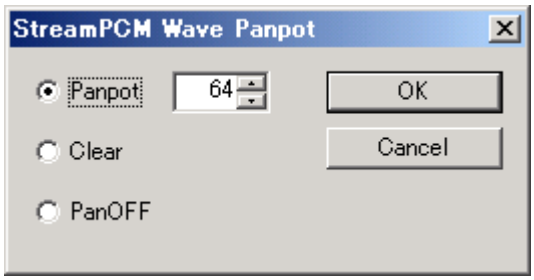


Figure 4-29 StreamPCM Wave Panpot

[Note] Please refer to "SMF Authoring Guideline For MA-3 Authoring Tool" about "StreamPCM Wave PanpotClear" and "StreamPCM Wave Panpot PanOFF."

A menu will be displayed if the right click of the status, such as “WaveID” and “Fs”, is carried out.

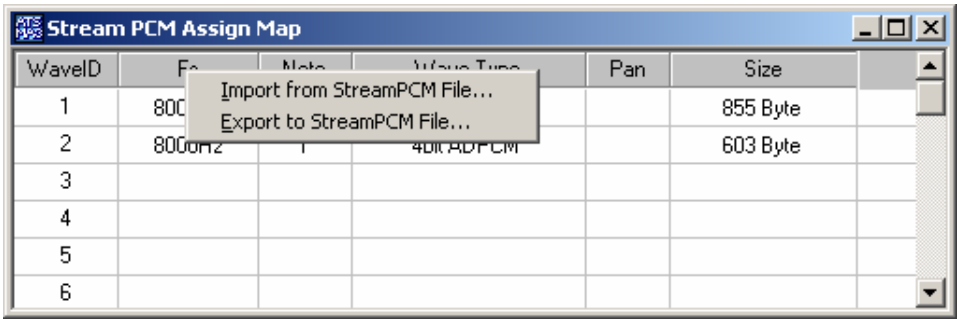


Figure 4-30 StreamPCM right click menu

◆ Import from StreamPCM File

Waveform data can be read from StreamPCM File saved by Export to StreamPCM File.

◆ Export to StreamPCM File

All the waveform data registered into Stream PCM Assign Map can be saved at StreamPCM File. (An extension serves as .sm3).

4.13.5 Mixer

The playback balance of each channel can be maintained. (It cannot change, while playing data.).

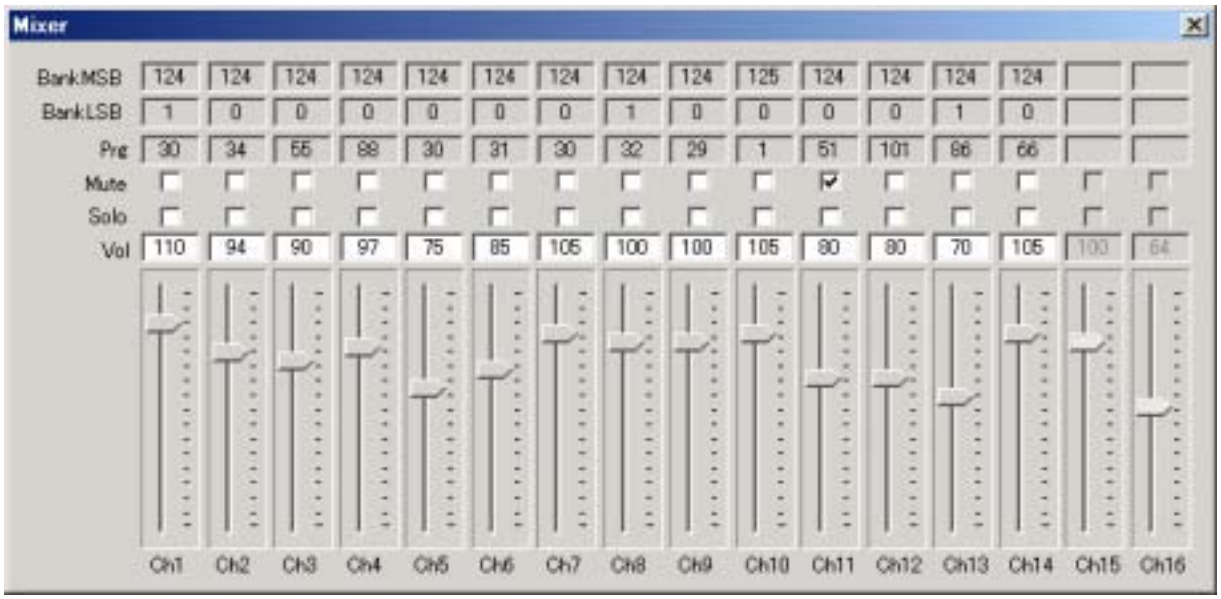


Figure 4-31 Mixer

◆ Bank MSB (BankSelect MSB)

The bank select MSB is displayed.

◆ Bank LSB (BankSelect LSB)

The bank select LSB is displayed.

◆ Prg (Program)

Program number is displayed.

◆ Mute

A correspondent channel is muffled. Reflection is not carried out to music data (SMAF).

◆ Solo

Solo playback of the correspondent channel is carried out. Reflection is not carried out to music data (SMAF).

◆ Vol

Volume value is displayed.

4.13.6 Event Density

The event density in the read music is displayed.

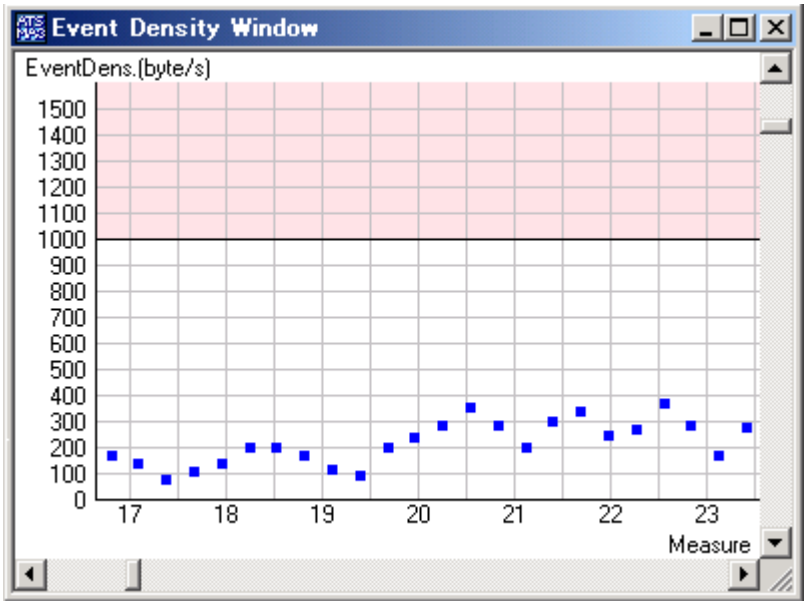


Figure 4-32 Event Density Window

◆ Event Density [byte/s]

Event density is displayed. The unit time used as the standard at the time of converting event density can be set up by preference.

[Note]: When the value to which the maximum event density exceeds 1000 byte/sec is detected, a warning is taken out, and it cannot save at the file of SMAF form. Moreover, when the value to which average event density exceeds 500 byte/sec is detected, a warning is taken out and it cannot save at the file of SMAF form.

◆ Measure

Time is displayed in units of beat.

◆ The right-and-left direction scroll bar

It can scroll right and left.

◆ The vertical direction scroll bar

If it moves upward, a Measure display will zoom in.

If it moves downward, a Measure display will zoom out.

4.13.7 STM Size

The stream PCM size in the read music is displayed.

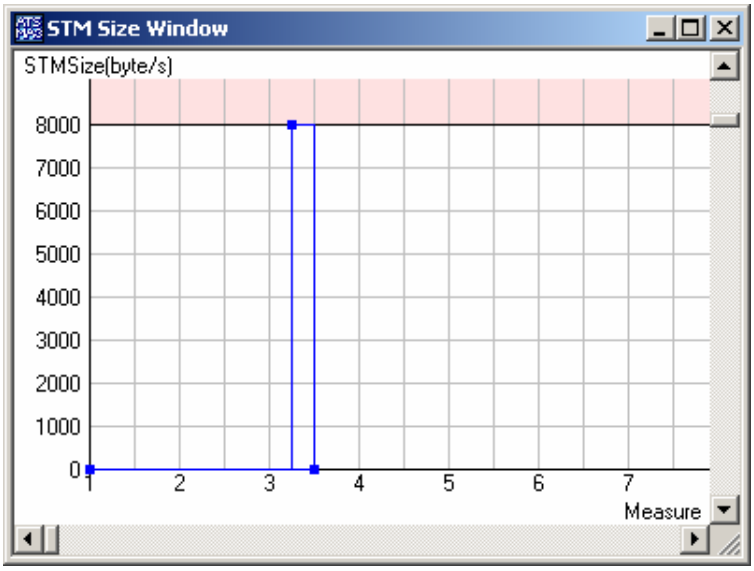


Figure 4-33 STM Size Window

◆ STM Size [byte/s]

Stream PCM size is displayed. The display of STM Size changes by setup of [StreamPCM Reserve] of Preference.

◆ Measure

Time is displayed.

It is displayed by measure unit.

◆ Horizontal direction scroll bar

It can scroll right and left.

◆ Vertical direction scroll bar

If it moves upward, a Time display will zoom in.

If it moves downward, a Time display will zoom out.

4.13.8 Edit Information

The information can be inputted / edited.

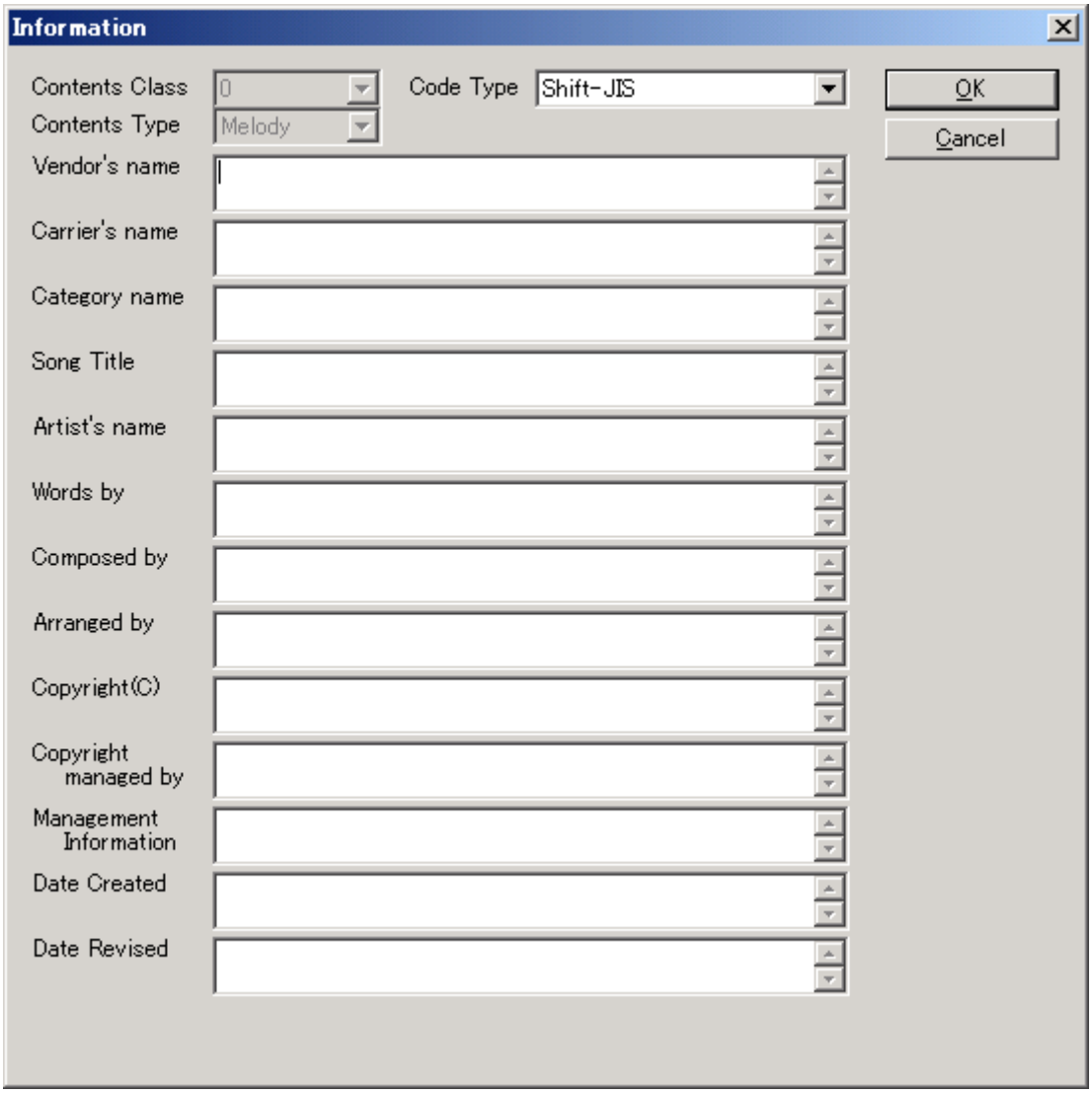


Figure 4-34 Editing information

◆ Contents Class

A contents class is displayed.

◆ Contents Type

A contents type is displayed.

◆ Code Type

A code type can be set up. Shift-JIS, Latin-1, EUC-KR, and either of UTF-8 can be chosen.

◆ Vendor's name

A vender name can be inputted.

◆ Carrier's name

A career name can be inputted.

◆ Category name

A category name can be inputted.

◆ Song Title

A music name can be inputted.

◆ Artist’s name

An artist name can be inputted.

◆ Words by

A songwriter name can be inputted.

◆ Composed by

A composer name can be inputted.

◆ Arranged by

An arrangement person name can be inputted.

◆ Copyright (C)

A copyright can be inputted.

◆ Copyright managed by

An administrator organization name can be inputted.

◆ Management Information

Management information can be inputted.

◆ Data Created

Creation time can be inputted.

◆ Date Revised

The time of a renewal date can be inputted.

4.13.9 Velocity Change

The velocity of the note event in the read music can be changed.

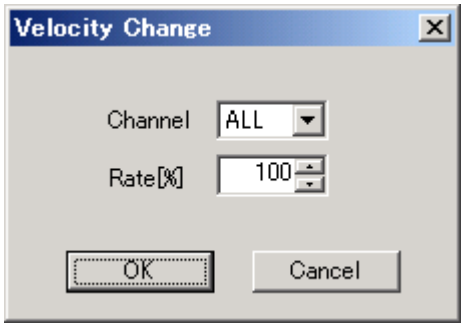


Figure 4-35 Velocity Change

◆ Channel

The channel set as the object of velocity change is specified.

1, 2, 3, 4, 5, 6, 7, 8, 9, 10, 11, 12, 13, 14, 15 or 16 channels, and STM (StreamPCM) and ALL (all note events) can be specified.

◆ Rate (%)

The change rate of a velocity value is specified out of 50 - 200%. When you input a value directly, please push the [Enter] key after the input.

4.13.10 File Access Log

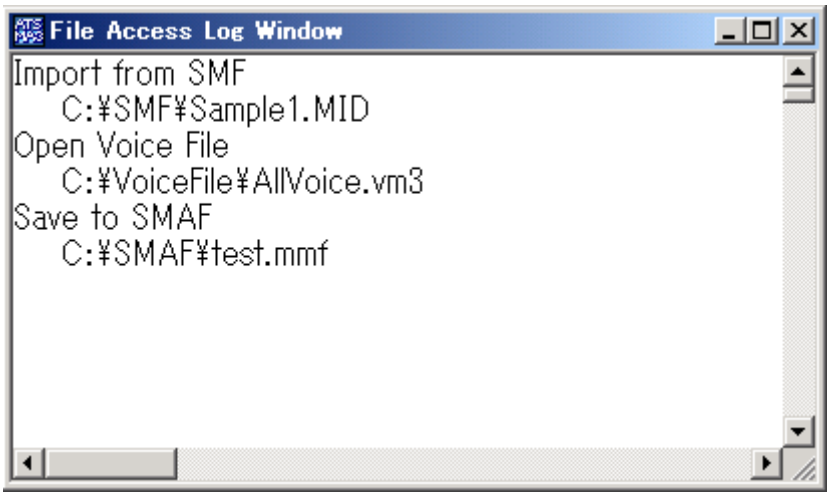


Figure 4-36 File Access Window

A log is displayed when operation related to file is performed. The path of performed operation and File is displayed. The contents of a display do not disappear until it ends an application.

