

S1V30080 Series Sound Tool User Guide

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1. Introduction

1.1 Introduction

This is the S1V30080 Series Sound Tool User Guide.

This manual describes how to use the Sound Tool. The Sound Tool is a PC sound editing tool specifically designed for the S1V30080 Series IC. Installing this Sound Tool on a PC enables command data and ROM images specifically for the S1V30080 Series IC to be created easily.

The Sound Tool is provided in English and Japanese language versions.

- Japanese language version installer (Installs the Japanese language version)
- English language version installer (Installs the English language version)

The English language version displays all information in English. The Japanese language version displays information in Japanese when run on a Japanese language operating system, and in English on operating systems of other languages.^{Note 1}

Note 1: Do not install both versions.

The S1V30080 Series Evaluation Kit also includes the following items.

- S1V30080 Series Evaluation Board
- EPSON Speech IC Speech Guide Creation Tool Ver. 1.10 or later

It outputs audio (ERV file) supported by the S1V30080 Series. These ERV files are read in using the Sound Tool. They can be used on the Sound Tool as Audio Main and Audio Multi audio sources.

The ROM image file output by the Sound Tool can be stored in the S1V30080 internal Mask ROM and in external serial flash memory.

1.2 Main Sound Tool Functions

- Melody editing function

Allows the audio tone and length and timing of the tone to be edited on a piano roll format window. Allows a melody to be entered, composed or arranged. The timbre can also be changed by altering the envelope. The melody can be played back for checking on the Sound Tool immediately after editing.^{Note 1}

- Buzzer/tone setting

Allows the buzzer/tone frequency to be set.

- Audio (ERV file) import function

ERV files are audio files created by the EPSON Speech IC Speech Guide Creation Tool Ver 1.10 or later for the S1V30080 Series. Allows ERV files to be imported.

- Mixing editing function

The S1V30080 Series allows mixing of the following channels.

- | | |
|-------------------------|------|
| • Audio Main | 1 ch |
| • Audio Multi | 5 ch |
| • Buzzer/tone or melody | 5 ch |

Audio can be checked on a PC.^{Note 1}

1. Introduction

- ROM image generation function

The S1V30080 Series plays back audio, melodies, and buzzer/tones stored in the internal Mask ROM or external serial flash memory. The Sound Tool generates ROM image files for this purpose.

A ROM image file can include data by selection from various types of sound data (audio, melody, buzzer/tones) registered for the Sound Tool project.

- Host command generation function

Generates command data for the host.

- Playback confirmation function

The **Play** button can be clicked on any editing window to check the sound on a PC simulating the actual LSI sound.^{Note 1}

Note 1: The sound played back is a PC simulation of the S1V30080 sound source. The sound source is the same, but the timbre and volume may differ due to the difference in audio output system configuration.

1.3 Operating Environment

The Sound Tool requires the following operating environment.

- An IBM PC/AT or fully compatible machine
- The Sound Tool has been confirmed to operate on Windows XP Professional SP2 and Windows Vista SP1.
- The IBM PC/AT or fully compatible machine must comply with the specifications listed below.

Operating system	Windows XP Professional SP2 or later, or Windows Vista SP1 or later
CPU	2.0 GHz or more recommended
RAM	1.0 GB or more recommended

- Administrative rights are required for the computer to install the Sound Tool.

Note: The Japanese language version has been confirmed to operate on Japanese language operating systems. The English language version has been confirmed to operate on English language operating systems.

1.4 Terminology

This section explains the terminology used for the S1V30080 and in the explanation of the Sound Tool.

No.	Term	Explanation
1	Audio Main playback	Playback set by ISC_SEQUENCER_MAIN_CONFIG_REQ or the Main command in the memory for the S1V30080.
2	Audio Multi playback	Playback set by ISC_SEQUENCER_MULTI_CONFIG_REQ or the Multi command in the memory for the S1V30080.
3	Audio playback	General name for Audio Main and Audio Multi playback.
4	Synthesizer Melody playback	Playback set by ISC_SYNTHESIZER_*_REQ for the S1V30080. Also abbreviated as Melody playback.
5	Synthesizer Buzzer/Tone playback	Playback set by ISC_SYNTHESIZER_BUZZ_TONE_SET_REQ for the S1V30080. Also abbreviated as Buzz/Tone playback.
6	Synthesizer playback	General name for Synthesizer Melody and Synthesizer Buzz/Tone playback.
7	Audio data	Audio data read in using ERV (Epson Raw Voice) audio data files. Created using EPSON Speech IC Speech Guide Creation Tool Ver. 1.10 or later. File extension is “erv.”
8	Sound	General name for sound output by the S1V30080.
9	Mixing playback	Playback using two or more of Audio Main playback, Audio Multi playback, and Synthesizer playback.
10	Type	Audio Main, Audio Multi, Buzz/Tone, or Melody type.
11	Envelope	Envelope enclosing the waveform. The envelope parameters can be altered to control the timbre for Synthesizer Melody playback.
12	Cell	Rounded rectangular shape indicating sound components on the Timing chart or Melody windows.
13	ROM image	Audio or command data stored in the S1V30080 internal Mask ROM or external serial flash memory. Includes file management sections.
14	ROM/Command creation	ROM/Command creation dialog box.
15	[ROM] Command	Command data stored in the ROM. Referred to as memory storage commands in the <i>S1V30080 Series Message Protocol Specification</i> . Note that this resembles “ROM/Command creation.”
16	[ROM] Audio Data	Audio data stored in the ROM.
17	[Host] Command	Command data sent from the host to the S1V30080.
18	File_Index_Number	Index number of the memory storage commands and audio data stored in the memory.

1.5 Installing

1.5.1 License

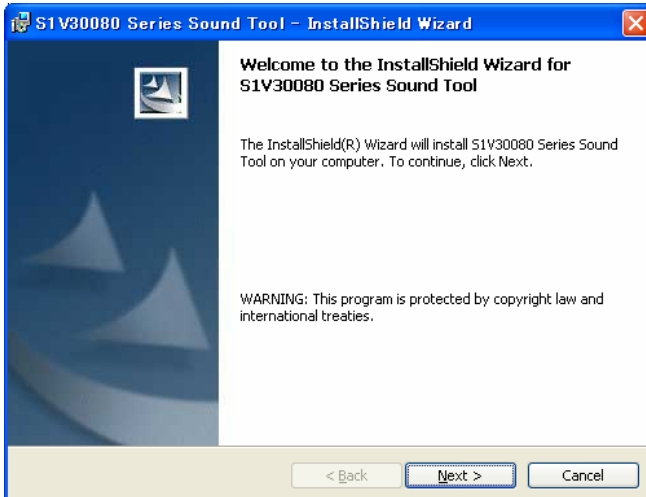
Agreement with the license terms stipulated in the “Software License Agreement” attached separately is necessary to use the Sound Tool. The licensed software cannot be installed or used unless the user agrees with this license agreement.

1.5.2 Installing software

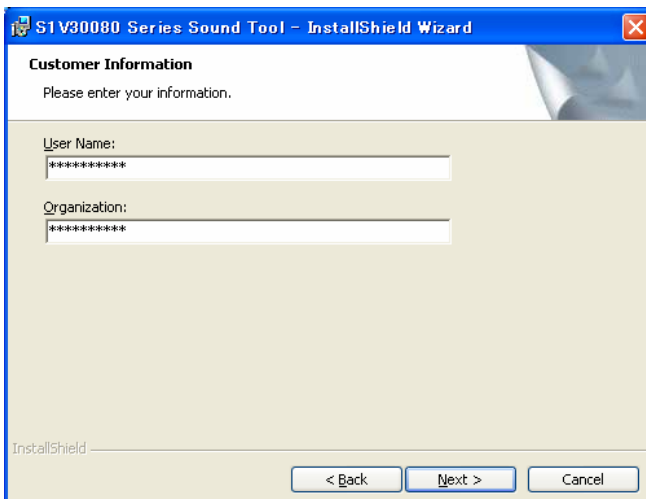
To install the Sound Tool, decompress the ZIP file provided and install the “setup.exe” archived inside.

1. Introduction

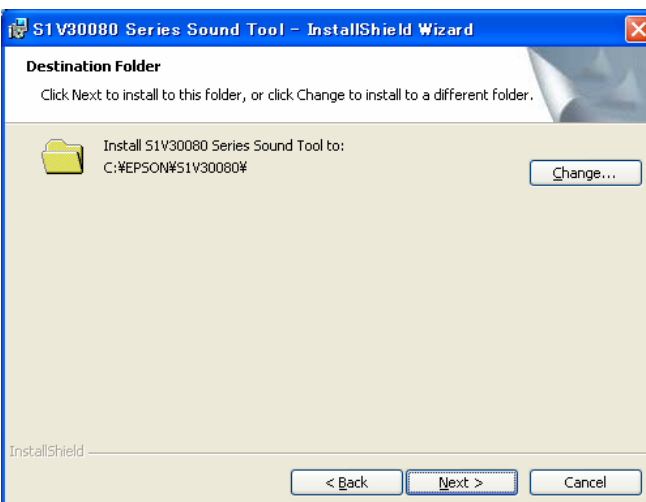
- (1) Start Windows.
(Exit any applications that are running.)
- (2) Decompress and view the ZIP file.
- (3) Double-click “setup.exe” to launch the installer.



- (4) Click the **Next** button in the S1V30080 Series Sound Tool InstallShield Wizard to proceed.

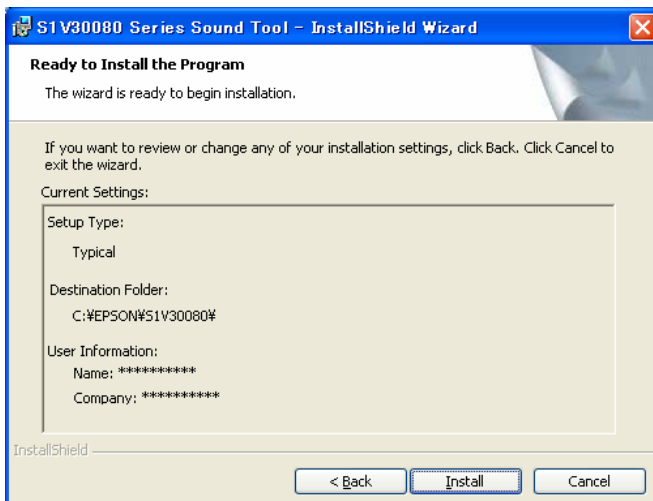


- (5) Check the user name and organization, and click the **Next** button to proceed.

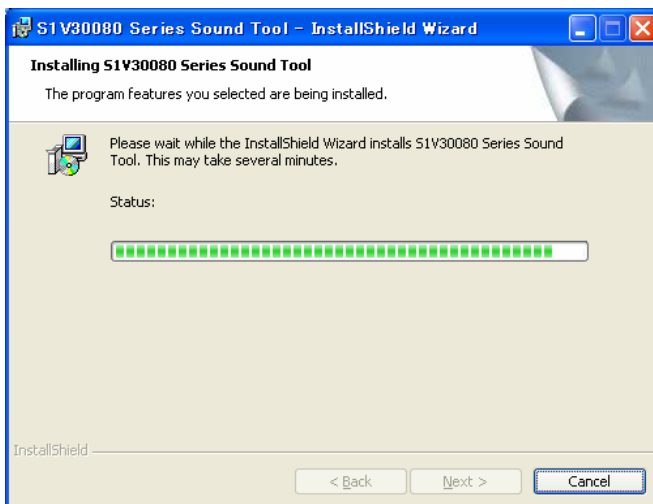


- (6) Check the installation location displayed. To change the installation location, click the **Change...** button to display the **Destination Folder** dialog box. To use the default installation location, click the **Next** button to proceed.

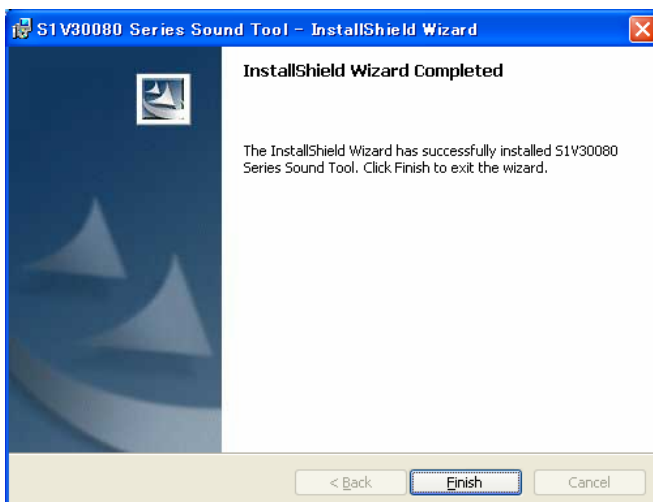
* In the **Destination Folder** dialog box, select the folder for installation from the list in the dialog box, or enter the folder path in the **Folder name** text box and click the **OK** button.



- (7) Preparations are now complete to install the program. To install with these parameters, click the **Install** button.



- (8) Installation starts.



- (9) Installation ends. Program launch icons are provided in the Start menu and on the desktop.

2. Creating a Simple Melody

2. Creating a Simple Melody

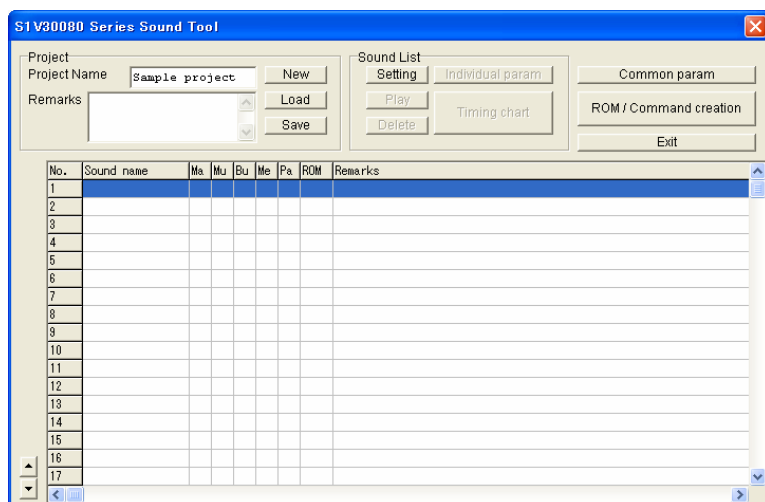
- (1) ROM/command creation by editing a melody
- (2) ROM/command creation by editing a buzzer/tone
- (3) ROM/command creation by loading audio (ERV file)
- (4) ROM/command creation using mixing editing

The various procedures are explained here.

2.1 ROM/command creation by editing a melody

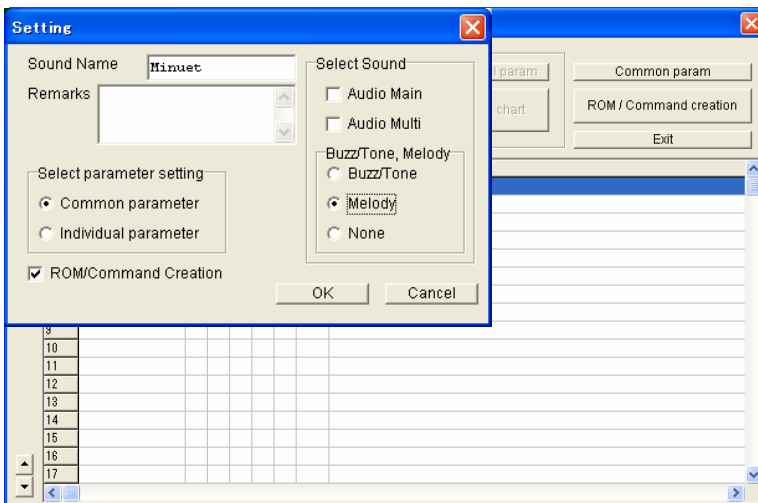
2.1.1 Melody creation

Launching the Sound Tool displays the **Sound list** dialog box. First, enter the project name and set the location in which to save it. The procedure is as shown below.



