Sound Artist Tool

© 1998 Sony Computer Entertainment Inc.

Publication date: August 1998

Sony Computer Entertainment America
919 E. Hillsdale Blvd., 2nd floor
Foster City, CA 94404

Sony Computer Entertainment Europe
Waverley House
7-12 Noel Street
London W1V 4HH, England

The *Sound Artist Tool* manual is supplied pursuant to and subject to the terms of the Sony Computer Entertainment PlayStation® License and Development Tools Agreements, the Licensed Publisher Agreement and/or the Licensed Developer Agreement.

The *Sound Artist Tool* manual is intended for distribution to and use by only Sony Computer Entertainment licensed Developers and Publishers in accordance with the PlayStation® License and Development Tools Agreements, the Licensed Publisher Agreement and/or the Licensed Developer Agreement.

Unauthorized reproduction, distribution, lending, rental or disclosure to any third party, in whole or in part, of this book is expressly prohibited by law and by the terms of the Sony Computer Entertainment PlayStation® License and Development Tools Agreements, the Licensed Publisher Agreement and/or the Licensed Developer Agreement.

Ownership of the physical property of the book is retained by and reserved by Sony Computer Entertainment. Alteration to or deletion, in whole or in part, of the book, its presentation, or its contents is prohibited.

The information in the *Sound Artist Tool* manual is subject to change without notice. The content of this book is Confidential Information of Sony Computer Entertainment.

PlayStation and PlayStation logos are registered trademarks of Sony Computer Entertainment Inc. All other trademarks are property of their respective owners and/or their licensors.

Table of Contents

List of Figures iii
List of Tables v
About This Manual vii
Changes Since Last Release vii
Related Documentation vii
Manual Structure vii
Developer Reference Series vii
Typographic Conventions viii
Developer Support ix

Chapter 1: Overview
Operating Rules 1-2
Features 1-2
System Configuration and Music Creation 1-3

Chapter 2: Installation
Setting up DTL-H800 2-3
Installing DTL-S810 2-4
Testing System 2-5

Chapter 3: Tutorials
Creating Sound Data for PlayStation Unit 3-3
SMF2SEQ - Creating Sequence Data 3-4
AIFF2VAG - Creating Waveform Data 3-6
VAG Player - Reproduces Waveform Data 3-8
SoundDelicatessen-Implements Sound Source Data 3-9
RAW2DA - Creates CD-DA Data 3-20
RAW2XA - Creates CD-ROM XA Voice Data 3-21
Reproduction by DTL-H2000 3-22

Chapter 4: References
Sound File Formats 4-3
Commands and Names of Window Components 4-9
Supporting MIDI in Sound Library 4-25

List of Figures

Figure 1–1: Example of Music Creation Environment 1-4
Figure 1–2: Macintosh 1-5
Figure 1–3: PC/AT-compatible machine 1-5
Figure 2–1: Installing Board 2-3
Figure 2–2: Installing Software 2-4
Figure 2–3: Error Message Panel 2-5
Figure 2–4: “SoundBoard” Menu 2-6
Figure 2–5: “Keyboard” Window 2-6
Figure 3–1: SMF Output in Performer 3-4
Figure 3–2: SMF2SEQ File Menu 3-5
Figure 3–3: SMF2SEQ 3-5
Figure 3–4: SMF2SEQ Deleted Messages 3-5
Figure 3–5: SMF2SEQ Mode Menu 3-6
Figure 3–6: AIFF Output in SoundDesignerII 3-6
Figure 3–7: AIFF2VAG File Menu 3-7
Figure 3–8: AIFF2VAG Conversion File 3-7
Figure 3–9: AIFF2VAG Compression Mode Menu 3-7
Figure 3–10: AIFF2VAG Conversion Mode Menu 3-8

Figure 3–11: Dialog Box for Dragging and Dropping VAG Player Icon 3-8
Figure 3–12: VAB Structure 3-9
Figure 3–13: Example of VAB 3-9
Figure 3–14: Message Displayed during SoundDelicatessen Startup 3-10
Figure 3–15: Error Message Panel during SoundDelicatessen Startup 3-10
Figure 3–16: Dialog Box after Board Initialization 3-10
Figure 3–17: SoundDelicatessen Program List Window 3-11
Figure 3–18: SoundDelicatessen Tone List Window 3-12
Figure 3–19: SoundDelicatessen VAG List Window 3-12
Figure 3–20: Cataloging to SoundDelicatessen VAG List 3-13
Figure 3–21: Setting SoundDelicatessen Tone Attributes 3-13
Figure 3–22: Keyboard Window 3-14
Figure 3–23: Dialog Box for Saving SoundDelicatessen File 3-14
Figure 3–24: ADSR Setting Window 3-15
Figure 3–25: Dialog Box for Saving SoundDelicatessen File 3-16
Figure 3–26: DEVICE Setting Example in Performer 5.02 3-17
Figure 3–27: Setting SoundDelicatessen Reverb 3-18
Figure 3–28: Printing Option Dialog Box 3-19
Figure 3–29: Printing Setting Dialog Box 3-19
Figure 3–30: Printing Dialog Box 3-20
Figure 3–31: “Format” Menu 3-22
Figure 3–32: Monitor Output of Sample Program 3-23
Figure 4–1: SEQ Format 4-3
Figure 4–2: SEP Format 4-4
Figure 4–3: VAG Format 4-5
Figure 4–4: VAB Format 4-6
Figure 4–5: VAB Program Attribute Table 4-6
Figure 4–6: VAB Tone Attribute Table 4-7
Figure 4–7: VH Format 4-7
Figure 4–8: VB Format 4-8
Figure 4–9: DA Format 4-8
Figure 4–10: SMF2SEQ Panel 4-9
Figure 4–11: SMF2SEQ: “File” Menu 4-9
Figure 4–12: SMF2SEF File Selection Dialog Box 4-9
Figure 4–13: SMF2SEQ: SEQ File Specification Dialog Box 4-9
Figure 4–14: SMF2SEQ "Output Mode" Menu 4-10
Figure 4–15: AIFF2VAG Panel 4-10
Figure 4–16: AIFF2VAG: “File” Menu 4-10
Figure 4–17: AIFF2VAG: AIFF File Selection Dialog Box 4-11
Figure 4–18: AIFF2VAG: Conversion Panel 4-11
Figure 4–19: AIFF2VAG: VAG File Specification Dialog Box 4-11
Figure 4–20: AIFF2VAG: “Compression” Menu 4-12
Figure 4–21: AIFF2VAG "Mode" Menu 4-12
Figure 4–22: AIFF2VAG Playback Confirmation Panel 4-13
Figure 4–23: VAG Player Panel 4-13
Figure 4–24: VAG Player: “File” Menu 4-13
Figure 4–25: VAG Player: VAG File Selection Dialog Box 4-13
Figure 4–26: VAG Player: Dialog box for dragging and dropping 4-14
Figure 4–27: SoundDelicatessen Panel 4-14
Figure 4–28: SoundDelicatessen: “File” menu 4-14
Figure 4–29: SoundDelicatessen: Program list window 4-15
Figure 4–30: SoundDelicatessen: Program Import 4-15
Figure 4–31: SoundDelicatessen: Program Export 4-16
Figure 4–32: SoundDelicatessen: Print setting dialog box 4-16
Figure 4–33: SoundDelicatessen Printer Dialog Box 4-17
Figure 4–34: SoundDelicatessen: Print option dialog box 4-17

Figure 4–35: SoundDelicatessen: “Edit” menu 4-18
Figure 4–36: SoundDelicatessen: “Windows” menu 4-19
Figure 4–37: SoundDelicatessen: Tone list window 4-19
Figure 4–38: SoundDelicatessen: ADSR setting window 4-20
Figure 4–39: SoundDelicatessen: VAG list window 4-20
Figure 4–40: SoundDelicatessen: Keyboard window 4-21
Figure 4–41: SoundDelicatessen: “SoundBoard” menu 4-21
Figure 4–42: SoundDelicatessen: “DSP” menu 4-22
Figure 4–43: RAW2A Panel 4-23
Figure 4–44: RAW2DA: “File” menu 4-23
Figure 4–45: RAW2DA: “OutputMode” menu 4-23
Figure 4–46: RAW2XA Panel 4-24
Figure 4–47: RAW2XA: “File” menu 4-24
Figure 4–48: RAW2XA: “Format” menu 4-24
Figure 4–49: RAW2XA: “OutputMode” menu 4-25

List of Tables

Table 1–1: Sound Data Formats 1-2
Table 1–2: PlayStation Sound Formats 1-3
Table 1–3: Equipment Needed for Creation Environment 1-4
Table 3–1: PlayStation Sound Formats 3-3
Table 3–2: Applications Supported 3-3
Table 3–3: Supported DOS Applications 3-3
Table 3–4: Appropriate Format (SMF) 3-4
Table 3–5: SoundDelicatessen Reverb Type 3-18
Table 3–6: Control Pad Keys 3-23
Table 4–1: Reverb Types 4-22
Table 4–2: Data Descriptions 4-26
Table 4–3: Vibration Types 4-26
Table 4–4: Reverb Type 4-26
Table 4–5: Repetition Functions 4-27
Table 4–6: Marking Function 4-27

About This Manual

This manual is the latest release of instructions relating to the Sound Artist Tool for the PlayStation® as of Run-Time Library release 4.3. The purpose of this manual is (1) to provide installation and operation instructions for the DTL-H800 Sound Artist Board and (2) to explain how to use the Sound Artist Tool software.

Changes Since Last Release

There have been no substantial changes to this document since its last release.

Related Documentation

Developers should use this manual in conjunction with Run-Time Library release 4.3.

Manual Structure

Section	Description
Ch. 1: Overview	Describes the Sound Artist Board and Sound Artist Tool in general terms and explains system requirements for startup.
Ch. 2: Installation	Describes steps for setting up and testing the Sound Artist Board and Sound Artist Tool.
Ch. 3: Tutorials	Describes the following six applications to develop a procedure for creating sound data: 1. SMF2SEQ (Sequence data converter); 2. AIFF2VAG (Waveform data converter); 3. VAG Player (Waveform data reproduction tool); 4. SoundDelicatessen (Tool for creating and reproducing sound source); 5. RAW2DA (CD-DA data creation tool); 6. RAW2XA (CD-ROM XA audio data encoder).
Ch. 4: References	Provides sound file formats, tool commands, and names of window components.

Developer Reference Series

This manual is part of the *Developer Reference Series*, a series of technical reference volumes covering all aspects of PlayStation development. The complete series is listed below:

Manual	Description
PlayStation Hardware	Describes the PlayStation hardware architecture and overviews its subsystems.
PlayStation Operating System	Describes the PlayStation operating system and related programming fundamentals.
Run-Time Library Overview	Describes the structure and purpose of the run-time libraries provided for PlayStation software development.
Run-Time Library Reference	Defines all available PlayStation run-time library functions, macros and structures.
Inline Programming Reference	Describes in-line programming using DMPSX, GTE inline macro and GTE register information.

SDevTC Development Environment	Describes the SDevTC (formerly "Psy-Q") Development Environment for PlayStation software development.
3D Graphics Tools	Describes how to use the PlayStation 3D Graphics Tools, including the animation and material editors.
Sprite Editor	Describes the Sprite Editor tool for creating sprite data and background picture components.
Sound Artist Tool	Provides installation and operation instructions for the DTL-H800 Sound Artist Board and explains how to use the Sound Artist Tool software.
File Formats	Describes all native PlayStation data formats.
Data Conversion Utilities	Describes all available PlayStation data conversion utilities, including both stand-alone and plug-in programs.
CD Emulator	Provides installation and operation instructions for the CD Emulator subsystem and related software.
CD-ROM Generator	Describes how to use the CD-ROM Generator software to write CD-R discs.
Performance Analyzer User Guide	Provides general instructions for using the Performance Analyzer software.
Performance Analyzer Technical Reference	Describes how to measure software performance and interpret the results using the Performance Analyzer.
DTL-H2000 Installation and Operation	Provides installation and operation instructions for the DTL-H2000 Development System.
DTL-H2500/2700 Installation and Operation	Provides installation and operation instructions for the DTL-H2500/H2700 Development Systems.

Typographic Conventions

Certain Typographic Conventions are used through out this manual to clarify the meaning of the text. The following conventions apply to all narrative text except for structure and function descriptions:

Convention	*Meaning*
`courier`	Indicates literal program code.
Bold	Indicates a document, chapter or section title.

The following conventions apply within structure and function descriptions only:

Convention	*Meaning*
Medium Bold	Denotes structure or function types and names.
Italic	Denotes function arguments and structure members.

Developer Support

Sony Computer Entertainment America (SCEA)

SCEA developer support is available to licensees in North America only. You may obtain developer support or additional copies of this documentation by contacting the following addresses:

Order Information	Developer Support
In North America	*In North America*
Attn: Developer Tools Coordinator Sony Computer Entertainment America 919 East Hillsdale Blvd., 2nd floor Foster City, CA 94404 Tel: (650) 655-8000	E-mail: DevTech_Support@playstation.sony.com Web: http://www.scea.sony.com/dev Developer Support Hotline: (650) 655-8181 (Call Monday through Friday, 8 a.m. to 5 p.m., PST/PDT)

Sony Computer Entertainment Europe (SCEE)

SCEE developer support is available to licensees in Europe only. You may obtain developer support or additional copies of this documentation by contacting the following addresses:

Order Information	Developer Support
In Europe	*In Europe*
Attn: Production Coordinator Sony Computer Entertainment Europe Waverley House 7-12 Noel Street London W1V 4HH Tel: +44 (0) 171 447 1600	E-mail: dev_support@playstation.co.uk Web: https://www-s.playstation.co.uk Developer Support Hotline: +44 (0) 171 447 1680 (Call Monday through Friday, 9 a.m. to 6 p.m., GMT or BST/BDT)

Chapter 1:
Overview

Operating Rules

The Sound Artist Board and Sound Artist Tool are applications which are activated by Macintosh OS and follow Macintosh rules of operation. This manual is designed for the user who is familiar with Macintosh operation, so no explanation is provided for general Macintosh issues. Please refer to the Macintosh User's Manual for details.

Features

The PlayStation Sound Artist Board (DTL-H800, hereafter referred to as the PlayStation Sound Board) and the PlayStation Sound Artist Tool (DTL-S810, hereafter referred to as the PlayStation Sound Tool) are applications executed on Apple Macintosh. They are tools for creating sound data for the PlayStation. Using the tools along with existing sound tools enables music creation for the PlayStation.

The following are other features of the PlayStation Sound Tool:

- Sound chip SPU for the PlayStation is mounted.
  The PlayStation Sound Board is equipped with the same sound chip (SPU) as the PlayStation and with a sound source memory of 4 M-bits (= 512 k-bytes). Hence, sound data equivalent to data for the PlayStation can be reproduced on Macintosh. The SPU is provided with DSP for reverb effect implementation.
- Optical digital output is covered.
  The PlayStation Sound Board is equipped with a square optical digital output terminal (TOSLINK). The terminal allows data creation in a high-quality music reproduction environment.
- FreeMIDI is supported.
  The Sound Board driver included in the PlayStation Sound Tool is compatible with the FreeMIDI System (ver.1.26 ~) advocated by Mark of the Unicorn Co. The Sound Tool can be operated directly from sequencer software and the MIDI keyboard.
- Standard MIDI File (SMF) and Audio Interchange File Format (AIFF) are supported.
  The Sound Tool supports SMF and AIFF as source data and is highly compatible with other general sound tools.

File Formats

The PlayStation Sound Tool supports the following sound data formats.

Table 1–1: Sound Data Formats

Data format	Definition
SMF	Standard MIDI File (Format 1)
AIFF	16-bit Audio Interchange File Format (AIFF)
SDII	SoundDesignerII File Format

The PlayStation Sound Tool supports the following sound formats for the PlayStation.

Table 1–2: PlayStation Sound Formats

Sound format	Definition
SEQ	PlayStation sound sequence format
VAG	PlayStation waveform format
VAB	PlayStation wave bank format
DA	PlayStation CD-DA format
XA	PlayStation CD-ROM XA audio channel format
SEP	PlayStation sound sequence chuck format
VH	PlayStation wave bank header format
VB	PlayStation wave bank body format

The XA format supported by RAW2XA is based on the following specifications:

CD-ROM XA

SYSTEM DESCRIPTION CD-ROM XA

Copyright May 1991

For details of the formats, see Chapter 4, References.