4.13.11 Preference

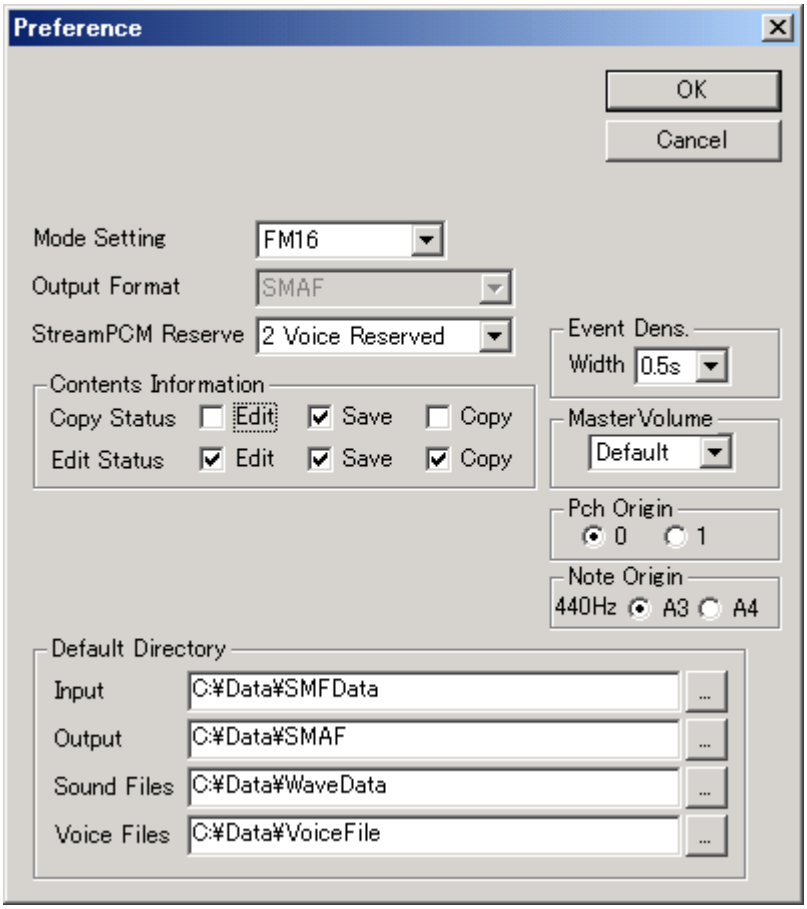


Figure 3-37 Preference

◆ Mode Setting

FM mode is changed. FM mode cannot be changed when music data is read on the authoring tool. Please change FM mode after closing music data.

- FM16 -- It is the mode which two operator and four operator voice can be used, and can carry out 16 sound pronunciations
- FM32 -- It is the mode which two operator voice can be used, and can carry out 32 sound pronunciations.

◆ Output Format

An output format is displayed.

◆ Stream PCM Reserve

The number of the maximum pronunciation of Stream PCM can be set up. It can choose whether they are No Reserved, 1 Voice Reserved, 2 Voice Reserved, and else.

◆ Contents Information

Copy Status…. Copy status can be set up.

Edit: With checking, edit of the contents concerned becomes good in a mobile phone. In order to confirm a setup of the following and Edit Status, it is necessary to check this.

Save: The save of the applicable contents becomes possible in the mobile phones by putting checkmark in the checkbox.

Copy: The transmission of the applicable contents becomes possible in the mobile phones by putting checkmark in the checkbox.

Edit Status ……Sets Edit Status

Edit Status becomes Copy Status of the secondary works which was edited by edit application on the mobile phone. Please refer to the explanation of the above Copy Status.

◆ Event Dens. Width.

The unit time used as the standard at the time of converting event density can be set up.
0. 1Sec, 0.2 Sec, 0.5 Sec, 1.0 Sec, 1.5 Sec, or 2.0Sec can be chosen.
(A density unit is byte/Sec=Density/Width)

◆ Pch Origin (Program change origin)

It is able to change whether a program change number begins from 1 or begins from 0 by choosing Pch Origin.

◆ Note Origin

It is able to set up a display whether 440Hz Note is displayed as A4 or A3. Although the Note display of EventList and PianoRoll are changed, the pitch of the pronounced sounds does not change.

◆ Default Directory

It is able to set up as the default directory at the time of reading various files by clicking a right-hand side button and choosing arbitrary folders.

4.13.12 DVA Checker

◆ Mode...Check over the Max Voice Number.

When push the check button, it checks the position and the number of pronunciation beyond the number of the maximum simultaneous pronunciation in each mode (FM32, FM16). Only when the result is “Over”, the value of “Time”, “FM”, and “PCM” are displayed.

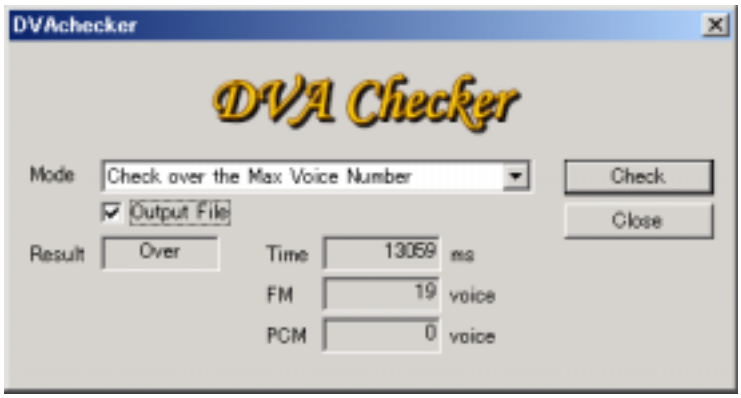


Figure 4-38 DVA Checker 1

◆ Mode...Check the Max Voice Number of Sequence.

When push the check button, it checks the position of the number of the maximum simultaneous pronunciation and the number of pronunciation in data. Irrespective of the result, the value of "Time", "FM", and "PCM" are surely displayed.

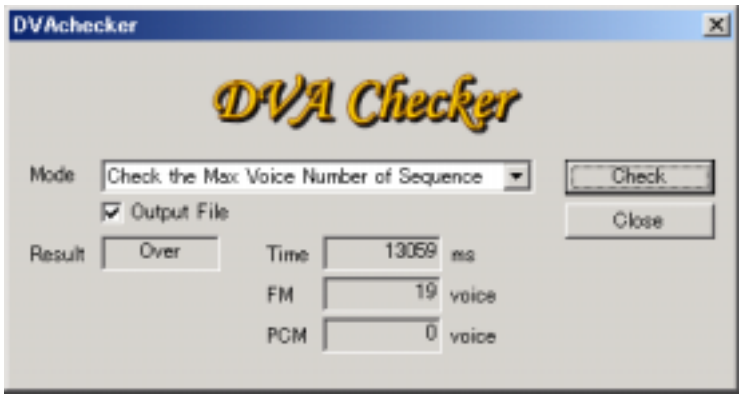


Figure 4-39 DVA Checker 2

◆ Output File

By check up on "Output file" box, the time and the number of pronunciation when exceeding the number of the maximum simultaneous pronunciation in each mode (FM32, FM16) can be saved by text file form (DVAChecker_result.txt). A text file is saved at the folder which has installed the MA-3 Authoring Tool.

◆ Result

The result which checked the number of simultaneous pronunciation is displayed. If it is not over the number of the maximum simultaneous pronunciation in each mode, “O.K.” is shown in the Result box. Moreover, If it has exceeded, it displays “Over” in the box. When a result is “Over”, please open the above-mentioned text file and check details.

◆ Time

Object time is displayed per ms.

◆ FM

The number of simultaneous pronunciation of FM voice is displayed.

◆ PCM

The number of simultaneous pronunciation of PCM voice is displayed.

4.13.13 about Authoring Tool

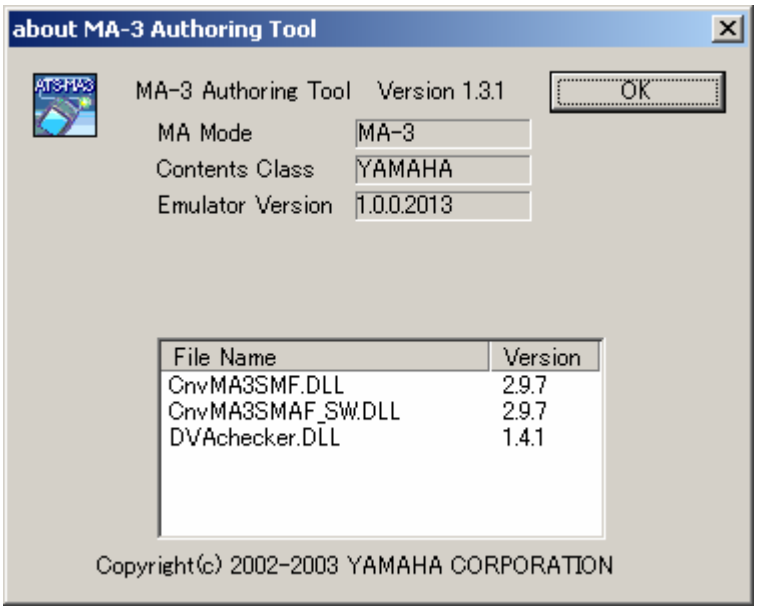


Figure 4-40 about Authoring Tool

4.14 Voice Edit

4.14.1 Voice List Window

① In order to start a Voice window, please click the voice list button of an application window or chose a Voice List from the Window menus of a menu bar.

Figure 4-41 Voice List button

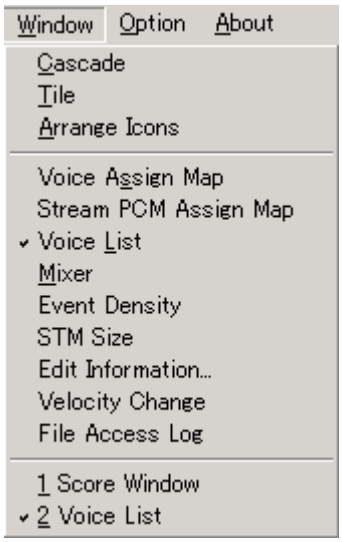


Figure 4-42 Window menu

↓

② Then Voice List window is displayed.

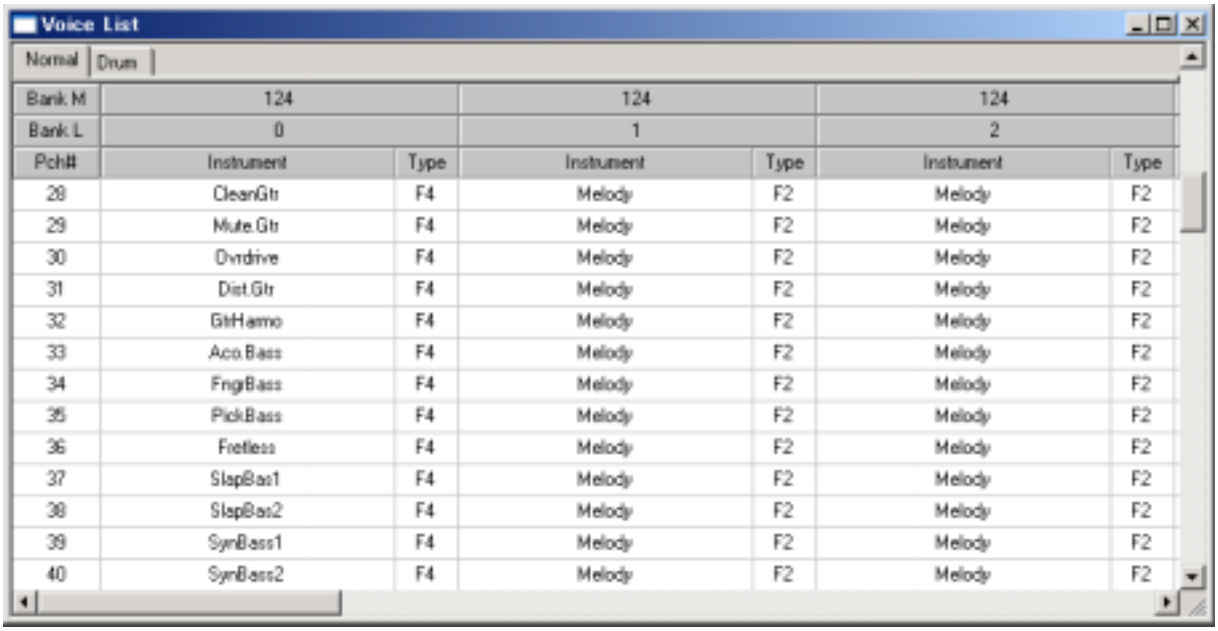
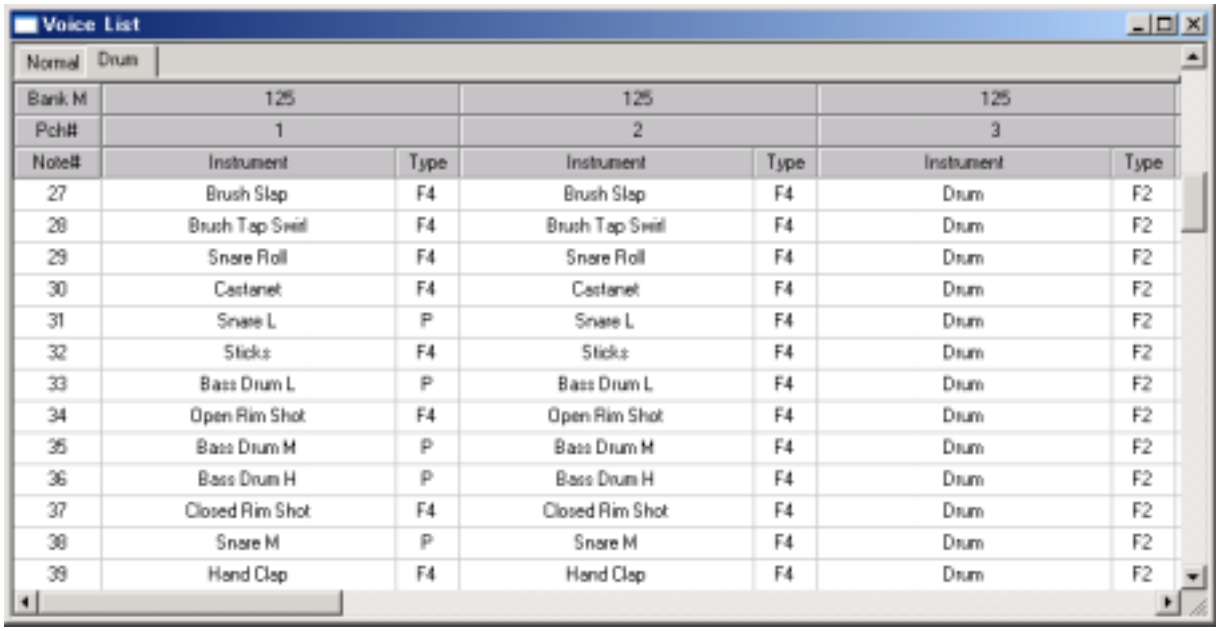


Figure 4-43 Voice List window / normal voice

③ Moreover, the display of a normal voice and drum voice can be changed by changing the tab in a voice list window.



Bank M	125		125		125	
Pch#	1		2		3	
Note#	Instrument	Type	Instrument	Type	Instrument	Type
27	Brush Slap	F4	Brush Slap	F4	Drum	F2
28	Brush Tap Swirl	F4	Brush Tap Swirl	F4	Drum	F2
29	Snare Roll	F4	Snare Roll	F4	Drum	F2
30	Castanet	F4	Castanet	F4	Drum	F2
31	Snare L	P	Snare L	F4	Drum	F2
32	Sticks	F4	Sticks	F4	Drum	F2
33	Bass Drum L	P	Bass Drum L	F4	Drum	F2
34	Open Rim Shot	F4	Open Rim Shot	F4	Drum	F2
35	Bass Drum M	P	Bass Drum M	F4	Drum	F2
36	Bass Drum H	P	Bass Drum H	F4	Drum	F2
37	Closed Rim Shot	F4	Closed Rim Shot	F4	Drum	F2
38	Snare M	P	Snare M	F4	Drum	F2
39	Hand Clap	F4	Hand Clap	F4	Drum	F2

Figure 4-44 Voice List window / drum voice

◆ The voice name which corresponds to the program number and a voice type are displayed per each bank as normal voice list. Moreover, the voice name which corresponds to the note number and a voice type per each program are displayed as drum voice list.

◆ Voice change is possible for each voice respectively, and the changed voice can be saved per bank. For more detail about preservation of a voice list, please refer to "4.14.5 Saving of Voice lists".

◆ In order to close a “voice list” window, please click the [x] button at the upper right of a voice list [Voice List] window, or chose again the [Voice List] from the [Window] menus of the menu bar of an application window.

[Note]

In the voice with a user waveform, PCM voice waveform registration is carried out to the MA-3 emulator to the timing which opens VoiceEdit.

In the MA-3 emulator, the data total capacity is restricted to 8176 bytes. For this reason, when the data total capacity of PCM voice waveform registration is more than 8176 bytes, it cannot pronounce normally. In this case, please perform "Reset" of the [Option] menu, and then re-reregister a PCM voice waveform. (Please refer to P26 "4.4.1 RAM size" about the capacity of data.)

4.14.2 The Copy of Voice Data

① The right click of the mouse is carried out on a voice name to copy on the “Voice List” window. A pop up menu is displayed. “Copy” is chosen here.

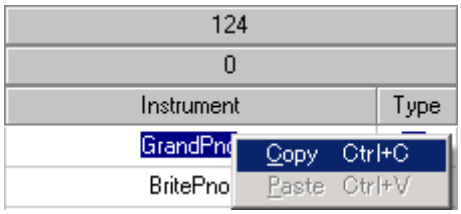


Figure 4-45 The Copy of Voice Data

② Next, a mouse right button is clicked on a voice name to paste the copied voice. A pop up menu is displayed. “Paste” is chosen here.

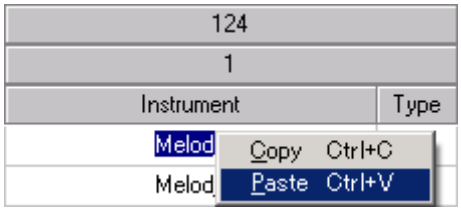


Figure 4-46 The Paste of Voice Data

③ Finally, a voice is pasted..

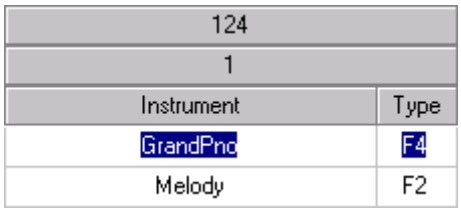


Figure 4-47 The result of pasted a voice data

[Note]

The Copy/Paste of the editing menu of the menu bar of application, or a tool bar can perform an operation of a voice “copy/paste”.