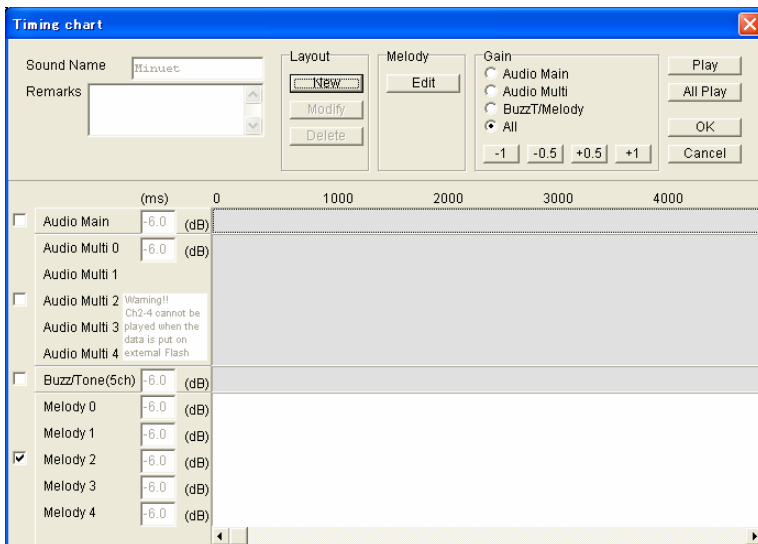
- (1) Launch the Sound Tool.
- (2) Click the **New** button in the dialog box displayed as shown on the left. Enter the name for **File name** in the directory specified for **Save in**, and click the **Save** button. Note that the file has not yet been created at this stage.
- (3) The name entered in (2) is displayed for **Project Name** as shown on the left.

2. Creating a Simple Melody



(4) Now click the **Setting** button. Enter a name for **Sound Name**. Here, we will enter “Minuet” for the melody used in this example.

(5) Here we will edit a melody, so click the **Melody** radio button and check **ROM/Command Creation**. Click **OK**.



(6) On returning to the previous dialog box, click the **Timing chart** button.

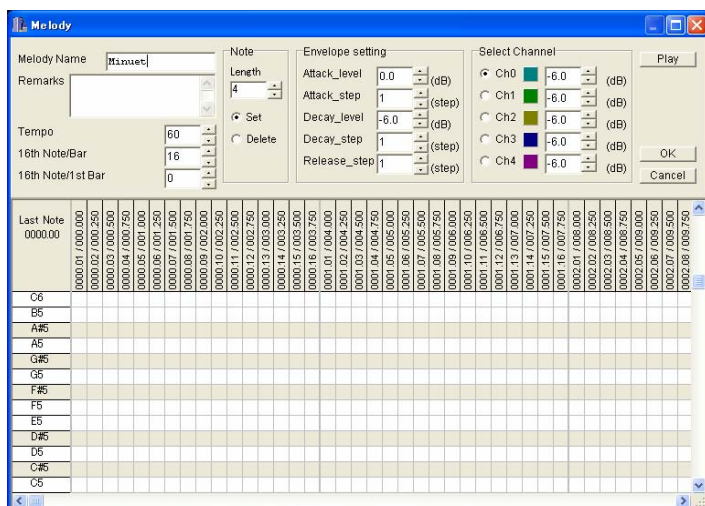
(7) Next click the **Edit** button at the top of the dialog box to proceed to the melody editing window.

2.1.2 Melody editing

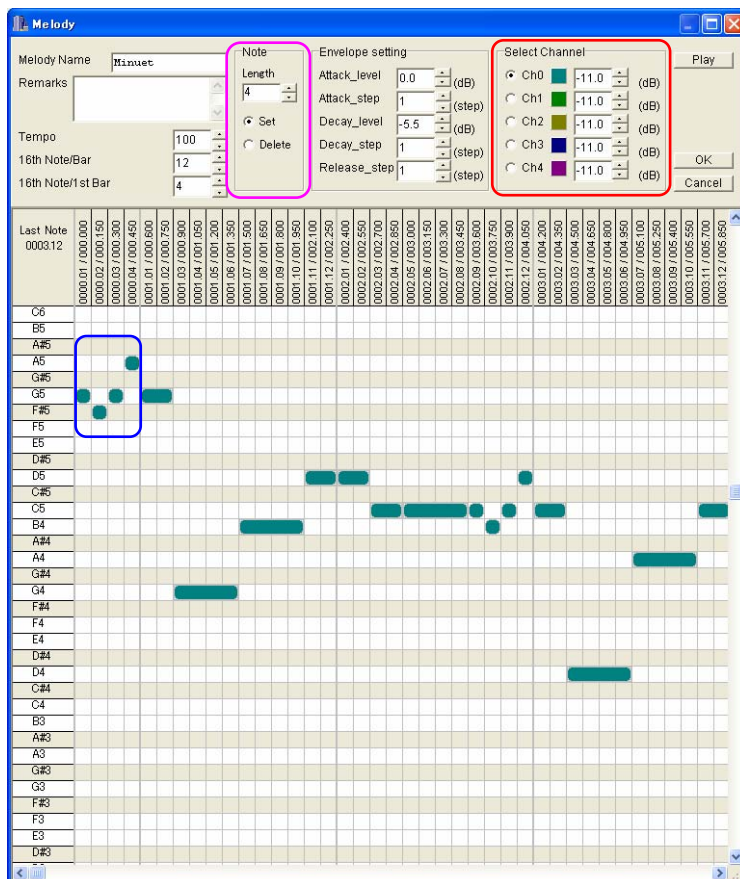
Here, notes can be entered to edit melodies and chords. The vertical axis (rows) represents pitch (up for high pitch and down for low pitch), and the horizontal axis (columns) represents the number of notes, bars, and time in sixteenth note units. Colored cells represent notes, with several cells joined together to represent sustained notes. There are five sound channels, allowing up to five notes to be sounded simultaneously. The channels can be distinguished using five different colors.

The melody “Minuet” used as a sample here is included in the sample project.

2. Creating a Simple Melody



- (1) A melody name can be entered in **Melody Name** on the left separately from the sound name.
- (2) **Tempo** can be set between 10 and 200. The melody tempo can be adjusted as desired.
- (3) **16th Note/Bar** allows the number of sixteenth notes per bar to be entered in the range 1 to 32. The shortest note available here is the sixteenth note.
- (4) **16th Note/1st Bar** allows the length of the first bar only to be altered. It can be used for upbeat melodies (melodies in which the first bar does not start on the first beat).

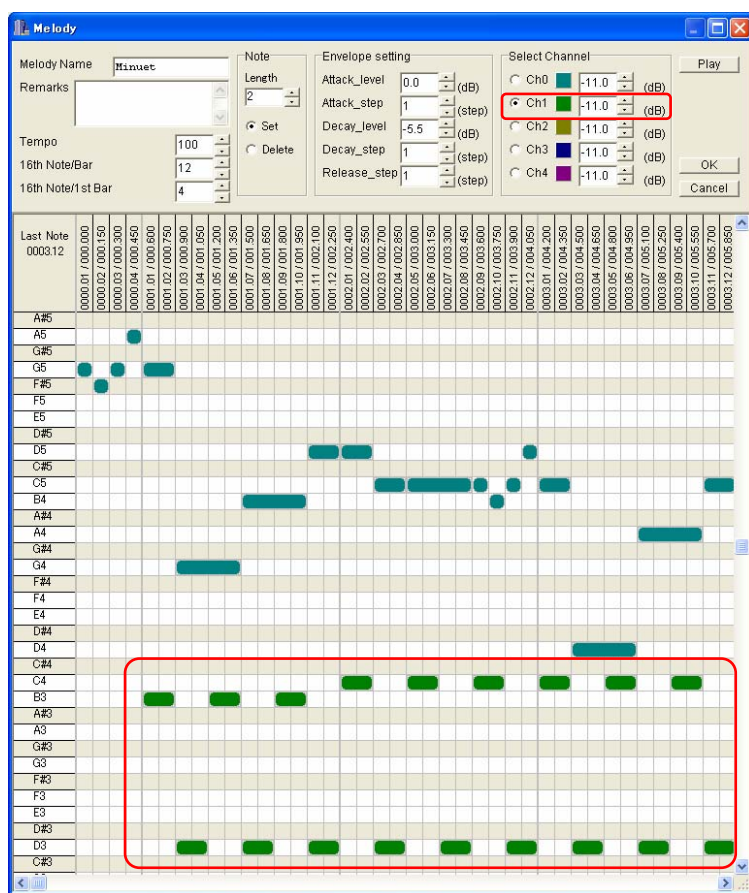


- (5) A minuet is three-four time, and so here we set **16th Note/Bar** to 12.
- (6) As the first bar starts with three beats, we set **16th Note/1st Bar** to 4, completing preparations for entering notes.
- (7) When entering notes, specify the note length using **Length**. The first note is an upbeat sixteenth note, so we set the **Length** to 1, and enter four notes with the radio button at **Set**, paying attention to the pitch.
- (8) To delete a note, set the note length to be deleted in **Length**, select the **Delete** radio button, and then click the note to be deleted.

Continue entering the melody (main theme) in the same way by setting **Length** appropriately.

- (9) We can now listen to the melody entered so far. Click the **Play** button at the top right to check the melody.

2. Creating a Simple Melody



(10) We will next enter the accompaniment. Change the channel selection to **Ch1** in **Select Channel**.

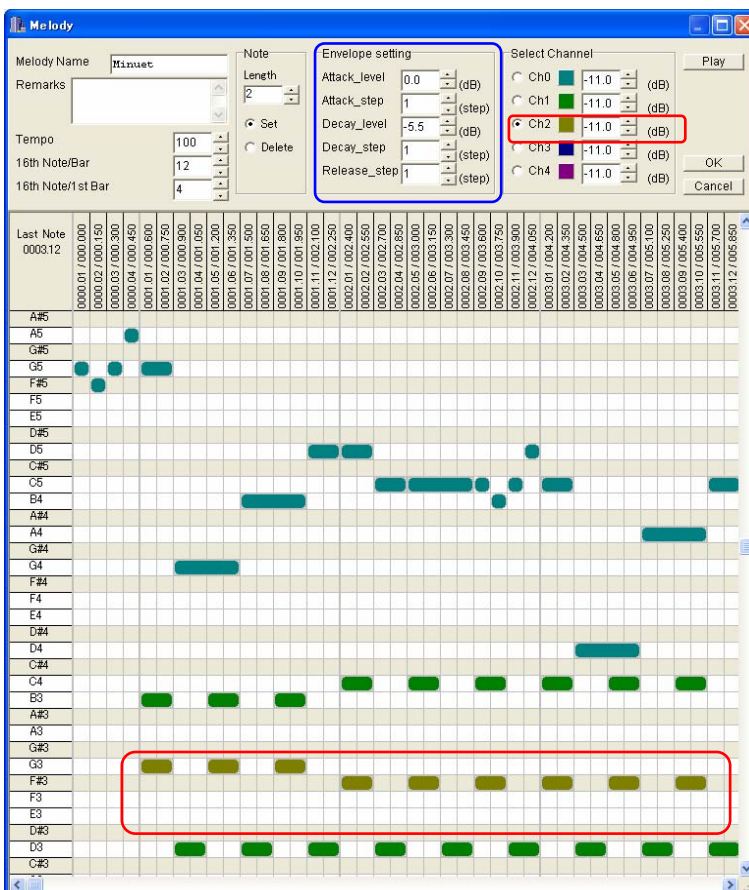
(11) The channel color can be selected as desired for identification by clicking the color box.

The volume can also be set individually for each channel. ^{Note 1}

(12) Enter high and low notes alternately in accordance with the code. These are the green cells.

(13) Click the **Play** button once again to check the melody.

Note 1: If the sound is distorted, lower the volume.



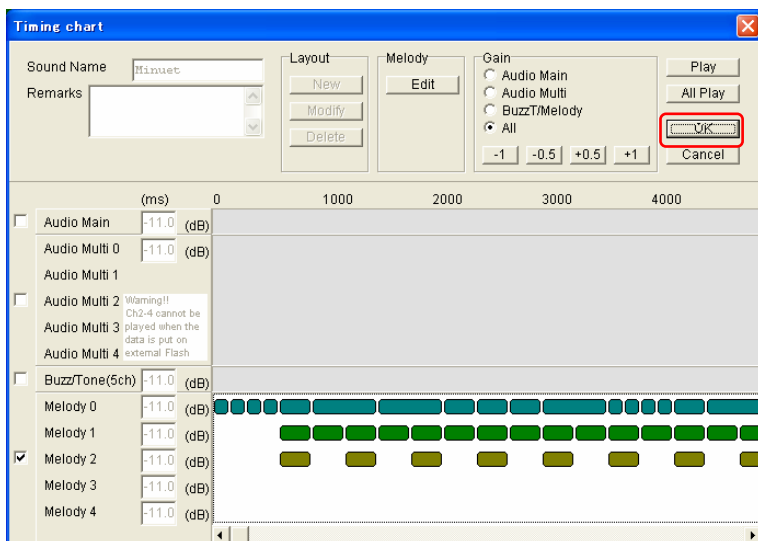
(14) The main theme and accompaniment have now been set, but adding a further channel adds depth to the melody to make it sound more attractive.

(15) Click the **Ch2** radio button in **Select Channel** and enter the notes in accordance with the code to produce attractive harmonies with Ch1. Note entry is now complete.

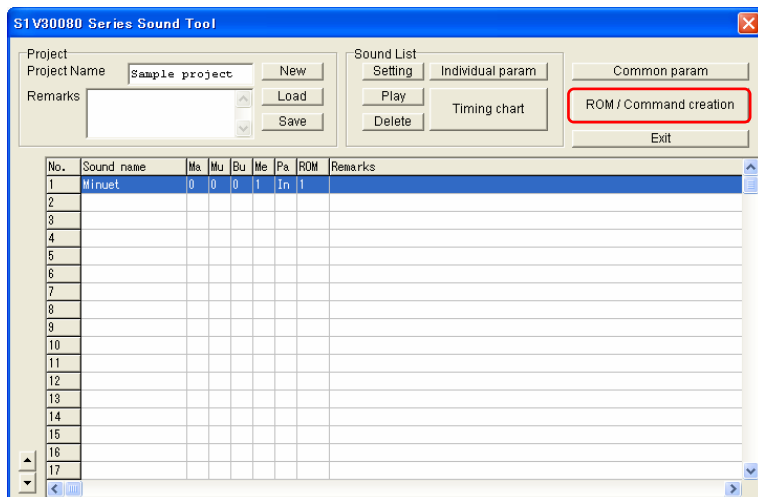
(16) The timbre can be altered using the **Envelope setting** enclosed in blue.

2. Creating a Simple Melody

2.1.3 Creating ROM/commands



(1) Once the melody has been created and checked, the next step is to create the ROM image. Click **OK** on returning to the Timing chart to return to the initial window.



(2) Click the **ROM/Command creation** button on the right.

2. Creating a Simple Melody

ROM / Command creation

[ROM] Image Size
☒ 256KB
☐ 512KB
☐ Flash ROM
Count Max : 255

[ROM] Present data size

	Count	Size(Byte)
Command	1	204
Audio	0	0
Total	1	236

Create Play Close

[ROM] Command [ROM] Audio Data [Host] Command

No.	SoundNo.	Data Type	PlayCount	Ena
1	1	Melody	1	1
2				
3				
4				
5				
6				
7				
8				
9				
10				

[ROM] Command details

Command No.
Sound No.
Play Count

Data Type
☐ Audio Main
☐ Audio Multi
☐ Buzz/Tone
☒ Melody

☒ [ROM] Enable
☐ [ROM] Disable

- (3) The size can be selected using the **[ROM] Image Size** radio buttons.
- (4) Here, we will create ROM/commands for the melody only, and so the table in the middle of the window shows “1” for **SoundNo.** and “Melody” for **Data Type**.
- (5) The **Play** button can be used here too to check the audio playback.^{Note 1} Once the melody has been checked, click the **Create** button in the middle to output the ROM image file, host command, and ROM image CSV file. Files are saved in the folder in which the project file was created.

Note 1: The playback may sound different here, as common parameters are used for playback. (Refer to Section 3.2.2, “Common parameters and Individual parameters.”)