System Configuration and Music Creation

The use of the PlayStation Sound Tool involves the following devices and software:

- Apple Macintosh II/Quadra™ series and Power Macintosh™ series
  - PCI slot x 1 or more
  - Memory area of 16 M-bytes or more
  - Hard disk (10 MB or more space needed)
- Peripheral devices
  - Display of 13 or more inches
  - D/A converter (such as DAT) with square optical (TOSLINK) input
  - Reproduction devices including amplifier, speaker and headphone
- Software
  - MacOS 7.5.3 or later
  - FreeMIDI System Ver.1.26 or later

In order to use the PlayStation Sound Tool comfortably, it is recommended that the following environment be set up:

- Apple PowerMacintosh series
  - PowerPC 604 / 120 MHz or higher
  - PCI slot x 2 or more
  - 32 M bytes or more of memory area
  - Hard disk (1 GB or more) for saving sound source data
- Peripheral Equipment
  - High resolution display of 17 inches or more

Environment for Music Creation

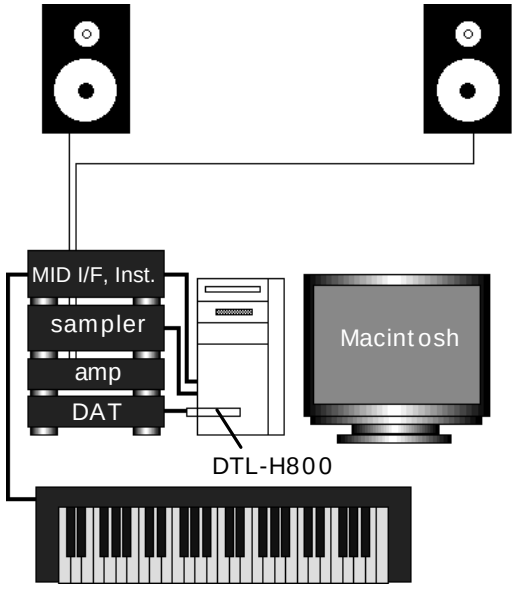
Actual music creation using the PlayStation tool involves the following system in addition to the items given in the preceding paragraph for the operating environment.

Table 1–3: Equipment Needed for Creation Environment

	Function	Device
Sampler	Records data from DAT, CT and other devices to HD.	Audiomedia III (Digidesign) Pro Tools III (Digidesign) CD-3000 (AKAI)
Waveform editing software	Edits stored waveforms.	SoundDesigner II (Digidesign) Alchemy (Passport Design) INFINITY (Jupiter)
MIDI keyboard	Enters score data from keyboard.	
Sequence software	Enters, edits and reproduces score data.	Performer (Mark of the Unicorn) Vision (Opcode System)
MIDI Interface	Connects a MIDI device to the Macintosh serial port.	MIDI Interface (Apple Computer) MIDI Translator (Opcode Systems) MIDI Timepiece (Mark of the Unicorn)
MIDI Manager	Patches software and devices for MIDI.	Free MIDI (Mark of the Unicorn) OMS (Opcode System)

Example of Music Creation Environment

Figure 1–1: Example of Music Creation Environment



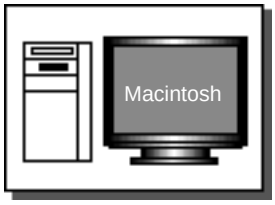
Process of Music Creation

The following gives the process of music creation for the PlayStation unit.

On Macintosh

- HD recording and waveform editing
- Waveform data conversion
- Sound source set development and editing
- Sequence development and editing
- Sequence data conversion

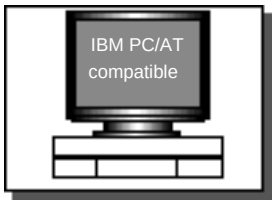
Figure 1–2: Macintosh



On PC/AT-compatible machine

- Programming and linking
- Final sequence and SE checking
- Inspection of real time effects
- Data conversion and interleave (MovConv *)
- CD-ROM fixing (CD-ROM generator *)
- Completion

Figure 1–3: PC/AT-compatible machine



- MovConv (MOVCONV.EXE) is included in the PlayStation Runtime Library (DTL-S2310).
- The CD-ROM Generator is a CD-ROM generation tool (DTL-S2210).

Chapter 2:
Installation

Setting up DTL-H800

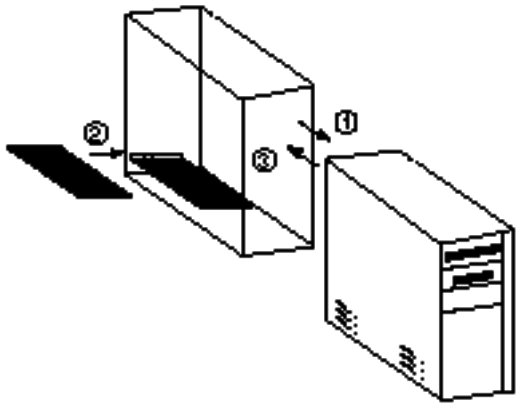
Setting up the PlayStation Sound Board (DTL-H800) requires the following operations:

- PlayStation Sound Board installation
- Connection of the board output to the D/A converter

Installing PlayStation Sound Board

Referring to the Macintosh manual, unplug the power cable and remove the cover of the computer being used (1). Install DTL-H800 in an empty PCI slot (2) and replace the cover (3).

Figure 2–1: Installing Board



Connecting Board Output and D/A Converter

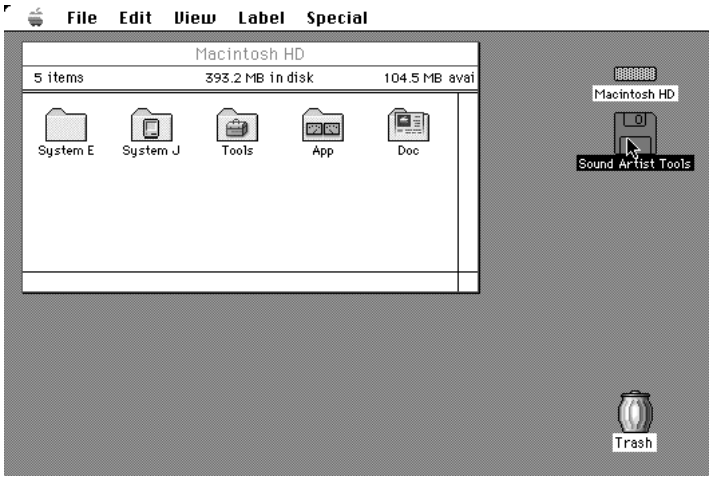
The rear panel of DTL-H800 is provided with a set of square TOSLINK optical digital output terminals so attach them to the D/A converter (DAT, etc.) using the square optical cable sold separately.

Installing DTL-S810

The Sound Artist Tool disk for the Macintosh is required in order to perform installation.

1. Start up the Macintosh.
2. Insert the Sound Artist Tool disk into the floppy disk drive.
3. Drag the disk icon to the location where DTL-S810 is to be installed.

Figure 2–2: Installing Software



DTL-S810 has now been installed.

Should the application icon not be displayed correctly after the installation (becoming the default icon), reconstruct the desktop computer. This can be accomplished by starting up the Macintosh with both the option key and the command key (the key with the Apple mark) pressed. For details, refer to the Macintosh user's guide.

Testing System

Immediately after installing the PlayStation Sound Board (DTL-H800) and the PlayStation Sound Tool (DTL-S810), carry out the following tests to check that the system is installed correctly.

Connection Test

Check that the PlayStation Sound Board is installed correctly in the PCI slot and that the square optical cable is connected correctly.

Reproduction Test

Check the actual sound reproduction using PlayStation Sound Tool sample data.

Should an error be detected during the test, make sure that the system is properly connected and that the software is installed correctly. Should the cause not be isolated, please contact our business department.

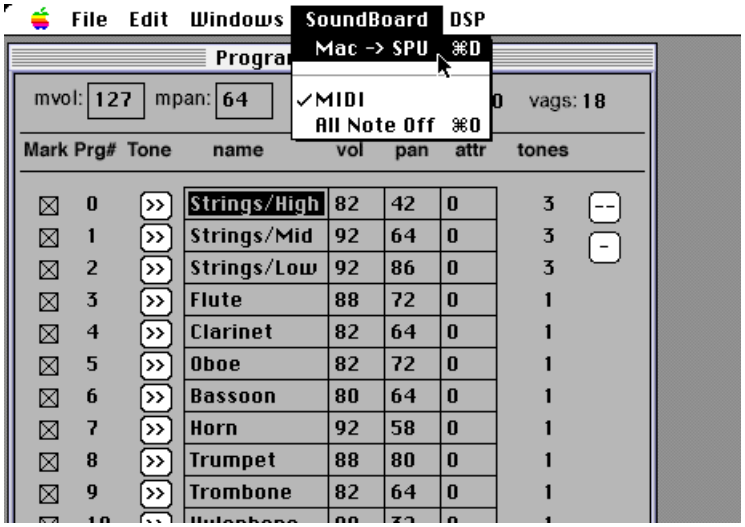
1. Open the “sample” folder in the installed Sound Artist Tool folder.
2. Open the VAB folder, double click the file named “sample.vab,” and start up the Sound Tool SoundDelicatessen. If the following dialog box is displayed, this indicates that the board is not correctly installed. Immediately shut down the system and check board setup.

Figure 2–3: Error Message Panel

If double clicking the file does not startup SoundDelicatessen, double click and initiate SoundDelicatessen in the “Bank Editor” folder in the installed Sound Artist Tool folder. Then, open the “sample.vab” file within the application.

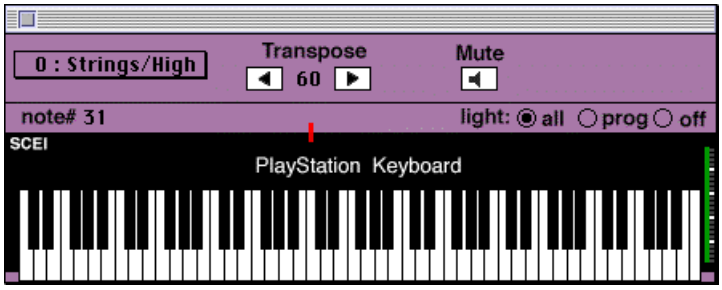
3. When the SoundDelicatessen is started up, data is automatically transferred to the Sound Board, and the keyboard window is displayed. It is also possible to select ”Mac -> SPU” from the “SoundBoard” menu and then manually transfer sound data to the SPU sound source memory.

Figure 2–4: “SoundBoard” Menu



When data transfer is complete, the Keyboard window is displayed.

Figure 2–5: “Keyboard” Window



4. Clicking the displayed Keyboard window with the mouse causes a piano sound to be reproduced. Should no piano sound be reproduced, check the D/A converter and amplifier connections, and also the volume.
5. Select “Quit” from the “File” menu to terminate SoundDelicatessen.

Chapter 3:
Tutorials

Creating Sound Data for PlayStation Unit

The following are the sound data formats which can be handled by the PlayStation:

Table 3–1: PlayStation Sound Formats

Data format	Definition
SEQ	PlayStation sound sequence data format
SEP	PlayStation sound multi-track sequence data format
VAB	PlayStation sound bank data format
VH	PlayStation sound bank data format (Attribute part)
VB	PlayStation sound bank data format (Waveform part)
DA	PlayStation CD-DA format
XA	PlayStation CD-ROM XA voice channel format
VAG	PlayStation waveform data format (Intermediate data format)

The PlayStation Sound Tool supports the following applications to create and edit data:

Table 3–2: Applications Supported

Application	Definition
SMF2SEQ	Sequence data converter
AIFF2VAG	Waveform data converter
VAG Player	Waveform data player
SoundDelicatessen	Sound source bank editor (including the Sound Board driver)
RAW2DA	Endian converter for CD-DA data
RAW2XA	Data encoder for CD-ROM XA voice channel

The PlayStation programmer tool supports the following two applications for DOS/V to simplify data and memory management:

Table 3–3: Supported DOS Applications

Application	Definition
VABSPLIT.EXE	VAB data separation tool
SEQ2SEP.EXE	SEP creation tool

Refer to the on-line programmer tools manual for these DOS/V applications.

SMF2SEQ - Creating Sequence Data

SMF2SEQ converts a format 1 standard MIDI file (SMF) created by such sequence software (score editing software) as Performer (Mark of the Unicorn) and Vision (Opcode) into the sequence data format (SEQ file) for the PlayStation.

Table 3–4: Appropriate Format (SMF)

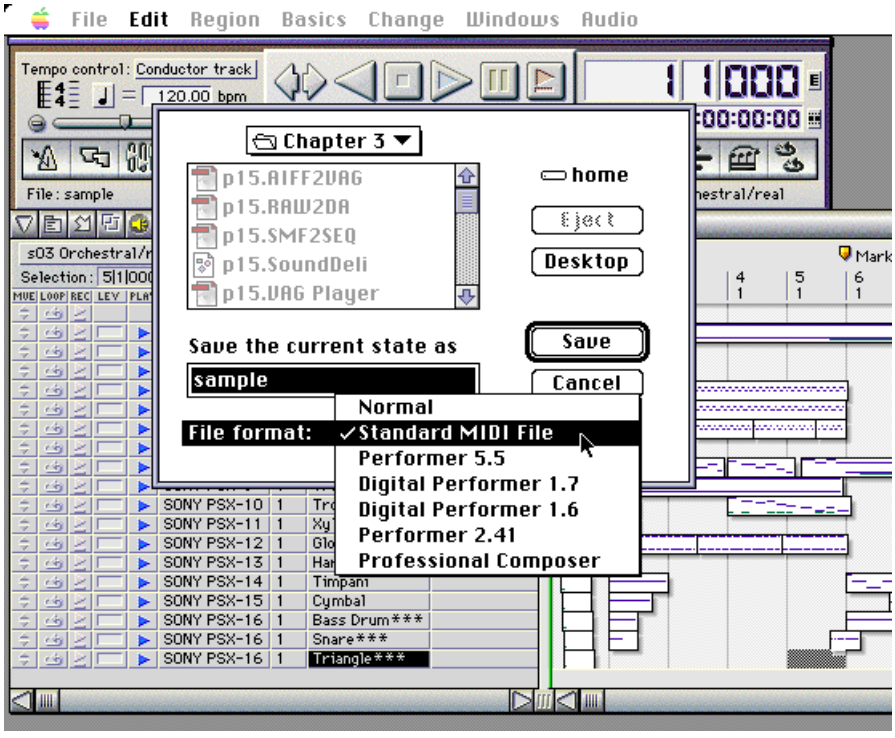
Appropriate format	SMF (Format 1)
Sampling frequency	Optional
Appropriate message	Note on/off
	Program change
	Pitch bend
	Control change

Resolution in SEQ is optional. But the highest resolution depends on the actual reproduction mode (1/60 sec., 1/120 sec., 1/240 sec., etc.).

Setting up SMF File

Before using SMF2SEQ, save the sequence to be converted by your sequence software in the SMF format (format 1).

Figure 3–1: SMF Output in Performer

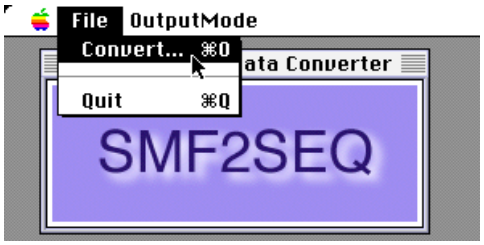


SMF2SEQ - Creating Sequence Data

Using SMF2SEQ

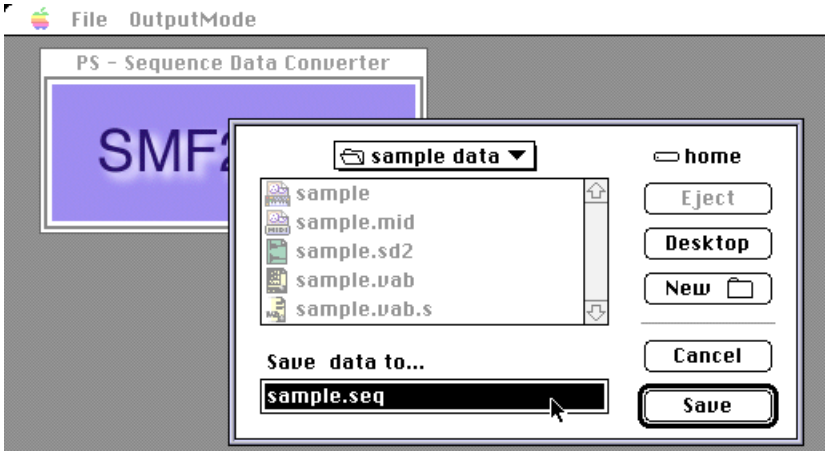
1. Double click the SMF2SEQ icon to start up the application.
2. Select “Convert” in the “File” menu, and specify the file to be converted.