4.14.3 FM Synthesizer Edit Parameter

A double click of the user voice name of a voice list window displays a voice editing window.

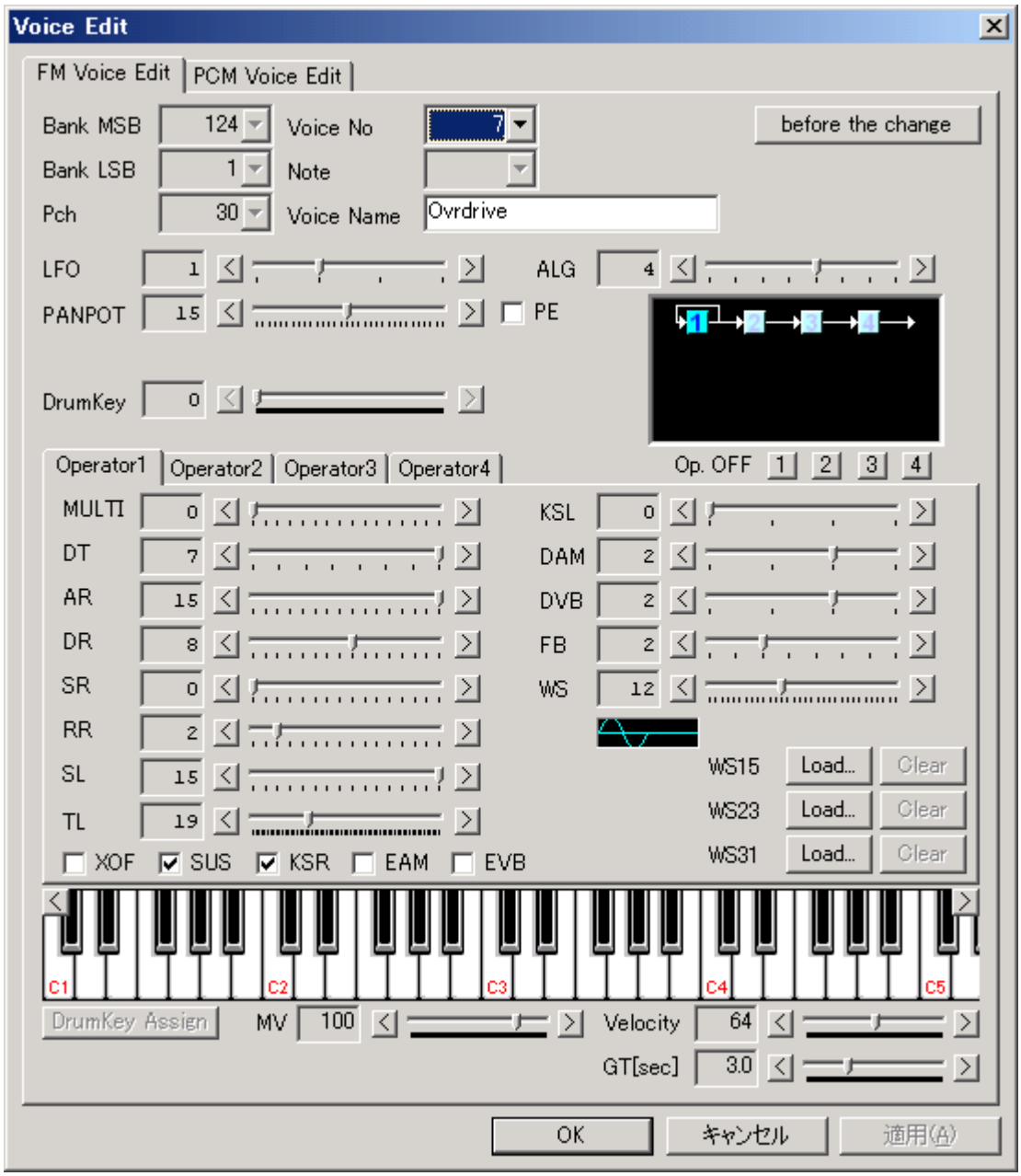


Figure 4-48 FM Synthesizer Edit window

For closing a “Voice Edit” window, click “O.K.” or “Cancel” at the lower part of a voice editing window.

◆ Bank MSB

The bank selection MSB in which the voice under edit exists is displayed. Here, it cannot change.

◆ Bank LSB

The bank selection LSB in which the voice under edit exists is displayed.

◆ Pch (Program Change)

The program change of the voice under edit is displayed.

◆ Voice No. (Voice Number)

The voice number under edit is expressed as a voice assignment map.

◆ Note

The note number of the drum voice under edit is displayed. It is not displayed at the time of edit of a normal voice.

◆ Voice Name

The voice name under edit is set up.

◆ ALG (Algorism)

Algorithm is set up. Two operators and four operators change according to the kind of algorithm.

[Note]

In the FM32 mode, if algorithm of 2op is not chosen, it does not pronounce normally. Please set 0 or 1 to ALG.

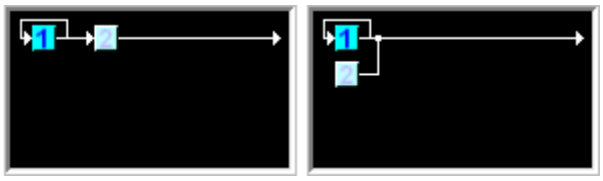


Figure 4-49 Algorism 0.1

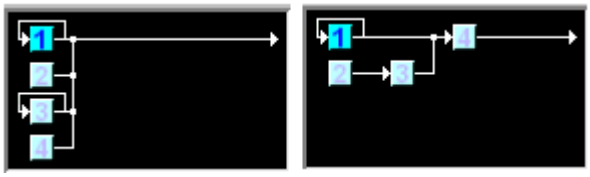


Figure 4-50 Algorism 2.3

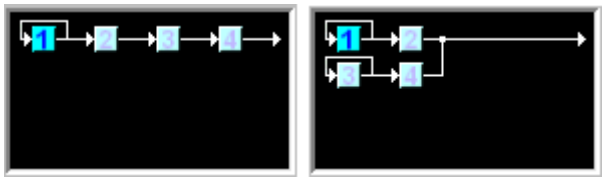


Figure 4-51 Algorism 4.5

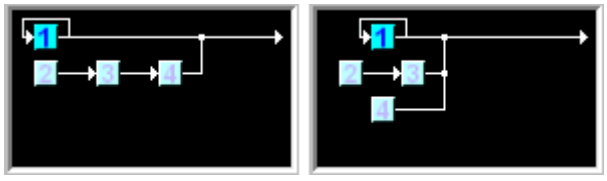


Figure 4-52 Algorism 6.7

◆ Op. OFF (Operator Off 1 to 4)

Each operator's output can be turned off by choosing the button of 1-4.

◆ LFO

It is a LFO frequency setup used for every voice.

LFO= 0 : 1.8 Hz

LFO= 1 : 4.0Hz

LFO= 2 : 5.9Hz

LFO= 3 : 7.0Hz

◆ PANPOT

It is the right-and-left balance set up for every channel. (0--15--31) It orientates to the right, so that it is so large that a value is small to the left.

◆ Drum Key

With the parameter which functions only at the time of drum voice edit, the actual key which the voice under present edit pronounces is changed.

◆ PE (Pan Enable)

By checking in this box, a pan setup of a control change is repealed and the value of the pan pot of a voice is confirmed.

◆ Operator 1 to 4

Each operator is changed. The 1 to 2 display and 1 to 4 display change by setup of algorithm. If a right click is carried out on Operator1 - 4 tabs, a COPY/Paste menu is displayed and Operator can be copied.

Figure 4-53 Operator Copy / Paste

◆ Before the change

The sound before edit can be heard by pushing this switch. In order to return to the voice under edit, this switch is pushed again.

◆ MULTI

It designates the magnification of frequency.

MULTI	0	1	2	3	4	5	6	7	8	9	10,11	12,13	14,15
Magnification	1/2	1	2	3	4	5	6	7	8	9	10	12	15

◆ DT (Detune)

It designate a detune.

Detune is specified. A feeling of a chorus is brewed by shifting a pitch delicately.

DT=1-3 shift a pitch upwards. Gap width becomes large in the order of 1, 2, and 3.

DT=5-7 shift a pitch downwards. Gap width becomes large in the order of 5, 6, and 7.

DT=0 and 4 are a standard pitch.

Detune frequency is influenced of a MULTI setup. When MULTI= 2 (twice), a gap of pitch also becomes twice.

◆ AR (Attack rate)

It indicates a time from the starting of tone generation (-96dB) till becoming a maximum volume (0dB).

◆ DR (Decay)

Decay rate is the decay time form the moment the maximum volume (0dB) to the moment Sustain Level (SL).

◆ SR (Sustain rate)

Sustain rate designates the rate of decay from the moment a Sustain Level is attained. Unlike other rate setting, setting this to “0” causes continuation of the Sustain Level.

◆ RR (Release rate)

Release rate is the time form key off to the moment the silent state (-96 db) is attained. When a check is placed in the check box of SUS, the setting is ignored.

◆ SL (Sustain Level)

The Sustain Level is the one at which Decay rate changes to release rate for decaying tone, or the level at which volume of a continuous tone is sustained.

◆ TL (Total level)

It sets the level of envelopes.

◆ KSL (Level scaling)

For the natural instruments, the volume generally decreases and the interval becomes higher. The scaling of level simulates this phenomenon. KSL sets the amount of decay per octaves.

KSL = 0 : 0

KSL = 1 : 3.0dB / oct

KSL = 2 : 1.5 dB / oct

KSL = 3 : 6.0 dB / oct

◆ DAM (Depth of amplitude modulation)

It sets the depth of amplitude modulation (AM)

DAM = 0 : 1.3 dB

DAM = 1 : 2.8 dB

DAM = 2 : 5.8 dB

DAM = 3 : 11.8 dB

◆ DVB (Depth of vibrato modulation)

DVB = 0 : 3.4 cents

DVB = 1 : 6.7 cents

DVB = 2 : 13.5 cents

DVB = 3 : 26.8 cents

◆ FB (Amount of feedback)

This function enables only Modulator side Operator. It designates the degree of feedback modulation.

Setting value	0	1	2	3	4	5	6	7
The degree of modulation	0	π/16	π/8	π/4	π/2	π	2π	4π

◆ WS (Waveform selection)

It designates a waveform of each operator that is used for FM operation. The waveform that is used can be selected from 32 types.

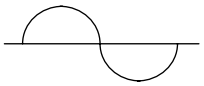
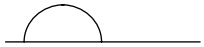
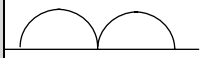
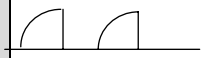
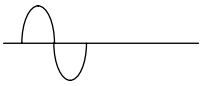
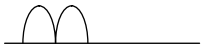
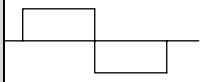
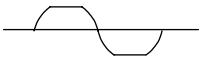
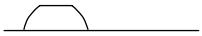
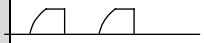
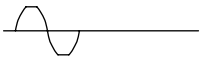
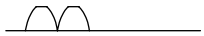
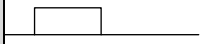
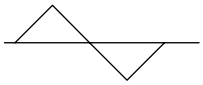
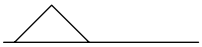
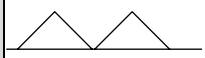
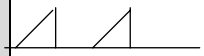
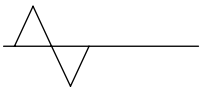
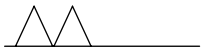
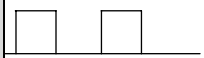
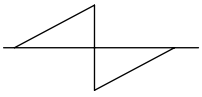
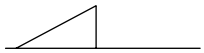
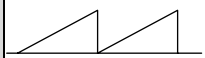
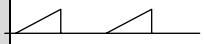
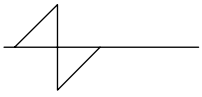
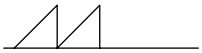
0		1		2		3	
4		5		6		7	
8		9		10		11	
12		13		14		15	Use arbitrary waveform stored in SRAM.
16		17		18		19	
20		21		22		23	Use arbitrary waveform stored in SRAM.
24		25		26		27	
28		29		30		31	Use arbitrary waveform stored in SRAM.

Figure FM Fundamental Wave Forms

◆ WS 15/23/31 (Wave 15/23/31)

It allows to make a decision of an arbitrary basic waveform.

① At first, sets WS as 15 (23/31)

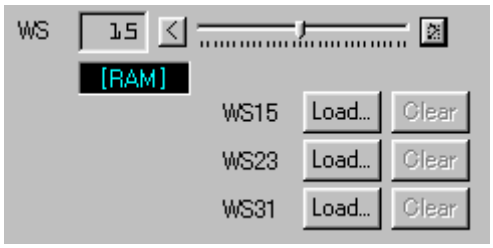


Figure 4-45 WS15 Set up

↓

② Secondly, click a “Load” button of WS15, and then the sound files are read.

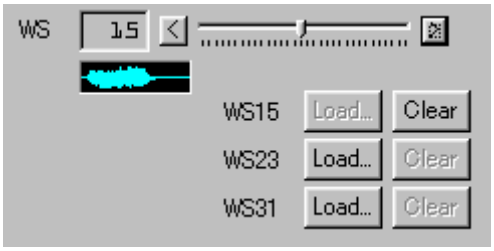


Figure 4-55 WS Load

↓

When a push on “Clear” button, clearing each waves.

◆ XOF (Ignore KeyOff)

It sets whether KeyOff is to be ignored or not. Place a check in the check box to ignore KeyOff. KeyOff dose not cause the change of state.

◆ SUS (Sustain)

The propriety of the rate change after KeyOff is set up. If this box is checked and hold 1 (damper) ON of a MIDI message is received, after KeyOff will maintain SR (SASUTIN rate) and will come to shift to RR (release rate) in hold 1 (damper) OFF.

◆ KSR (Rate scaling)

Key scale ON/OFF of a rate can be set up by checking this box. By the natural musical instrument, the standup of sound and falling become early as a pitch becomes high in general. The key scale of a rate carries out the SHIMYU rate of this phenomenon.

◆ EAM (Amplitude modulation)

ON/OFF of AM modulation is set up. A setup of DAM becomes effective by checking this box.

◆ EVB (Vibrato modulation)

ON/OFF of vibrato modulation is set up. A setup of DVB becomes effective by checking this box.

[Note] Make sure to set EVB to on to enable modulation of MIDI message.

◆ Keyboard

The voice under editing can be monitored by clicking the keyboard.

Display at editing normal voice

In the case of normal voice, pronounces higher musical interval to the right side of keyboard, lower musical interval to the left side.

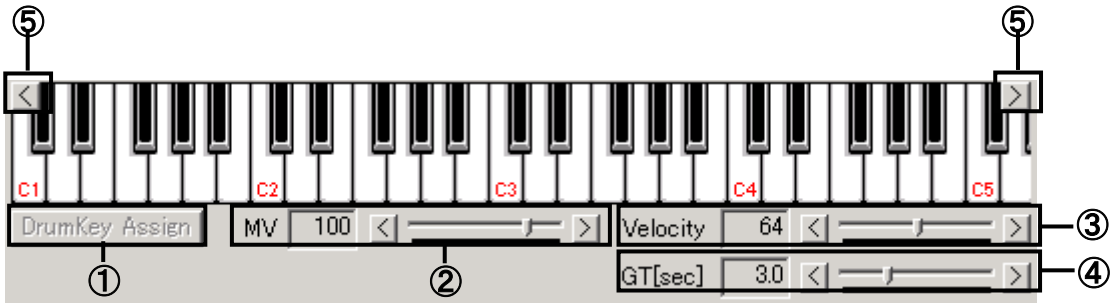


Figure 4-56 Keyboard FM normal voice

① DrumKey AssignIt is not use at editing normal voice. (It effective only at editing drum voice)

② MV (Master volume)

Master volume value at monitoring by the keyboard can be changed.

③ Velocity

Velocity value at monitoring by the keyboard can be changed.

④ GT (Gate time)

Gate time at monitoring by Keyboard can be changed.

⑤ Scrolling button

By pushing this button, the display of keyboard compass can be changed.

(Click of right side button displays higher interval)

(Click of left side button displays lower interval)

Display at editing drum voices

In the case of drum voice, pronounces only when Note No. under editing is clicked.

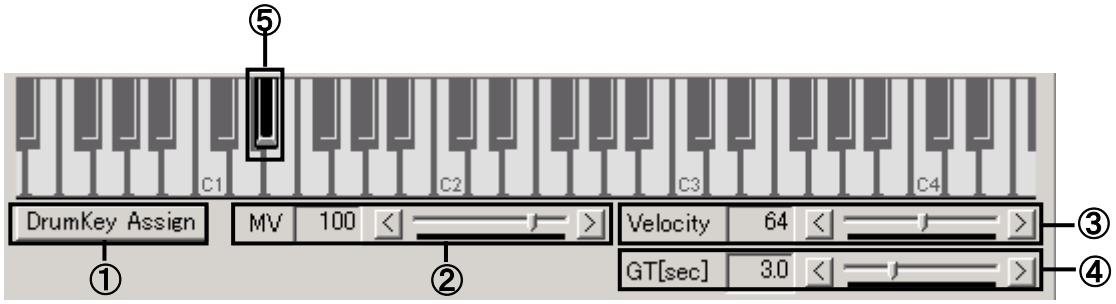


Figure 4-57 Keyboard drum voice

① DrumKey Assign

By pushing this switch, it can pronounce the drum voice in higher musical interval to the right side of keyboard, lower musical interval to the left side. Please find out the key of liking and set up DrumKey. (Figure DrumKey Assign is in the status pushed the DrumKey Assign swith)

② MV (Master volume)

Master volume value at monitoring by the keyboard can be changed.