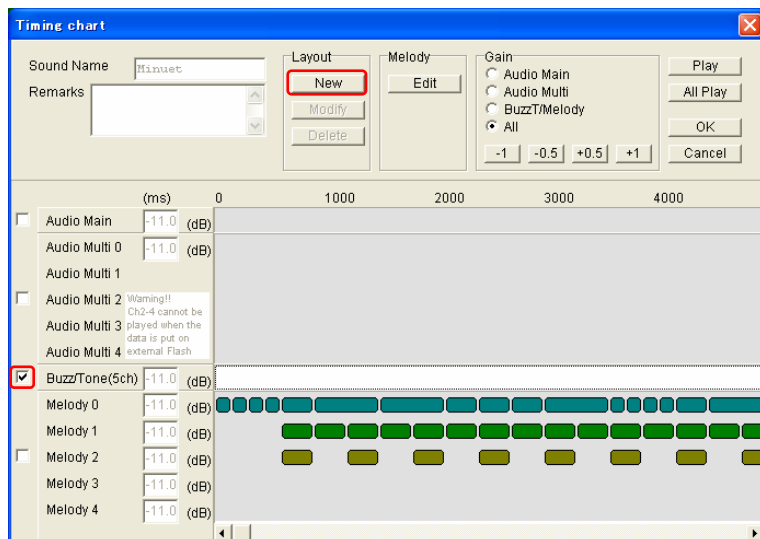
2. Creating a Simple Melody

2.2 ROM/command creation by editing a buzzer/tone

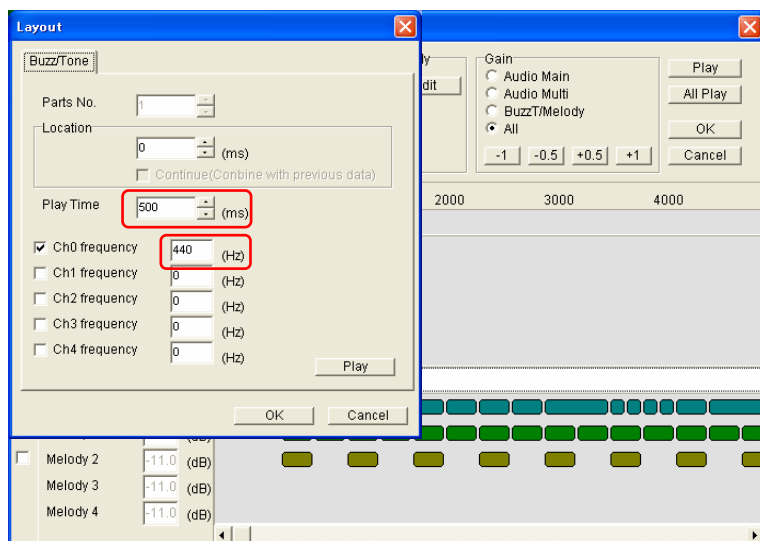
2.2.1 Creating a buzzer/tone

We will next create a buzzer/tone. Five channel frequencies can be combined for playback.

The buzzer/tone cannot be played back simultaneously with a melody, so one or the other should be selected here.



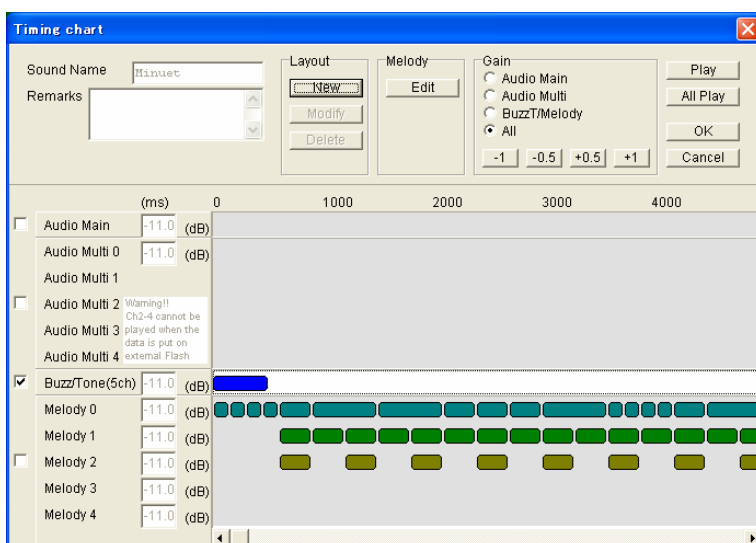
- (1) Return to the Timing chart.
- (2) Select the **Buzz/Tone (5ch)** check box, and click the **New** button in **Layout** with the buzzer/tone track selected.



- (3) The **Ch0** check box is selected by default, allowing the desired frequency to be entered and the timing for sounding the buzzer/tone to be entered for **Play Time**.
- (4) The **Play** button can be clicked here to check the sound. ^{Note 1}
- (5) It is also possible to create sounds by combining multiple channels here. If using multiple channels, check the corresponding check boxes and use the **Play** button to check the sound.

Note 1: If the sound is distorted, return to the **Timing chart** dialog box and reduce the **Gain** value.

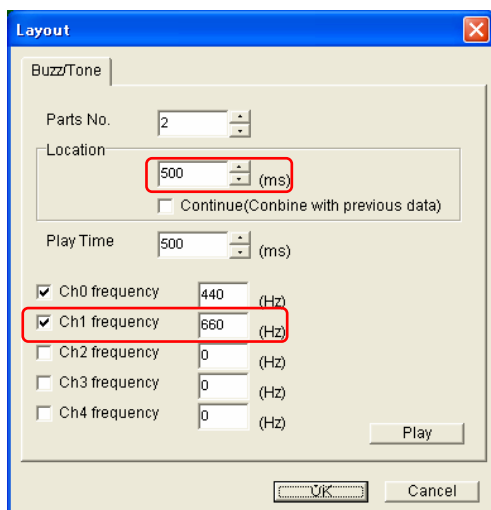
2. Creating a Simple Melody



(6) Once the sound has been checked, click the **OK** button.

(7) On returning to the Timing chart, the buzzer/tone created will be displayed on the Buzz/Tone track as blue cells.

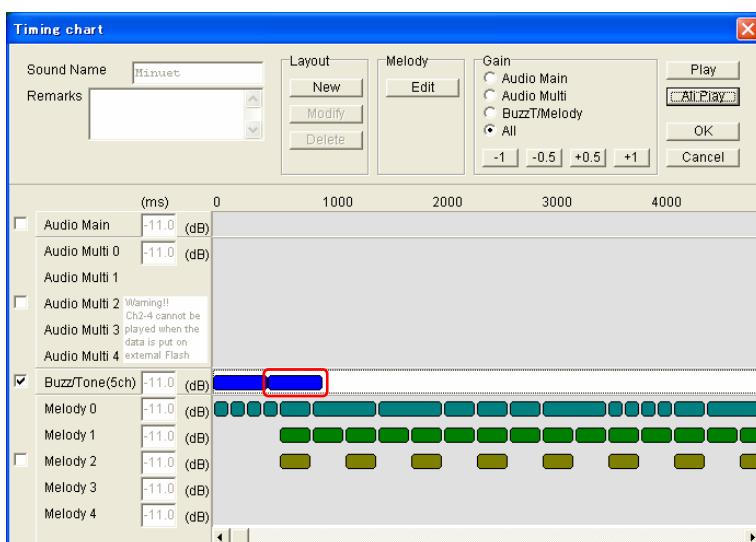
(8) To add more sounds, click the **New** button.



(9) The value 500 ms is already entered by default in **Location** for creation immediately after the buzzer/tone previously created. This should be altered if a gap is required. ^{Note 1}

(10) We will next combine a buzzer/tone by entering 660 for **Ch1**. Once the audio has been checked using the **Play** button, click the **OK** button.

Note 1: The interval between cells may be up to 1,000 ms.



(11) On returning to the Timing chart, the cells are added to the Buzz/Tone line.

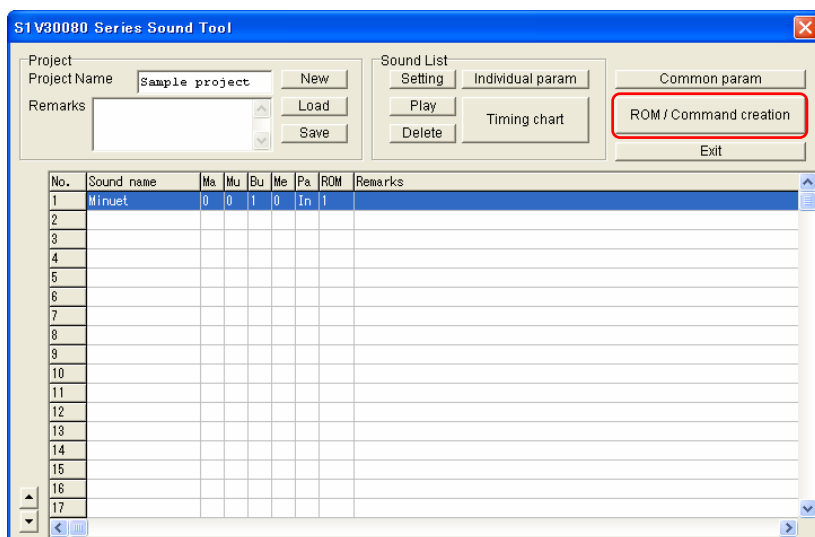
(12) To edit the buzzer/tone created, click and select the buzzer cell to be edited, and click the **Modify** button. It can then be modified on the Layout window.

(13) To delete a buzzer/tone, select the corresponding buzzer/tone cell in the same way, and then click the **Delete** button.

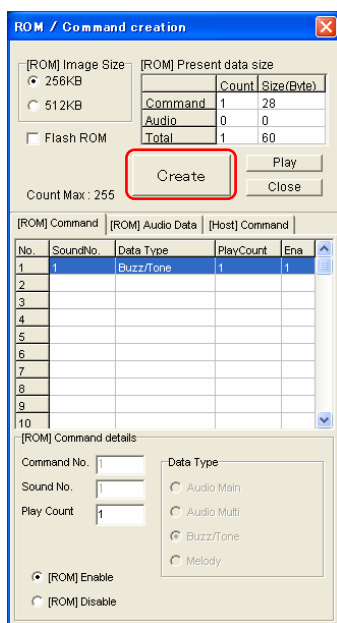
2. Creating a Simple Melody

2.2.2 ROM/command creation

We will now create a ROM/command for a buzzer/tone only.



- (1) Click the **ROM/Command creation** button on the right.



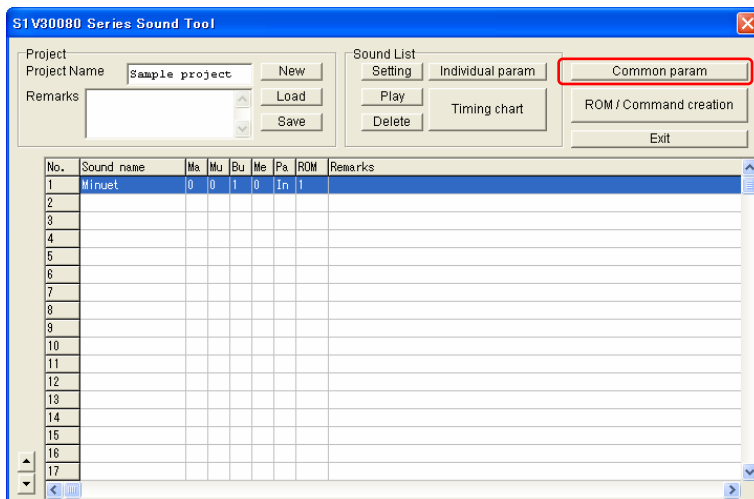
- (2) The ROM/Command creation window is displayed with “Buzz/Tone.” Sound can be checked here in the same way as when creating melodies.
- (3) After checking the sound, also check the ROM image size, and click the **Create** button here.
- (4) The ROM image file, host command, and ROM image CSV file are output to the folder in which the project file was created.

2.3 ROM/command creation by loading audio (ERV file)

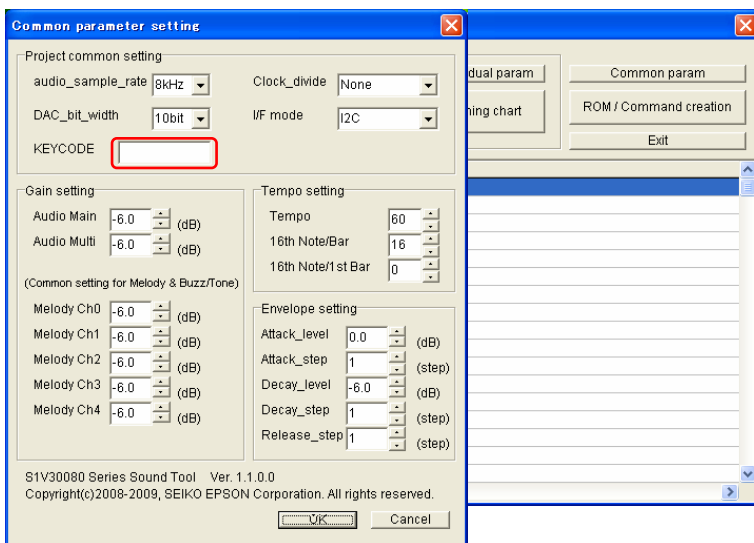
2.3.1 Loading and editing audio

ERV (Epson original format) files can be loaded, edited, and combined here. ERV files created using EPSON Speech IC Speech Guide Creation Tool Ver. 1.10 or later can be used here. An ERV file created beforehand set with a sampling rate of 8 kHz, quantization of 10 bits/sample should be prepared before proceeding with the procedures described below.

2. Creating a Simple Melody

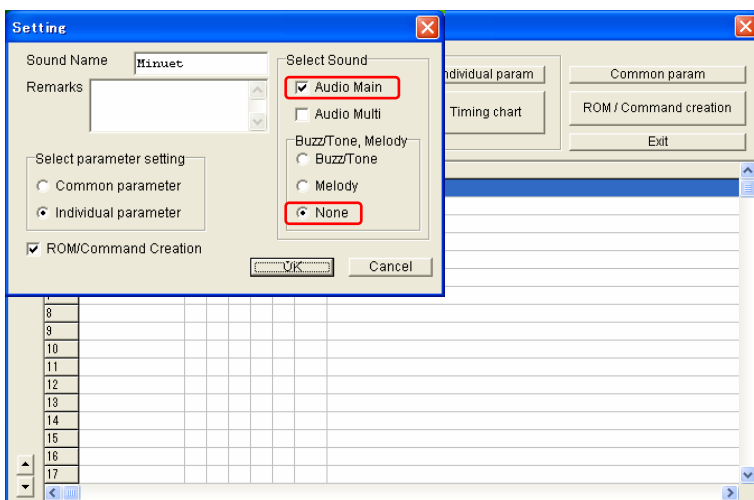


- (1) Before loading the audio, the keycode created for the audio must be registered.
- (2) Click **Common param** at the top right of the window shown on the left.



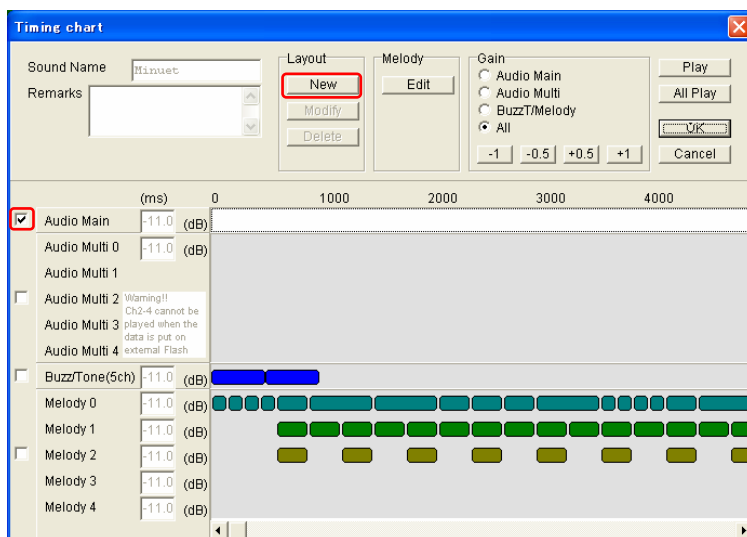
- (3) Enter the keycode set when the audio was created in the **KEYCODE** box in the Common parameter setting window. ^{Note 1}
- (4) Click **OK** to return to the original window.

Note 1: If a value is entered automatically, this can be used.