Figure 3–2: SMF2SEQ File Menu



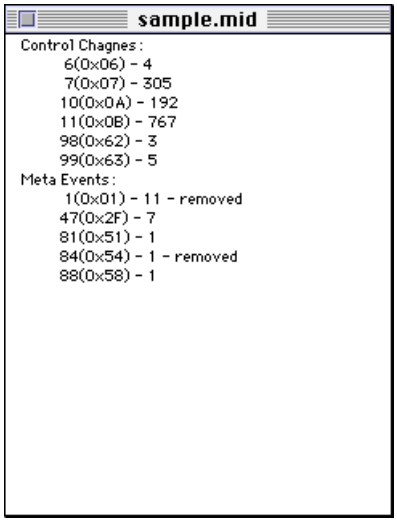
3. When prompted to enter the output file name, enter the file name to be assigned after conversion.

Figure 3–3: SMF2SEQ



4. When conversion is complete, the MIDI message summary which was deleted during conversion will be displayed.

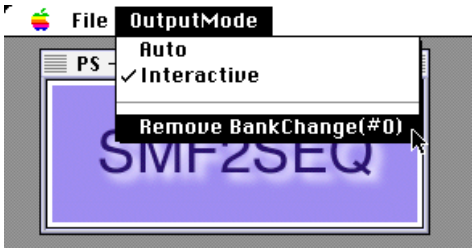
Figure 3–4: SMF2SEQ Deleted Messages



5. Select “Quit” from the “File” menu to terminate the application. An SMF file can also be converted by dragging it to the SMF2SEQ icon. (Two or more SMF files can be selected.)

   Also, setting the Automatic Conversion Mode (Auto), Interactive Conversion Mode (Interactive) and BankChange Forced Deletion Mode (Remove BankChange) is possible using the mode menu.

Figure 3–5: SMF2SEQ Mode Menu



AIFF2VAG - Creating Waveform Data

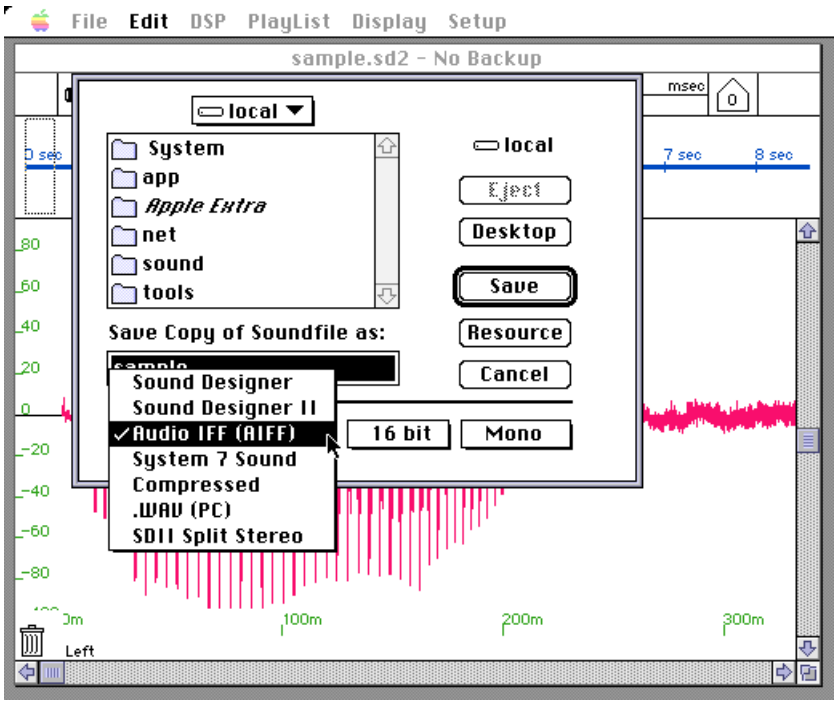
AIFF2VAG converts an Apple AIFF (Audio Interchange File Format) file created by such existing waveform editing software as SoundDesigner II™ (Digidesign) and Alchemy™ (Passport Designs) into the waveform data format VAG file for the PlayStation unit.

For VAG, a multiple of 28 of samples are handled as one block because of hardware characteristics. Thus, handling a sound source with a loop requires that the loop length be a multiple of 28.

Setting up AIFF File

Before using AIFF2VAG, save the waveform data to be converted by your waveform editing software in the AIFF format (16 bits, monophonic, non-compressed).

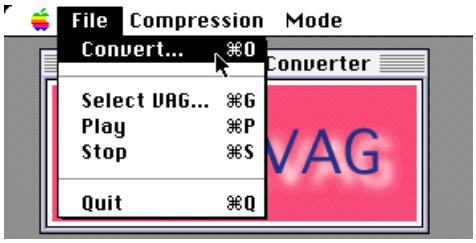
Figure 3–6: AIFF Output in SoundDesignerII



Using AIFF2VAG

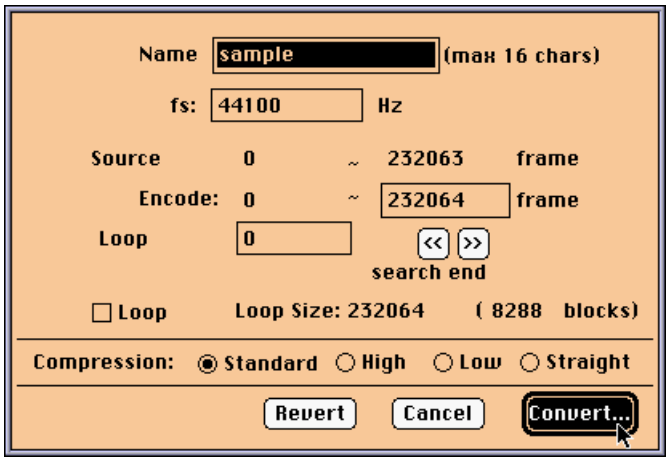
1. Double click the AIFF2VAG icon to start up the application.
2. The AIFF file to be converted is requested when “Convert” is selected from the “File” menu, so specify the file at this time.

Figure 3–7: AIFF2VAG File Menu



3. Specify the number of samples to be converted and the loop start point.

Figure 3–8: AIFF2VAG Conversion File

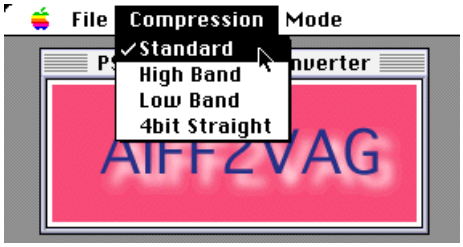


4. When the output file name is requested, enter the file name to be assigned after conversion.
5. Select “Quit” from the “File” menu to terminate the application.

   An AIFF file can also be converted by dragging it to the AIFF2VAG icon. (Two or more AIFF files can be selected.)

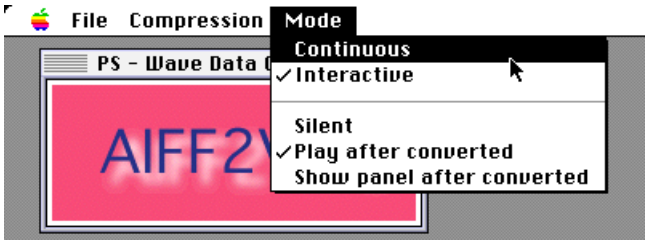
   Setting of the standard, high band components, low band components and 4bit straight compression can be carried out by means of the Compression mode menu. When noise components are conspicuous in normal compression, they can sometimes be made less so when converted in another mode.

Figure 3–9: AIFF2VAG Compression Mode Menu



Setting of the automatic conversion mode (Auto) or Interactive conversion mode (Interactive) and also setting of the modes related to sound reproduction after conversion (Silent, Play after converted, Show panel after conversion) is possible by means of the Conversion mode.

Figure 3–10: AIFF2VAG Conversion Mode Menu



It is also possible to reproduce a VAG file which has already been converted by selecting “Select VAG...” from the file menu. By pressing the mouse button on the AIFF2VAG panel after selecting VAG, sound production can be repeatedly checked.

VAG Player - Reproduces Waveform Data

VAG Player is a tool for using the PlayStation Sound Board to reproduce a waveform data format VAG file for the PlayStation unit converted by AIFF2VAG.

This reproduction is based on the AIFF sampling frequency during conversion, and changes the reproduction pitch.

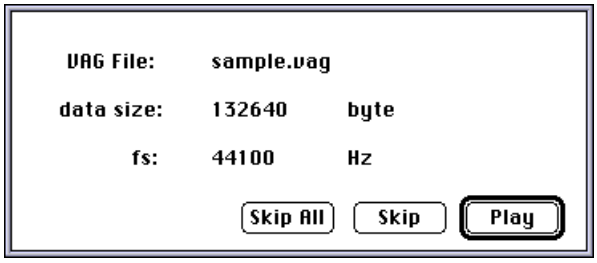
Using VAG Player

1. Double click the VAG Player icon to start up the application.
2. Select “Open” from the “File” menu, and then select the VAG file to be reproduced.
3. When the file has been selected, VAG data is transferred to the PlayStation Sound Board, which in turn reproduces sound.
4. When prompted to do so, select the file to be reproduced next. Press “Cancel” to return to activation state.
5. Select “Quit” from the “File” menu to terminate the application.

A VAG file can also be reproduced by dragging it to the VAG Player icon. (Two or more VAG files can be selected.)

The file name, file size and sampling frequency of the selected VAG file are displayed. Pressing the “Play” button reproduces VAG. (If two or more files have been selected, press the “Play” button for each VAG file.) When reproduction of the VAG file is not required, press “Skip”. When canceling the reproduction of all VAG files, select “Skip All”.

Figure 3–11: Dialog Box for Dragging and Dropping VAG Player Icon



SoundDelicatessen-Implements Sound Source Data

This section describes the structure of VAB data of created by SoundDelicatessen and how to use SoundDelicatessen, and briefly explains the components of the window.

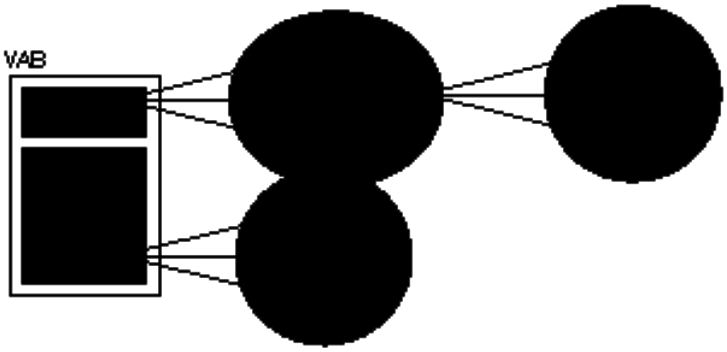
For the screen configuration and component sections, and for the dialog messages, see chapter 4.

VAB Data Structure

This paragraph first explains the structure of VAB data briefly.

VAB data is composed of tone attributes (including program attributes) comprising two hierarchies, and of a list of waveforms (VAG list).

Figure 3–12: VAB Structure



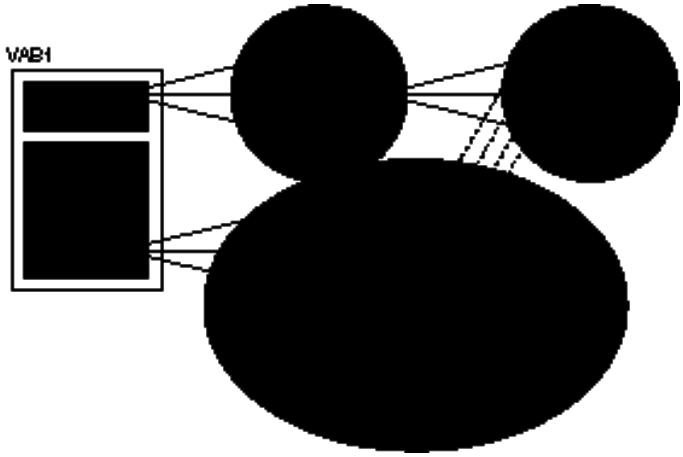
Up to 128 program attributes can be cataloged in one unit of VAB. A program corresponds to a sound source number in MIDI, being equivalent to music instrument levels of “piano”, “guitar”, “drum”, etc. Program changes (patch changes) in the sequence data cause the current program to be altered.

The tone attributes are program components. A maximum of 16 tone attributes can be cataloged in one program. Up to 2,048 tone attributes can be cataloged in one VAB.

A VAG list can contain up to 254 VAG files converted by AIFF2VAG. Restrictions of the SPU sound source memory requires that the total of VAG data be 520,160 bytes or less.

The following gives an example of VAB.

Figure 3–13: Example of VAB



In a program (instrument) level, VAB in the above example is composed of “piano”, “drum”, “guitar” and “effect sound”.

The “drum” comprises four tones of “kick”, “cymbals”, “snare” and “tambourine”. The tones are based on an independent VAG list.

Preparing Required Data

SoundDelicatessen requires a VAG file created by the above-mentioned AIFF2VAG as waveform data. This is explained here using “sample.vag” as an example.

Also, the VAB sound source test which uses the second half sequencer, utilizes the “sample.vab”, “sample.vab.s” and “sample.mid” VAB files included in the sample data.

Startup

Double click on the SoundDelicatessen icon to start up SoundDelicatessen.

If SoundDelicatessen has been started up correctly, the following message is displayed for several seconds.

Figure 3–14: Message Displayed during SoundDelicatessen Startup

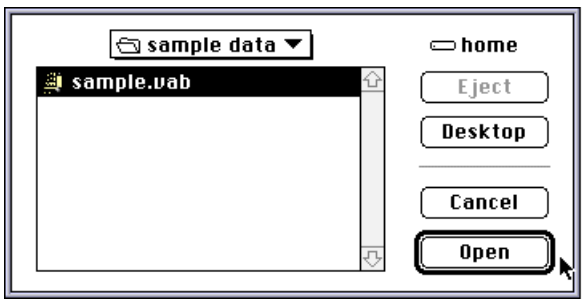
If the PlayStation Sound Board is not correctly installed, the following message is displayed.

Figure 3–15: Error Message Panel during SoundDelicatessen Startup

If the message is displayed, immediately shut down the system and check the system setup in accordance with Chapter 2, Installation.

When board initialization is complete, the following dialog is displayed and a VAB is requested. When creating a new file, press the ‘cancel’ button.

Figure 3–16: Dialog Box after Board Initialization



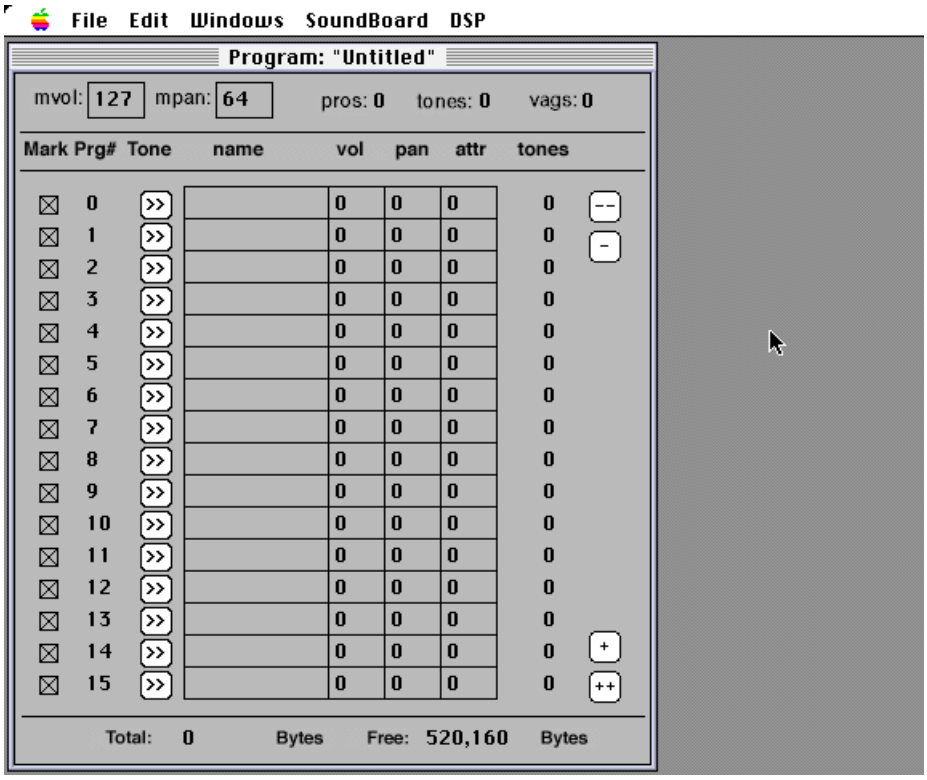
Termination

To terminate SoundDelicatessen, select “Quit” from the “File” menu, or enter Command-Q.