③ Velocity

Velocity value at monitoring by the keyboard can be changed.

④ GT (Gate Time)

Gate time at monitoring by the keyboard can be changed

⑤ Key

It displays only the note number under editing.

[Example] When “Hand Clap] of the Note No. 39 is under editing, pronounces only the keyboard of D#2 (39). All keys can be made to pronounce by pushing the DrumKey Assign swith.

(Refer to Figure DrumKey Assign)

Figure 4-58 DrumKey Assign

4.14.4 PCM voice edit parameter

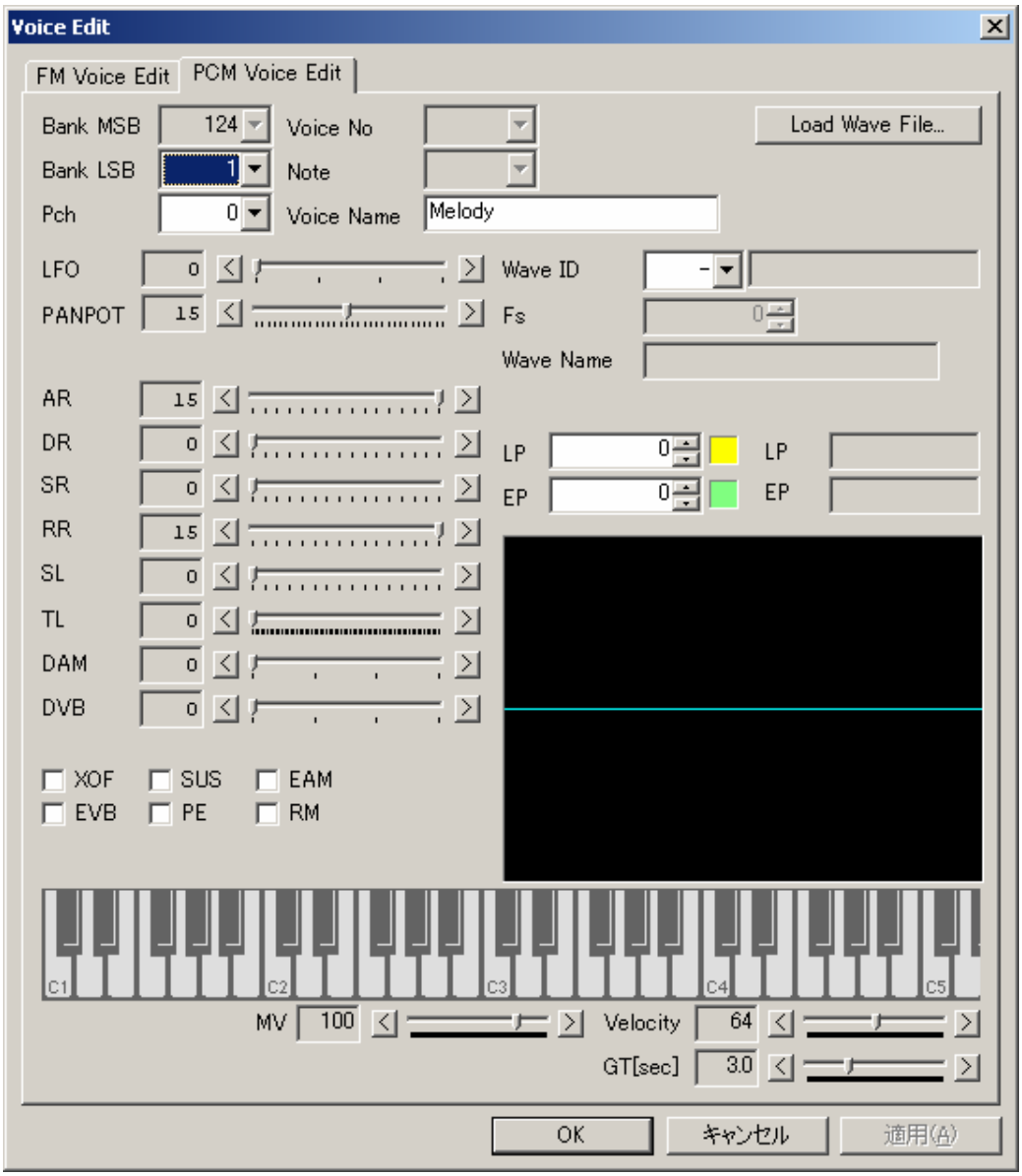


Figure 4-59 PCM Voice Edit

◆ Bank MSB

It displays the BankSelect MSB in which the voice being edited exists. It cannot be changed here.

◆ Bank LSB

It displays the BankSekect KSB in which the voices being edited exist.

◆ Pch (Program change)

It displays a program change for the voices being edited.

◆ Voice No.

It displays the voice number being edited in Voice Assign Map

◆ Note

It displays the note of Drum Voice being edited. It is not displayed at edition of the normal voice.

◆ Voice Name

It set up the voice name being edited.

◆ Load Wave File

16bit mono sound file (encodes to 4-bitADPCM or 8bitPCM) or 8bit mono sound file (encodes to 8bitPCM) that the sampling frequency is up to 48kHz (AIFF, WAVE) can be read. The stereo sound file cannot be read.

- The read sound file is assigned to the key of Note NO. 60 (C key).
- The read sound file can be played up to 48kHz.

[Example] When the 24000Hz sound file is read.

Focusing on the C key (24000Hz) of NoteNo.60, if a low key is flipped, Fs will become low, and if a high key is flipped, Fs will become high.

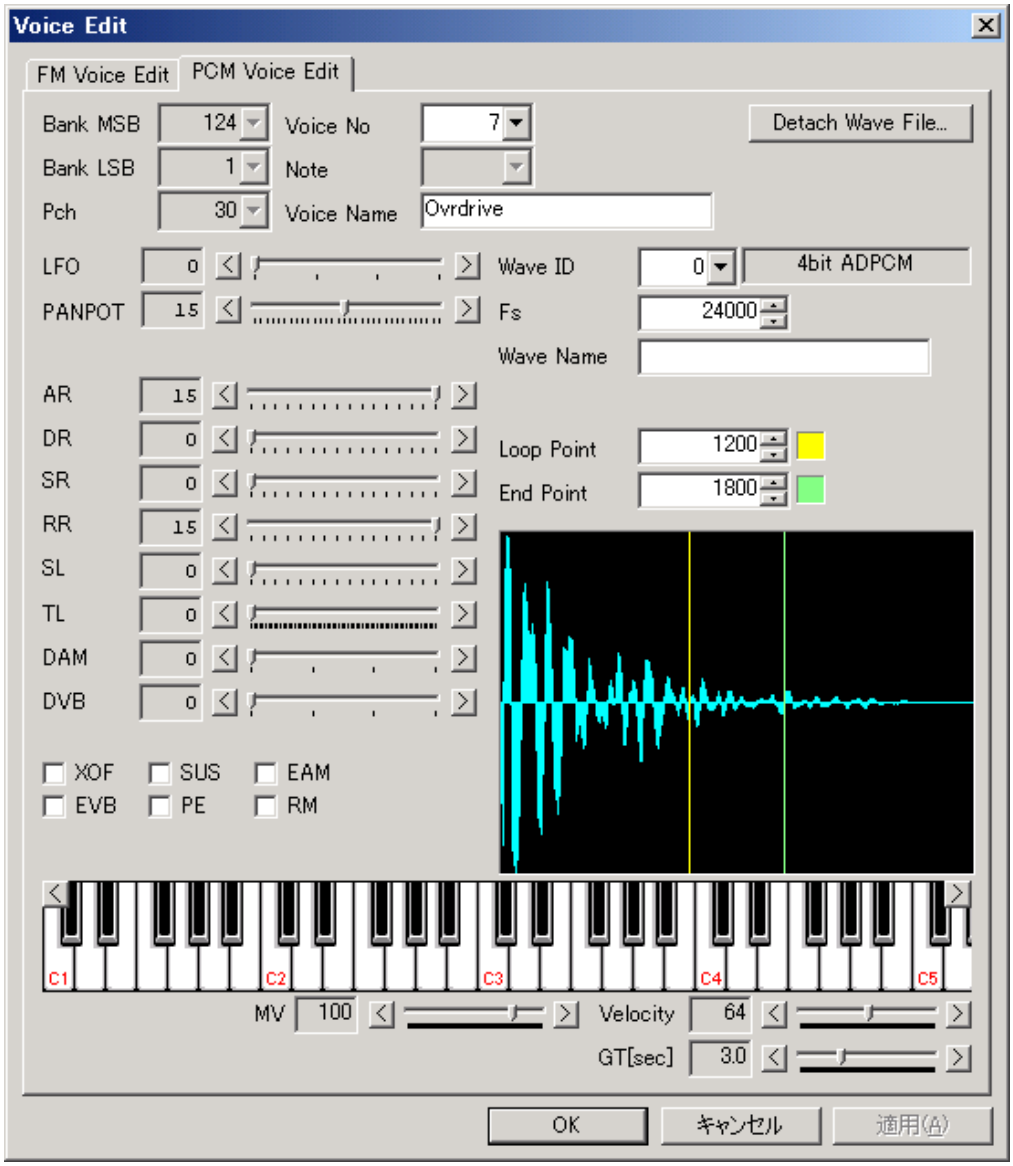


Figure 4-60 PCM Voice Edit LoadWave

When a waveform is read, “Load Wave File” button changes to “Detach Wave File” button.

◆ Detach Wave File

When press the switch, the waveform which is read at “Load Wave File” is deleted.

◆ LFO

It sets LFO frequency that is used for each voice.

LFO = 0 : 1.8 Hz

LFO = 1 : 4.0 Hz

LFO = 2 : 5.9 Hz

LFO = 3 : 7.0 Hz

◆ Panpot

It is the right-and-left balance set up for every channel. (0--15--31) It orientates to the right, so that it is so large that a value is small to the left.

◆ AR (Attack rate)

An attack rate is time after pronunciation starts (-96dB) until it becomes the maximum volume (0dB).

◆ DR (Decay rate)

The decay rate is attenuation time after becoming the maximum volume (0dB) until it is set to a Sustain level (SL).

◆ SR (Sustain rate)

The attenuation after reaching a sustain level is specified to be a sustain rate. A sustain level is maintained by setting it as 0 unlike other rate setup.

◆ RR (Release rate)

A release rate is time after carrying out key-off until it will be in a silent state (-96db).

◆ SL (Sustain level)

In the case of attenuation sound, it is the level which shifts to a release rate from a decay rate, and, in the case of self-sustaining sound, is a volume level under continuation.

◆ TL (Total level)

It sets up the level of envelope.

◆ DAM (Depth of amplitude modulation)

It sets up the depth of amplitude modulation (AM).

DAM = 0 : 1.3 dB

DAM = 1 : 2.8 dB

DAM = 2 : 5.8 dB

DAM = 3 : 11.8 dB

◆ DVB (Depth of vibrato modulation)

DVB = 0 : 3.4 cents

DVB = 1 : 6.7 cents

DVB = 2 : 13.5 cents

DVB = 3 : 26.8 cents

◆ Wave ID

Two or more PCM waveforms can be read in MA3. The management number can be displayed and chosen.

◆ Fs

The sampling frequency of the read waveform is displayed..
On MA-3 Authoring Tool, the frequency when flipping NoteNo.60 (C key) is displayed.
A pitch changes by changing a value.

[Note] Some gap may arise in a pitch with Fs value finally set up on account of application. Please choose and set up Fs value from the following tables "a recommendation Fs setting value list."

"List of recommendation Fs setting value"					(units Hz)		
4125	10125	16125	22125	28125	34125	40125	46125
4500	10500	16500	22500	28500	34500	40500	46500
4875	10875	16875	22875	28875	34875	40875	46875
5250	11250	17250	23250	29250	35250	41250	47250
5625	11625	17625	23625	29625	35625	41625	47625
6000	12000	18000	24000	30000	36000	42000	48000
6375	12375	18375	24375	30375	36375	42375	
6750	12750	18750	24750	30750	36750	42750	
7125	13125	19125	25125	31125	37125	43125	
7500	13500	19500	25500	31500	37500	43500	
7875	13875	19875	25875	31875	37875	43875	
8250	14250	20250	26250	32250	38250	44250	
8625	14625	20625	26625	32625	38625	44625	
9000	15000	21000	27000	33000	39000	45000	
9375	15375	21375	27375	33375	39375	45375	
9750	15750	21750	27750	33750	39750	45750	

◆ Wave Name

The read waveform name is displayed.

◆ LP (Loop Point)

The loop point at the time of carrying out loop playback is specified
Moreover, the wave height value at the following point is also displayed.

4bitADPCM :Loop Point
8bitPCM :Loop Point + 1

◆ End Point

A playback end point and the loop End Point of loop playback are specified.
Moreover, the wave height value at the following point is also displayed.

4bitADPCM : End Point
8bitPCM : End Point + 1

[NOTE] It does not pronounce, if the value is “0”

◆ XOF (Ignore KeyOff)

It sets whether the rate change after KeyOff is allowed or not. Place a check in the check box to ignore KeyOff. KeyOff dose not cause the change of state.

◆ SUS (Sustain)

The propriety of the rate change after KeyOff is set up. If this box is checked and hold 1 (damper) ON of a MIDI message is received, after KeyOff will maintain SR (sustain rate) and will come to shift to RR (release rate) in hold 1 (damper) OFF.

◆ EAM (Amplitude modulation On/Off)

ON/OFF of AM modulation is set up. A setup of DAM becomes effective by checking this box.

◆ EVB (Vibrato modulation On/Off)

ON/OFF of vibrato modulation is set up. A setup of DVB becomes effective by checking this box.

[Note] In order to confirm MOJURESHON of a MIDI message, please be sure to turn ON EVB.

◆ PE (Pan Enable)

Place a check in the check box to disable pan setting of the control change and to enable the value of Panpot of voices.

◆ RM (Designation of ROM/RAM)

Selects ROM or RAM for waveform which is used. When ROM is designated, a waveform can be selected from seven waveform list in the ROM at Wave ID. When RAM is designated, arbitrary waveform can be designated from the load wave file.

◆ Keyboard

The voice under editing can be monitored by clicking the keyboard.

Display at editing normal voice

In the case of normal voice, pronounces higher musical interval to the right side of keyboard, lower musical interval to the left side.

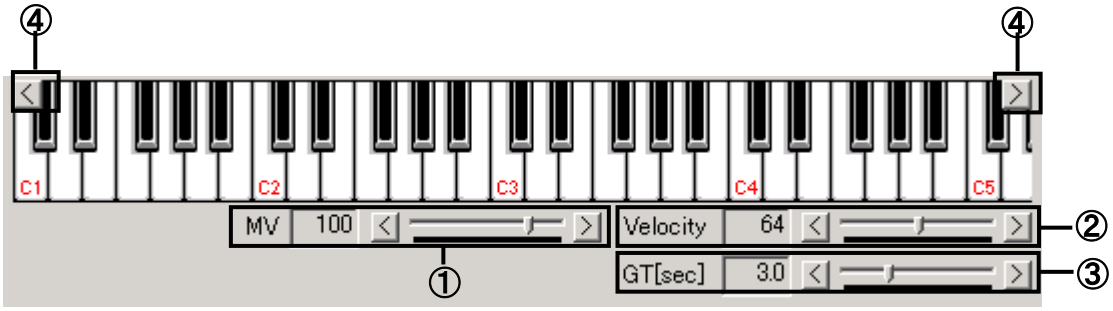


Figure Keyboard PCM normal voice

① MV (Master volume)

Master volume value at monitoring by the keyboard can be changed.

② Velocity

Velocity value at monitoring by the keyboard can be changed.

③ GT (Gate Time)

Gate Time at the time of monitoring by Keyboard can be changed.

④ Scrolling button

By pushing this button displays of keyboard compass can be changed.

Click a right button for displays higher interval.

Click a left button for displays lower interval.

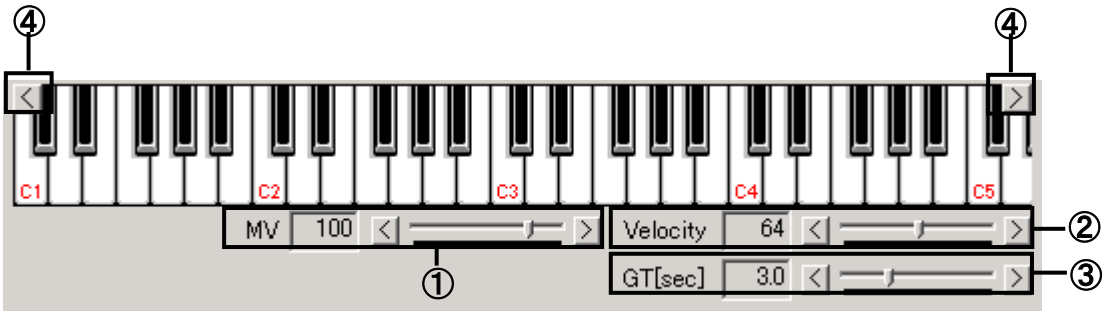


Figure Keyboard FM drum voice

① MV (Master volume)

Master volume at monitoring by the keyboard can be changed.

② Velocity

Velocity value at monitoring by the keyboard can be changed.

③ GT (Gate Time)

Gate Time at monitoring by Keyboard can be changed.

④ Scroll button

By pushing this button, the display of keyboard compass can be changed.

(Click of right side button displays higher interval)

(Click of left side button displays lower interval)

<u>The display at the time of editing about a drum voice.</u>

In the case of a drum voice, only when NoteNo under editing is clicked, it pronounces.