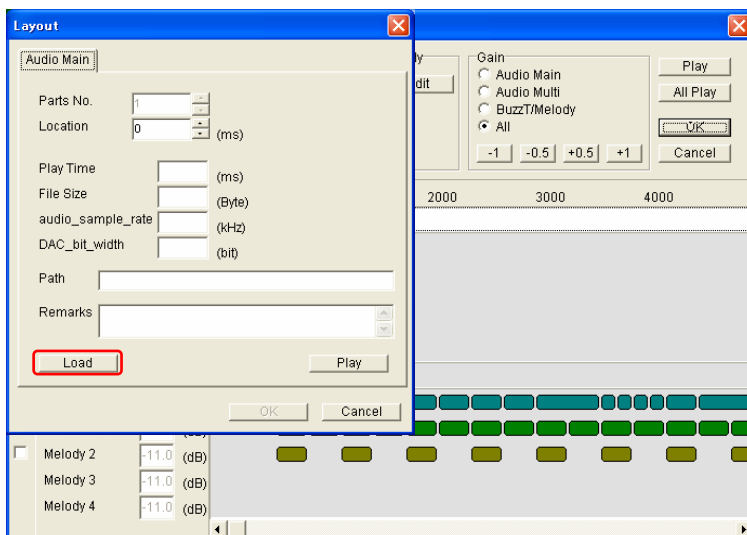


- (5) After returning to the original window, click the **Setting** button to display the window shown on the left.
- (6) Here, only audio is loaded, so select the **Audio Main** check box for **Select Sound**, and click the **None** radio button for the **Buzz/Tone, Melody** selection.
- (7) Click **OK**.

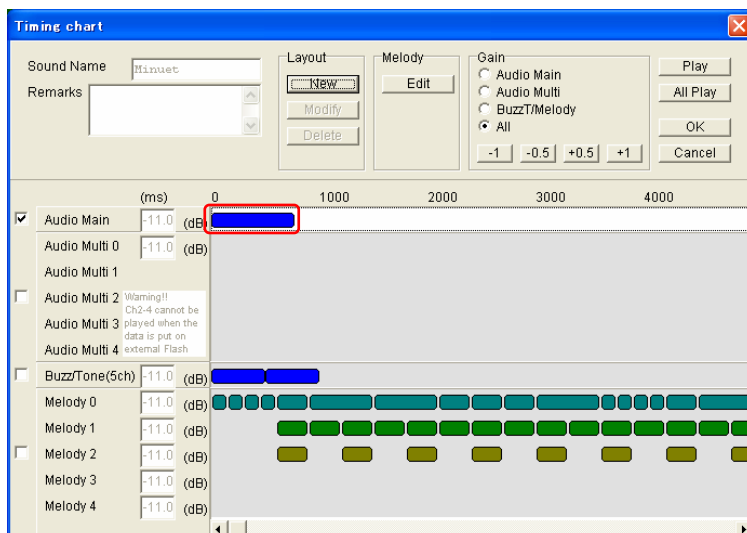
2. Creating a Simple Melody



- (8) Click the **Timing chart** button. Confirm that the **Audio Main** check box is selected on the left-hand side.
- (9) Next click the **New** button for loading audio to display the Layout window.

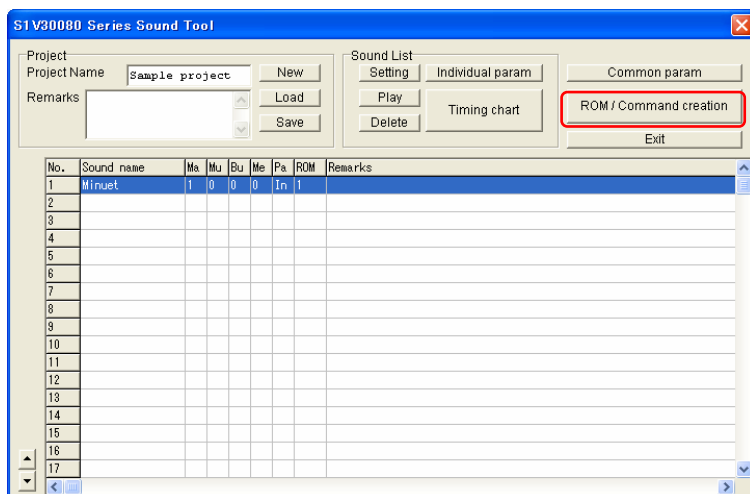


- (10) Load a previously created ERV file using the **Load** button at the bottom left of the Layout window.
- (11) The ERV file is loaded from the Audio file load window.
- (12) Check the audio for the ERV file loaded using the **Play** button, and click the **OK** button.

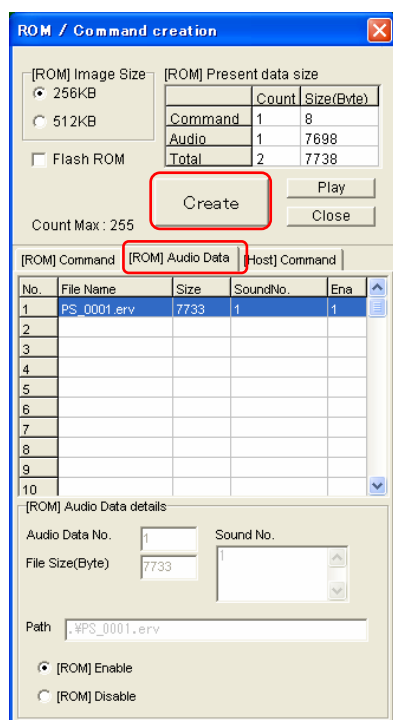


- (13) On returning to the Timing chart, the audio is displayed as cells on the **Audio Main** line.
- (14) Cells can be edited here in the same way as for buzzer/tones by clicking on the cell and clicking the **Modify** button. The **Location** value can be altered to adjust the timing at which the audio is inserted.

2.3.2 ROM/command creation



- (1) Click the **ROM/Command creation** button on the window shown on the left.

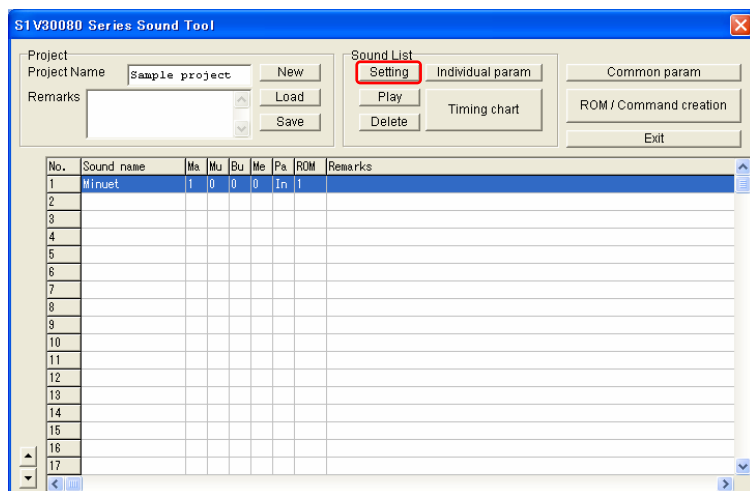


- (2) The ROM/Command creation window appears. Click the **Audio Data** tab in the middle of the table to display the ERV file name loaded. Sound can be checked here in the same way as when creating melodies or buzzer/tones.
- (3) After checking the sound, also check the ROM image size, and click the **Create** button here.
- (4) In the same way, the ROM image file, host command, and ROM image CSV file are also output to the folder in which the project file was created.

2. Creating a Simple Melody

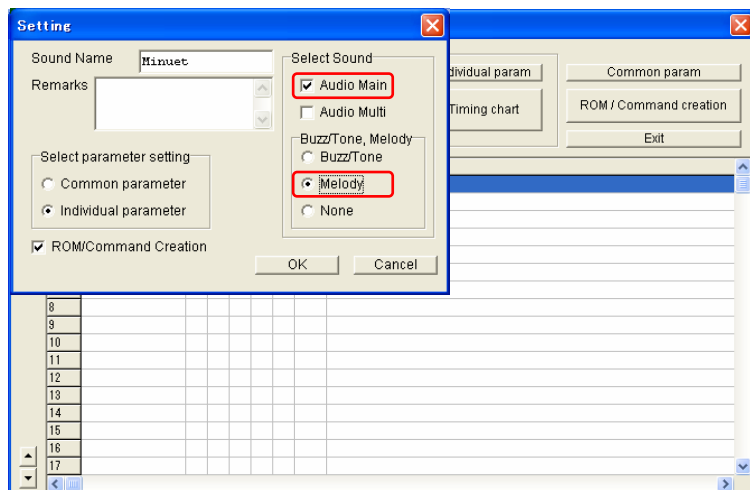
2.4 ROM/command creation using mixing editing

2.4.1 Mixing



(1) ROM/commands can be created by mixing audio and melodies simultaneously or alternately overlaying audio with buzzer/tones.

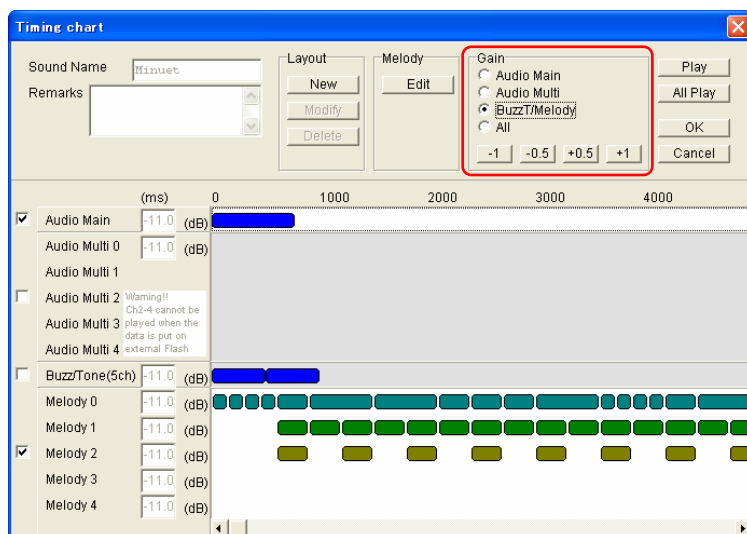
(2) First click the **Setting** button.



(3) Select the **Audio Main** check box in the Setting window, and click the **Melody** radio button.

(4) Click the **OK** button.

2. Creating a Simple Melody

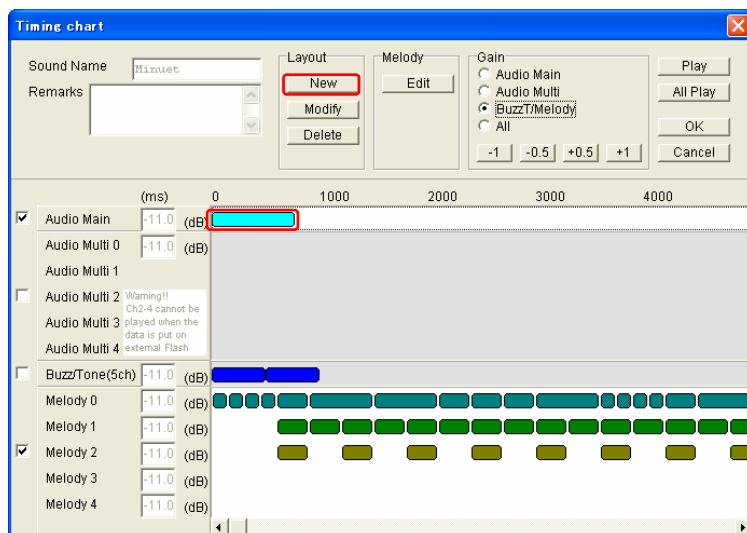


(5) Click the **Timing chart** button to check the timing chart while playing back the audio using the **All Play** button.

(6) Here, the audio and melody previously loaded are played back together.

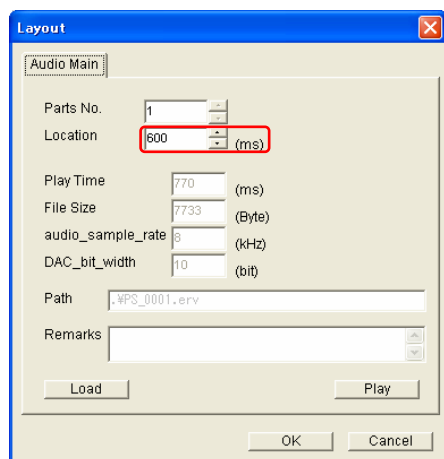
(7) The audio timing and gain can be adjusted while checking here.

(8) The volume can be adjusted by selecting the desired parts using the **Gain** radio buttons. Here, the melody volume is lower than for the audio, so click the **BuzzT/Melody** radio button and then click the **+1** button as required to increase the volume.



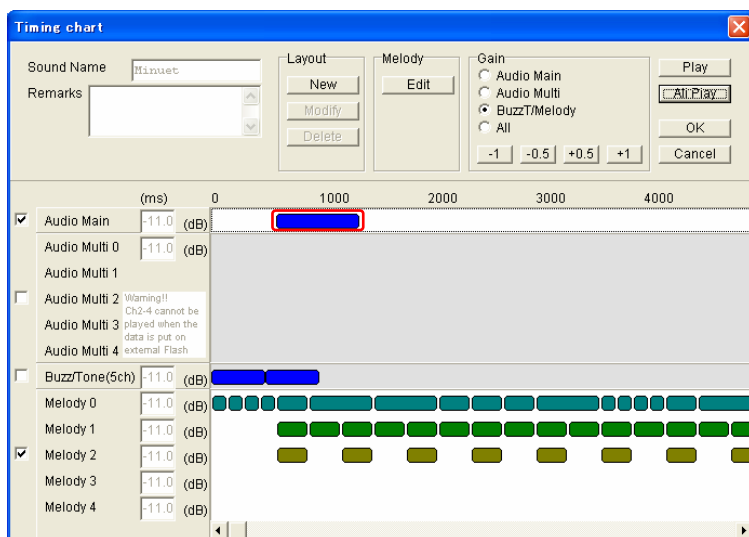
(9) We will next alter the audio start timing.

(10) The **Audio Main** cell previously loaded changes color when clicked and selected. Now click the **Modify** button.



(11) The audio start position can then be adjusted using **Location** in the Layout window shown on the left. Enter 600 here and click **OK**.

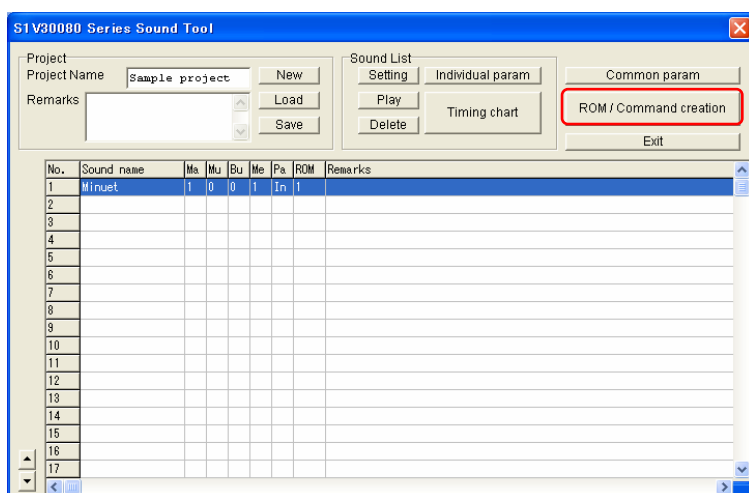
2. Creating a Simple Melody



(12) On returning to the Timing chart, the audio cell has moved to the right.

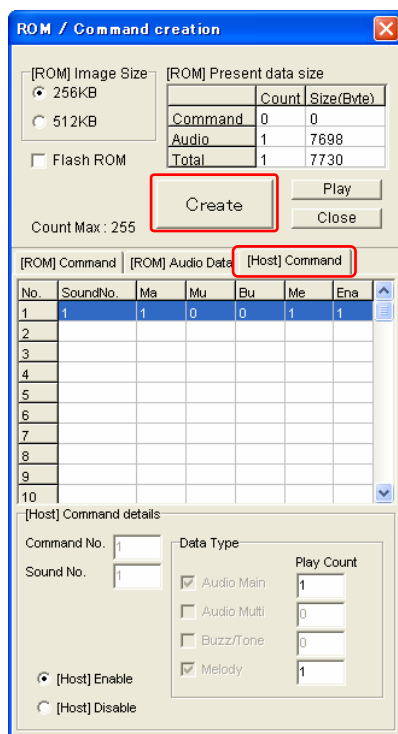
(13) Check the audio and melody timing using the **All Play** button.

2.4.2 ROM/command creation



(1) Once audio and melody mixing is finished, click the **ROM/Command creation** button on the window shown on the left.

2. Creating a Simple Melody



- (2) The ROM/Command creation window appears. Click the **Audio Data** tab in the middle of the table to display the ERV file name loaded.
- (3) The ERV file audio can be played back for checking.
- (4) To check the mixed audio, click the **Host Data** tab at the top right of the table. The audio is displayed as sound, and can be played back for checking.
- (5) Once the audio has been checked, click the **Create** button here.
- (6) In the same way, the ROM image file, host command, and ROM image CSV file are also output to the folder in which the project file was created.