Creating a new VAB

1. Double click on the SoundDelicatessen icon to start up the application.
2. Press “Cancel” in the VAB Open dialog and then select “New” from the “File” menu to open a new VAB.
3. The gray window is displayed.

Figure 3–17: SoundDelicatessen Program List Window

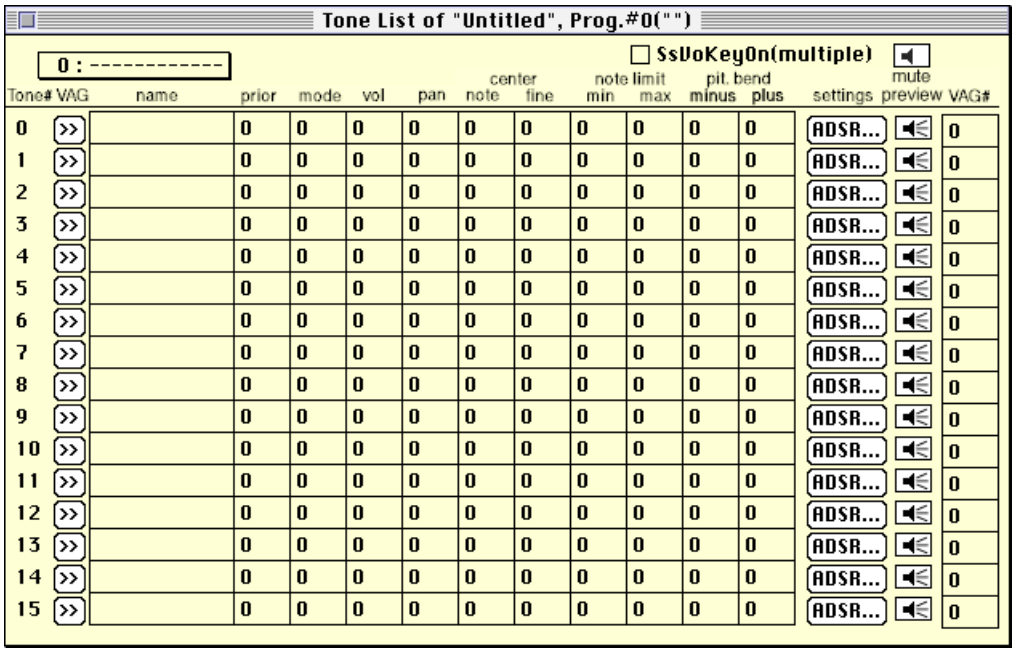


This is the program list window. In the program list window, tone names and volume balance can be set for panning.

First, enter “drum” in the program name column for program number (Prog#) 0 and, then, press the tab key. Enter “127” for volume (vol) and press the tab key again. Then, enter “64” for panning. Now, the program (instrument) can be developed which provides for the highest volume and center panning, and has a name of the drum.

4. Press the tone list display button (“>>”) at the top (Prog#0) of the program list window to display the cream-colored window.

Figure 3–18: SoundDelicatessen Tone List Window

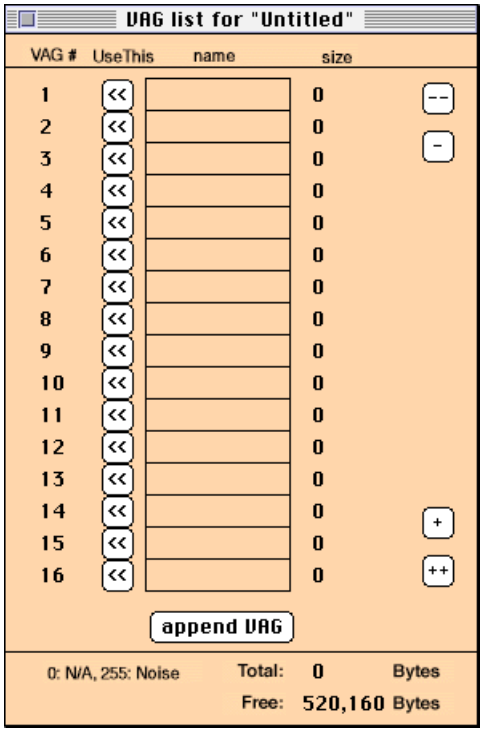


This is the tone list window. In the tone list window, catalog the actual waveforms constituting tones in the above program window.

Also, selecting “Show Tones” in the “Windows” menu allows the tone list window to be displayed.

5. With the tone list window left as it is, press the VAG link button (“>>”) on its top (Tone#) to have the orange window displayed.

Figure 3–19: SoundDelicatessen VAG List Window

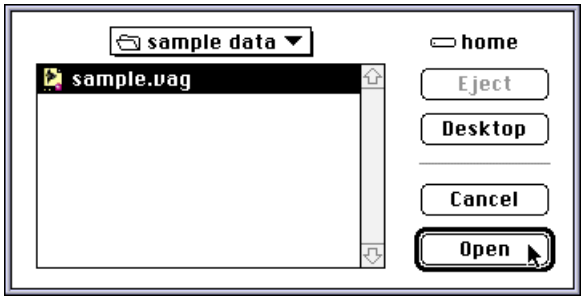


This is the VAG list window. In the VAG list window, catalog the waveform data VAG file created by AIFF2VAG.

Also, selecting “Show VAGs” in the “Window” menu allows the VAG list window to be displayed.

6. The next step is to actually catalog the VAG. First, click the “append VAG” button in the window. When asked which VAG file is to be cataloged, select the “sample.vag” included in the sample data.

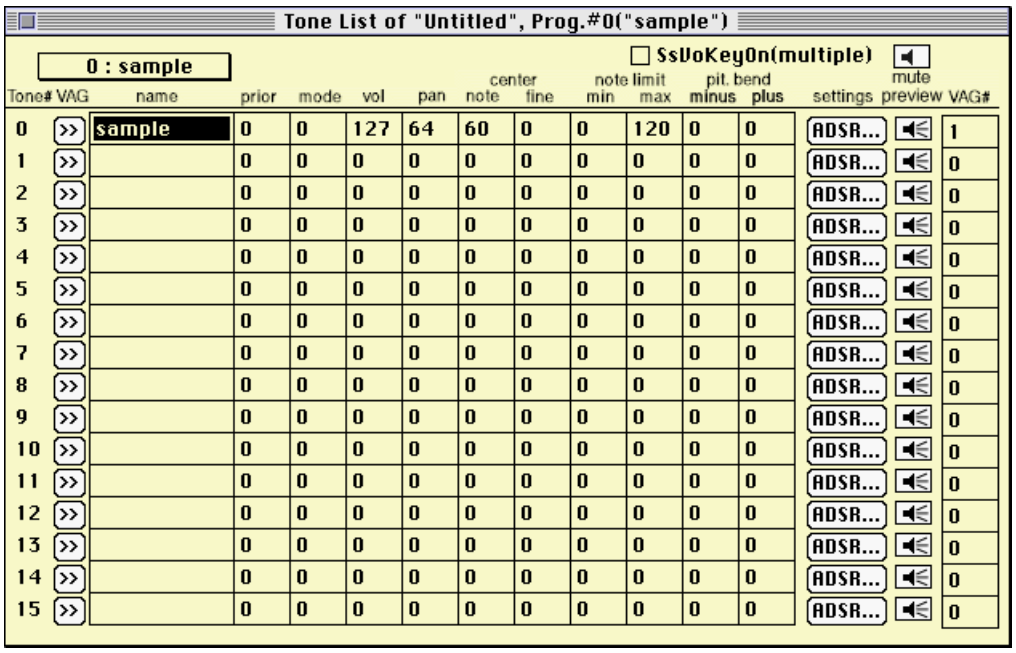
Figure 3–20: Cataloging to SoundDelicatessen VAG List



If other VAG types have been created, catalog them.

7. Use the cataloged VAG in the tone list window. Clicking the “Use This” button (“<<”) at the top causes the tone list window to be displayed and the default tone attribute values to be entered automatically.

Figure 3–21: Setting SoundDelicatessen Tone Attributes



The tone attributes are: tone number (Tone#); VAG link button (VAG); tone name (name); priority (prior); waveform mode (mode); volume (vol); pan pot (pan); center pitch (center note); fine center pitch (center fine); effective interval (note limit min/max); vertical pitch bend (pit. bend minus/plus); ADSR settings (settings); and VAG reference number (VAG#).

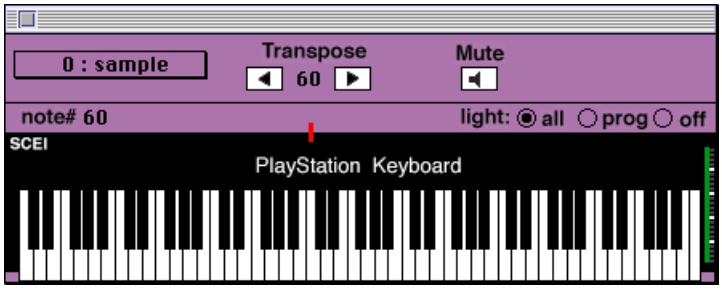
The above tone attributes are arranged from the left in that order.

For the tone attributes, see chapter 4.

8. Now, a simple sound source has been implemented. Following is a test of the actual sound reproduction.

   First, select “Mac -> SPU” from the SoundBoard menu, and transfer the waveform data to the SPU sound source memory. The violet keyboard window then appears.

Figure 3–22: Keyboard Window



   This keyboard allows a check of sound production by clicking with the mouse.

   Clicking and dragging keys on the keyboard enable reproduction at various intervals.

   Pressing the mouse button causes a “note on” message to be sent to the Sound Board and releasing the button causes a “note off” message to be sent to the Sound Board. Clicking the button with the shift key pressed causes the “note off” message to be ignored. When continuing loop sound reproduction, click the keyboard with the shift key pressed.

9. Finally, save the created sound source data VAB and terminate SoundDelicatessen.

   Saving VAB data requires the selection of “Save ...” or “Save As ...” from the “File” menu. When saving for the first time or if “Save As ...” has been selected, enter the name of the file to be saved when requested. Because data is handled by a PC, it is recommended that the file name be “????????.vab” (eight half-size alphabetic characters plus .vab).

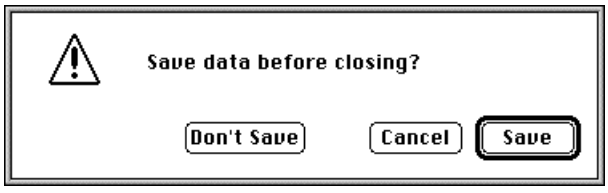
   To terminate SoundDelicatessen, select “Quit” from the “File” menu.

Editing VAB

1. Double click the created VAB file and start up SoundDelicatessen. This causes the VAB file to be opened automatically after the startup and the data to be downloaded to the Sound Board.

   With SoundDelicatessen started up and the file opened, press the “Save” button to save the edited VAB data, the “Don’t Save” button when saving is not needed, and the “Cancel” button to continue editing, in response to the save prompt.

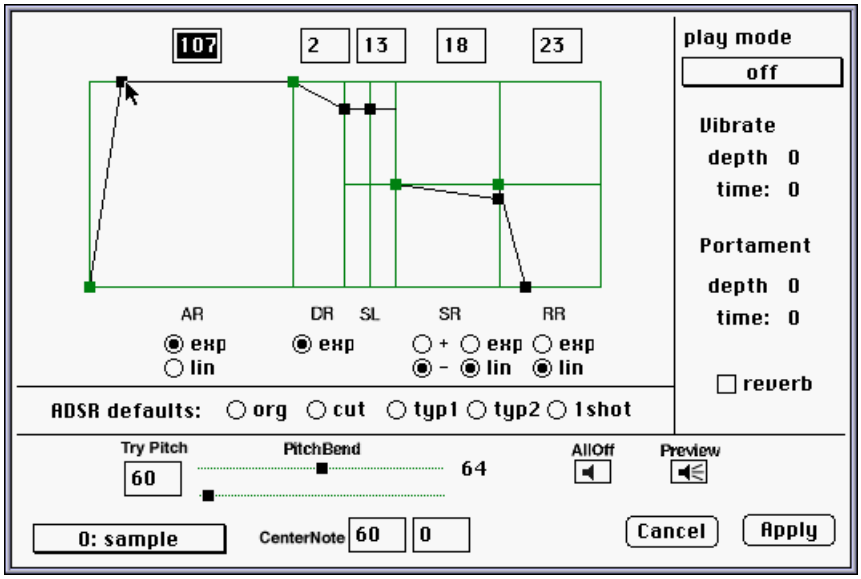
Figure 3–23: Dialog Box for Saving SoundDelicatessen File



2. The VAB file is opened, with the program list window displayed.
3. Press the tone list display button (“>>”) for program number zero to display the tone list for program number zero.
4. Select “Mac -> SPU” in the “SoundBoard” menu to transfer sound data to the SPU sound source memory.
5. Click on the displayed keyboard window to make sure that sound is produced. Then, click the tone list again for display nearest you.

6. Change the “Pan” item from 64 (center) to 0 (left) or 127 (right). Click the keyboard to make sure that the reproduced sound is accompanied by pan pot effects.
7. Change the “note limit/max” item from 127 to 60. Then, drag the keys from the furthest left position to the furthest right position. By setting the note limit at 60, check to make sure that sound is produced only for intervals lower than 60.
8. Press the “ADSR ...” button to display the ADSR setting screen.

Figure 3–24: ADSR Setting Window



On the ADSR setting screen, the following can be carried out. 1) Set ADSR. 2) Set the waveform reproduction mode. 3) Test the pitch bend.

a. For ADSR, the change rate or level can be set for any of the following items. The change rate can be set to provide for exponential or linear changes (only in AR, SR and RR). Further, for SR, the mode of increase or decrease can also be set.

   AR (Attack rate): Change rate after key-on until the highest volume
   DR (Decay rate): Change rate from the highest volume to the threshold level
   SL (Sustain level): Continued sound level
   SR (Sustain rate): Change rate after the threshold level has been reached
   RR (Release rate): Change rate of attenuation after key-off

b. In the waveform reproduction mode, the following items can be set.

Vibrate, Portamento

depth: Sets the amplitude of vibration in the range from 0 to 127 in units of 1/4 of half tone.
time: Sets the time of one period of vibration in the range from 0 to 254 in units of ticks (1/60 seconds).
reverb: Specifies the use of reverb effects during tone reproduction.

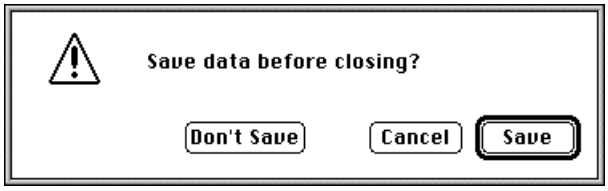
Using MIDI to Check VAB

SoundDelicatessen supports the FreeMIDI System. SoundDelicatessen allows VAB to be checked by the MIDI sequence software (Performer and Vision) on Macintosh and from the keyboard.

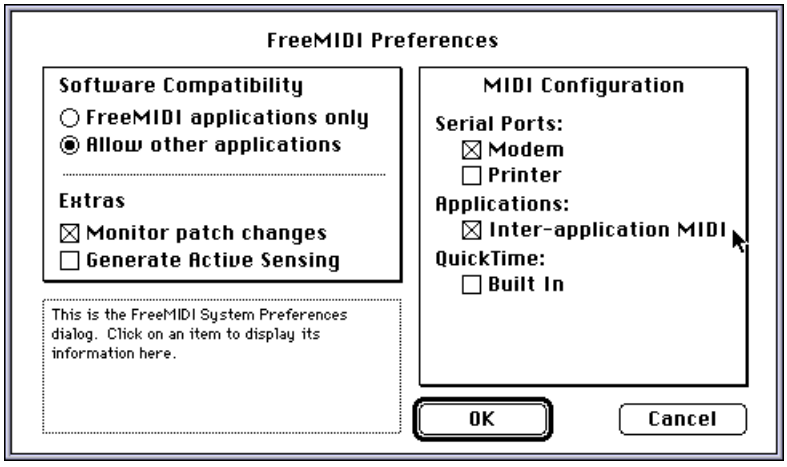
1. Double click and open VAB file “sample.vab” included in sample data.