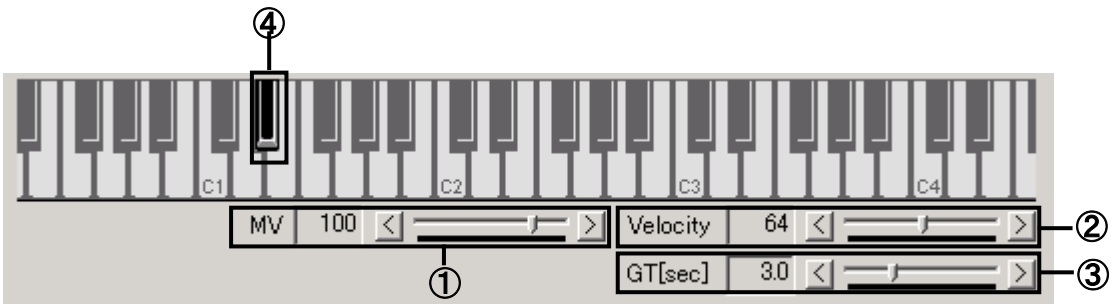


Figure Keyboard FM drum voice

① MV (Master volume)

Master volume value at monitoring by the keyboard can be changed.

② Velocity

Velocity value at monitoring by the keyboard can be changed.

③ GT (Gate Time)

Gate time at the time of monitoring by Keyboard can be changed.

④ Key

Only the note number under editing is displayed.

[Example] When "Hand Clap" of the note number of No. 39 is under editing, only the keyboard of D#1 (39) is pronounced.

4.14.4.1 LP and EP Automatic Control Function

If it is an inaccurate voice which is carried out when reading a sound file and displaying a current PCM voice, the above conformation message will be appeared
"Automatically operated. -Loop and/or End Point adjusted according to PCM mode"
In addition, it is twisted into a correct value automatically.

Example of correcting the sampling number "2000",
<4bit ADPCM>
In case of the OneShot(LoopPoint=EndPoint)
In case of (LoopPoint ≧ Sample) or (EndPoint ≧ Sample)
LoopPoint = EndPoint = Sample – 1
ex) LP=2000/EP=2000 → LP=1999/EP=1999
LP=2000/EP=2001 → LP=1999/EP=1999
When only LoopPoint is outside the range
LoopPoint=EndPoint
ex) LP=2001/EP=1500 → LP=1500/EP=1500
When only EndPoint is outside the range
EndPoint=Sample -1
ex) LP=1500/EP=2001 → LP=1500/EP=2000
<8bit PCM>
In case of the OneShot(LoopPoint=EndPoint)
In case of (LoopPoint≧Sample -1) and (EndPoint≧Sample -1)
LoopPoint = EndPoint = Sample -2
ex) LP=2000/EP=2000 → LP=1998/EP=1998
When only LoopPoint is outside the range
LoopPoint=EndPoint
ex) LP=2001/EP=1500 → LP=1500/EP=1500
When only EndPoint is outside the range
EndPoint=Sample -1
ex) LP=1500/EP=2001 → LP=1500/EP=1999

4.14.5 Saving of Voice lists

◆ Saving all voices

Select “Save MA3 Voice File” from “File” menu of the menu bar of the application window, and then the “Save as dialog box is displayed (shown in Figure “Save as” dialog). Enter the file name in “File name” , extension is “.vm3), and click “Save” button to save the data.

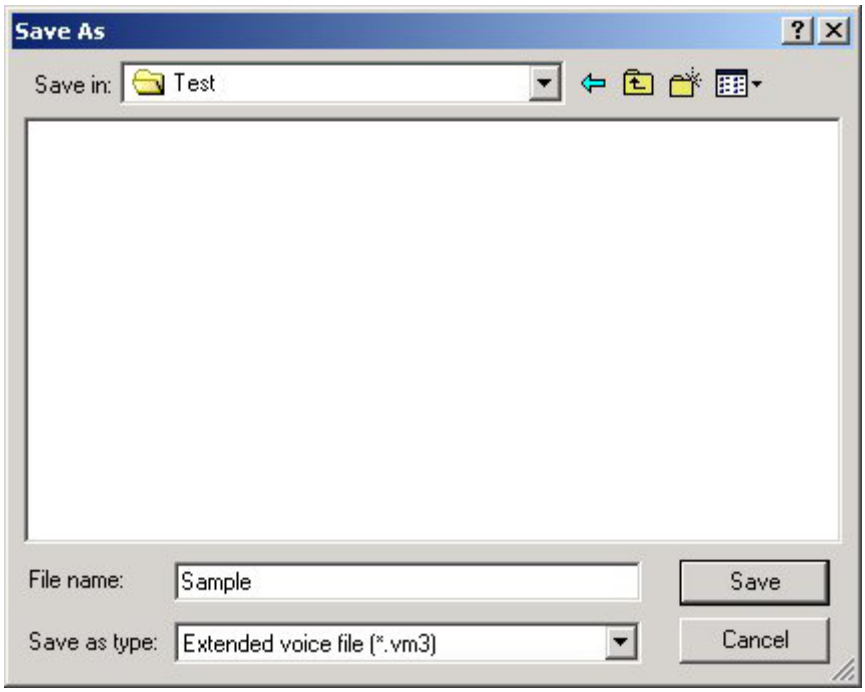


Figure 4-63 “Save as” dialog

◆ Saving per Bank unit

A right click is carried out in the BankMSB column of Voice List. “ExportToBankVoice” is chosen from a pop-up window. It names and a preservation dialog box is displayed. Here, it is saved, if a name is inputted (an extension serves as .vm3) and “preservation” button is clicked.

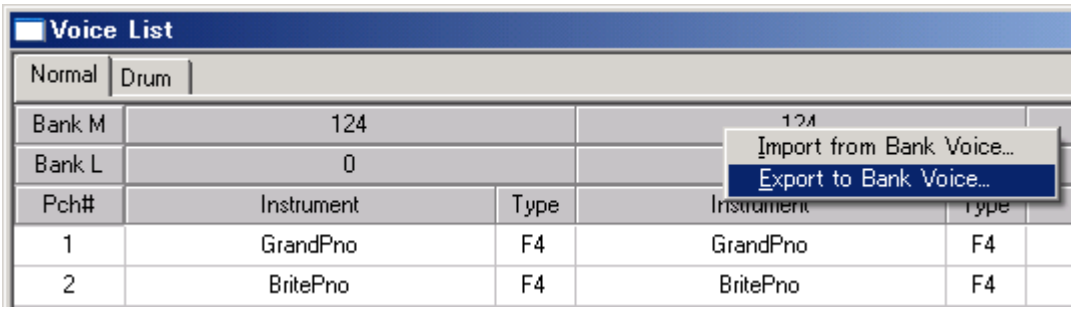


Figure 4-64 Export to Bank Voice

4.14.6 Reading voice lists

◆ Reading all voices

"Open MA3 Voice File" is chosen from the "File" menus of the menu bar of an application window. The dialog box to open is displayed. Here, the name of an extended voice list file to read is chosen, and if the button "to open" is clicked, a voice list file will be read.

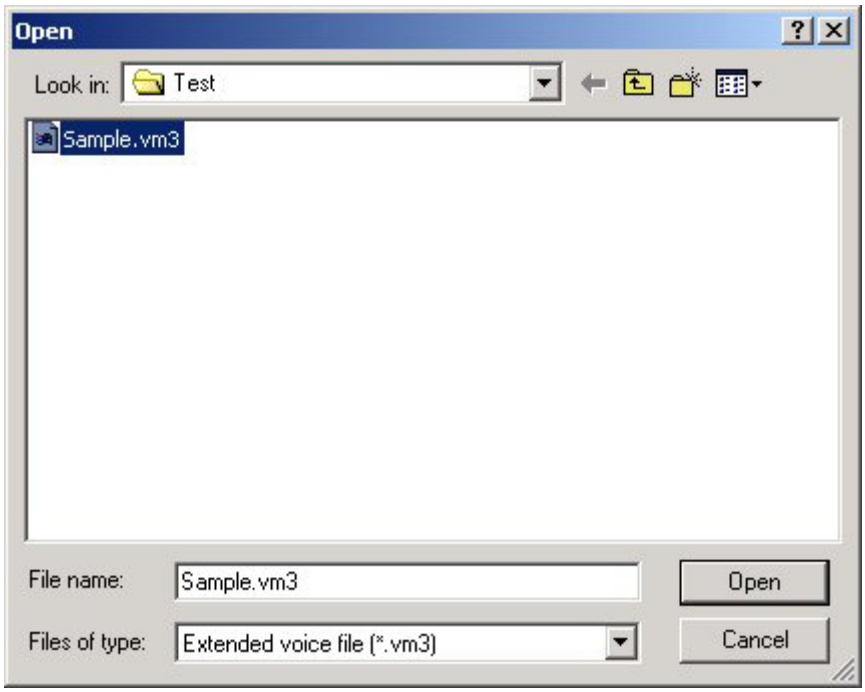


Figure 4-65 Voice File / open dialog

◆ Reading of a bank unit

A right click is carried out in the BankMSB column of Voice List. "ImportFromBank Voice" is chosen from a pop-up window.

A dialog box is displayed. A click of the button chooses the name of an extended voice list file to read, and is opened reads a voice list file.

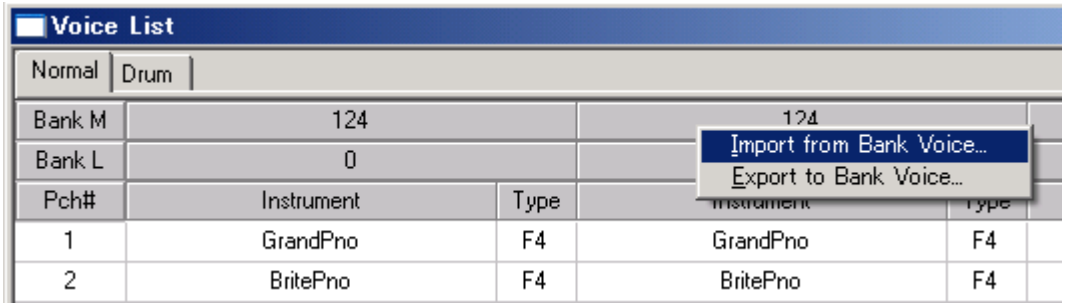


Figure 4-66 Import from Bank Voice

5. The restriction matter by emulator specification

There are the following specification differences in MA-3 emulator and the actual mobile phone (MA-3 LSI).
Please check final pronunciation with the actual mobile phone.

In FM voice with many high range ingredients, the emulator sound may differ from actual mobile phone sound.

At MA-3 emulator, pronunciation is calculated by 32 kHz.
At actual mobile phone (MA-3 LSI), it is calculated by 48 kHz.
Therefore, in the case of FM voice with many high range ingredients, the emulator sound may differ from actual mobile phone sound a little.
As for especially the sound near a noise etc., it is influenced greatly.

When volume change is rapid, volume change may not be heard smoothly.

In MA-3 emulator, interpolation processing is not performed at the time of volume change.
Interpolation processing is performed in actual mobile phone. Therefore, when volume change is rapid, it may differ a little from the sound of actual mobile phone and volume change may not be heard smoothly.

Sound with late attack voice may differ from its sound of mobile phone.

In MA-3 emulator, the attack curve of EG is simplified as compared with the mobile phone.
Sound, which uses a voice with late attack, may differ from its sound of actual mobile phone.

Tempo may fluctuate by CPU load.

Since MA-3 emulator is software, fluctuation of tempo may occur by the load of CPU.

Reaction of key control differs from the mobile phone.

Since MA-3 emulator has accelerated processing compared with the mobile phone, the reaction of key control is earlier than it of mobile phone.

The resolution of pitch bend differs from the mobile phone.

The resolution of pitch bend in MA-3 emulator is 16384 steps (-8192 ~ 8191).
It differs from mobile phone. The resolution in mobile phone is 128 steps (-64 ~ 63).

6. Datum

6.1 Let's think about FM synthesizer.

Most of the persons who attempt to use this authoring tool may have knowledge of FM synthesizer sufficiently (or to some extent, even if not sufficiently).

Therefore, this chapter explains fundamental matters briefly, and describes the techniques for utilization of this authoring tool concretely.

Even if you may find information in this chapter that you already know, read it for confirmation of the matters.

6.1.1 From FM that "select" tone to FM that "create" tone

- Changes of FM musical synthesizer –

6.1.1.1 Emergence of musical synthesizer

"Electronic musical instruments" have primarily existed since long time ago, longer than the period anybody can imagine.

However, the most revolutionary matter in the world of the electronic musical instruments may be the emergence of the "musical synthesizer". The circuits for authoring three elements of sounds, "intervals", "voices" and "volume" are arranged in the synthesizer so that they can be created very simply and effectively.

Even before the emergence of the musical synthesizer, the electronic musical instruments provided "sounds" which are "original" in themselves, they allowed the players only to select the sounds.

But, the emergence of the musical synthesizer allowed the players to "create sounds".

The musicians (mainly the keyboard players) have become able to use the electronic instruments as a means for presenting their original(their own) sounds in addition to presentation through playing, allowing to expand their capability of presentation.

6.1.1.2 Epoch making emergence of DX

Yamaha released DX 7 in 1983 as a model that represents what is call DX series.

The fact is, the first digital keyboard that uses FM synthesizer is not DX. Yamaha released GS series in 1981 and CE series in 1982. However, both of these series were keyboards that select "sound" although it allowed making of voices a little.

It is apparent that the emergence of DX influenced much on the following musical synthesizers because DX is a musical synthesizer which was born to pursue "creation of sounds", allowing control of enormous number of parameters, which is unimaginable from its simple appearance, and is given a function that can memorize the created tones internally and externally.

YAMAHA

Digital Programmable Algorithm Synthesizer

DX7

6.1.2 Basic knowledge of FM synthesizer

About 20 years have passed after the release of SX series.

After the release of DX, Yamaha have installed FM synthesizers on various synthesizer

In this period, they have been improved and redesigned in various parts to be more easily operable and excellent musical instruments.

Therefore, the following sections describes the basic features of FM synthesizer, though very briefly.

6.1.2.1 "Waveform"＋"Time" constitute sounds.

The musical synthesizers of all digital keyboards that include not only the FM synthesizer but also PCM synthesizer are not given "oscillator circuits" that are provided in analog synthesizers although they are electronic musical instruments.

The devices that replace the "oscillator circuits" are "memory circuits, and the instruments create the "sounds" by controlling the "oscillator circuits" through various control signals.

The principal feature of the FM synthesizers is, if it is described briefly by omitting technical and complex expression, that they also read waveform data from the "memory circuits".

When it reads the data,

"It reads data" by "controlling the time."

Then, how does it "control the time"?

"It gives waveform that controls the time to the memory circuits."

To make this complex expression simple, it is explained by using a concrete example.

- Assume that here is a sawtooth wave that rises from 0 V to 10 V and then returns to 0 V.

The memory circuits are set so that, when the sawtooth wave signal is added to the memory circuits, the memory circuit (a) outputs signal when the voltage of the sawtooth wave reaches 1 V, the memory circuit (b) outputs signal when the voltage of the sawtooth wave reaches 2 V, and so on.

Then, since the voltage level of sawtooth wave increases linearly, memory circuits outputs pure sinusoidal wave as a result.

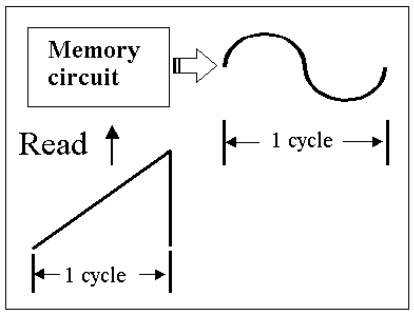
It is natural that the frequency of the outputted sinusoidal wave is equal to that of the sawtooth wave. This operation is described in short as follows.

"It gives waveform that controls the time to the memory circuits."

This is the very basic principle of the "digital musical synthesizer".

Needless to say, the synthesizer performs its the internal processing not with analog signal but with "0" and "1" codes.

It is a matter of course.



6.1.2.2 Degree of freedom for creation of sounds

Based on the previous description, you may think of an idea to contain waveform of other voices than sinusoidal wave in the memory circuits. Roughly saying, it is the principle of PCM synthesizer.

As described later, the method of making voices with the FM synthesizer is based on the idea of " hybridization of sinusoidal waves".

Basically, this method creates any complex waveform by hybridizing sinusoidal waves that are outputted.

Isn't it realistic to store various waveforms in the memory circuits to read out them as necessary, at the first thought?

Yes, it is true. But, the number of voices that can be obtained with this method is limited to the number of waveforms stored in the memory circuits.

Moreover, like most of PCM system, "hybridization" is impossible for this case, and waveforms that are obtained are only "subtracted".

This method passes roughly formed waveforms through filters to shape them up to desired ones.

On the other hand, FM synthesizer is to provide (create) various waveforms.

6.1.2.3 Idea of Operators

The "Box" that outputs sinusoidal waves by using the method described above is called "Operator".

MA-3 has four " Operators".

Theses operators are superimposed to create various waveforms.

MA-3 authors various sounds by combining the " Operators".

The resultant Operator that is generated as a voice is called "Carrier", and an Operator that modulates the Carrier is called a "Modulator".

This is explained by using an analogy as follows.

There are two persons, standing one behind another. The person who is at the front can only generate voice "Ah".

The person who is behind the front person tickles and surprises the front one when the front one generates the voice.

Figure Operator and Carrier

Then, the front one's "Ah" changes to "Hyaa!" or "yell!!" by being affected by the rear one.
This approximately analogize the mechanism of the Operator.