3. Detailed Explanation

3. Detailed Explanation

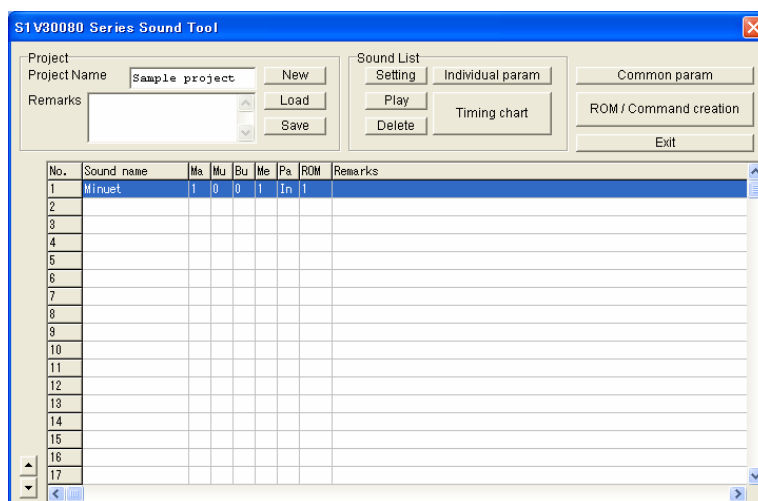
This section explains the details and precautions for using the Sound Tool for the different windows.

3.1 Window layout

The Sound Tool uses four main windows.

- Sound list window
- Timing chart window
- Melody editing window
- ROM/Command creation window

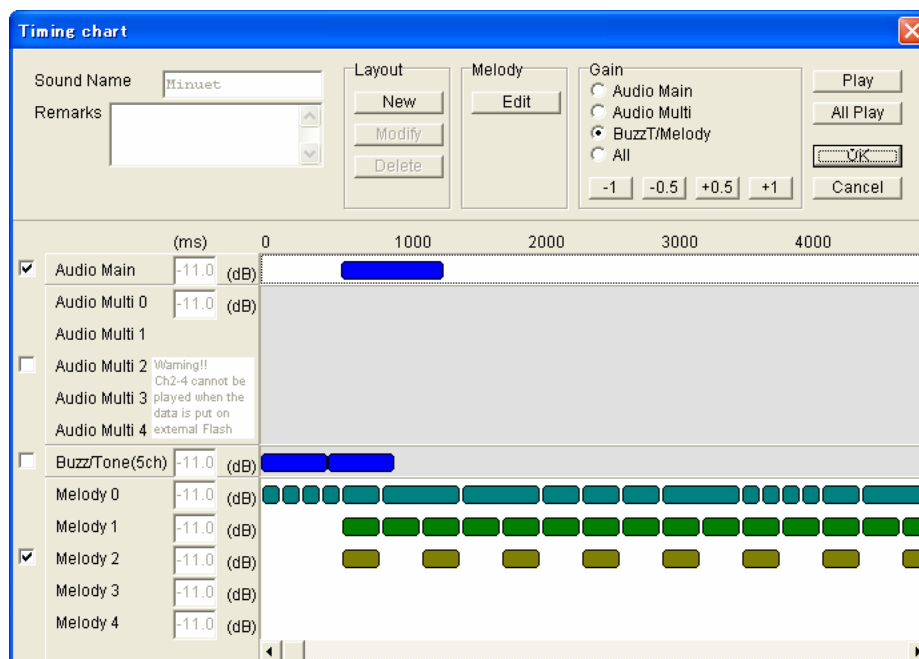
3.1.1 Sound list



[Overview]

- This is first displayed when the Sound Tool is launched.
- Allows a project to be created or changed.
- Displays the sound list.
- Allows common parameters to be set for the project.
- Allows the Sound Tool to be quit.

3.1.2 Timing chart

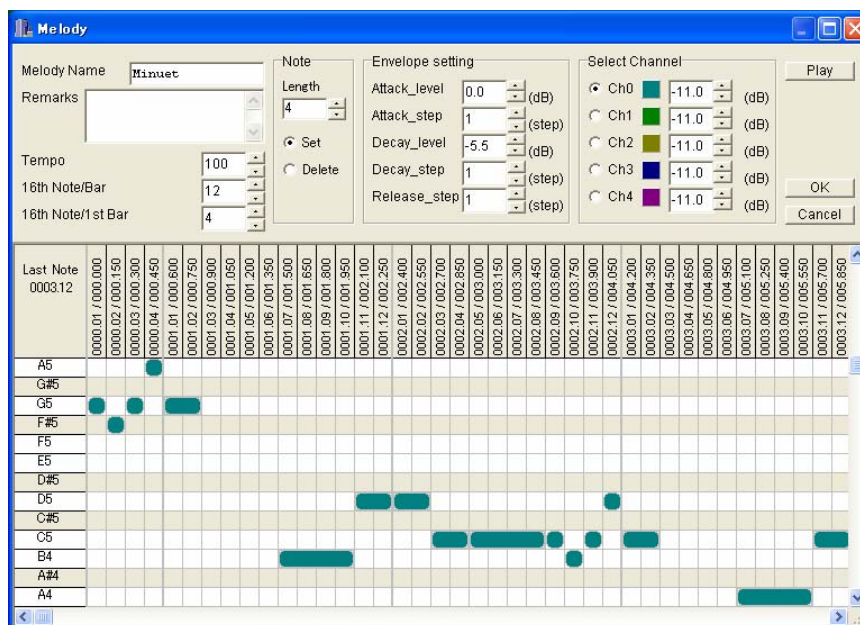


[Overview]

- This window is displayed by clicking the **Setting** button on the Sound list window.
- The playback timing is displayed as cells.
- The timing for various types can be viewed simultaneously.
- The actual audio can be played back for checking.
- The gain can be set for each type.

3. Detailed Explanation

3.1.3 Melody editing window



[Overview]

- Allows melodies to be created and edited.
- Allows the timbre to be altered using the envelope settings.
- Allows playback for checking.

3.1.4 ROM/command creation window

ROM / Command creation

[ROM] Image Size: ☒ 256KB ☐ 512KB ☐ Flash ROM

[ROM] Present data size

	Count	Size(Byte)
Command	0	0
Audio	1	7698
Total	1	7730

Count Max: 255

Create Play Close

[ROM] Command [ROM] Audio Data [Host] Command

No.	SoundNo.	Data Type	PlayCount	Ena
1				
2				
3				
4				
5				
6				
7				
8				
9				
10				

[ROM] Command details

Command No. Sound No. Play Count

Data Type

☐ Audio Main ☐ Audio Multi ☐ Buzz/Tone ☐ Melody

☐ [ROM] Enable ☐ [ROM] Disable

[Overview]

- Allows the creation of ROM images.
- Allows command data to be output as a C language source file.
- Allows the file information required for creating ROM images to be viewed.
- Allows playback for checking.

3. Detailed Explanation

3.2 Project settings

3.2.1 Common project settings

The following settings must be set initially with the Sound Tool. They are all related to system settings using the S1V30080. These are grouped as common project settings, as they are fixed values used within a project. The settings are described in more detail later.

- audio_sample_rate
- DAC_Bit_Width
- KEYCODE
- Clock_divide
- I/F mode

3.2.2 Common parameters and individual parameters

Settings other than the common project settings are parameters related to playback of individual sounds.

- Gain setting
- Tempo setting
- Envelope setting

These playback parameters are set for use by the Sound Tool. Two types of parameter sets are included as shown below.

- Common parameters
- Individual parameters

Either parameter set can be selected for use with each sound. This selection can also be changed later as necessary.

Individual parameters are a set of parameters that can be assigned individually to each sound. By contrast, common parameters are a set of parameters that apply to all sounds, and can be assigned to a single project only.

3.2.2.1 Common parameters

Common parameters form a single parameter set for a project. All sounds using the common parameters are played back using the same parameters.

3.2.2.2 Individual parameters

Individual parameters form a single parameter set assigned individually to each sound. Sounds using individual parameters allow the individual tempo, volume, and timbre to be set.

The initial individual parameters for newly created sounds are set using the copied common parameter values.

Values such as Gain settings displayed in the **Timing chart** and **Melody** dialog boxes are normally individual parameters.

3.2.2.3 Automatic switching from common parameters to individual parameters

Altering parameter settings such as Gain automatically switches the settings to use individual parameters even for sounds using common parameters. The changes are retained as individual parameters.

These can of course be reverted later to use common parameters. The individual parameters are still retained even in this case.

3.2.2.4 ROM/command creation

- Common parameters are incorporated in the ROM image when created in the **ROM/Command creation** dialog box.
- Individual parameters are created as commands, and are not included in the ROM image. Settings are transmitted from the host using commands when playing back using the S1V30080.

The parameter types used for sound playback on the three tabs in the **ROM/Command creation** dialog box are as shown below.

- [ROM] Command
When sounds are played back on this tab, they will normally be played back using the common parameters, even if individual parameters are selected.^{Note 1}
- [ROM] Audio Data
Playing back ERV files on this tab plays them back unchanged.
- [Host] Command
When sounds are played back on this tab, they will be played back using the common parameters if common parameters are selected, and using individual parameters if individual parameters are selected.

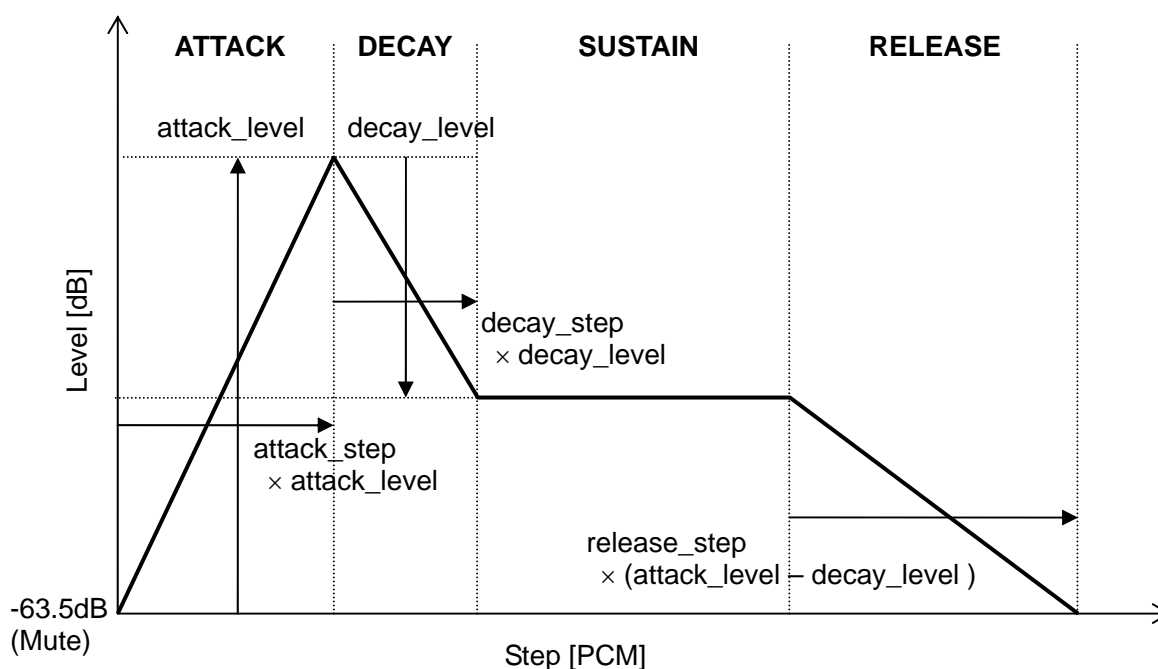
Note 1: [ROM] Command is a memory storage command as described in the *S1V30080 Series Message Protocol Specification*. Memory storage commands are simulated in the Sound Tool, as they are usually played back using common parameters in standalone mode.

3. Detailed Explanation

3.2.3 Envelope setting

The envelope is the envelope enclosing the waveform. The envelope is made up of Attack, Decay, Sustain, and Release parts. The timbre can be modified by altering these parameters. The following values can be set for the S1V30080.

- tempo: Number of quarter notes per minute. Example: ♩=60/min gives a length of 250 ms for sixteenth notes.
- attack_level: Attack level value
- attack_step: The number of PCM samples necessary for a 0.5 dB increase during the Attack phase
- decay_level: The level for decay from the attack level
- decay_step: The number of PCM samples necessary for a 0.5 dB decrease during the Decay phase
- release_step: The number of PCM samples necessary for a 0.5 dB decrease during the Release phase



The envelope is applied for each sixteenth note. (If the continuation bit is set to 1 for the file_event structure, the envelope will be applied to the notes set with an extended Sustain phase.) Playback will not therefore be possible as desired if envelope values are set exceeding the sixteenth note PCM sample number, as the number of PCM samples will become saturated. Values should be set to satisfy the equation below.

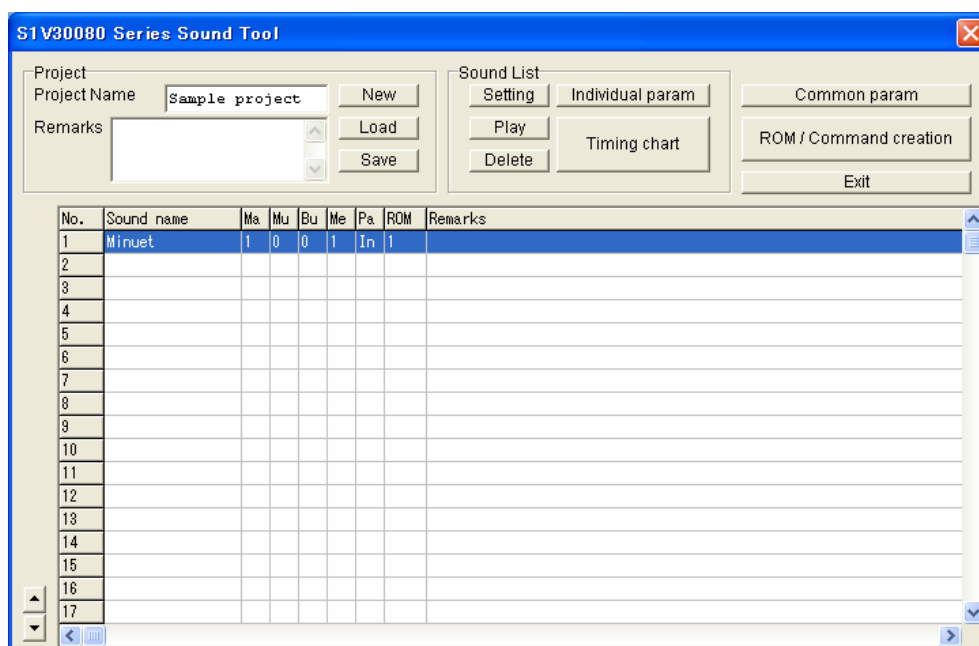
$$\begin{aligned} & f_s [\text{Hz}] \times (60/\text{tempo}) \times (1/4) \\ & > (\text{attack_step} \times \text{attack_level}) \\ & \quad + (\text{decay_step} \times \text{decay_level}) \\ & \quad + (\text{release_step} \times (\text{attack_level} - \text{decay_level})) \end{aligned}$$

The output volume of the S1V30080 depends on the envelope value set by ISC_SYNTHESIZER_MELODY_CONFIG_REQ added to the value (dB) set by ISC_AUDIO_CONFIG_REQ or ISC_AUDIO_VOLUME_REQ.

The next section describes the various windows (dialog boxes) in more detail.

3.3 Sound list dialog box details

- This is displayed when the program is launched.
- It is used for creating new projects, and loading and saving projects.
- The sounds registered for the project are displayed as a list.
- The common and individual parameters can be set for each sound.
- The "ERV_List.csv" file outputted from EPSON Speech IC Speech Guide Creation Tool can be imported.
- The Timing chart window can be displayed from this window.
- The ROM/Command creation window can be displayed from this window.