   With VAB opened by SoundDelicatessen, the dialog box pops up to inquire whether to save and close the file. (See the Figure below.) Click the “Save” button to save the file, the “Don’t Save” button to open the VAB file without saving, and the “Cancel” button to stop opening the VAB file and continue to edit currently opened VAB.

Figure 3–25: Dialog Box for Saving SoundDelicatessen File



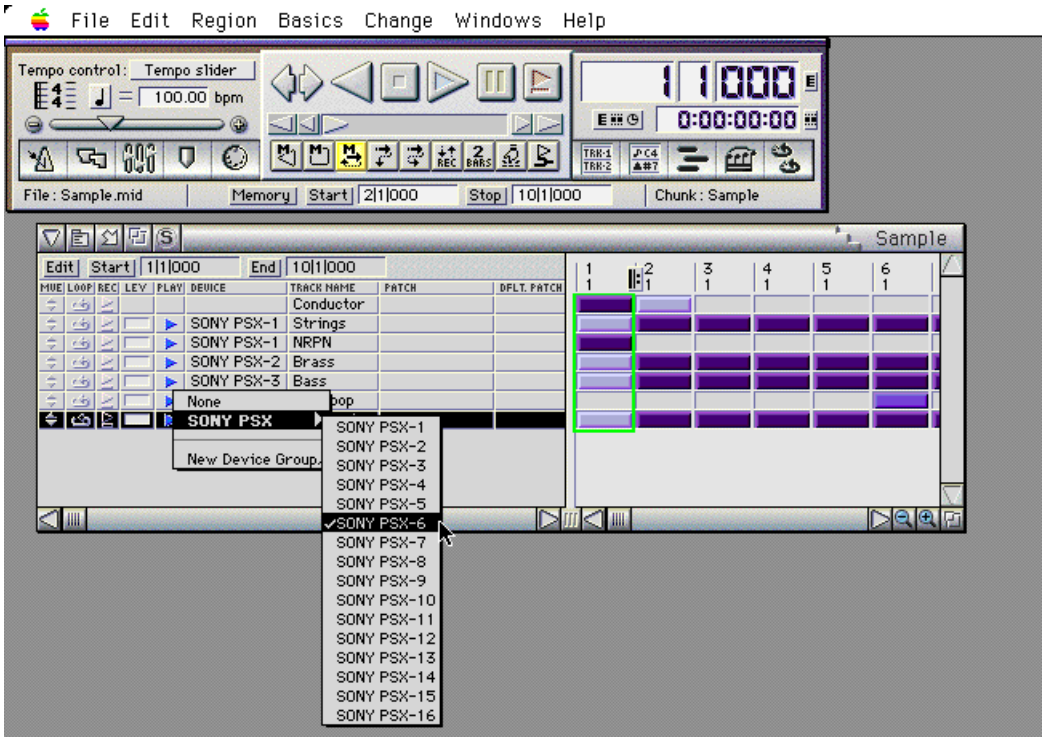
2. Select “Mac -> SPU” in the SoundBoard menu to transfer VAB to the SPU sound source memory.
3. Next, start up the sequence software to open the “sample.mid” SMF file included in the sample data.
4. Confirm the FreeMIDI System settings in the FreeMIDI Setup application.



In the above example, FreeMIDI is installed.

5. Use the sequence software to set the output device to “SONY PSX-1~16”, reproduce the recently-opened SMF data, and make sure that sound is output from the SoundBoard via DAT, etc.

Figure 3–26: DEVICE Setting Example in Performer 5.02



If the MIDI message is sent correctly from the sequence software to the SoundDelicatessen, a red dot flashes above the keyboard in the keyboard window and the indicator to the right of the keyboard expands and contracts.

If no sound is reproduced and no changes are observed in the keyboard window, it is possible that MIDI may was not set up properly so check the FreeMIDI System connection and devices.

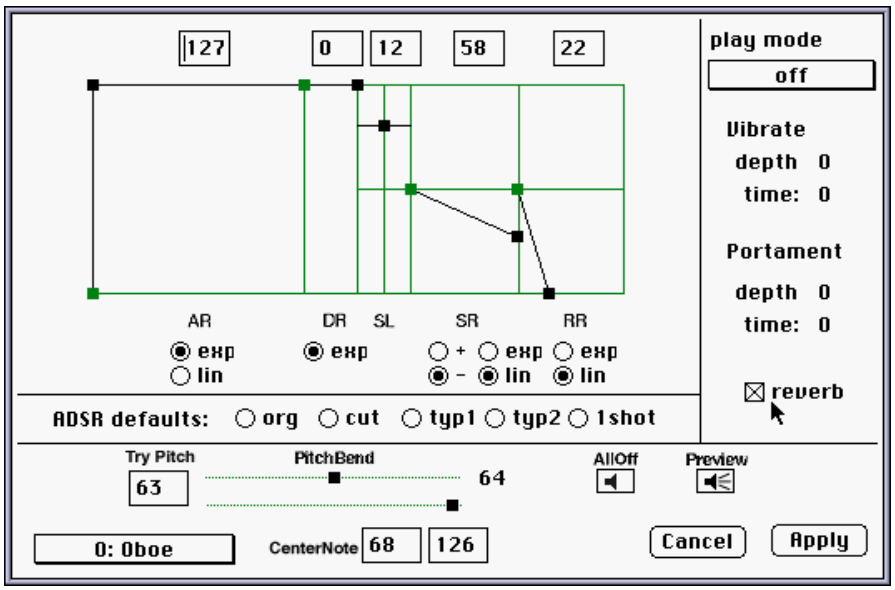
Checking Reverb

The PlayStation unit can access nine kinds of reverb effects. This section explains how to set the reverb.

1. Double click and open VAB file “sample.vab” included in sample data.
2. Select “Mac -> SPU” from the SoundBoard menu to transfer VAB to the SPU sound source memory.
3. Click the tone list display button (“>>”) to the left of “piano” in the top line of the program list to display the tone list for program number zero.
4. Next, click the “piano2” ADSR setting button (“ADSR ...”) in the top line of the tone list to display the ADSR setting window.

5. Click the “reverb” checkbox and declare the use of reverb in this tone. Then press the “Apply” button to fix settings.

Figure 3–27: Setting SoundDelicatessen Reverb



In the tone list, the “piano2” “mode” item becomes “4”. This tone is thereby set to use reverb. Also, the reverb can be set by entering a number “4” for this item. For “piano3”, “piano4” and “piano5” a number of 4 is entered in order that the reverb can take effect.

Now, the reverb for VAB data can be applied.

6. Next, in the “DSP” menu, select the “5: Hall” type.

   Thus, SPU starts to operate the reverb.

7. With the keyboard window displayed, click the keyboard to check effects of reverb sound.

The depth (reverb sound volume) can be set in the reverb settings. Also, in the “7:Echo” type, delay and feedback can be set and in the “8:Delay” type, the delay can be set.

The use of the reverb requires a reverb operation work area of several k-bytes to several tens of k-bytes. The following table indicates the required sizes. The size of each type is also covered in the DSP menu.

Table 3–5: SoundDelicatessen Reverb Type

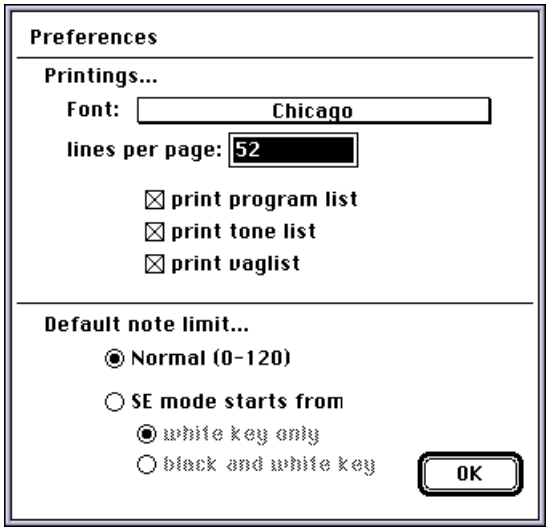
Type	Work size (bytes)	Effect
Room	9,920	Small room
Studio A	9,000	Studio (Small)
Studio B	18,496	Studio (Medium)
Studio C	28,640	Studio (Large)
Hall	44,512	Hall
Space	63,168	Universal space
Echo	98,368	Echo
Delay	98,368	Delay
Pipe	7,072	In a metal pipe

Printing VAB Attribute Table

SoundDelicatessen can print the set program, tone and VAG lists. A printed sheet providing effect tone sound layout in a program allows the efficient utilization of the effect sound. The program can use the output sheet along with data for smoother data exchange.

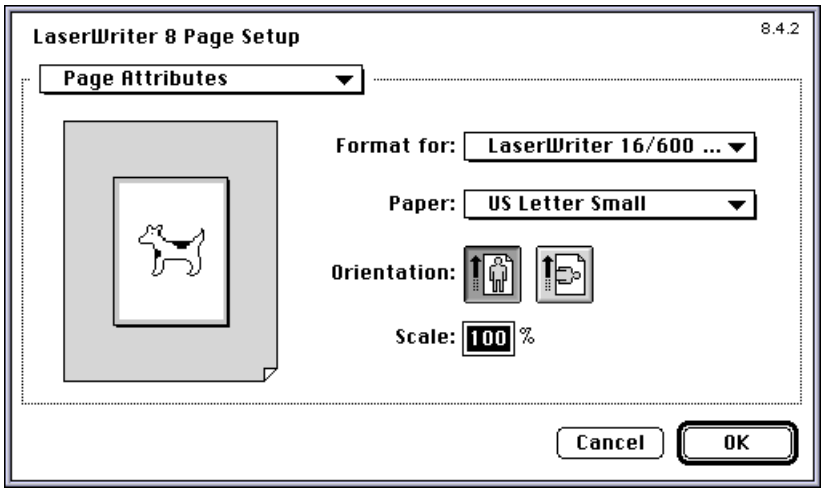
1. With the VAB file opened, select “Preferences ...” in the “File” menu to display the print setting dialog box. Specify the printer font to be used for output, the number of printing lines per page, program, tones, and whether or not the VAG list is to be printed.

Figure 3–28: Printing Option Dialog Box



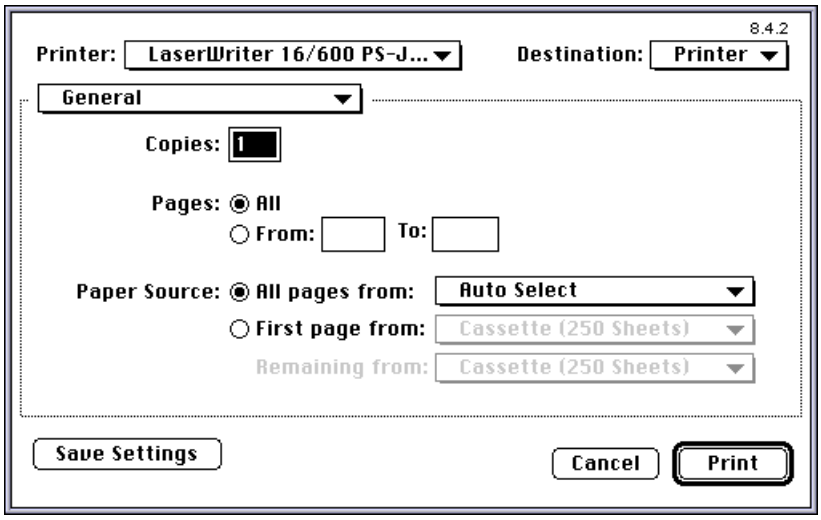
2. Next, select “Page Setup ...” in the “File” menu to have the printing setting dialog box displayed. Check the form size and the printing direction, and press the “OK”button.

Figure 3–29: Printing Setting Dialog Box



3. Select “Print ...” in the “File” menu to have the printing dialog box displayed. Check the number of prints and press the “Print” button.

Figure 3–30: Printing Dialog Box



Note: In the above example, printer driver LaserWrite 8 is used to display the dialog box for output to Apple LaserWriter II NTX. For other printers, the displayed screen may be different.

RAW2DA - Creates CD-DA Data

RAW2DA converts the SoundDesigner II format (a sampling rate of 44.1 kHz, 16-bit straight PCM stereophonic (L→R→L→R) data, big Endian) created by such existing waveform editing software as SoundDesigner II (Digidesign) and Alchemy (Passport Designs) into the CD-DA file (little Endian) for the PlayStation.

The CD-ROM Generator software which masters disks for the PlayStation supports Windows .WAV waveform format data. When the waveform editing software being used can directly output the .WAV data, there is no need to use RAW2DA. At that time, confirm that it is 44.1 kHz stereo 16 bit.

Preparing DA Data

Before using RAW2DA, save the sound data to be converted by your waveform editing (HD recording) software in the SoundDesigner II format (16 bits, stereophonic, 44.1 kHz). Make sure that the sampling rate is 44.1 kHz for stereophonic sound (two channels).

Note: The converter does not convert the sampling rate nor make monophonic sound stereophonic. Be sure to use stereophonic data of 16 bits.

Using RAW2DA

1. Double click the RAW2DA icon to start up the application.
2. Specify a file in response to the request for a SoundDesigner II file to be converted after selecting “Convert ...” in the “File” menu.
3. In response to the prompt message for an output file name, enter the file name to be assigned after the conversion.
4. Select “Quit” from the “File” menu to terminate the application.

A SoundDesigner II format file can also be converted by dragging its icon to the RAW2DA icon. (Two or more icons can be selected at a time.) With “Auto” selected in the “OutputMode” menu after having started up the application, the selected files from the second onward are converted consecutively into the corresponding DA data. (An extension of “.da” is appended automatically.)

RAW2XA - Creates CD-ROM XA Voice Data

RAW2XA converts the SoundDesigner II format (a sampling rate of 18.9 or 37.8 kHz, 16-bit straight PCM monophonic or stereophonic data, big Endian) created by such existing waveform editing software (HD recording software) as SoundDesigner II (Digidesign) and Alchemy (Passport Designs) into the CD-ROM XA voice data file for PlayStation.

Unlike such typical straight PCM (not compressed) data, XA voice data is compressed by ADPCM and, thus, its data amount can be regulated. Depending on the mode, 4 to 16 channels of voice data can be interleaved during ordinary speed CD reproduction, and 8 to 32 channels of voice data can be interleaved during double speed reproduction. Interleaved desired XA multi-channel voice data on the CD can be selected and reproduced by specifying the channel.

Preparing XA Data

Before using RAW2XA, save the sound data to be converted by your waveform editing (HD recording) software in the SoundDesigner II format (16 bits, monophonic or stereophonic, 18.9 or 37.8 kHz).

The PlayStation unit supports the XA voice data formats for the following four modes:

- 37.8 kHz: Stereophonic 8 channels. Interleave supported.
- 37.8 kHz: Monophonic 16 channels. Interleave supported.
- 18.9 kHz: Stereophonic 16 channels. Interleave supported.
- 18.9 kHz: Monophonic 32 channels. Interleave supported.

Note: The converter does not convert sampling rates, or the monophonic mode into the stereophonic mode and vice versa. Be sure be develop data for the mode during reproduction.

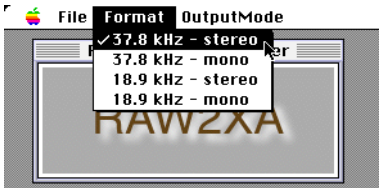
Using RAW2XA

1. Double click the RAW2XA icon to start up the application.
2. Select “Convert ...” from the “File” menu, and specify the file in the SoundDesigner II format to be converted.
3. In response to the prompt message for an output file name, enter the file name to be assigned after conversion.
4. Select “Quit” from the “File” menu to terminate the application.

A SoundDesigner II format file can also be converted by dragging its icon to the RAW2DA icon. (Two or more icons can be selected at a time.) With “Auto” selected in the “OutputMode” menu after having started up the application, the selected files from the second onward are converted consecutively into the corresponding DA data. (A “.da” extension is automatically appended.)

If the data to be converted is not stereophonic at a frequency of 37.8 kHz, select the appropriate data format in the “Format” menu before conversion.

Figure 3–31: “Format” Menu



Interleaving the converted XA file with other data involves programmer movie tool MovPack (MOVPACK.EXE). For details, refer to the programmer tool manual.

Reproduction by DTL-H2000

This section briefly explains the procedure for using sound data (SEQ and VAB) created by the PlayStation Sound Tool for reproduction by the programmer tool (DTL-H2000).

For details of the program and compiler, refer to the programmer tool manual.

Developing Sound Data and Program

This paragraph describes sound reproduction using sequence data (SEQ) and sound source data (VAB). The needed sample program is stored in the following directory for the programmer tool.