Moreover, the number of "Modulators" who surprises the "Carrier" is not limited to one. It can be three who make the mischief as a group (parallel type), or

Figure Parallel type

A Modulator does mischief on the second Modulator, the second Modulator does mischief on the third Modulator, and the third Modulator does mischief on the "Carrier" (series type) in some case.

Figure Series type

Four Operators are built in, the voices are roughly classified into 2op voices that are constituted with two operators, and 4op voices that are constituted with all of the four operators.

In addition, all of these "Operator" of MA-3 are the same, and are not classified into those "for Carriers" and those "for Modulators".

Operators are classified according to the purpose of their use.

This feature helps to increase the degree of freedom, and thus, eight types of rows of the Operators are provided (This is called "algorithm").

5.1.3 Self-feedback, how wonderful it is

When you see the algorithm, you will find the part as “self-feedback” of the following figure.
This is called "self-feedback ".

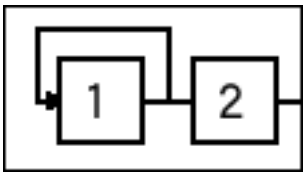


Figure Self-feedback

The self-feedback is ,as the name describes, able to modulate itself. The level of feedback is raised, an effect that Operators having the same pitch comes in a line is obtained.

For some WS that is selected, further increase of the level provides the effect such as a random oscillation, which allows for the use such as a noise generator.

Naturally, since these Operators are the same as other Operator except that they perform the self-feedback, they are exactly all-round parameters that can add changes on time bases by using EG.

The following basic formula is shown for those who are interested in understanding the FM synthesizer theoretically.

$$F(t)=A(t)\ \sin\{wct + I(t)\ \sin wmt\}$$

F(t) : Output

A(t) : EG data of carrier

wct : Frequency of carrier

I(t) : EG data of modulator

wmt : Frequency of modulator

Figure Formula for Oprators

Basis of the FM synthesizer have been explained briefly.
We will be happy if the information is useful for your authoring of the voices.

6.2 About PCM and ADPCM

PCM(Pulse Code Modulation) is a digital record system to convert analog signal such as sounds into digital signal. It is recorded as digital signal by extracting the signal of voice, which is continuous waveform, and quantizing at a regular interval (sampling).

ADPCM(Adaptive Differential Pulse Code Modulation) makes whole amount of data small by quantizing only the differences of adjacent data at the time of sampling.

6.3 Voice List

6.3.1 MA-3 Native Normal Voice MAP（FM16 modes 0～63）

Bank MSB	124		124		124		124	124		124	
Bank LSB	0		1		2		3～7	8		9	
	Preset		User Assignable								
Pch#	Inst	Typ	Inst	Typ	Inst	Typ		Inst	Typ	Inst	Typ
0	GrandPno	F4	User	A	User	A	・・・	User	A	User	A
1	BritePno	F4	User	A	User	A	・・・	User	A	User	A
2	E.GrandP	F4	User	A	User	A	・・・	User	A	User	A
3	HnkyTonk	F4	User	A	User	A	・・・	User	A	User	A
4	E.Piano1	F4	User	A	User	A	・・・	User	A	User	A
5	E.Piano2	F4	User	A	User	A	・・・	User	A	User	A
6	Harpsi.	F4	User	A	User	A	・・・	User	A	User	A
7	Clavi.	F4	User	A	User	A	・・・	User	A	User	A
8	Celesta	F4	User	A	User	A	・・・	User	A	User	A
9	Glocken	F4	User	A	User	A	・・・	User	A	User	A
10	MusicBox	F4	User	A	User	A	・・・	User	A	User	A
11	Vibes	F4	User	A	User	A	・・・	User	A	User	A
12	Marimba	F4	User	A	User	A	・・・	User	A	User	A
13	Xylophon	F4	User	A	User	A	・・・	User	A	User	A
14	TubulBel	F4	User	A	User	A	・・・	User	A	User	A
15	Dulcimer	F4	User	A	User	A	・・・	User	A	User	A
16	DrawOrgn	F4	User	A	User	A	・・・	User	A	User	A
17	PercOrgn	F4	User	A	User	A	・・・	User	A	User	A
18	RockOrgn	F4	User	A	User	A	・・・	User	A	User	A
19	ChrchOrg	F4	User	A	User	A	・・・	User	A	User	A
20	ReedOrgn	F4	User	A	User	A	・・・	User	A	User	A
21	Acordion	F4	User	A	User	A	・・・	User	A	User	A
22	Harmnica	F4	User	A	User	A	・・・	User	A	User	A
23	TangoAcd	F4	User	A	User	A	・・・	User	A	User	A
24	NylonGtr	F4	User	A	User	A	・・・	User	A	User	A
25	SteelGtr	F4	User	A	User	A	・・・	User	A	User	A
26	Jazz Gtr	F4	User	A	User	A	・・・	User	A	User	A
27	CleanGtr	F4	User	A	User	A	・・・	User	A	User	A
28	Mute.Gtr	F4	User	A	User	A	・・・	User	A	User	A
29	Ovrdrive	F4	User	A	User	A	・・・	User	A	User	A
30	Dist.Gtr	F4	User	A	User	A	・・・	User	A	User	A
31	GtrHarmo	F4	User	A	User	A	・・・	User	A	User	A
32	Aco.Bass	F4	User	A	User	A	・・・	User	A	User	A
33	FngrBass	F4	User	A	User	A	・・・	User	A	User	A
34	PickBass	F4	User	A	User	A	・・・	User	A	User	A
35	Fretless	F4	User	A	User	A	・・・	User	A	User	A
36	SlapBas1	F4	User	A	User	A	・・・	User	A	User	A
37	SlapBas2	F4	User	A	User	A	・・・	User	A	User	A
38	SynBass1	F4	User	A	User	A	・・・	User	A	User	A
39	SynBass2	F4	User	A	User	A	・・・	User	A	User	A
40	Violin	F4	User	A	User	A	・・・	User	A	User	A
41	Viola	F4	User	A	User	A	・・・	User	A	User	A
42	Cello	F4	User	A	User	A	・・・	User	A	User	A
43	ContraBs	F4	User	A	User	A	・・・	User	A	User	A
44	Trem.Str	F4	User	A	User	A	・・・	User	A	User	A
45	Pizz.Str	F4	User	A	User	A	・・・	User	A	User	A
46	Harp	F4	User	A	User	A	・・・	User	A	User	A
47	Timpani	F4	User	A	User	A	・・・	User	A	User	A
48	Strings1	F4	User	A	User	A	・・・	User	A	User	A
49	Strings2	F4	User	A	User	A	・・・	User	A	User	A
50	Syn.Str1	F4	User	A	User	A	・・・	User	A	User	A
51	Syn.Str2	F4	User	A	User	A	・・・	User	A	User	A
52	ChoirAah	F4	User	A	User	A	・・・	User	A	User	A
53	VoiceOoh	F4	User	A	User	A	・・・	User	A	User	A
54	SynVoice	F4	User	A	User	A	・・・	User	A	User	A
55	Orch.Hit	F4	User	A	User	A	・・・	User	A	User	A
56	Trumpet	F4	User	A	User	A	・・・	User	A	User	A
57	Trombone	F4	User	A	User	A	・・・	User	A	User	A
58	Tuba	F4	User	A	User	A	・・・	User	A	User	A
59	Mute.Trp	F4	User	A	User	A	・・・	User	A	User	A
60	Fr.Horn	F4	User	A	User	A	・・・	User	A	User	A
61	BrasSect	F4	User	A	User	A	・・・	User	A	User	A
62	SynBras1	F4	User	A	User	A	・・・	User	A	User	A
63	SynBras2	F4	User	A	User	A	・・・	User	A	User	A

6.3.2 MA-3 Native Normal Voice MAP（FM16 modes 64～127）

Bank MSB	124		124		124		124	124		124	
Bank LSB	0		1		2		3～7	8		9	
	Preset		User Assignable								
Pch#	Inst	Typ	Inst	Typ	Inst	Typ		Inst	Typ	Inst	Typ
64	SprnoSax	F4	User	A	User	A	・・・	User	A	User	A
65	Alto Sax	F4	User	A	User	A	・・・	User	A	User	A
66	TenorSax	F4	User	A	User	A	・・・	User	A	User	A
67	Bari.Sax	F4	User	A	User	A	・・・	User	A	User	A
68	Oboe	F4	User	A	User	A	・・・	User	A	User	A
69	Eng.Horn	F4	User	A	User	A	・・・	User	A	User	A
70	Bassoon	F4	User	A	User	A	・・・	User	A	User	A
71	Clarinet	F4	User	A	User	A	・・・	User	A	User	A
72	Piccolo	F4	User	A	User	A	・・・	User	A	User	A
73	Flute	F4	User	A	User	A	・・・	User	A	User	A
74	Recorder	F4	User	A	User	A	・・・	User	A	User	A
75	PanFlute	F4	User	A	User	A	・・・	User	A	User	A
76	Bottle	F4	User	A	User	A	・・・	User	A	User	A
77	Shakhchi	F4	User	A	User	A	・・・	User	A	User	A
78	Whistle	F4	User	A	User	A	・・・	User	A	User	A
79	Ocarina	F4	User	A	User	A	・・・	User	A	User	A
80	SquareLd	F4	User	A	User	A	・・・	User	A	User	A
81	Saw.Lead	F4	User	A	User	A	・・・	User	A	User	A
82	CaliopLd	F4	User	A	User	A	・・・	User	A	User	A
83	ChiffLd	F4	User	A	User	A	・・・	User	A	User	A
84	CharanLd	F4	User	A	User	A	・・・	User	A	User	A
85	Voice Ld	F4	User	A	User	A	・・・	User	A	User	A
86	Fifth Ld	F4	User	A	User	A	・・・	User	A	User	A
87	Bass &Ld	F4	User	A	User	A	・・・	User	A	User	A
88	NewAgePd	F4	User	A	User	A	・・・	User	A	User	A
89	Warm Pad	F4	User	A	User	A	・・・	User	A	User	A
90	PolySyPd	F4	User	A	User	A	・・・	User	A	User	A
91	ChoirPad	F4	User	A	User	A	・・・	User	A	User	A
92	BowedPad	F4	User	A	User	A	・・・	User	A	User	A
93	MetalPad	F4	User	A	User	A	・・・	User	A	User	A
94	Halo Pad	F4	User	A	User	A	・・・	User	A	User	A
95	SweepPad	F4	User	A	User	A	・・・	User	A	User	A
96	Rain	F4	User	A	User	A	・・・	User	A	User	A
97	SoundTrk	F4	User	A	User	A	・・・	User	A	User	A
98	Crystal	F4	User	A	User	A	・・・	User	A	User	A
99	Atmosphr	F4	User	A	User	A	・・・	User	A	User	A
100	Bright	F4	User	A	User	A	・・・	User	A	User	A
101	Goblins	F4	User	A	User	A	・・・	User	A	User	A
102	Echoes	F4	User	A	User	A	・・・	User	A	User	A
103	Sci-Fi	F4	User	A	User	A	・・・	User	A	User	A
104	Sitar	F4	User	A	User	A	・・・	User	A	User	A
105	Banjo	F4	User	A	User	A	・・・	User	A	User	A
106	Shamisen	F4	User	A	User	A	・・・	User	A	User	A
107	Koto	F4	User	A	User	A	・・・	User	A	User	A
108	Kalimba	F4	User	A	User	A	・・・	User	A	User	A
109	Bagpipe	F4	User	A	User	A	・・・	User	A	User	A
110	Fiddle	F4	User	A	User	A	・・・	User	A	User	A
111	Shanai	F4	User	A	User	A	・・・	User	A	User	A
112	TnklBell	F4	User	A	User	A	・・・	User	A	User	A
113	Agogo	F4	User	A	User	A	・・・	User	A	User	A
114	SteelDrm	F4	User	A	User	A	・・・	User	A	User	A
*1 115	WoodBlok	F4	User	A	User	A	・・・	User	A	User	A
*2 116	TaikoDrm	F4	User	A	User	A	・・・	User	A	User	A
*3 117	MelodTom	F4	User	A	User	A	・・・	User	A	User	A
*4 118	Syn.Drum	F4	User	A	User	A	・・・	User	A	User	A
*4 119	RevCymbl	F4	User	A	User	A	・・・	User	A	User	A
120	FretNoiz	F4	User	A	User	A	・・・	User	A	User	A
121	BrthNoiz	F4	User	A	User	A	・・・	User	A	User	A
*5 122	Seashore	F4	User	A	User	A	・・・	User	A	User	A
*6 123	Tweet	F4	User	A	User	A	・・・	User	A	User	A
*7 124	Telphone	F4	User	A	User	A	・・・	User	A	User	A
*7 125	Helicptr	F4	User	A	User	A	・・・	User	A	User	A
*6 126	Applause	F4	User	A	User	A	・・・	User	A	User	A
*5 127	Gunshot	F4	User	A	User	A	・・・	User	A	User	A

*1 : 50cent/halftone, #69 = F#4
*2 : 50cent/halftone, #69 = A2
*3 : 50cent/halftone, #69 = C#4
*4 : 50cent/halftone
*5 : 20cent/halftone
*6 : 5cent/halftone
*7 : 10cent/halftone
The voice attached * is treated as Drum voice by key control judging.
(UserBank is same)

(*) Type F2: FM 2 Operator, F4: FM 4 Operator, P: PCM, A: F2/F4/P Assignable

6.3.3 MA-3 Native Normal Voice MAP（FM32 modes 0～63）

6.3.4 MA-3 Native Normal Voice MAP（FM32 modes 64～127）

Bank MSB	124		124		124		124	124		124	
Bank LSB	0		1		2		3～7	8		9	
	Preset		User Assignable								
Pch#	Inst	Typ	Inst	Typ	Inst	Typ		Inst	Typ	Inst	Typ
64	SprnoSax	F2	User	A	User	A	...	User	A	User	A
65	Alto Sax	F2	User	A	User	A	...	User	A	User	A
66	TenorSax	F2	User	A	User	A	...	User	A	User	A
67	Bari.Sax	F2	User	A	User	A	...	User	A	User	A
68	Oboe	F2	User	A	User	A	...	User	A	User	A
69	Eng.Horn	F2	User	A	User	A	...	User	A	User	A
70	Bassoon	F2	User	A	User	A	...	User	A	User	A
71	Clarinet	F2	User	A	User	A	...	User	A	User	A
72	Piccolo	F2	User	A	User	A	...	User	A	User	A
73	Flute	F2	User	A	User	A	...	User	A	User	A
74	Recorder	F2	User	A	User	A	...	User	A	User	A
75	PanFlute	F2	User	A	User	A	...	User	A	User	A
76	Bottle	F2	User	A	User	A	...	User	A	User	A
77	Shakhchi	F2	User	A	User	A	...	User	A	User	A
78	Whistle	F2	User	A	User	A	...	User	A	User	A
79	Ocarina	F2	User	A	User	A	...	User	A	User	A
80	SquareLd	F2	User	A	User	A	...	User	A	User	A
81	Saw.Lead	F2	User	A	User	A	...	User	A	User	A
82	CaliopLd	F2	User	A	User	A	...	User	A	User	A
83	ChiffLd	F2	User	A	User	A	...	User	A	User	A
84	CharanLd	F2	User	A	User	A	...	User	A	User	A
85	Voice Ld	F2	User	A	User	A	...	User	A	User	A
86	Fifth Ld	F2	User	A	User	A	...	User	A	User	A
87	Bass &Ld	F2	User	A	User	A	...	User	A	User	A
88	NewAgePd	F2	User	A	User	A	...	User	A	User	A
89	Warm Pad	F2	User	A	User	A	...	User	A	User	A
90	PolySyPd	F2	User	A	User	A	...	User	A	User	A
91	ChoirPad	F2	User	A	User	A	...	User	A	User	A
92	BowedPad	F2	User	A	User	A	...	User	A	User	A
93	MetalPad	F2	User	A	User	A	...	User	A	User	A
94	Halo Pad	F2	User	A	User	A	...	User	A	User	A
95	SweepPad	F2	User	A	User	A	...	User	A	User	A
96	Rain	F2	User	A	User	A	...	User	A	User	A
97	SoundTrk	F2	User	A	User	A	...	User	A	User	A
98	Crystal	F2	User	A	User	A	...	User	A	User	A
99	Atmosphr	F2	User	A	User	A	...	User	A	User	A
100	Bright	F2	User	A	User	A	...	User	A	User	A
101	Goblins	F2	User	A	User	A	...	User	A	User	A
102	Echoes	F2	User	A	User	A	...	User	A	User	A
103	Sci-Fi	F2	User	A	User	A	...	User	A	User	A
104	Sitar	F2	User	A	User	A	...	User	A	User	A
105	Banjo	F2	User	A	User	A	...	User	A	User	A
106	Shamisen	F2	User	A	User	A	...	User	A	User	A
107	Koto	F2	User	A	User	A	...	User	A	User	A
108	Kalimba	F2	User	A	User	A	...	User	A	User	A
109	Bagpipe	F2	User	A	User	A	...	User	A	User	A
110	Fiddle	F2	User	A	User	A	...	User	A	User	A
111	Shanai	F2	User	A	User	A	...	User	A	User	A
112	TnklBell	F2	User	A	User	A	...	User	A	User	A
113	Agogo	F2	User	A	User	A	...	User	A	User	A
114	SteelDrm	F2	User	A	User	A	...	User	A	User	A
*1 115	WoodBlok	F2	User	A	User	A	...	User	A	User	A
*2 116	TaikoDrm	F2	User	A	User	A	...	User	A	User	A
*3 117	MelodTom	F2	User	A	User	A	...	User	A	User	A
*4 118	Syn.Drum	F2	User	A	User	A	...	User	A	User	A
*4 119	RevCymbl	F2	User	A	User	A	...	User	A	User	A
120	FretNoiz	F2	User	A	User	A	...	User	A	User	A
121	BrthNoiz	F2	User	A	User	A	...	User	A	User	A
*5 122	Seashore	F2	User	A	User	A	...	User	A	User	A
*6 123	Tweet	F2	User	A	User	A	...	User	A	User	A
*7 124	Telphone	F2	User	A	User	A	...	User	A	User	A
*7 125	Helicptr	F2	User	A	User	A	...	User	A	User	A
*6 126	Applause	F2	User	A	User	A	...	User	A	User	A
*5 127	Gunshot	F2	User	A	User	A	...	User	A	User	A

*1 : 50cent/halftpne, #69 = F#4
*2 : 50cent/halftone, #69 = A2
*3 : 50cent/halftone, #69 = C#4
*4 : 50cent/halftone
*5 : 20cent/halftone
*6 : 5cent/halftone
*7 : 10cent/halftone
The voice, which is set to Pch# with "*", is treated as drum voice by key control judging. (User Bank is also.)