3. Detailed Explanation

3.3.1 Project

3.3.1.1 Project Name

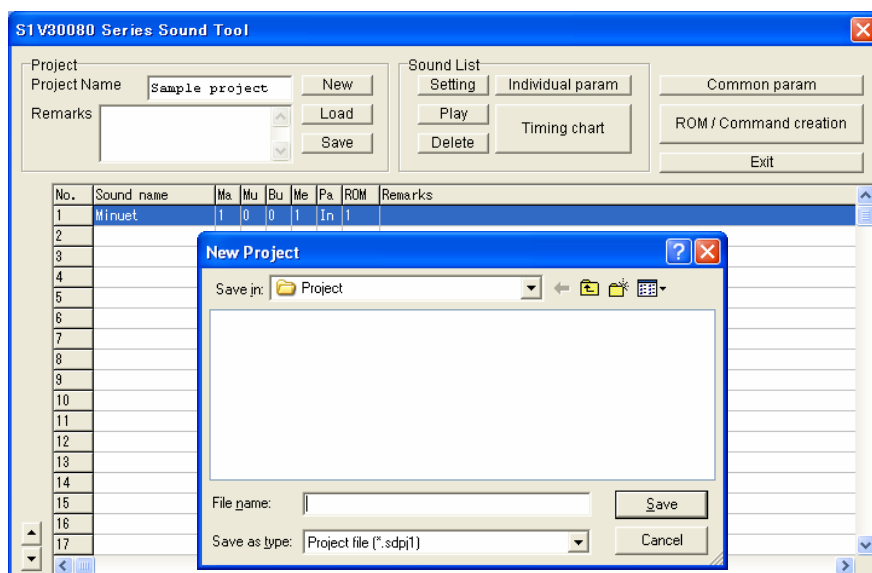
The Project Name can be displayed with up to 16 characters. The project file name appears when a new project is created, but this can be changed to any desired name.

3.3.1.2 Remarks

Remarks can be added. A maximum of 250 characters are permitted.

3.3.1.3 New button

This opens the **New Project** dialog box.



- Enter the file name to create the project.
- Project files have the file extension “sdpj1.”

3.3.1.4 Load button

This opens the **Open project** dialog box. This is used to select and load project files.

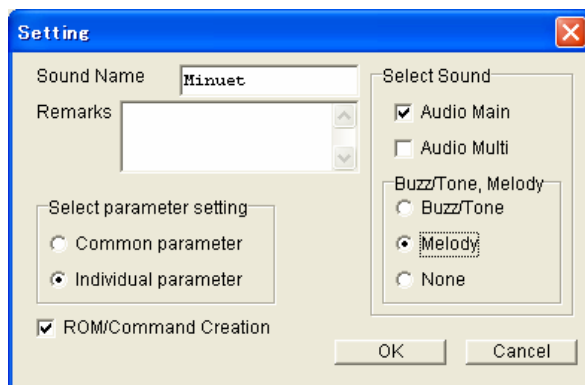
3.3.1.5 Save button

This opens the **Save project** dialog box. This is used to specify and save a file name.

3.3.2 Sound List

3.3.2.1 Setting button

- Selecting a sound list and clicking the **Setting** button opens the **Setting** dialog box.
- To register a new sound, select a blank line and click the **Setting** button.



- **Sound Name**
Enter a sound name. The sound name can be up to 16 characters long.
- **Remarks**
Remarks can be added. A maximum of 250 characters are permitted.
- **Select parameter setting**
 - Selecting the **Common parameter** radio button plays back the sound using the common parameters.
 - Selecting the **Individual parameter** radio button plays back the sound using the individual parameters.
- **ROM/Command Creation**
Selecting this check box adds the sound to the list of candidates when the **ROM/Command creation** button is clicked.
Deselecting this check box does not affect the sound when the **ROM/Command creation** button is clicked.
- **Select Sound**
Selects the type used with this sound. The **Timing chart** and other buttons are disabled if none is checked and **None** is selected.
Melody and buzzer/tone cannot be selected at the same time with the S1V30080.
Sounds with multiple types selected here are not affected by commands (memory storage commands) stored in the ROM when the **ROM/Command creation** button is clicked. For more details, refer to Section 3.6, "ROM/Command creation dialog box details."
- **OK / Cancel**
Click the **OK** button to complete the setting procedure.
Click the **Cancel** button to abort the setting procedure.

3. Detailed Explanation

3.3.2.2 Play

Plays back the sound selected.

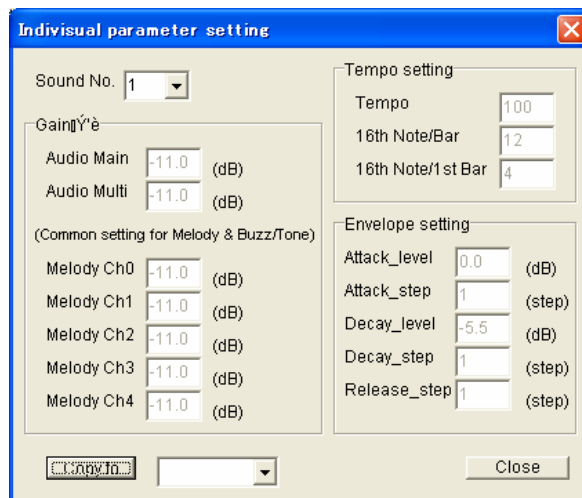


3.3.2.3 Delete

Deletes the sounds selected.

3.3.2.4 Individual parameter setting

- This button is enabled when individual parameters are set for the parameters used. For details of the parameters displayed, refer to the “Common parameter setting” section.



- Sound No.
Displays the sound number. The individual parameters can also be displayed for other sounds.
- Copy →
The parameters displayed here can be copied for use with other sounds. The parameters displayed here can also be used as common parameters. The copy destination can be selected as common or other sound numbers.
- Close
Exits the individual parameter display.

3.3.2.5 Timing chart

This opens the Timing chart window for the sound selected.

The Timing chart window is described in more detail in “Timing chart dialog box details.”

3.3.2.6 "ERV_List.csv"(Sentences) importing

The "ERV_List.csv" file outputted from EPSON Speech IC Speech Guide Creation Tool can be imported. It is efficient to import voice guidance sentences combined by phrases.

EPSON Speech IC Speech Guide Creation Tool generates "ERV_List.csv" file at the same folder as ERV files. This file has the combining information of sentences and phrases.

Sound tool imports a sentence as a sound, respectively. It is added to a sound list. The information on the combination of ERV files is taken into an Audio Main track. Importing is not performed when a project does not exist.

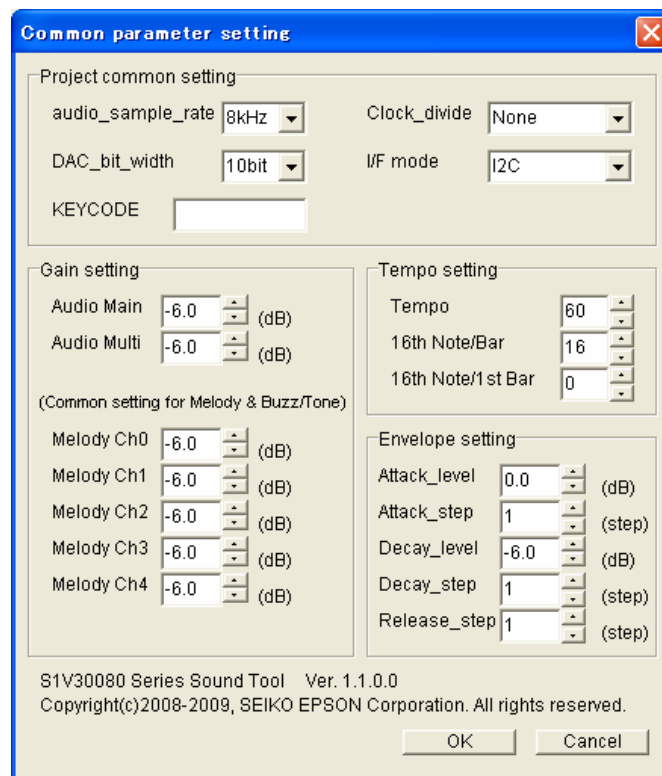
- The folder which has a "ERV_List.csv" file is opened by Explorer, and "ERV_List.csv" file can be imported by drags and drops to a sound list dialog.
- Each information in a "ERV_List.csv" file is imported as follows.
 - Sentence ID Sound name
 - Sentence Remarks
 - Delay Location
 - Phrase ID ERV file name
 - Phrase Remarks (at Layout dialog)
- Setup used for Setting dialog is as follows.
 - Select parameter setting Common parameter
 - ROM/Command Creation Checked (at ROM/Command Creation CheckBox)
 - Select Sound Checked (at Audio Main CheckBox)

3.3.3 Common parameter setting, ROM/Command creation, Exit

3.3.3.1 Common parameter setting

- This opens the Common parameter setting window.
- For more information about individual parameters, refer to the *S1V30080 Series Message Protocol Specification*.

3. Detailed Explanation



- **audio_sample_rate**
This selects the audio sampling frequency from a choice of 4, 8, 12, or 16 kHz.
- **DAC_Bit_Width**
Selects the DAC bit width as either 8 or 10 bits. Select 10 bits when using the S1V30080 external serial flash memory.
- **KEYCODE**
 - The Keycode is the unique 8-digit hexadecimal code provided to the customer by Epson Sales staff. This is required for playing back audio files (ERV files). (Example keycode: 1234ABCD) If uncertain about the keycode, please contact your Epson representative or Epson Sales staff.
 - If this box is empty, it means that the keycode has not been set.

- If the folder containing the Sound.exe program run file also contains a text file named keycode.txt, the keycode contained in the file will automatically be imported.
- The keycode is also contained in the project (*.sdpj1) file. The keycode may therefore be displayed when the project is loaded, even if the keycode.txt file does not exist. In this case, the project file keycode takes priority.
- Clock_divide
Sets the system clock division ratio. Select from a choice of none, 2, 4, and 8. The default selection is "None."
- I/F mode
Sets the host I/F type. Select from a choice of SPI, I2C, Standalone1, and Standalone2. The default selection is I2C.
- Gain setting
Sets the gain for each channel. This can be set between a maximum of 0 dB and minimum of -63 dB in 0.5 dB steps. Volume is disabled when Mute is selected. The default selection is -6.0 dB. Melody and Buzzer/tone cannot be selected at the same time, and the gain setting applies to both.
- Tempo
This sets the tempo. Sets the value n for the beat with n quarter notes per minute.
Minimum tempo = 10/min, maximum tempo = 200/min in intervals of 10.
Example: Tempo = 60/min gives a length of 250 ms for sixteenth notes.
- 16th Note/Bar
Specifies the number of sixteenth notes per bar.
Maximum 32, minimum 1, default 16
Example 1: 16 for four-four time.
Example 2: 24 for three-two time.
- 16th Note/1st Bar
Specifies the number of sixteenth notes per bar for the first bar.
Maximum 32, minimum 1, default 0
This is set for upbeat melodies in which the first bar does not start on the first beat.
- Envelope setting
This sets the envelope. For more information about envelope settings, refer to Section 3.2.3, "Envelope setting."
 - Attack level
Attack level value
Minimum -32 dB, maximum 0 dB (in 0.5 dB steps), default 0 dB
 - Attack step
The number of PCM samples necessary for a 0.5 dB increase during the Attack phase
Minimum 1 step, maximum 127 steps, default 1 step
 - Decay level
The level for decay from the attack level
Minimum -63.5 dB, maximum 0.5 dB (in 0.5 dB steps), default -6 dB

3. Detailed Explanation

- Decay step

The number of PCM samples necessary for a 0.5 dB decrease during the Decay phase

Minimum 1 step, maximum 127 steps, default 1 step

- Release step

The number of PCM samples necessary for a 0.5 dB decrease during the Release phase

Minimum 1 step, maximum 127 steps, default 1 step

3.3.3.2 ROM/Command creation

This opens the ROM/Command creation window.

The ROM/Command creation window is described in more detail in the Timing chart window section.

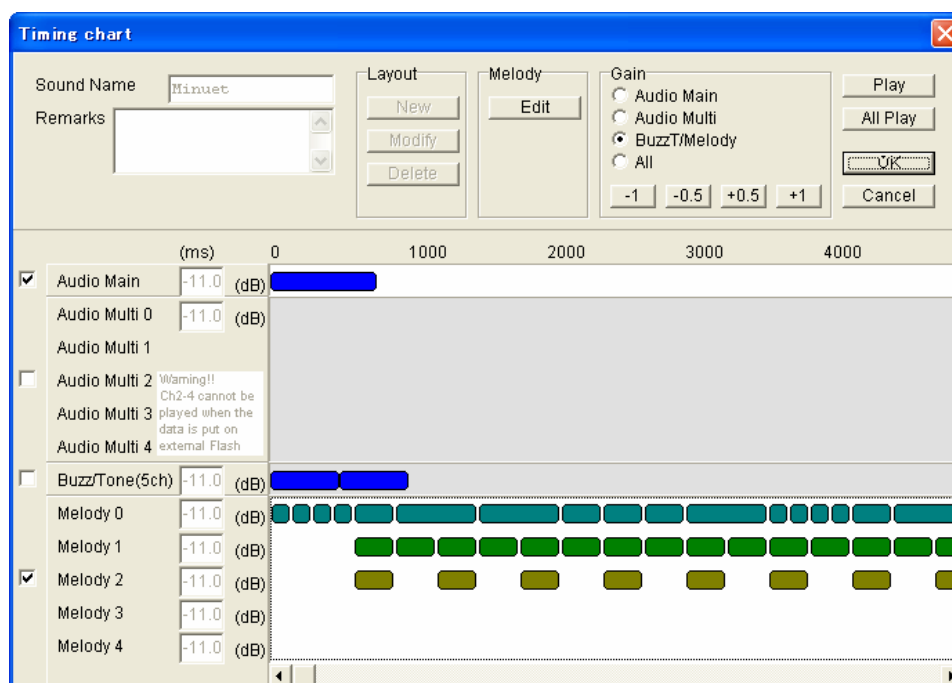
3.3.3.3 Exit

Exits.

3.4 Timing chart dialog box details

Sound List → Timing chart

- Displays the individual sound components and allows the components to be created and edited.



3.4.1 Sound

- Sound Name**
 Displays the sound name.
- Remarks**
 Remarks can be added. A maximum of 120 characters are permitted.
- Track**
 - Displays the separate tracks for Audio Main, Audio Multi, Buzz/Tone, and Melody.
 - There are check boxes for each sound type set, for setting whether corresponding sound types exist.
 - New, Modify, and Delete can be used on the track selected. Using the **Edit** button for the Melody track opens the **Melody** dialog box, regardless of whether other tracks are selected.
- Play**
 Plays back the track selected.
- All Play**
 Plays back all tracks simultaneously.
- OK/Cancel**
 Quits this window. If **OK** is clicked, the settings are retained, but if **Cancel** is clicked, the settings are discarded.

3. Detailed Explanation

3.4.2 Layout

3.4.2.1 New, Modify (Audio Main)

- Selecting the Audio Main track and clicking the **New** button allows a new Audio Main track to be added.
- Cells already existing on the track can be edited by selecting with the mouse and clicking the **Modify** button.

The screenshot shows a 'Layout' dialog box with a blue title bar and a close button. The 'Audio Main' tab is selected. The dialog contains the following fields and controls:

- Parts No.**: A numeric input field with the value '2' and a small up/down arrow.
- Location**: A numeric input field with the value '770' and a small up/down arrow, followed by '(ms)'.
- Play Time**: An empty numeric input field followed by '(ms)'.
- File Size**: An empty numeric input field followed by '(Byte)'.
- audio_sample_rate**: An empty numeric input field followed by '(kHz)'.
- DAC_bit_width**: An empty numeric input field followed by '(bit)'.
- Path**: A text input field.
- Remarks**: A text area with up/down scroll arrows.
- Buttons**: 'Load', 'Play', 'OK', and 'Cancel' buttons at the bottom.

- **Parts No.**
 - Displays the part numbers within the Layout window. The numbers are assigned automatically.
 - Parts No. cannot be altered if the **New** button was used to start editing.
 - Parts No. can be altered if the **Modify** button was used to start editing.
- **Location**

Specifies the time from the start. The Location value can be set to ensure that it does not overlap neighboring cells. The maximum range is +1,000 ms from the end of the previous cell. The interval between cells must not exceed 1,000 ms.
- **Play Time**

This displays the ERV file playback time. Units: ms.
- **File Size**

This displays the ERV file size. Units: bytes.
- **audio_sample_rate**

This displays the ERV file sampling frequency. Units: kHz.

- Bit Width

This displays the ERV file bit width. 8 bits or 10 bits.

10 bits should be selected if the ERV file quantization bit is set to “8F bit/sample” with EPSON Speech IC Speech Guide Creation Tool Ver 1.10 or later. For more information, refer to the *S1V30080 Series Evaluation Kit Start Guide*.

- Path

This displays the ERV file path.

- Comment

Displays comment information stored inside the ERV file. Comment information may be up to 512 bytes long, but only 120 bytes can be displayed. Comments can also be edited. (Does not affect the comment information inside the ERV file.)