`\psx\sample\sound\simple`

The following are the files to be used:

Sample program description file	`\psx\sample\sound\simple\readme_e.txt`
Make file	`\psx\sample\sound\simple\makefile.mak`
Main program	`\psx\sample\sound\simple\main.c`
VH (VAB attribute)	`\psx\sample\sound\simple\sample.vh`
VB (VAB waveform)	`\psx\sample\sound\simple\sample.vb`
SEQ	`\psx\sample\sound\basic\fuga.seq`

Using DTL-H2000 to Reproduce Sound Data

1. Compile the program.

   Compiling the program involves movement to the \psx\sample\sound\simple and the entry of “make all”. The following are the contents of makefile.mak:

```
makefile.mak
       all:
              ccpsx -g -Xo$80100000 -Xm main.c -omain.cpe.main.sym.main.map
       load:
pqbload sample.vh 80015000
pqbload sample.vb 80020000
pqbload ..\basic\fuga.seq 80010000
       clean:
del *.?~
del *.??~
del *.cpe
del *.sym
del *.map
```

   Entering “make all” causes the following command to be issued in accordance with the description of makefile.mak.

```
ccpsx -g -Xo$80100000 -Xm main.c -omain.cpe.main.sym.main.map
```

   Program compilation is now complete.

2. Load data.

   To load data, enter “make load”. The following three commands are executed in accordance with the makefile.mak description:

   ```
   pqbload sample.vh 80015000
   pqbload sample.vb 80020000
   pqbload ..\basic\fuga.seq 80010000
   ```

   Each of the commands transfers sample.vh, sample.vb and fuga.seq sound data to the specified addresses.

3. Use the debugger to execute the program.

   Executing the program requires that “dbugpax main/r50 /2” be entered. The debugger is started up, with the main program loaded to the debugger. Pressing “F-9” causes the program to be started up. Operate the control pad to reproduce sound.

   The current tempo, volume and status are displayed.

Figure 3–32: Monitor Output of Sample Program

The following are the keys on the control pad:

Table 3–6: Control Pad Keys

Key	Description
START	Play (Starts playing.)
SELECT	Stop (Stops playing.)
X	Replay
•	Pause
R1	Gradually increases the tempo.
L1	Gradually decreases the tempo.
↑	Increases the volume.
↓	Decreases the volume.
←	Gradually decreases the volume to zero.
→	Gradually increases the volume to 127.
SELECT + START	Close (Terminates playing)

Program Flow

This paragraph briefly explains the program flow used for the sample. The items not related to sound are omitted.

```
main.c
/*
 * sample..simple
 */
#include <sys/types.h>
#include <libgte.h>
#include <libgpu.h>                 /* Declares the header file of the
                                       library to be used.*/
#include <libetc.h>
#include <libsnd.h>

short vab;                          /* Declares the variable where the VAB
                                       ID is to be stored.*/
short seq;                          /* Declares the variable where the SEQ
                                       ID is to be stored.*/

char seq_table[SS_SEQ_TABSIZ * 1 * 1];
                                    /* Acquires the attribute table for SEQ
                                       to be used.*/

main()
{
SsInit();                           /* Initializes the sound library.*/
SsSetTableSize (seq_table, 1, 1);   /* Passes the SEQ attribute table to the
                                       library.*/
SsSetTickMode(SS_NOTICK);           /* Declares the sound interrupt mode.*/

vab = SsVabOpenHead ((u_char *)VAB_HADDR, -1);
                                    /* Passes the VAB attribute section to
                                       the library.*/
       if (vab == -1) {
       printf ("SsVabOpenHead : failed !!!\n");
       return;
       }
if (SsVabTransBody ((unsigned char *)VAB_BADDR, vab) != vab) {
                                    /* Starts transferring the VAB waveform
                                       section to the sound buffer.*/
       printf ("SsVabTransBody : failed !!!\n");
       return;
       }
SsVabTransCompleted (SS_WAIT_COMPLETED);
                                    /* Waits for the completion of the
                                       transfer.*/
seq = SsSeqOpen((u_long *)SEQ_ADDR, vab);
                                    /* Passes SEQ to the library.*/

SsSetMVol(MVOL, MVOL);              /* Sets the main volume.*/
SsSeqSetVol(seq, SVOL, SVOL);       /* Sets the SEQ volume.*/

SsStart();                          /* Starts sound interrupt (play).*/

while (1) {                         /* Main loop*/

                                    /* Main processing*/
VSync(0);                           /* Waits for the V blank.*/
SsSeqCalledTbyT();                  /* Sound processing function */
}
SsSeqClose(seq);                    /* Closes SEQ.*/
SsVabClose(vab);                    /* Closes VAB.*/
SsEnd();                            /* Stops sound library utilization.*/
SsQuit();                           /* Terminates sound library
utilization.*/
       return;
}
```

Chapter 4: References

Sound File Formats

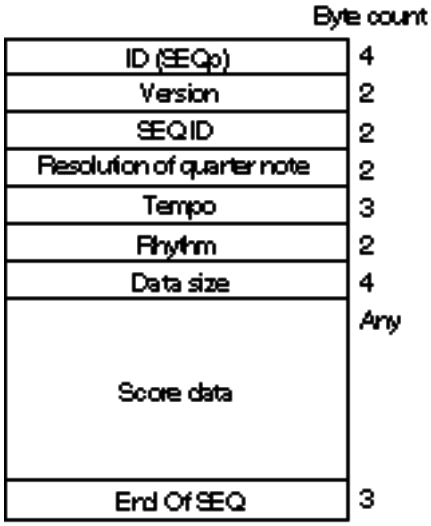
This section explains the following file formats.

- SEQ
- SEP
- VAG
- VAB
- VH
- VB
- DA
- XA

SEQ

SEQ is the PlayStation sequence data format. The typical extension in DOS is ".SEQ".

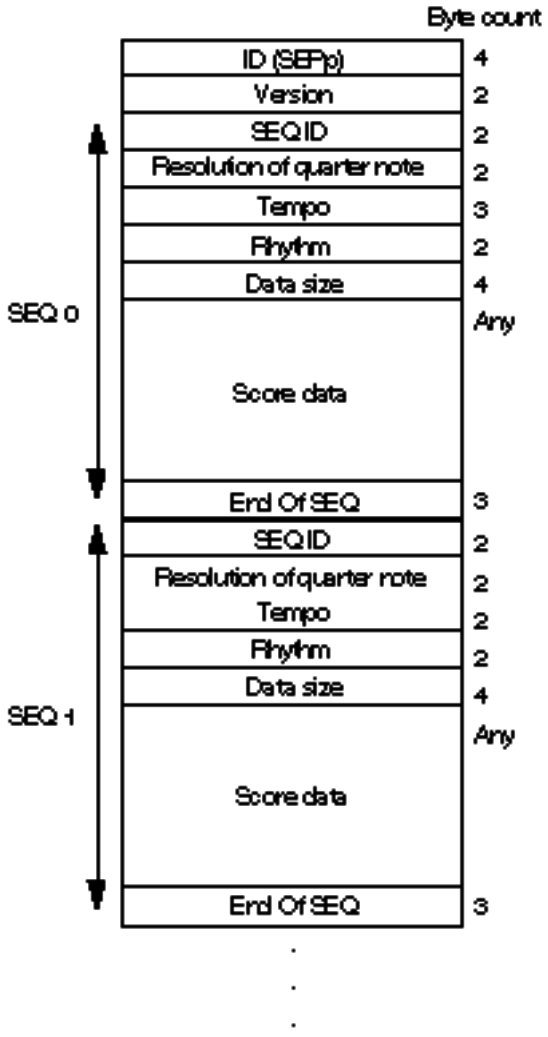
Figure 4–1: SEQ Format



SEP

SEP is the PlayStation multi-track sequence data format. The typical extension in DOS is ".SEP".

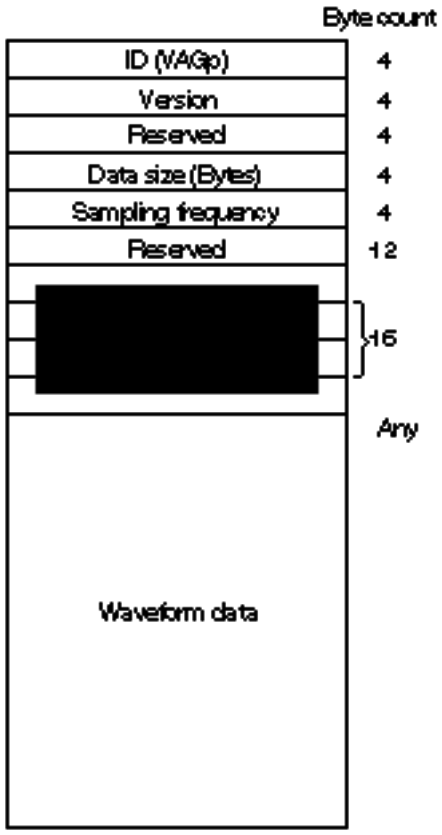
Figure 4–2: SEP Format



VAG

VAG is the PlayStation single waveform data format. The typical extension in DOS is ".VAG".

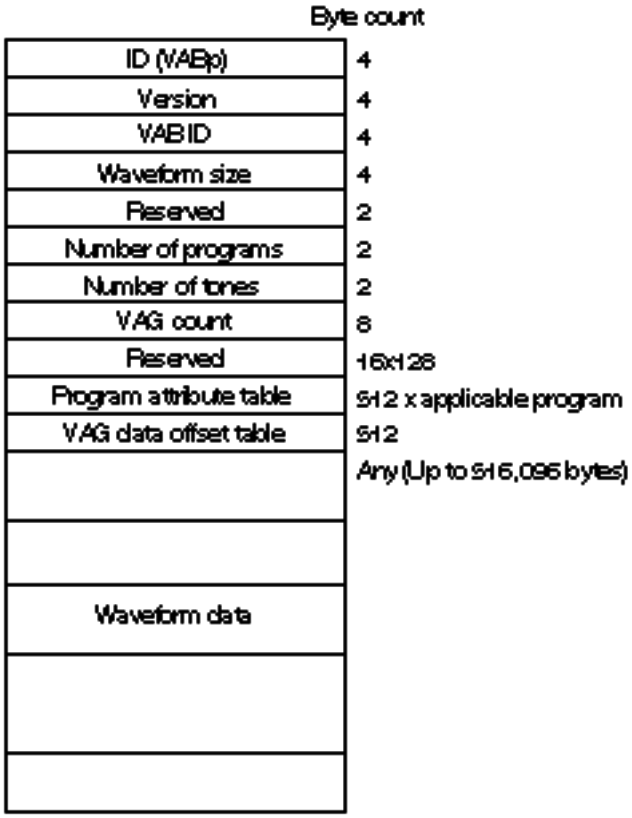
Figure 4–3: VAG Format



VAB

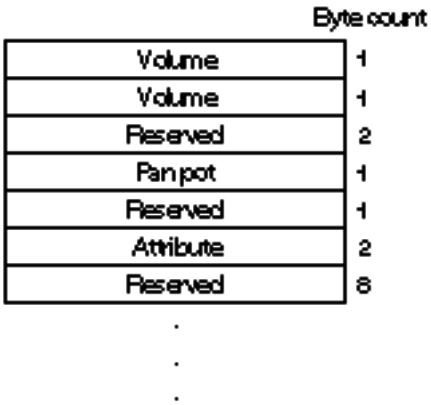
VAB is the PlayStation sound source data format. The typical extension in DOS is ".VAB".

Figure 4–4: VAB Format



The program attribute table has the following structure.

Figure 4–5: VAB Program Attribute Table



The tone attribute table has the following structure.

Figure 4–6: VAB Tone Attribute Table

	Byte count
Priority	1
Reproduction mode	1
Volume	1
Pan pot	1
Center note	1
Fine pitch	1
Low note limit	1
High note limit	1
Width of vibration	1
Period of vibration	1
Width of portamento	1
Period of portamento	1
Pitch bend (Upper)	1
Pitch bend (Lower)	1
Reserved	2
ADSR	4
Parent program number	2
Reference VAG number	2
Reserved	8

.
.
.

VH

VH is the VAB attribute table section. The typical extension in DOS is ".VH".

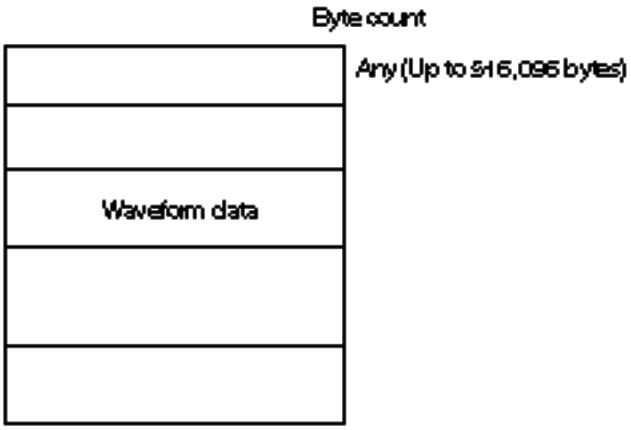
Figure 4–7: VH Format

	Byte count
ID (VABp)	4
Version	4
VAB ID	4
Waveform size	4
Reserved	2
Number of programs	2
Number of tones	2
VAG count	2
Reserved	8
Program attribute table	16 x 128
Tone attribute table	512 x applicable program
VAG data offset table	512

VB

VB is the VAB waveform data section. The typical extension in DOS is ".VB".

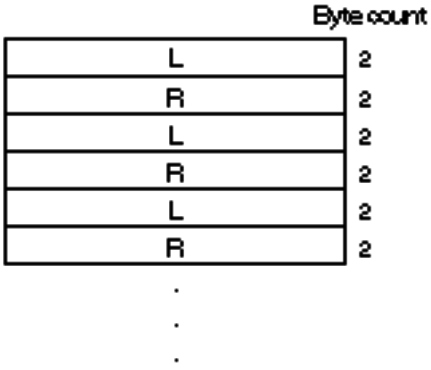
Figure 4–8: VB Format



DA

DA is the PlayStation CD-DA data format. The typical extension in DOS is ".DA".

Figure 4–9: DA Format



XA

XA is the PlayStation CD-ROM XA voice data format. The typical extension in DOS is ".XA".

The XA format is based on the following specifications. The XA file output by RAW2XA has a sub-header.

CD-ROM XA
SYSTEM DESCRIPTION CD-ROM XA

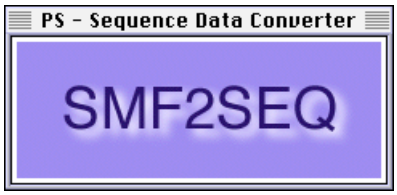
Copyright May 1991

Commands and Names of Window Components

SMF2SEQ

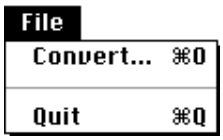
Upon the startup of SMF2SEQ, the following dialog box is displayed.

Figure 4–10: SMF2SEQ Panel



[File] menu

Figure 4–11: SMF2SEQ: "File" Menu

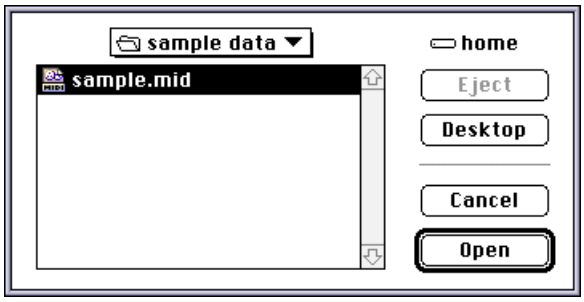


[File] - [Convert ...]

Starts conversion from SMF into SEQ.

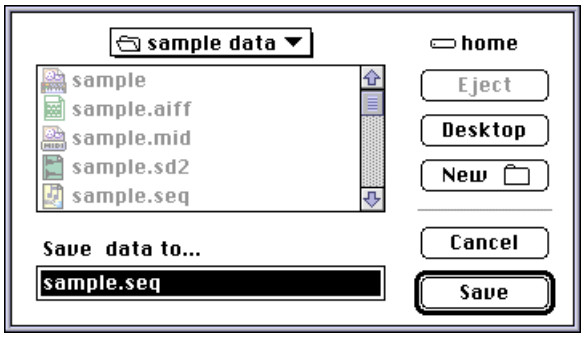
Upon the selection of the [Convert ...] command, the SMF file selection dialog box is displayed. Specify an SMF file to be converted.

Figure 4–12: SMF2SEF File Selection Dialog Box



When the [Open] button is pressed, the SEQ file name specification dialog box is displayed.