（*） Type F2: FM 2 Operator, F4: FM 4 Operator, P: PCM, A: F2/F4/P Assignable

6.3.5 MA-3 Native Drum Instrument MAP（FM16 modes）

@ 29	Snare Roll	F4	Snare Roll	F4	User	A	・・・	User	A
30	Castanet	F4	Castanet	F4	User	A	・・・	User	A
31	Snare L	P	Snare L	F4	User	A	・・・	User	A
32	Sticks	F4	Sticks	F4	User	A	・・・	User	A
33	Bass Drum L	P	Bass Drum L	F4	User	A	・・・	User	A
34	Open Rim Shot	F4	Open Rim Shot	F4	User	A	・・・	User	A
35	Bass Drum M	P	Bass Drum M	F4	User	A	・・・	User	A
36	Bass Drum H	P	Bass Drum H	F4	User	A	・・・	User	A
37	Closed Rim Shot	F4	Closed Rim Shot	F4	User	A	・・・	User	A
38	Snare M	P	Snare M	F4	User	A	・・・	User	A
39	Hand Clap	F4	Hand Clap	F4	User	A	・・・	User	A
40	Snare H	P	Snare H	F4	User	A	・・・	User	A
41	Floor Tom L	P	Floor Tom L	F4	User	A	・・・	User	A
42	Hi-Hat Closed	P	Hi-Hat Closed	F4	User	A	・・・	User	A
43	Floor Tom H	P	Floor Tom H	F4	User	A	・・・	User	A
44	Hi-Hat Pedal	P	Hi-Hat Pedal	F4	User	A	・・・	User	A
45	Low Tom	P	Low Tom	F4	User	A	・・・	User	A
46	Hi-Hat Open	P	Hi-Hat Open	F4	User	A	・・・	User	A
47	Mid Tom L	P	Mid Tom L	F4	User	A	・・・	User	A
48	Mid Tom H	P	Mid Tom H	F4	User	A	・・・	User	A
49	Crash Cymbal 1	P	Crash Cymbal 1	F4	User	A	・・・	User	A
50	High Tom	P	High Tom	F4	User	A	・・・	User	A
51	Ride Cymbal 1	P	Ride Cymbal 1	F4	User	A	・・・	User	A
52	Chinese Cymbal	P	Chinese Cymbal	F4	User	A	・・・	User	A
53	Ride Cymbal Cup	F4	Ride Cymbal Cup	F4	User	A	・・・	User	A
54	Tambourine	F4	Tambourine	F4	User	A	・・・	User	A
55	Splash Cymbal	P	Splash Cymbal	F4	User	A	・・・	User	A
56	Cowbell	F4	Cowbell	F4	User	A	・・・	User	A
57	Crash Cymbal 2	P	Crash Cymbal 2	F4	User	A	・・・	User	A
58	Vibraslap	F4	Vibraslap	F4	User	A	・・・	User	A
59	Ride Cymbal 2	P	Ride Cymbal 2	F4	User	A	・・・	User	A
60	Bongo H	F4	Bongo H	F4	User	A	・・・	User	A
61	Bongo L	F4	Bongo L	F4	User	A	・・・	User	A
62	Conga H Mute	F4	Conga H Mute	F4	User	A	・・・	User	A
63	Conga H Open	F4	Conga H Open	F4	User	A	・・・	User	A
64	Conga L	F4	Conga L	F4	User	A	・・・	User	A
65	Timbale H	F4	Timbale H	F4	User	A	・・・	User	A
66	Timbale L	F4	Timbale L	F4	User	A	・・・	User	A
67	Agogo H	F4	Agogo H	F4	User	A	・・・	User	A
68	Agogo L	F4	Agogo L	F4	User	A	・・・	User	A
69	Cabasa	F4	Cabasa	F4	User	A	・・・	User	A
70	Maracas	F4	Maracas	F4	User	A	・・・	User	A
@ 71	Samba Whistle H	F4	Samba Whistle H	F4	User	A	・・・	User	A
@ 72	Samba Whistle L	F4	Samba Whistle L	F4	User	A	・・・	User	A
73	Guiro Short	F4	Guiro Short	F4	User	A	・・・	User	A
74	Guiro Long	F4	Guiro Long	F4	User	A	・・・	User	A
75	Claves	F4	Claves	F4	User	A	・・・	User	A
76	Wood Block H	F4	Wood Block H	F4	User	A	・・・	User	A
77	Wood Block L	F4	Wood Block L	F4	User	A	・・・	User	A
78	Cuica Mute	F4	Cuica Mute	F4	User	A	・・・	User	A
79	Cuica Open	F4	Cuica Open	F4	User	A	・・・	User	A
80	Triangle Mute	F4	Triangle Mute	F4	User	A	・・・	User	A
81	Triangle Open	F4	Triangle Open	F4	User	A	・・・	User	A
82	Shaker	F4	Shaker	F4	User	A	・・・	User	A
83	Jingle Bells	F4	Jingle Bells	F4	User	A	・・・	User	A
84	Bell Tree	F4	Bell Tree	F4	User	A	・・・	User	A

・Only the voice attached @ reacts to KeyOff.
・Exclusion allotment of Key#42/#44/#46
・Exclusion allotment of Key#71/#72
・Exclusion allotment of Key#73/#74
・Exclusion allotment of Key#78/#79
・Exclusion allotment of Key#80/#81
It is exclusion allotment when the voice is set as the above NoteNo. of UserBank

6.3.6 MA-3 Native Drum Instrument MAP (FM32 mode)

Bank MSB	125		125		125		125	125	
Pch#	0		1		2		3～8	9	
	Preset				User Assignable				
Note#	Inst	Typ	Inst	Typ	Inst	Typ		Inst	Typ
24	Seq Click H	F2	Seq Click H	F2	User	A	…	User	A
25	Brush Tap	F2	Brush Tap	F2	User	A	…	User	A
@ 26	Brush Swirl	F2	Brush Swirl	F2	User	A	…	User	A
27	Brush Slap	F2	Brush Slap	F2	User	A	…	User	A
@ 28	Brush Tap Swirl	F2	Brush Tap Swirl	F2	User	A	…	User	A
@ 29	Snare Roll	F2	Snare Roll	F2	User	A	…	User	A
30	Castanet	F2	Castanet	F2	User	A	…	User	A
31	Snare L	P	Snare L	F2	User	A	…	User	A
32	Sticks	F2	Sticks	F2	User	A	…	User	A
33	Bass Drum L	P	Bass Drum L	F2	User	A	…	User	A
34	Open Rim Shot	F2	Open Rim Shot	F2	User	A	…	User	A
35	Bass Drum M	P	Bass Drum M	F2	User	A	…	User	A
36	Bass Drum H	P	Bass Drum H	F2	User	A	…	User	A
37	Closed Rim Shot	F2	Closed Rim Shot	F2	User	A	…	User	A
38	Snare M	P	Snare M	F2	User	A	…	User	A
39	Hand Clap	F2	Hand Clap	F2	User	A	…	User	A
40	Snare H	P	Snare H	F2	User	A	…	User	A
41	Floor Tom L	P	Floor Tom L	F2	User	A	…	User	A
42	Hi-Hat Closed	P	Hi-Hat Closed	F2	User	A	…	User	A
43	Floor Tom H	P	Floor Tom H	F2	User	A	…	User	A
44	Hi-Hat Pedal	P	Hi-Hat Pedal	F2	User	A	…	User	A
45	Low Tom	P	Low Tom	F2	User	A	…	User	A
46	Hi-Hat Open	P	Hi-Hat Open	F2	User	A	…	User	A
47	Mid Tom L	P	Mid Tom L	F2	User	A	…	User	A
48	Mid Tom H	P	Mid Tom H	F2	User	A	…	User	A
49	Crash Cymbal 1	P	Crash Cymbal 1	F2	User	A	…	User	A
50	High Tom	P	High Tom	F2	User	A	…	User	A
51	Ride Cymbal 1	P	Ride Cymbal 1	F2	User	A	…	User	A
52	Chinese Cymbal	P	Chinese Cymbal	F2	User	A	…	User	A
53	Ride Cymbal Cup	F2	Ride Cymbal Cup	F2	User	A	…	User	A
54	Tambourine	F2	Tambourine	F2	User	A	…	User	A
55	Splash Cymbal	P	Splash Cymbal	F2	User	A	…	User	A
56	Cowbell	F2	Cowbell	F2	User	A	…	User	A
57	Crash Cymbal 2	P	Crash Cymbal 2	F2	User	A	…	User	A
58	Vibraslap	F2	Vibraslap	F2	User	A	…	User	A
59	Ride Cymbal 2	P	Ride Cymbal 2	F2	User	A	…	User	A
60	Bongo H	F2	Bongo H	F2	User	A	…	User	A
61	Bongo L	F2	Bongo L	F2	User	A	…	User	A
62	Conga H Mute	F2	Conga H Mute	F2	User	A	…	User	A
63	Conga H Open	F2	Conga H Open	F2	User	A	…	User	A
64	Conga L	F2	Conga L	F2	User	A	…	User	A
65	Timbale H	F2	Timbale H	F2	User	A	…	User	A
66	Timbale L	F2	Timbale L	F2	User	A	…	User	A
67	Agogo H	F2	Agogo H	F2	User	A	…	User	A
68	Agogo L	F2	Agogo L	F2	User	A	…	User	A
69	Cabasa	F2	Cabasa	F2	User	A	…	User	A
70	Maracas	F2	Maracas	F2	User	A	…	User	A
@ 71	Samba Whistle H	F2	Samba Whistle H	F2	User	A	…	User	A
@ 72	Samba Whistle L	F2	Samba Whistle L	F2	User	A	…	User	A
73	Guiro Short	F2	Guiro Short	F2	User	A	…	User	A
74	Guiro Long	F2	Guiro Long	F2	User	A	…	User	A
75	Claves	F2	Claves	F2	User	A	…	User	A
76	Wood Block H	F2	Wood Block H	F2	User	A	…	User	A
77	Wood Block L	F2	Wood Block L	F2	User	A	…	User	A
78	Cuica Mute	F2	Cuica Mute	F2	User	A	…	User	A
79	Cuica Open	F2	Cuica Open	F2	User	A	…	User	A
80	Triangle Mute	F2	Triangle Mute	F2	User	A	…	User	A
81	Triangle Open	F2	Triangle Open	F2	User	A	…	User	A
82	Shaker	F2	Shaker	F2	User	A	…	User	A
83	Jingle Bells	F2	Jingle Bells	F2	User	A	…	User	A
84	Bell Tree	F2	Bell Tree	F2	User	A	…	User	A

- Only the voice attached "@" is reacts to KeyOff.
- Exclusion allotment of Key#42/#44/#46
- Exclusion allotment of Key#71/#72
- Exclusion allotment of Key#73/#74
- Exclusion allotment of Key#78/#79
- Exclusion allotment of Key#80/#81

In case also that voice set to above NoteNo. Of User Bank, Excusion allotment.

(*)Type F2:FM 2 Operator, F4: FM 4 Operator, P: PCM, A: F2/F4/P Assignable

6.3.7 MA-3 GM Level1 Normal Voice MAP (Built-in ROM voices)

Bank MSB	0		0	
Bank LSB	0		1-127	
	Preset			
Pch#	Inst	Typ	Inst	Typ
0	GrandPno	F2	←	
1	BritePno	F2	←	
2	E.GrandP	F2	←	
3	HnkyTonk	F2	←	
4	E.Piano1	F2	←	
5	E.Piano2	F2	←	
6	Harpsi.	F2	←	
7	Clavi.	F2	←	
8	Celesta	F2	←	
9	Glocken	F2	←	
10	MusicBox	F2	←	
11	Vibes	F2	←	
12	Marimba	F2	←	
13	Xylophon	F2	←	
14	TubulBel	F2	←	
15	Dulcimar	F2	←	
16	Draw Orgn	F2	←	
17	PercOrgn	F2	←	
18	RockOrgn	F2	←	
19	ChrchOrg	F2	←	
20	ReedOrgn	F2	←	
21	Acordion	F2	←	
22	Harmnica	F2	←	
23	TangoAcd	F2	←	
24	NylonGtr	F2	←	
25	SteelGtr	F2	←	
26	Jazz Gtr	F2	←	
27	CleanGtr	F2	←	
28	Mute.Gtr	F2	←	
29	Ovrdrive	F2	←	
30	Dist.Gtr	F2	←	
31	GtrHarmo	F2	←	
32	Aco.Bass	F2	←	
33	FngrBass	F2	←	
34	PickBass	F2	←	
35	Fretless	F2	←	
36	SlapBas1	F2	←	
37	SlapBas2	F2	←	
38	SynBass1	F2	←	
39	SynBass2	F2	←	
40	Violin	F2	←	
41	Viola	F2	←	
42	Cello	F2	←	
43	ContraBs	F2	←	
44	Trem.Str	F2	←	
45	Pizz.Str	F2	←	
46	Harp	F2	←	
47	Timpani	F2	←	
48	Strings1	F2	←	
49	Strings2	F2	←	
50	Syn.Str1	F2	←	
51	Syn.Str2	F2	←	
52	ChoirAah	F2	←	
53	VoiceOoh	F2	←	
54	SynVoice	F2	←	
55	Orch.Hit	F2	←	
56	Trumpet	F2	←	
57	Trombone	F2	←	
58	Tuba	F2	←	
59	Mute.Trp	F2	←	
60	Fr.Horn	F2	←	
61	BrasSect	F2	←	
62	SynBras1	F2	←	
63	SynBras2	F2	←	

Bank MSB	0		0	
Bank LSB	0		1-127	
	Preset			
Pch#	Inst	Typ	Inst	Typ
64	SprnoSax	F2	←	
65	Alto Sax	F2	←	
66	TenorSax	F2	←	
67	Bari.Sax	F2	←	
68	Oboe	F2	←	
69	Eng.Horn	F2	←	
70	Bassoon	F2	←	
71	Clarinet	F2	←	
72	Piccolo	F2	←	
73	Flute	F2	←	
74	Recorder	F2	←	
75	PanFlute	F2	←	
76	Bottle	F2	←	
77	Shakhchi	F2	←	
78	Whistle	F2	←	
79	Ocarina	F2	←	
80	SquareLd	F2	←	
81	Saw .Lead	F2	←	
82	CaliopLd	F2	←	
83	ChiffLd	F2	←	
84	CharanLd	F2	←	
85	Voice Ld	F2	←	
86	Fifth Ld	F2	←	
87	Bass &Ld	F2	←	
88	New AgePd	F2	←	
89	Warm Pad	F2	←	
90	PolySyPd	F2	←	
91	ChoirPad	F2	←	
92	BowedPad	F2	←	
93	MetalPad	F2	←	
94	Halo Pad	F2	←	
95	SweepPad	F2	←	
96	Rain	F2	←	
97	SoundTrk	F2	←	
98	Crystal	F2	←	
99	Atmosphr	F2	←	
100	Bright	F2	←	
101	Goblins	F2	←	
102	Echoes	F2	←	
103	Sci-Fi	F2	←	
104	Sitar	F2	←	
105	Banjo	F2	←	
106	Shamisen	F2	←	
107	Koto	F2	←	
108	Kalimba	F2	←	
109	Bagpipe	F2	←	
110	Fiddle	F2	←	
111	Shanai	F2	←	
112	TnklBell	F2	←	
113	Agogo	F2	←	
114	SteelDrm	F2	←	
*1 115	WoodBlok	F2	←	
*2 116	TaikoDrm	F2	←	
*3 117	MelodTom	F2	←	
*4 118	Syn.Drum	F2	←	
*4 119	RevCymbl	F2	←	
120	FretNoiz	F2	←	
121	BrthNoiz	F2	←	
*5 122	Seashore	F2	←	
*6 123	Tweet	F2	←	
*7 124	Telphone	F2	←	
*7 125	Helicptr	F2	←	
*6 126	Applause	F2	←	
*5 127	Gunshot	F2	←	

*1 : 50cent/halftpne, #69 = F#4
*2 : 50cent/halftone, #69 = A2
*3 : 50cent/halftone, #69 = C#4
*4 : 50cent/halftone
*5 : 20cent/halftone
*6 : 5cent/halftone
*7 : 10cent/halftone
The voice attached "*" is treated as drum voice by key control judging.