- Load

This opens the Audio (ERV file) load window.

- Play

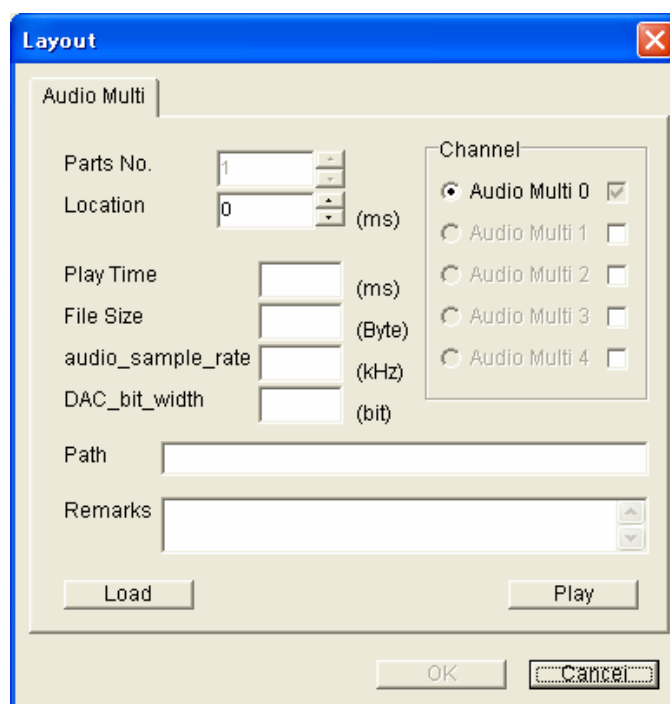
Plays back the audio (ERV file).

- OK/Cancel

Quits this window. If **OK** is clicked, the settings are retained, but if **Cancel** is clicked, the settings are discarded.

3.4.2.2 New, Modify (Audio Multi)

- Selecting the Audio Multi track and clicking the **New** button allows a new Audio Multi track to be added.
- Cells already existing on the track can be edited by selecting with the mouse and clicking the **Modify** button.



3. Detailed Explanation

- Channel
 - Up to five channels can be set (Audio Multi 0 to 4).
 - Audio Multi 0 cannot be disabled.
 - Audio Multi 1 to 4 can be selected after the Audio Multi 0 part has been created. The order of Audio Multi 1 to 4 is not related to the order in which they are created.
- Parts No.

Same as for New, Modify (Audio Main).
- Location

Same as for New, Modify (Audio Main).
- Play Time

This displays the ERV file playback time for the channel selected. Units: ms.
- File Size

This displays the ERV file size for the channel selected. Units: bytes.
- audio_sample_rate

This displays the ERV file sampling frequency for the channel selected. Units: kHz.
- Bit Width

This displays the ERV file bit width for the channel selected. 8 bits or 10 bits.

10 bits should be selected if the ERV file quantization bit is set to “8F bit/sample” with EPSON Speech IC Speech Guide Creation Tool Ver 1.10 or later. For more information, refer to the *S1V30080 Series Evaluation Kit Start Guide*.
- Path

This displays the ERV file path for the channel selected.
- Comment

Displays comment information stored inside the ERV file for the channel selected. Comment information may be up to 512 bytes long, but only 120 bytes can be displayed. Comments can also be edited. (Does not affect the comment information inside the ERV file.)
- Load

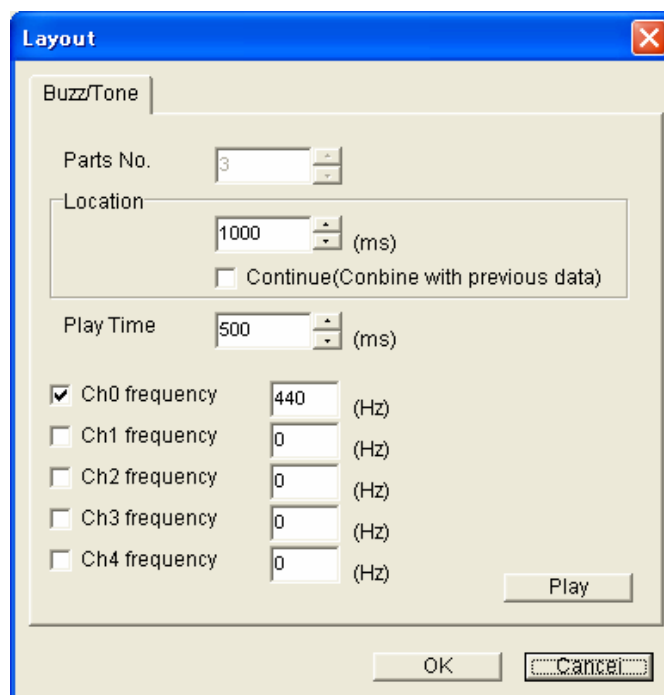
Same as for New, Modify (Audio Main).
- Play

Same as for New, Modify (Audio Main).
- OK/Cancel

Quits this window. If **OK** is clicked, the settings are retained, but if **Cancel** is clicked, the settings are discarded.

3.4.2.3 New, Modify (Buzzer/Tone)

- Selecting the Buzz/Tone track and clicking the **New** button allows a new Buzzer/Tone track to be added.
- Cells already existing on the track can be edited by selecting with the mouse and clicking the **Modify** button.



- **Parts No.**
Same as for New, Modify (Audio Main).
- **Location**
Same as for New, Modify (Audio Main).
- **Continue**
 - Can be joined to the previous cell (part). In this case, the interval between the two cells will be 0 ms, and they will be played back joined together.
 - Continue cannot be used when Parts No is 1, as there is no previous cell.
 - A series of cells joined using Continue is referred to as a Continue block.
- **Play Time**
 - Sets the buzzer/tone playback time. Units: ms. Maximum 2,550 ms.
 - The Play Time value can be set to ensure that it does not overlap neighboring cells, provided it is not for a Continue block.
 - The Play Time value can be set to a maximum of 2,550 ms if it is a Continue block. The Location is automatically adjusted for subsequent cells.
- **Ch 0 to 4 frequency**
Sets the frequency for each channel. Minimum 0 Hz. Maximum 2,000 Hz. Note that the maximum value that can be set will be 1,999 Hz if the audio_sample_rate value is 4 kHz.
- **Play**
Same as for New, Modify (Audio Main). The Gain (volume) value for each Buzz/Tone channel is the same as for the melody.^{Note 1}
- **Note 1:** The Gain value for each channel should be altered using the **Melody** dialog box.
- **OK/Cancel**
Quits this window. If **OK** is clicked, the settings are retained, but if **Cancel** is clicked, the settings are discarded.

3. Detailed Explanation

3.4.2.4 Delete (Audio Main, Audio Multi, Buzz/Tone)

Parts can be deleted by selecting the part and clicking the **Delete** button.

3.4.3 Melody

- Edit (Melody)

The melody can be edited by selecting the melody and clicking the **Edit** button.

3.4.4 Gain

- Audio Main / Audio Multi / BuzzT/Melody / All

This alters the gain for each type or overall.

The values displayed for each type and channel are the individual parameter Gain values.^{Note 1}

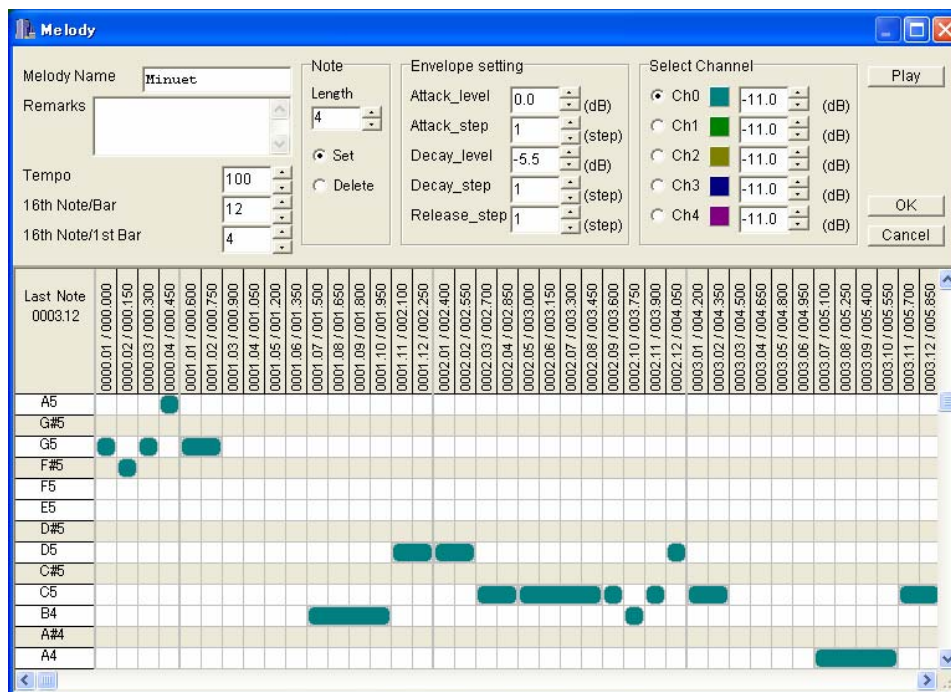
Sound set as common parameters will automatically be changed to individual parameters if this is changed.

Note 1: The gain value displayed for Buzz/Tone (5ch) is the mean of the gain values (dB) for Ch0 to Ch4.
The mean value is displayed here, but actual playback uses the values set for each channel.

3.5 Melody dialog box details

Sound List → Timing chart → Edit

- This edits the synthesizer melody.



3.5.1 Dialog box upper section

3.5.1.1 Melody Name

Enter the melody name. The name can be up to 16 characters (or 8 Japanese characters) long.

3.5.1.2 Remarks

Enter any remarks.

3.5.1.3 Tempo

This alters the tempo. ^{Note 1}

Minimum tempo = 10/min, maximum tempo = 200/min in intervals of 10.

Example: Tempo = 60/min gives a length of 250 ms for sixteenth notes.

The default value is the value set by the common or individual parameters.

3. Detailed Explanation

Note 1: Altering the tempo here automatically changes to individual parameters if common parameters are set.

3.5.1.4 16th Note/Bar

Specifies the number of sixteenth notes per bar.^{Note 1}

Example: 16 for four-four time.

Example: 24 for three-two time.

Maximum 32, minimum 1, default 16

Note 1: Altering the value here automatically changes to individual parameters if common parameters are set.

3.5.1.5 16th Note/1st Bar

Specifies the number of sixteenth notes per bar for the first bar.^{Note 1}

This is set if the first bar of an upbeat melody does not start on the first beat.

Maximum 32, minimum 1, default 0

Note 1: Altering the value here automatically changes to individual parameters if common parameters are set.

3.5.1.6 Note

- Length

This specifies the length of the note entered by clicking the mouse on the piano roll window. Specified as a number of sixteenth notes. The default value is 4.

- Set / Delete

When **Set** is selected, clicking the mouse on the piano roll window adds a note at that position with the length specified by the Length parameter.

When **Delete** is selected, clicking the mouse on the piano roll window deletes any note at that position.

3.5.1.7 Envelope setting

- Attack_level, Attack_step, Decay_level, Decay_step, Release_step

For more information about envelope settings, refer to Section 3.2.3, “Envelope setting.”

3.5.1.8 Channel selection

- Ch0 / Ch1 / Ch2 / Ch3 / Ch4

This specifies the channel selected by clicking the mouse on the piano roll window.

Clicking the colored panel displays the **Color** dialog box, allowing the channel color to be changed.

Changing the value changes the Gain value for that channel. Skilful use of several channels can add dynamism to the melody.

3.5.1.9 Play

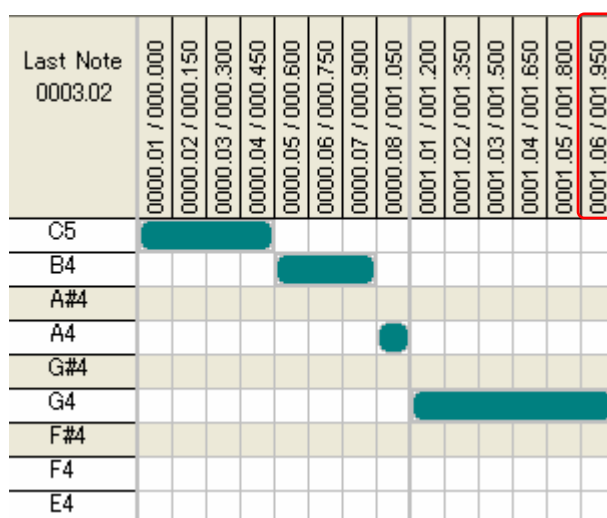
Plays back the melody input.

3.5.1.10 OK/Cancel

Quits this window. If **OK** is clicked, the settings are retained, but if **Cancel** is clicked, the settings are discarded.

3.5.2 Piano roll window (dialog box lower section)

The piano roll note input format is a style widely used for PC music software. It offers the advantage of indicating pitch and length more intuitively than conventional scores.



3.5.2.1 Top left section

Last Note indicates the position on the horizontal axis of the last note on the piano roll window.

3.5.2.2 Vertical axis

The vertical axis is for the pitch in semitone intervals. Up indicates higher pitch and down indicates lower pitch. The same coloring as a piano keyboard is used, with light gray representing the black keys of the piano.

Example 1: C6 Note C in C major. Larger numbers indicate higher pitch.

Example 2: G#5 Note G# in C major. Larger numbers indicate higher pitch.

The supported pitch range extends from C2 at the low end to B6 at the high end.

3.5.2.3 Horizontal axis

The horizontal axis forms the time axis. One column corresponds to the width of one sixteenth note.

3. Detailed Explanation

The time axis is expressed in two forms. The example below uses left-most column “0001.06 / 001.950.”

- Note notation

The integers of “0001.16” indicate the bar number, and numbers after the decimal point indicate the number within the bar in sixteenth note units.

Bar numbering starts from 0.

The sixteenth note unit numbers within bars start from 1.

- Time notation

The “001.950” indicates the playback time (in seconds) after the sound starts.

The bars are separated by bold lines. The horizontal axis length is restricted by S1V30080 commands to 409 sixteenth notes.

3.5.2.4 Table area

- The colored rounded rectangular shapes represent notes. One column width corresponds to a sixteenth note, and four column widths correspond to a quarter note.
- The channels are colored differently for easy identification of the different channels.
- Notes cannot be set in the same channel for the same column. The channel must be changed.
- There are five channels. Up to five notes can be played simultaneously.
- To delete a note, set **Length** to the same length or longer than the note to be deleted, and click the left hand edge of the note to be deleted. Notes contained within the length set in **Length** from the point clicked will be deleted. Note that notes will not be deleted unless they are fully enclosed within the deletion range.

3.6 ROM/Command creation dialog box details

Sound List → ROM/Command creation

- This is used to create ROM image files and sample command data (C language source files format) for the host CPU.
- Whether individual sounds or audio data are included or not in the ROM image can be selected.
- Sound covered by this dialog box is that with the **ROM/Command Creation** check box selected for **Setting** in the **Sound list** dialog box. Sound is not covered if the check box is unchecked.

ROM / Command creation

[ROM] Image Size
☐ 256KB
☒ 512KB

☐ Flash ROM

Count Max : 255

[ROM] Present data size

	Count	Size(Byte)
Command	6	664
Audio	3	321720
Total	9	322416

Create Play
Close

[ROM] Command [ROM] Audio Data [Host] Command

No.	SoundNo.	Data Type	PlayCount	Ena
1	1	Audio Main	1	1
2	2	Melody	1	1
3	3	Audio Multi	1	1
4	4	Audio Multi	1	1
5	5	Melody	1	1
6	7	Buzz/Tone	1	1
7				
8				
9				
10				

[ROM] Command details

Command No.
 Sound No.
 Play Count

Data Type
☒ Audio Main
☐ Audio Multi
☐ Buzz/Tone
☐ Melody

☒ [ROM] Enable
☐ [ROM] Disable

3.6.1 Window upper section

3.6.1.1 [ROM] Image Size

Selects the ROM image size.

- The S1V30080 internal MaskROM size is 256 KB.
- The maximum S1V30080 external serial flash memory size is 512 KB.

3. Detailed Explanation

The external serial flash memory cannot be used if 8 bits is selected for DAC_bit_width in the **Common parameter setting** dialog box. The available size is therefore limited to 256 KB.

3.6.1.2 Flash ROM

Select this check box to create a ROM image for S1V30080 external serial flash memory. Deselect the check box for internal Mask ROM.