Figure 4–13: SMF2SEQ: SEQ File Specification Dialog Box



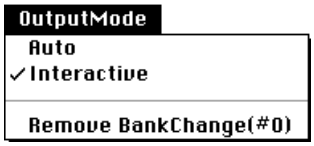
Pressing the [Save] button starts conversion.

[File] - [Quit]

Terminates the SMF2SEQ application.

[OutputMode] Menu

Figure 4–14: SMF2SEQ "Output Mode" Menu



[OutputMode] - [Auto]

Sets mode to continuous automatic conversion mode. When specifying multiple SMF files through drag and drop, the 'save to.....' directory specification panel is displayed only for the first file, all subsequent files are output to the same folder.

[OutputMode] - [Interactive]

Sets mode to interactive mode. The 'save to.....' file specification panel is displayed at conversion.

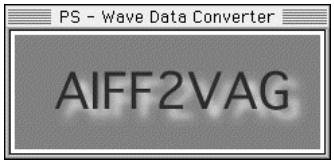
[OutputMode] - {Remove BankChange (#0)]

The BankChange message during conversion is forcibly deleted.

AIFF2VAG

Upon the startup of AIFF2VAG, the following dialog box is displayed.

Figure 4–15: AIFF2VAG Panel



[File] menu

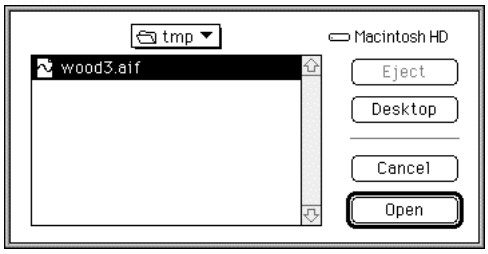
Figure 4–16: AIFF2VAG: "File" Menu

[File] - [Convert ...]

Starts conversion from AIFF into VAG.

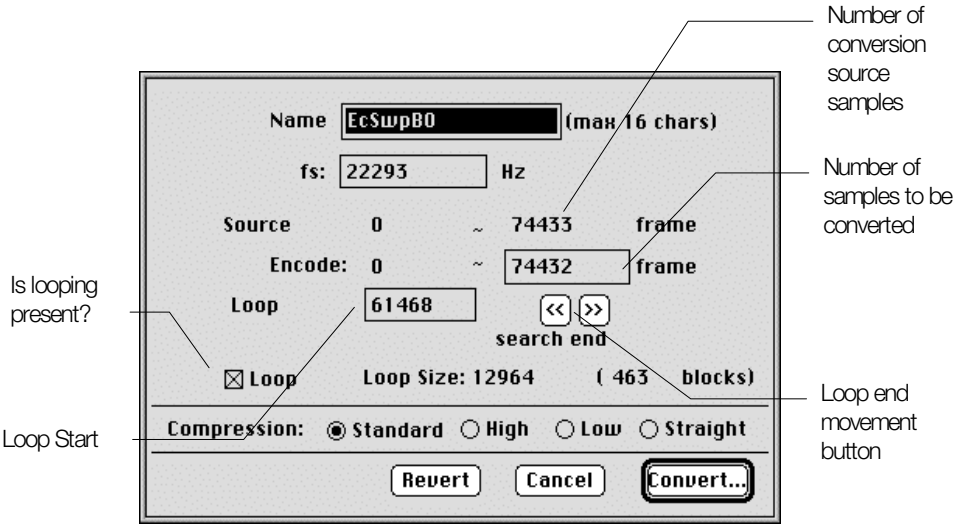
Upon the selection of the [Convert ...] command, the AIFF file selection dialog box is displayed. Specify an AIFF file to be converted.

Figure 4–17: AIFF2VAG: AIFF File Selection Dialog Box



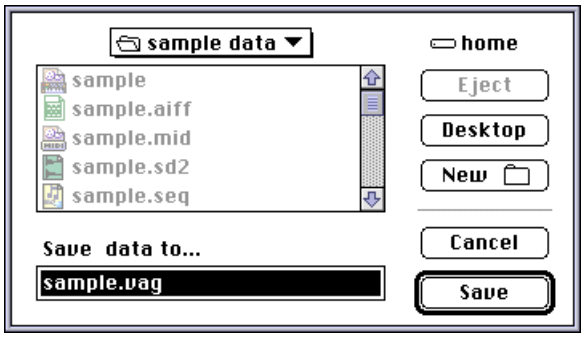
When the [Open] button is pressed, the loop point specification dialog box is displayed.

Figure 4–18: AIFF2VAG: Conversion Panel



When the [Convert] button is pressed, the VAG file name specification dialog box is displayed.

Figure 4–19: AIFF2VAG: VAG File Specification Dialog Box



Pressing the [Save] button starts conversion. When conversion is complete the VAG data is downloaded to the DTL-H800 and reproduced. (The “Mode” can be set so that it does not automatically reproduce).

[File] - [Select VAG...]

Specify the VAG file, download it to the DTL-H800 and reproduce it.

[File] - [Play]

Either the VAG data which was just converted or the VAG data which was downloaded is reproduced for a second time. Clicking the mouse on the AIFF2VAG panel has the same effect.

[File] - [Stop]

Stops repoduction of VAG data (including looped infinite waveforms). Clicking the mouse on the AIFF2VAG panel has the same effect (during downloading, release the button).

[File] - [Quit]

Terminates the AIFF2VAG application.

[Compression] menu

Figure 4–20: AIFF2VAG: “Compression” Menu

Specifies the type of compression.

[Compress] - [Standard]

Selects a typical compression type.

[Compress] - [High Band]

Selects the compression type adapted to the waveform comprising more high-frequency components.

[Compress] - [Low Band]

Selects the compression type adapted to the waveform comprising more low-frequency components.

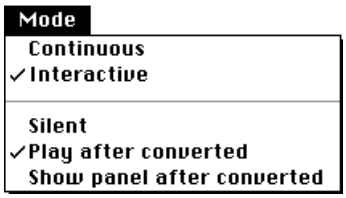
[Compress] - [4-bit Straight]

Selects the type for compressing 16-bit data simply to 4-bit data.

[Mode] Menu

Specifies the conversion mode and play mode.

Figure 4–21: AIFF2VAG "Mode" Menu



[Mode] - [Continuous]

Sets mode to continuous conversion mode. When specifying multiple AIFF files in drag and drop, the ‘save in.....directory’ specification panel is displayed only for the first file, all files after that are output to the same folder.

[Mode] - [Interactive]

Sets mode to interactive mode. The ‘save in.....directory’ setting panel is displayed at conversion.

[Mode] - [Silent]

No playing is carried out after conversion.

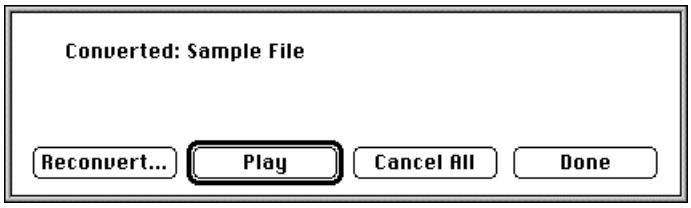
[Mode] - [Play after converted]

Automatically plays after conversion.

[Mode] - [Show panel after converted]

The following panel is displayed after conversion.

Figure 4–22: AIFF2VAG Playback Confirmation Panel



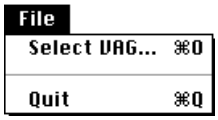
VAG Player

Starting up VAG Player causes the following dialog box to pop up.

Figure 4–23: VAG Player Panel

[File] menu

Figure 4–24: VAG Player: “File” Menu

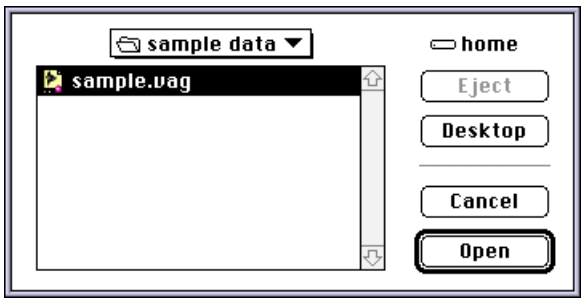


[File] - [Select VAG ...]

Select VAG to be reproduced.

After selecting the [Select VAG ...] command, the VAG file selection dialog box is displayed. Select the VAG to be reproduced.

Figure 4–25: VAG Player: VAG File Selection Dialog Box

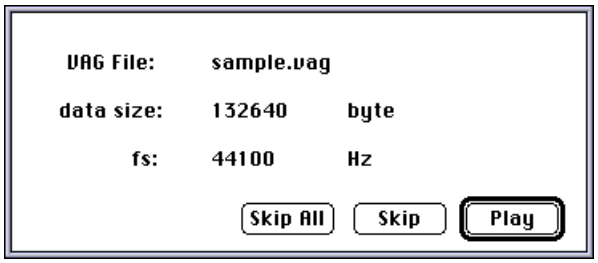


[File] - [Quit]

Terminates the VAG Player application.

Dragging the VAG file to the VAG Player application icon causes the following dialog box to be displayed. Two or more VAG units can be dropped.

Figure 4–26: VAG Player: Dialog box for dragging and dropping



The VAG file reproduction function is also included in AIFF2VAG.

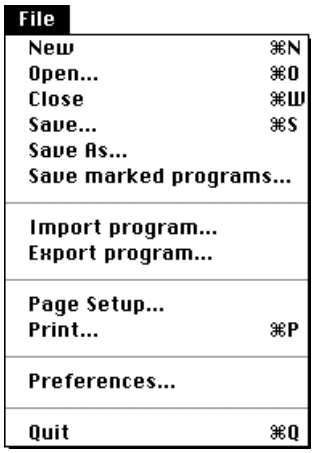
SoundDelicatessen

When SoundDelicatessen is started up, the following dialog box is displayed until set up is complete.

Figure 4–27: SoundDelicatessen Panel

[File] menu

Figure 4–28: SoundDelicatessen: “File” menu

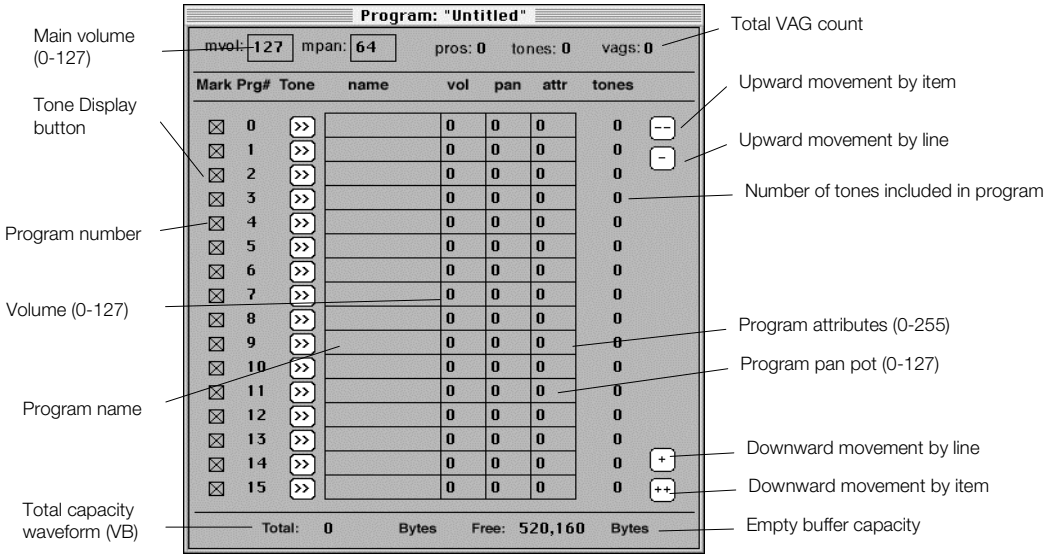


[File] - [NEW]

Opens new VAB.

Upon the selection of the [NEW] command, the following program list window is displayed.

Figure 4–29: SoundDelicatessen: Program list window



[File] - [Open ...]

Opens an existing VAB file.

[File] - [Close]

Closes the VAB file currently edited.

[File] - [Save ...]

Saves the VAB file currently edited.

[File] - [Save As ...]

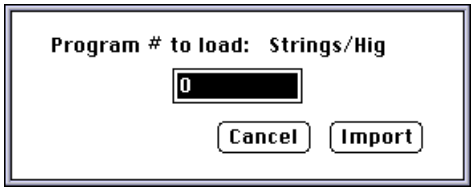
Saves the VAB file currently edited under an alias.

[File] - [Import program ...]

Loads a program unit.

Select the [Import program...] command and then the program file to be loaded. When the file has been selected, register the program order by entering a number from 0 to 127 when requested, and clicking the [Import] button.

Figure 4–30: SoundDelicatessen: Program Import



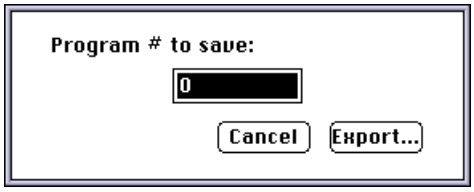
[File] - [Export program...]

Writes a program unit.

When using the [Export program...] command to output a program, click the tone display button for the program to be output, and select the [Export program...] command with the tone list window displayed.

When requested to confirm the number of the program to be output, click the [Export] button if the program is correct.

Figure 4–31: SoundDelicatessen: Program Export

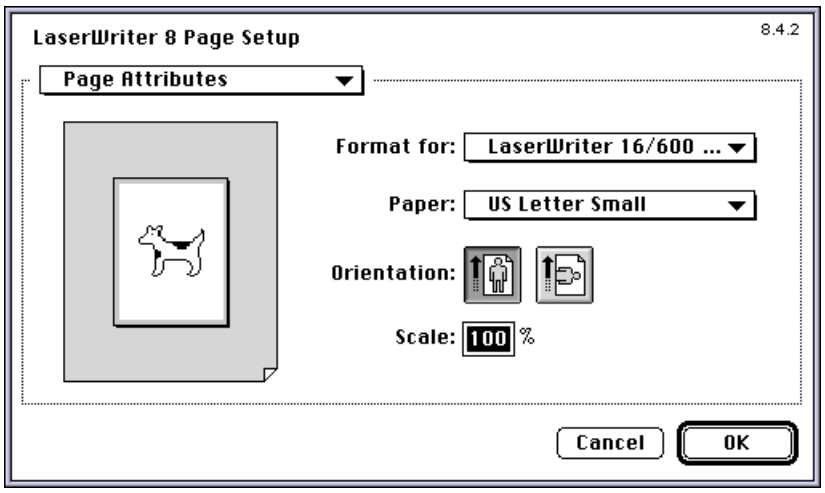


[File] - [Page Setup...]

Sets up the printer.

Set the paper size. The paper setting dialog box displayed may vary with the printer used.

Figure 4–32: SoundDelicatessen: Print setting dialog box

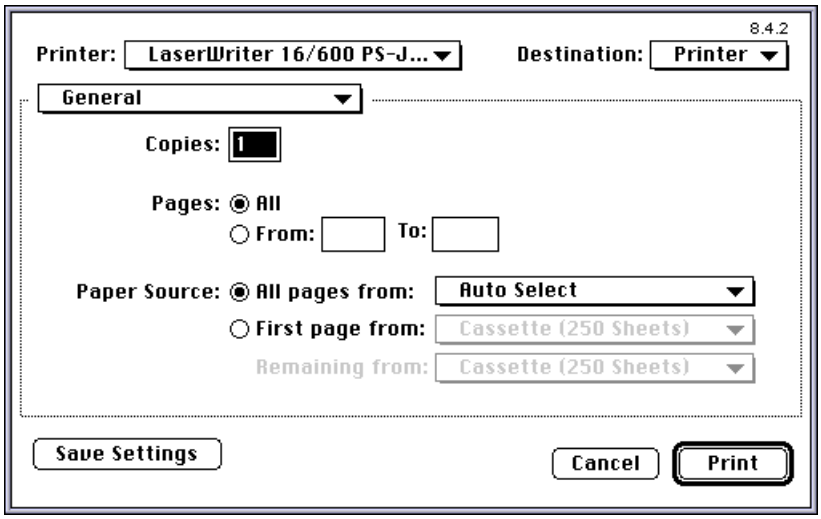


[File] - [Print]

Prints the attribute table (VH section).

Clicking the [print] button with the print count set starts printing. The printer dialog box displayed may vary with the printer used.