(*)Type F2: Operator, F4 : FM 4 Operator

6.3.8 MA-3 GM Level1 Drum Instrument MAP (Built-in ROM voices)

Bank MSB	0		0	
Pch#	0		1-127	
Note#	Inst	Typ	Inst	Typ
24	Seq Click H	F2	←	
25	Brush Tap	F2	←	
@ 26	Brush Swirl	F2	←	
27	Brush Slap	F2	←	
@ 28	Brush Tap Swirl	F2	←	
@ 29	Snare Roll	F2	←	
30	Castanet	F2	←	
31	Snare L	P	←	
32	Sticks	F2	←	
33	Bass Drum L	P	←	
34	Open Rim Shot	F2	←	
35	Bass Drum M	P	←	
36	Bass Drum H	P	←	
37	Closed Rim Shot	F2	←	
38	Snare M	P	←	
39	Hand Clap	F2	←	
40	Snare H	P	←	
41	Floor Tom L	P	←	
42	Hi-Hat Closed	P	←	
43	Floor Tom H	P	←	
44	Hi-Hat Pedal	P	←	
45	Low Tom	P	←	
46	Hi-Hat Open	P	←	
47	Mid Tom L	P	←	
48	Mid Tom H	P	←	
49	Crash Cymbal 1	P	←	
50	High Tom	P	←	
51	Ride Cymbal 1	P	←	
52	Chinese Cymbal	P	←	
53	Ride Cymbal Cup	F2	←	
54	Tambourine	F2	←	
55	Splash Cymbal	P	←	
56	Cowbell	F2	←	
57	Crash Cymbal 2	P	←	
58	Vibraslap	F2	←	
59	Ride Cymbal 2	P	←	
60	Bongo H	F2	←	
61	Bongo L	F2	←	
62	Conga H Mute	F2	←	
63	Conga H Open	F2	←	
64	Conga L	F2	←	
65	Timbale H	F2	←	
66	Timbale L	F2	←	
67	Agogo H	F2	←	
68	Agogo L	F2	←	
69	Cabasa	F2	←	
70	Maracas	F2	←	
@ 71	Samba Whistle H	F2	←	
@ 72	Samba Whistle L	F2	←	
73	Guiro Short	F2	←	
74	Guiro Long	F2	←	
75	Claves	F2	←	
76	Wood Block H	F2	←	
77	Wood Block L	F2	←	
78	Cuica Mute	F2	←	
79	Cuica Open	F2	←	
80	Triangle Mute	F2	←	
81	Triangle Open	F2	←	
82	Shaker	F2	←	
83	Jingle Bells	F2	←	
84	Bell Tree	F2	←	

- Only the voice attached "@" is reacts to KeyOff.
- Exclusion allotment of Key#42/#44/#46
- Exclusion allotment of Key#71/#72
- Exclusion allotment of Key#73/#74
- Exclusion allotment of Key#78/#79
- Exclusion allotment of Key#80/#81

(*)Type F2: FM 2 Operator, F4: FM 4 Operator, P: PCM, A: F2/F4/P Assignable

6.3.9 MA-3 ROM Wave MAP

WaveID	Instrument
0	Bass Drum
1	Snare Drum
2	Tom Tom
3	Hi-Hat Closed
4	Hi-Hat Open
5	Ride Cymbal
6	Clash Cymbal

6.4 Error messages

6.4.1 Error message issued at input/output

Display	Description of error	Cause
Can not save SMAF (SMF) file -Illegal output stream.	SMAF file cannot be saved. Output stream is not correct.	The document cannot be saved in SMAF (SMF) file.
Can not open SMAF (SMF) file -Illegal file format.	SMAF file cannot be opened. Format of the file is not correct.	Format of SMAF (SMF) file is not correct for reading.
Can not open MA1 (SMF) file -Illegal file format.	MA1 file cannot be opened. Format of the file is not correct.	Format of MA1 (MA3) is not correct for reading.
Can not import from SMF (M3N) file.. -Can not assign 4 operator on GM1 mode.	SMF file cannot be opened. In GM1mode, 4 operator tvoices cannot be assigned.	4 operator voices of bank 124 are stored in SMF or M3N that is defined as FM32 voice mode.
Can not import from file -Bank Number is different from selected bank.	File cannot be opened. Type of bank select is wrong.	When importing voices of bank row in VoiceList, the type of ban select is wrong.
Can not open voice file -Illegal file format.	Voice file cannot be opened. Format of the file is not correct.	Voice definition file format error
Can not save voice file-Illegal bank voice parameter.	Voice file cannot be saved. The bank of voice parameter is not correct.	Failed in exporting voices of bank row in VoiceList
Can not save SMAF (M3N) file -Illegal output stream.	SMAF file cannot be saved. Output stream is not correct.	Failed in saving files such as MA3SMAF/MNF.
Can not open file-Illegal file format.	File cannot be opened. Format of the file is not correct.	An attempt was made to read a file with extension that is not supported.
Can not convert file -DLL: Can not create file.	File cannot be converted. File cannot be made.	File cannot be made due to an error.
Can not convert file -DLL: Output buffer overflow.	File cannot be converted. It overflows from the buffer.	Converted file overflows from buffer.
Can not convert file -DLL: Illegal format type.	File cannot be converted. For type is not correct.	Invalid format extension exists.
Can not convert file -DLL: Illegal parameter of function.	File cannot be converted. Value of function parameter is not correct.	Value of function parameter is abnormal.
Can not convert file -DLL: Illegal event.	File cannot be converted. Even is not correct.	There is an even that is not defined.
Can not convert file -DLL: Temporary buffer overflow.	File cannot be converted. File overflows from temporary buffer.	Temporary buffer is full.
Can not convert file -DLL: MA-3 RAM overflow.	File cannot be converted. File exceeds capacity of built-in RAM.	Capacity of MA-3 RAM is 8176 Bytes, and thus, music data that exceeds this capacity cannot be played. MA-3 Authoring Tool calculate the size of music data to compare it with the RAM capacity, and issues this error message when the capacity is exceeded. The data size is calculated as described in the note below.
Can not convert file. DLL:Total length is less than 20(msec).	File cannot be converted. Total length is 20 or less msecs.	When the total length after converting to SMAF is 20 or less msecs
Can not convert SMF file -DLL: Nonsupport Format 1.	SMF file cannot be converted. Not compatible with Format 1	An attempt was made to read SMF with Format 1.
Can not assure of contents. -Max.Dens over 1000(Byte/s).	These contents cannot be guaranteed. The momentary maximum event density is over 1000.	When the momentary maximum event density is over 1000(Byte/s)
Can not assure of contents. -Ave.Dens over 500(Byte/s).	These contents cannot be guaranteed. Average event density is over 500.	When average event density is over 500(Byte/s)
Can not assure contents. - Total Length over 2000000(msec).	This content cannot be assured. TL (Total Length) is over 2000000(msec).	When it is going to play or save content which TL (Total Length) is over 2000000(msec).
Can not save SMAF file -Over total size of stream audio. (total % u byte/s)	SMAF cannot be saved. The total size of Stream PCM exceeds.	When the total size of Stream PCM exceeds criteria(8kByte/s)
Can not save file. -Mono mode is used and the maximum number of simultaneous notes is exceeded	File cannot be saved. Mono mode is used and the maximum number of simultaneous notes is exceeded.	When mono mode is used and the maximum number of simultaneous notes exceeded

Can not save File. File Name Exceed 59byte.	The file cannot be saved. The file name is over 59 bytes.	When 59 bytes or more of file name is attached for the file at save.
Can not convert file. PCM voice setting error: Invalid Loop point setting.	The file cannot be saved. Setting of Loop Point is uncorrected.	Setting of Loop Point is uncorrected.
Can not convert file. PCM voice setting error: Invalid End point Setting.	The file cannot be saved. Setting of End Point is uncorrected.	Setting of End Point is uncorrected.
Can not convert file. PCM voice setting error: Invalid SR <= 1 and XOF is checked.	The file cannot be saved. SR<= 1 and XOF is checked.	SR<= 1 and XOF is checked.
Can not convert file. PCM voice setting error: DR = 0, SL != 0 and XOF is checked.	The file cannot be saved. DR=0, SL!= 0,and XOF is checked.	DR=0, SL!= 0,and XOF is checked.
Can not convert file. PCM voice setting error: RR <= 1 and XOF is not checked.	The file cannot be saved. RR <= 1 and XOF is not checked.	RR <= 1 and XOF is not checked.

6.4.2 Error messages issued at starting

Display	Description of error	Cause
Can not open application -Application is already running.	The application has already been started.	An attempt was made to start MA-3 Authoring Tool that has already been started.
Can not open application -MA3_AT.ini(initial) file don't exist.	The application cannot be started. No ini file for MA-3 Authoring Tool exists.	MA3_AT.ini does not exist.
Can not open application. -Illegal parameter of MA-3_AT.ini (initial) file.	The application cannot be started. The parameter of ini file of MA-3 Authoring tool is not correct.	Parameter setting of MA-3_AT.ini is not correct.

6.4.3 Error messages related to internal input/output

Display	Description of error	Cause
Can not export to M3N -Unexpected problem is occurred.	M3N cannot be made. An unexpected problem has occurred.	It was impossible to make M3N due to an unknown problem.
Can not export to M3N -Over MA-3 RAM size (total %u byte)	M3N cannot be made. MA-3 RAM capacity is exceeded.	RAM capacity is exceeded.

6.4.4 MIDI related error messages

Display	Description of error	Cause
Can not assign sound file. -Over MA-3 RAM size (total %u byte)	Sound file is un-assignable. RAM Size is exceeded.	When RAM size is exceeded

6.4.5 Error messages on WaveData

Display	Description of error	Cause
Can not open sound file -Nonsupport stereo sound file.	Sound file cannot be opened. This is not compatible with stereophonic sound file.	Conversion processing was stopped because WaveFile is stereophonic.
Can not convert sound file -Unexpected problem is occurred.	Sound file cannot be converted.	Processing was stopped due to an unknown problem during WaveFile conversion.
Can not assign sound file. -Numbers of WaveID exceed 128.	Sound file cannot be assigned.	Processing was stopped because no vacant WaveID is present in VoiceList.
Can not assign sound file. - Numbers of Wave exceed 128. (for SMAF)	Sound file cannot be assigned.	Processing was stopped because no vacant WaveID is present in VoiceAssignMap.
Can not convert sound file. - Nonsupport Sampling Frequency. (Under 8000)	Sound file cannot be converted.	Sampling Frequency is over 8000 when WaveFile of 8 bit PCM is read at Stream PCM Assign MAP
Can not convert sound file. -Nonsupport Sampling Frequency. (Under 16000)	Sound file cannot be converted.	Sampling Frequency is over 16000 when WaveFile of 4 bit ADPCM is read at Stream PCM Assign MAP.
Can not convert sound file. Nonsupport Sampling Frequency. (Over 4000)	Sound file cannot be converted.	Sampling Frequency is less than 4000 when WaveFile of 8 bit PCM or 4 bit ADPCM in Stream PCM Assign Map.
Can not convert sound file. -Nonsupport Sampling Frequency. (Under 48000)	Sound file cannot be converted.	Sampling Frequency is over 48000 when WaveFile is read at Voice Edit/PCM.
Can not assign stereo sound file. - Other sound file is already assigned.	The sound file cannot be assigned. The other sound file has been assigned already.	Cannot register into Stream PCM Assign MAP for 2 consecutively.
Can not assign stereo sound file. - Over Wave ID. (ID 1-31)	The sound file cannot be assigned. It exceeds Wave ID. (ID 1-32).	It was going to register the wrong Stream PCM of Stereo into Wave ID 32.

6.4.6 Error messages related to user operations

Display	Description of error	Cause
Can not paste voice parameter -Can not assign 4 operator on GM1 mode.	Voice parameter cannot be pasted.	In FM32 tone mode, 4 operator voice was copied from VoiceList and pasted into VAM.
Can not play. -Illegal output stream.	It is can not play.	When playback data are not normal
Can not close Voice Edit. - Please load wave file or check 'RM'.	Voice Edit cannot be closed. Please load a waveform file or put a check into RM.	The O.K. button of PCM Voice Edit was selected in a state of no RM checkmark or voice waveform load ending.
Can not close Voice Edit. - Please load basic waveform.	Voice Edit cannot be closed. Please load a basic waveform.	When either of WS 15/23/31 was selected for either of Operator 1-4, and the waveform is not loaded to the WS, O.K. button of FM Voice Edit was selected.
Can not close Voice Edit. - Invalid Loop point setting.	Voice Edit cannot be closed. The setup of Loop Point is invalid.	When LP check is an error.
Can not close Voice Edit. - Invalid End point setting.	Voice Edit cannot be closed. The setup of End Point is invalid.	When EP check is an error.
Can not close Voice Edit. - Setting Error : SR <= 1 and XOF is checked.	Voice Edit cannot be closed. The setup is an error.: SR <= 1 and XOF is checked.	When the check of EG, LPL, and EPL is an error. in case of LP=EP
Can not close Voice Edit. - Setting Error : DR = 0, SL != 0 and XOF is checked.	Voice Edit cannot be closed. The setup is an error.: DR = 0, SL != 0 and XOF is checked.	When the check of EG, LPL, and EPL is an error. in case of LP=EP
Can not close Voice Edit. - Setting Error : RR <= 1 and XOF is not checked.	Voice Edit cannot be closed. The setup is an error.: RR <= 1 and XOF is not checked.	When the check of EG, LPL, and EPL is an error. in case of LP=EP

6.4.7 Other error messages

Display	Description of error	Cause
Exit application -Unexpected problem is occurred.	The application was closed.	A problem occurred.

6.5 Warning/verification messages

6.5.1 The warning message which comes out at the time of an input

Display	Appears when
Automatically operated. DLL: Note message(Note Number is 115 to 127) not be outputted.	When the note message of 115 to 127 exists.
Automatically operated Nonsupport voice assignment is changed.	The bank selection was a non-corresponded thing in reading of an SMF file.
Please check actual playing sound. 8 bit PCM stream audio exist.	When Stream PCM of 8bit PCM exists
Can not convert file. Max.Dens over 1000(Byte/s).	At the time of SMF Import, the maximum event density at the moment When it is over 1000 (byte/s).
Can not convert file. Ave.Dens over 500(Byte/s).	When average event density is over 500 (byte/s) at the time of SMF Import.

6.5.2 A MIDI-related warning message

Display	Appears when
Please check actual playing sound. program change is during pronunciation of Note.	Program Change is during pronunciation (NoteOn-NoteOff).
More than one Note messages found on the same duration in a mono mode channel.Only the last Note message will be accepted.	NoteOn of the same timing (Duration 0) is in a monochrome mode specification channel.

6.5.3 Warning messages issued at user operation

Display	Appears when
Exist editing document -Save the document?	An attempt was made to destroy a document that is being edited.
Exist editing voice parameter. -Save the voice parameter?	An attempt was made to destroy a application in the state that voice is being edited.
Automatically operated. -Loop and/or End Point adjusted accroding to PCM mode.	When an LP/EP automatic control function starts at the timing of PCM Voice Edit opening.

6.5.4 Warning message on WaveData

Display	Appears when
Please check pitch of actual playing sound. Value of Fs is corrected.	Fs of the read PCM in Voice Edit/PCM is less than 1500 or more than 48000.
Please check pitch of actual playing sound. Value of Fs is not recommended.	Fs of the registered PCM waveform in Normal voice is not recommendation value.
Please check actual playing sound. 8 bit PCM sound file is converted.	The read PCM is 8 bits.

6.5.5 Check Message Which Comes Out at Time of User Operation

Display	Cause
Confirm operation. Sound file will automatically detach.	Where a sound file is loaded to a PCM Voice Edit dialog, when it is going to turn ON the check of RM.a
Confirm operation. Sound file will automatically detach if noise is selected.	Change Source of ALVoiceEdit to Noise when reading a wave by LoadWaveFile of PCMVoiceEdit.
Voice List will be overwritten. Save the voice parameter?	When “Open Voice File” of File menu is selected.
Voice List will be overwritten and FM basic waveform may be overwritten. Save the voice parameter?	When “Import from Bank Voice” is selected in Voice List
Voice List may be overwritten. Save the voice parameter?	When “Preference” of Option menu is chosen.
Stream PCM Assign Map will be overwritten. Exort to StreamPCM File?	When “Import from StreamPCM File” is selected in Stream PCM Assign Map.

6.6 Shortcut key list

In MA-3 Authoring Tool, the following shortcut keys can be used.

[NOTE] Sign ”+” means “with”. For example, “[CTRL]+[F4]” means that "Push [F4] key with pushing the [Ctrl] key”.

6.6.1 Shortcut key common to each window

Key	Operation
[ESC]	Cancels an editing operation.
[DEL]	Deletes the event chosen.
[CTRL]+[F4]	Closes an active editing window.
[CTRL]+[F6](or [Tab])	Changes an active window in the editing window opened on the application window.
[Alt](or [GRPH])+[Tab]	Opens an application window, while minimizing MA-3 Authoring Tool.
[Alt](or [GRPH])+[Space key]	Opens an icon popup menu from the title bar of an application window.
[Alt](or [GRPH])+[-](Hyphen)	Opens an icon popup menu from the title bar of an active editing window.
[Alt](or [GRPH])+[F4]	Closes application.

6.6.2 Shortcut key about menu bar

Corresponding key	Operation
[Alt](or [GRPH])+ Letter key	Executes the menu item corresponding to each letter key. For example, when pushes [E] key with pushing [Alt] (or [GRPH]), the pull-down menu of [Edit] menu will open. Copy will be chosen when [C] key is pushed on it.
[Alt](or [GRPH])	Moves cursor to [File] of menu bar. In this status, can move cursor to right and left by pushing the cursor key of computer keyboard, and move to up and down on the opened menu.

6.6.3 Shortcut key of Control button

Corresponding button	Corresponding key
Start/Stop button	[Space]

6.6.4 Shortcut key of File menu

Corresponding command	Corresponding key
Open	[Ctrl]+[O]
Save	[Ctrl]+[S]
Import from SMF	[Ctrl]+[L]
Reload from SMF	[Ctrl]+[R]

6.6.5 Shortcut key of Edit menu

Corresponding command	Corresponding key
Copy	[Ctrl]+[C]
Paste	[Ctrl]+[V]

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