This check box is disabled if 8 bits is selected for DAC_bit_width in the **Common parameter setting** dialog box.

3.6.1.3 Count Max

Up to 255 commands and audio data items can be stored in the ROM image.

The number of commands here refers to the total number of sounds enabled in the **[ROM] Command** tab.

Similarly, the number of audio data items here refers to the total number of ERV files enabled in the **[ROM] Audio Data** tab.

3.6.1.4 [ROM] Present data size

This indicates the data count and size for commands, audio data, and the total.

- Quantity restriction

The combined command and audio data count must not exceed 255.

- Size restriction

The ROM image also contains management information, so the size will be slightly larger than the totals for commands and audio. The size cannot exceed the size stipulated in **[ROM] Image Size**.

Parts exceeding the limits will be displayed in red. The **Create** button is disabled if parts of the table are shown in red.

3.6.1.5 Play

This plays back the data selected in the **[ROM] Command**, **[ROM] Audio Data**, or **[Host] Command** tabs.

3.6.1.6 Create

This is used to create ROM image files and sample command data for the host CPU. It also outputs the data list created (CSV format file).

- ROM image file ROMImage_yymmdd_hhmmss.bin (For external serial flash memory)
 ROMImage_yymmdd_hhmmss_for_Mask.bin (For internal Mask ROM)
- Command data file HostCommand_yymmdd_hhmmss.c
- Data list file ROMImage_yymmdd_hhmmss.csv

These are output together in the same folder as the project file.

The **Create** button is disabled if parts of the table in the dialog box are shown in red.

3.6.1.7 Close

Closes this window. Setting information such as sound enable/disable and Play Count will be lost.

3.6.2 [ROM] Command tab

Displays the commands (memory storage commands) stored in the ROM.

The sounds displayed here include only single types. This includes sounds such as melodies only or Audio Multi only.

Note that the **[Host] Command** tab table shows all sounds, including multiple types.

Sounds are listed in order according to the **Sound list** dialog box. The display order can be altered in the **Sound** dialog box using the up and down buttons at the bottom left corner of the dialog box.

3.6.2.1 Command No. (No.)

This displays the command number for the command selected. Commands are stored in the ROM image in this order.

It is shown simply as “No.” in the table.

3.6.2.2 Sound No.

This displays the sound number for the command selected.

3.6.2.3 Data Type

This displays the data type for the command selected.

3.6.2.4 PlayCount

This specifies the play_count value (number of repeats) in specified S1V30080 commands. Note that the Sound Tool does not simulate repeated playback using PlayCount.

3.6.2.5 [ROM] Enable/Disable (Ena)

Sets whether to store the sound selected in the ROM image.

It is shown simply as “ENA” in the table. 1 corresponds to Enable and 0 to Disable.

The colors used in the table are explained below.

- Black
Normal [ROM] Enable state.
- Red
Indicates a warning. [ROM] Enable state, but the ERV file contained in the sound is disabled in the **[ROM] Audio Data** tab described later.
The **Create** button is disabled if the display appears in red.

3. Detailed Explanation

To clear this state, either enable the corresponding ERV file or set the sound itself to [ROM] Disable.

- Gray

[ROM] Disable state.

3.6.3 [ROM] Audio Data tab

Displays the audio (ERV) files stored in the ROM image. This is a list of the ERV files used for each sound.

The screenshot shows the 'ROM / Command creation' dialog box. The '[ROM] Image Size' section has radio buttons for '256KB' and '512KB' (selected), and a checkbox for 'Flash ROM'. The '[ROM] Present data size' table shows:

	Count	Size(Byte)
Command	6	664
Audio	3	321720
Total	9	322416

Buttons for 'Create', 'Play', and 'Close' are present. 'Count Max : 255' is displayed. The '[ROM] Audio Data' tab is active, showing a table with columns: No., File Name, Size, SoundNo., and Ena.

No.	File Name	Size	SoundNo.	Ena
1	Elise_8kHz_10bit_2	262204	1	1
2	Brahms8k10.erv	51927	3,6	1
3	PS_0001.erv	7733	4	1
4				
5				
6				
7				
8				
9				
10				

The '[ROM] Audio Data details' section shows:

Audio Data No.: 1, Sound No.: 1
File Size(Byte): 262204
Path: .\Elise_8kHz_10bit_209715.erv
Radio buttons for '[ROM] Enable' (selected) and '[ROM] Disable'.

3.6.3.1 Audio Data No. (No.)

This displays the number of the ERV file selected.

It is shown simply as "No." in the table.

3.6.3.2 Path (FileName)

This displays the ERV file path information.

The ERV file name is displayed in the **FileName** column of the table.

3.6.3.3 File Size(Byte) (Size)

This displays the ERV file size.

It is shown simply as “Size” in the table.

3.6.3.4 Sound No.

This displays the sound number corresponding to the ERV file selected.

3.6.3.5 [ROM] Enable/Disable (Ena)

Sets whether to store the ERV file selected in the ROM image.

Caution is necessary for Disable. Disabling an ERV file prevents the sound displayed in **Sound No.** from being played back by the S1V30080. The corresponding sound will be displayed in red in the **[ROM] Command** and **[Host] Command** tabs. The **Create** button will not be enabled unless the sound is disabled.

It is shown simply as “ENA” in the table. 1 corresponds to Enable and 0 to Disable.

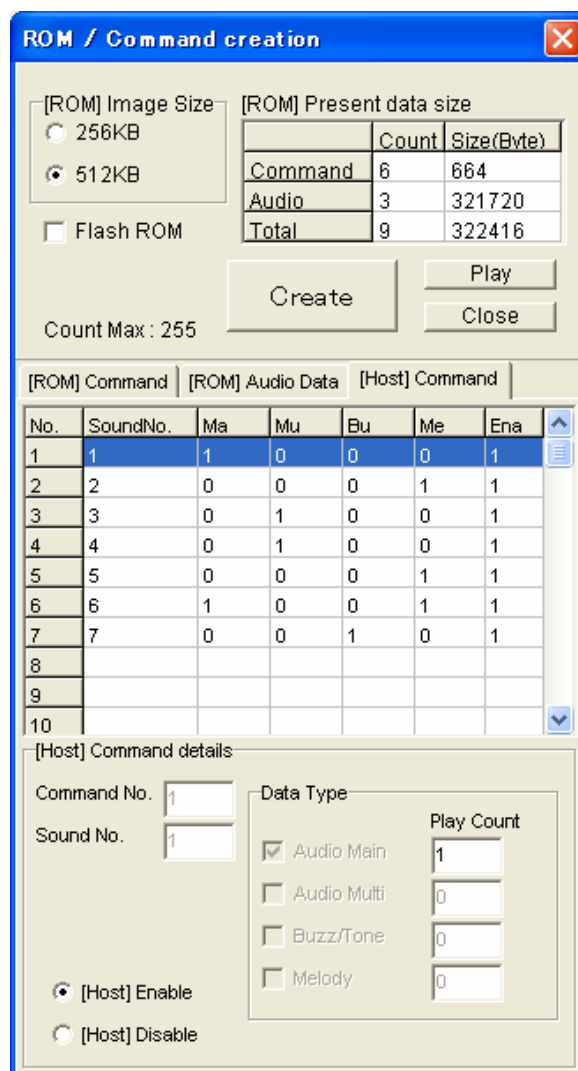
The colors used in the table are explained below.

- Black
[ROM] Enable state.
- Gray
[ROM] Disable state.

3. Detailed Explanation

3.6.4 [Host] Command tab

Displays the data (C language source) output as a host command.



The dialog box is titled "ROM / Command creation". It contains several sections:

- [ROM] Image Size:** Radio buttons for 256KB and 512KB (selected). A checkbox for "Flash ROM".
- [ROM] Present data size:** A table showing the size of the data.
- Buttons:** "Create", "Play", and "Close".
- Count Max:** 255.
- Tabs:** "[ROM] Command", "[ROM] Audio Data", and "[Host] Command" (selected).
- [Host] Command details:** A table with columns: No., SoundNo., Ma, Mu, Bu, Me, Ena.
- [Host] Command details:** A section for configuring the command.

	Count	Size(Byte)
Command	6	664
Audio	3	321720
Total	9	322416

No.	SoundNo.	Ma	Mu	Bu	Me	Ena
1	1	1	0	0	0	1
2	2	0	0	0	1	1
3	3	0	1	0	0	1
4	4	0	1	0	0	1
5	5	0	0	0	1	1
6	6	1	0	0	1	1
7	7	0	0	1	0	1
8						
9						
10						

[Host] Command details

Command No. Sound No.

☒ [Host] Enable ☐ [Host] Disable

Data Type

- ☒ Audio Main
- ☐ Audio Multi
- ☐ Buzz/Tone
- ☐ Melody

Play Count

1 0 0

3.6.4.1 Command No. (No.)

This displays the command number for the command selected.

It is shown simply as "No." in the table.

3.6.4.2 Sound No.

This displays the sound number for the command selected.

3.6.4.3 [Host] Enable/Disable (Ena)

Sets whether to store the command selected in the host.

3.6.4.4 Data Type (Ma, Mu, Bu, Me)

- Audio Main (Ma)

This indicates that the sound includes Audio Main.

It is shown simply as “Ma” in the table. 1 corresponds to “included” and 0 to “not included.”

This specifies the number of repeats for playback using Play Count.^{Note 1}

- Audio Multi (Mu)

This indicates that the sound includes Audio Multi.

It is shown simply as “Mu” in the table. 1 corresponds to “included” and 0 to “not included.”

This specifies the number of repeats for playback using Play Count.^{Note 1}

- Buzz/Tone (Bu)

This indicates that the sound includes audio buzzer.

It is shown simply as “Bu” in the table. 1 corresponds to “included” and 0 to “not included.”

This specifies the number of repeats for playback using Play Count.^{Note 1}

- Melody (Me)

This indicates that the sound includes a melody.

It is shown simply as “Me” in the table. 1 corresponds to “included” and 0 to “not included.”

This specifies the number of repeats for playback using Play Count.^{Note 1}

Note 1: This specifies the play_count value (number of repeats) in specific S1V30080 commands. Note that the Sound Tool does not simulate repeated playback using PlayCount.

The colors used in the table are explained below.

- Black

Normal [Host] Enable state.

- Red

Indicates a warning. [Host] Enable state, but the ERV file contained in the sound is disabled in the **[ROM] Audio Data** tab.

The **Create** button is disabled if the display appears in red.

To clear this state, either enable the corresponding ERV file or set the sound itself to [Host] Disable.

- Gray

[Host] Disable state.

3. Detailed Explanation

3.7 Folders and files

3.7.1 Directory configuration

The default run file after installing is C:\EPSON\S1V30080\Sound.exe.

3.7.2 Project files and project folders

Sound Tool editing information is saved as project files. Project files have the file extension “sdpj1.”

The folder in which a project is saved is called a project folder. The default project folder will be the folder named Project in the path for the run file. Saving a project with a different destination makes the new folder the project folder.

Files created using the **Create** button in the **ROM/Command creation** dialog box will be output to the project folder.

Double-clicking a project file launches the Sound Tool and loads the project file.

3.7.3 Audio (ERV) file

The default folder for loading ERV files is the project folder. When loading from a different folder, the new destination folder path is stored, and that folder is browsed upon subsequent loading.

If the folder containing the ERV file is a sub-folder of the project folder, the path is handled as a relative path within the project file. Conversely, the path is handled as an absolute path if it is not a sub-folder.

There is no need to respecify individual ERV file paths when moving a project to another folder, provided the ERV files are stored in sub-folders of the project folder and the sub-folders are also moved.

3.7.4 Files created using the ROM/Command creation dialog box

These are files created by clicking the **Create** button in the ROM/Command creation window. They are output to the project folder.

The following three types are created.

- ROM image file ROMImage_yymmdd_hhmmss.bin (For external serial flash memory)
 ROMImage_yymmdd_hhmmss_for_Mask.bin (For internal Mask ROM)
- Command data file HostCommand_yymmdd_hhmmss.c
- Data list file ROMImage_yymmdd_hhmmss.csv

yyymmdd_hhmmss is the time stamp.

Example: 090101_010000 indicates that the file was created at 01:00:00 on January 1, 2009.

3.7.4.1 ROM image file

The ROM image file is a binary image file containing S1V30080 memory storage commands and audio data. It forms a file written to the S1V30080 internal Mask ROM and S1V30080 external serial flash memory. The ROM image file configuration specifications have not been made public.

3.7.4.2 Command data file

The Command data file is a C language source format file containing the data output as a host command.

3.7.4.3 Data list file

The data list file is a csv format file output as a list of the ROM image file data. This file is output in text format with the following information delimited by commas.

- Memory storage command
 - File index number (FileIndexNo)^{Note 1}
 - Sound number (SoundNo)
 - Type
 - Play count (number of playback repeats)
 - File index number for related files^{Note 2}
 - Comment information for related files^{Note 2}
- Audio data
 - File index number (FileIndexNo)^{Note 1}
 - ERV file name (FileName)
 - Type
 - Size
 - Sound number (Sound number using this audio data)^{Note 2}

Note 1: Memory storage commands and audio data are managed within the ROM image using serial numbers. These are referred to as file index numbers (file_index_number).

Note that host commands created by the user will be used as parameters by the following commands.

- ISC_SEQUENCER_MAIN_CONFIG_REQ
- ISC_SEQUENCER_MULTI_CONFIG_REQ
- ISC_EASY_START_REQ

These also correspond to the file index numbers specified in standalone mode.

Note 2: If viewing the data list file in Windows Excel, the data may exceed the maximum number of columns allowed in Excel and a warning may be displayed if it contains an exceptionally large volume of sounds containing audio data. The parts exceeding the limits cannot be browsed in this case. Note that data list files can also be viewed using a text editor.

3. Detailed Explanation

3.8 Other restrictions

- Do not install both English and Japanese versions of the Sound Tool.
- The Gain settings can be changed in the dialog boxes described below.
 - Gain values for common parameters
 - All **Common parameter setting** dialog boxes
 - Gain values for individual parameters
 - Audio Main **Timing chart** dialog box
 - Audio Multi **Timing chart** dialog box
 - Melody **Melody** dialog box (**Timing chart** dialog box for combined 5 channel settings)
 - Buzz Tone Same as for Melody, as the same values are shared.
- Editing ERV files or replacing the file contents after placing an ERV file in the **Timing chart** dialog box may cause operating problems, and correct operation is not guaranteed. The **Modify** button should be used to reload the file.
- Editing of timing in the **Timing chart** dialog box is assumed to use the S1V30080 Series message protocol ISC_SOUND_START_REQ. The sound for each type starts simultaneously in this case.
- Melody editing window limitations. It is not possible to edit a melody to overlay the sound in a different channel with the same pitch to increase the volume to add emphasis at the overlaid part. This is a limitation of the Sound Tool, and is not a limitation of the S1V30080.
- S1V30080 specification restrictions applying to data stored in the external serial flash memory are as follows.
 - Number of Audio Multi channels 2 ch
 - Number of quantization bits 10 bitsROM image capacity is also subject to the following restrictions.
 - Internal Mask ROM 256 KB
 - External serial flash memory 256/512 KB
- The ISC_MELODY_START_REQ command is a melody playback command which transfers melody information to the S1V30080 from the host streamed in multiple segments. A command supporting streaming playback like this is not created. The ISC_MELODY_SET_REQ command transmitting melody information from the host in one go is supported.
- The S1V30080 allows repeated playback by setting the play_count value in specific commands such as ISC_SEQUENCER_MAIN_CONFIG_REQ, but the Sound Tool does not simulate repeated playback using PlayCount.
- Volume setting, stop, and mute commands are not output.

- The following commands are not supported by the Sound Tool.
 - ISC_CHKSUM_CONFIG_REQ
 - ISC_EASY_START_REQ
 - ISC_SOUND_STOP_REQ
 - ISC_AUDIO_VOLUME_REQ
 - ISC_AUDIO_MUTE_REQ
 - ISC_STATUS_REQ
 - ISC_STATUS_RESP
 - ISC_SYNTHESIZER_MELODY_START_REQ

Note 1: If synchronized start using ISC_SOUND_START_REQ is not used, the playback for each type will depend on the Host CPU command transmission timing.

Revision History

Revision History

Attachment-1

Rev. No.	Date	Page	Type	Revision details (including previous details) and reason
Rev 1.00	04/10/2009	All	New	New issue
Rev 1.01	05/20/2009	P47, 53	Addition	Added ROM image file specification in detail
Rev 1.02	06/17/2009	P29, 33	Addition	Added sentence importing

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