Figure 4–33: SoundDelicatessen Printer Dialog Box

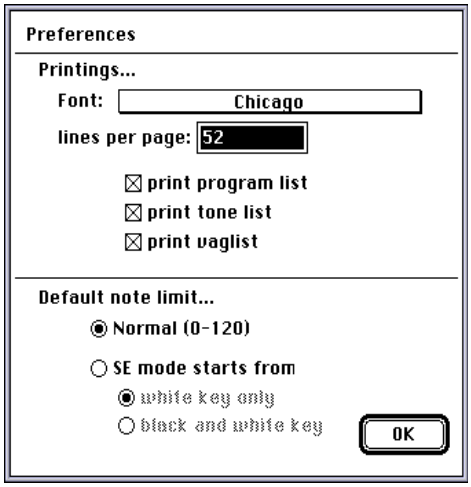


[File] - [Preferences...]

Sets the printing option.

Specify the printer font to be used.

Figure 4–34: SoundDelicatessen: Print option dialog box

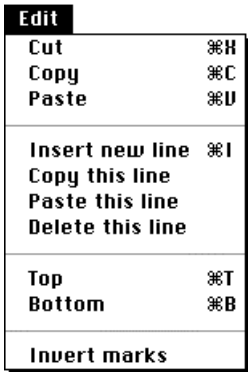


[File] - [Quit]

Terminates the SoundDelicatessen application.

[Edit] menu

Figure 4–35: SoundDelicatessen: “Edit” menu



[Edit] - [Cut]

Cuts the character pointed to by the inverted cursor.

[Edit] - [Copy]

Copies the character pointed to be the inverted cursor.

[Edit] - [Paste]

Pastes the previously cut or copied character to the current cursor position.

[Edit] - [Insert new line]

Inserts a new program, tone or VAG into the line pointed to by the inverted cursor.

[Edit] - [Copy this line]

Copies the program or tone pointed to by the inverted cursor. When copying a program, all the tones contained within it are also copied.

[Edit] - [Paste this line]

Copies the previously copied program or tone to the line pointed to by the cursor. When copying a program, all the tones contained within it are also pasted.

[Edit] - [Delete this line]

Deletes the program or tone pointed to by the inverted cursor. When copying a program, all the tones contained within it are also deleted.

[Edit] - [Top]

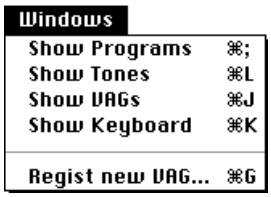
Movement to the start program, tone or VAG

[Edit] - [Buttom]

Movement to the end program, tone or VAG

[Windows] menu

Figure 4–36: SoundDelicatessen: “Windows” menu



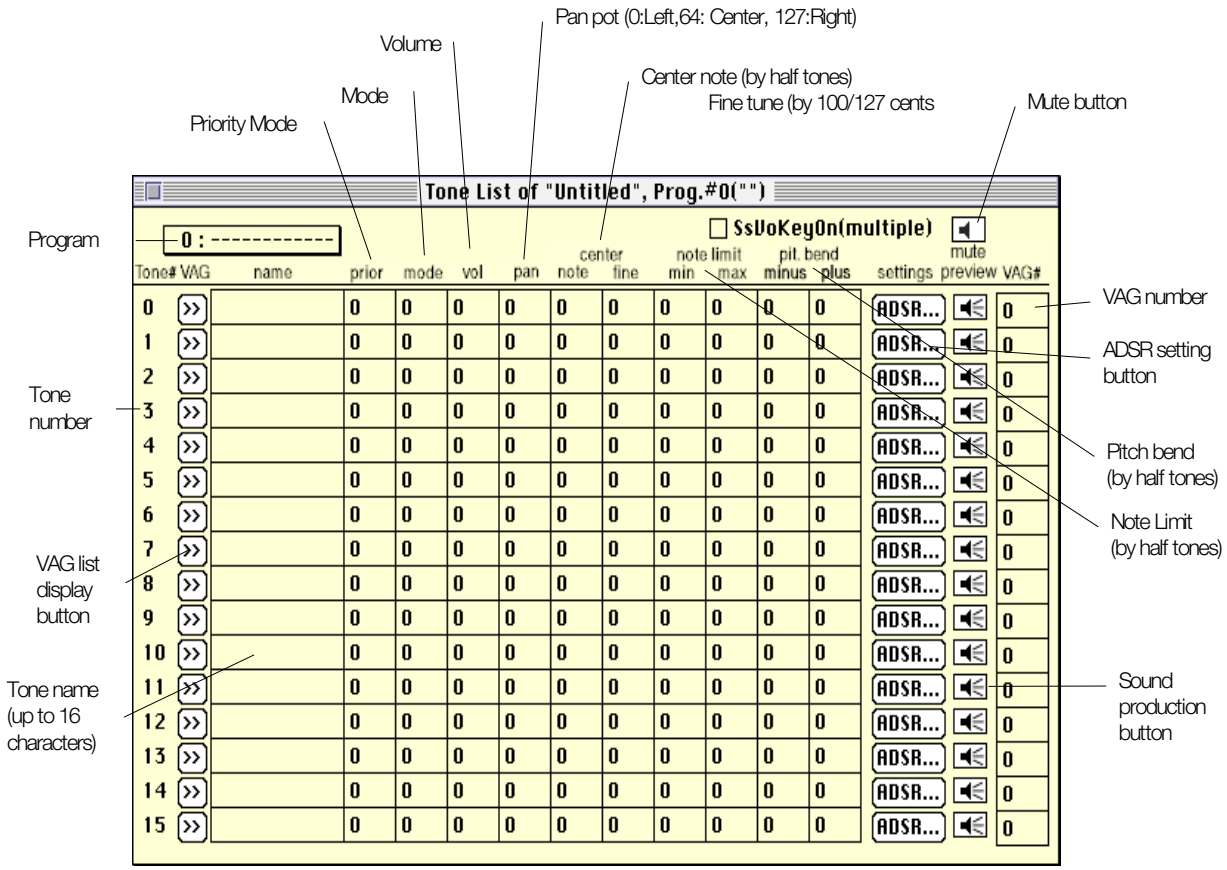
[Windows] - [Show Programs]

Displays the program list window.

[Windows] - [Show Tones]

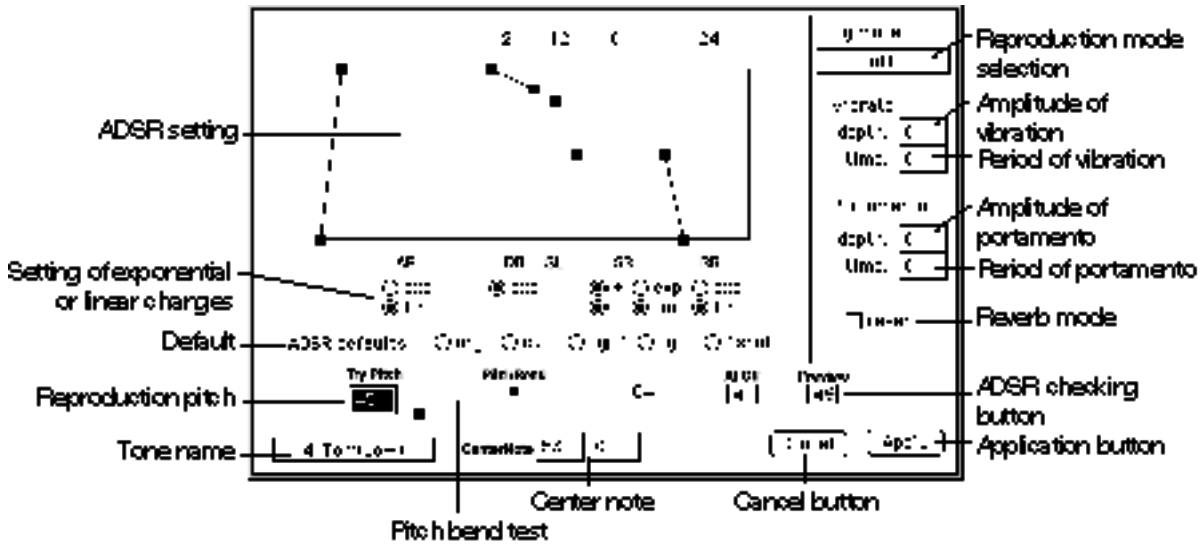
Displays the tone list window.

Figure 4–37: SoundDelicatessen: Tone list window



Clicking the “ADSR...” button in the tone list allows the tone ADSR, etc. to be set.

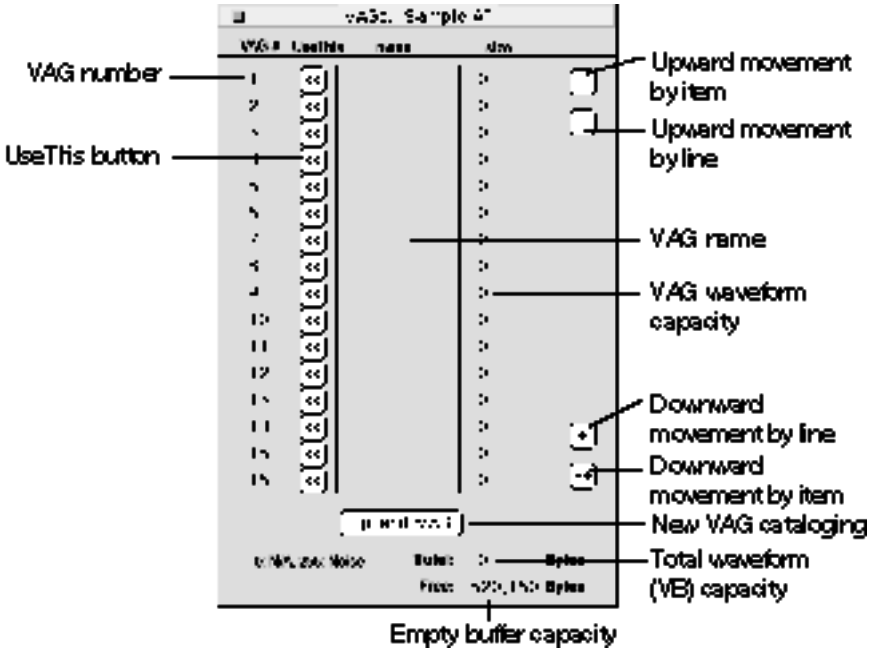
Figure 4–38: SoundDelicatessen: ADSR setting window



[Windows] - [Show VAGs]

Displays the VAG list window.

Figure 4–39: SoundDelicatessen: VAG list window



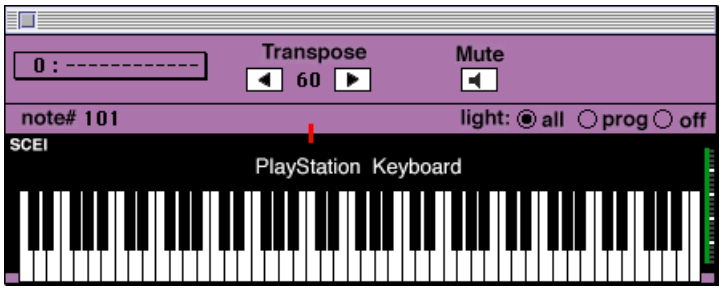
Clicking the [<<(UseThis)] button allows the VAG file to be used in the tone list (a link is applied.)

Clicking the [append VAG] button allows a new VAG to be cataloged to the end of the VAG list.

[Windows] - [Show Keyboard]

Displays the keyboard window.

Figure 4–40: SoundDelicatessen: Keyboard window



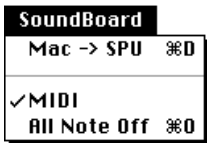
[Windows] - [Regist new VAG...]

Catalogs new VAG in the VAG list window.

This command is equivalent to [append VAG] on the VAG list window.

[SoundBoard] menu

Figure 4–41: SoundDelicatessen: "SoundBoard" menu



[SoundBoard] - [MAC -> SPU]

Transfers the VB (waveform data) section of the cataloged VAG to the Sound Board.

[SoundBoard] - [MIDI]

Sets MIDI.

With Apple MIDI Manager and MIDI Driver installed correctly, MIDI is connected automatically and this item is checked. Use this function to temporarily disconnect MIDI.

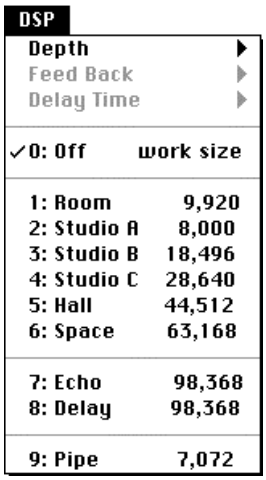
[SoundBoard] - [All Note Off]

Forcibly stops sound production from the Sound Board.

When the sequence is suspended or if a low release rate (ADSR RR) for the loop sound source has been set, some sound may remain. Use this function for muting.

[DSP] menu

Figure 4–42: SoundDelicatessen: “DSP” menu



[DSP] - [Depth]

This is a sub-menu for setting reverb depth (reverb volume).

[DSP] - [Feed Back]

This is a sub-menu for setting the reverb feedback amount.*

*The [Feed Back] command can only be set when using “Echo” type reverb.

[DSP] - [Delay Time]

This is a sub-menu for setting the reverb delay.*

* The [Feed Back] command can only be set when using “Echo” or “Delay” type reverbs.

The following are specifications of each reverb type:

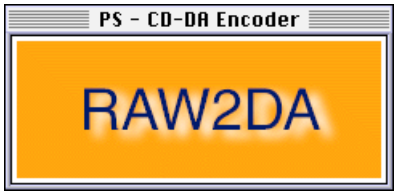
Table 4–1: Reverb Types

Type	Work size (bytes)	Effect
Room	9,920	Small room
Studio A	9,000	Studio (Small)
Studio B	18,496	Studio (Medium)
Studio C	28,640	Studio (Large)
Hall	44,512	Hall
Space	63,168	Universal space
Echo	98,368	Echo
Delay	98,368	Delay
Pipe	7,072	In a metal pipe

RAW2DA

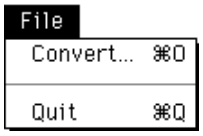
When starting up RAW2DA, the following dialog box is displayed.

Figure 4–43: RAW2A Panel



[File] menu

Figure 4–44: RAW2DA: “File” menu



[File] - [Convert...]

Selects a RAW file to be selected and starts conversion.

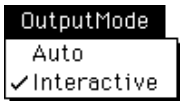
Like the SoundDesigner II format (44.1 kHz, stereophonic), the RAW file contains 16-bit straight PCM data in L→R→L→R order.

[File] - [Quit]

Terminates the RAW2DA application.

[OutputMode] menu

Figure 4–45: RAW2DA: “OutputMode” menu



[OutputMode] - [Auto]

Sets mode to continuous automatic conversion mode. When specifying multiple SDII data through drag and drop, the ‘save to.....’ directory specification panel is displayed for the first file only and all subsequent files are output to the same folder.

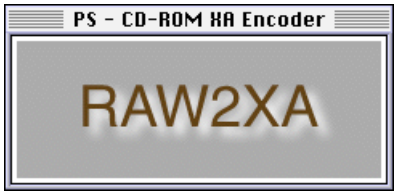
[OutputMode] - [Interactive]

Sets mode to interactive mode. The ‘save to.....’ file specification panel is displayed at conversion.

RAW2XA

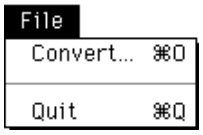
When RAW2XA is started up, the following dialog box is displayed.

Figure 4–46: RAW2XA Panel



[File] menu

Figure 4–47: RAW2XA: "File" menu



[File] - [Convert...]

Selects the RAW file or AIFF file to be converted and starts conversion.

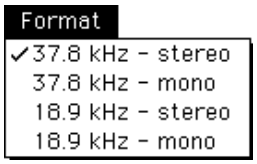
Like the SoundDesigner II format (44.1 kHz, stereophonic), the RAW file contains 16-bit straight PCM data in L→R→L→R order.

[File] - [Quit]

Terminates the RAW2XA application.

[Format] menu

Figure 4–48: RAW2XA: "Format" menu



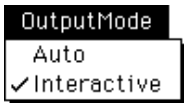
[Format] - [37.8 kHz - stereo]
[Format] - [37.8 kHz - mono]
[Format] - [18.9 kHz - stereo]
[Format] - [18.9 kHz - mono]

Specify the mode for the file to be converted.

RAW2XA does not convert the sampling frequency or stereophonic sound to monophonic sound and vice versa. Thus, prepare RAW data or AIFF data adapted to the format in advance.

[OutputMode] menu

Figure 4–49: RAW2XA: “OutputMode” menu



[OutputMode] - [Auto]

Sets mode to continuous automatic conversion mode. When specifying multiple SDII data or AIFF data through drag and drop, the ‘save to.....’ directory specification panel is displayed for the first file only and all subsequent files are output to the same folder.

[OutputMode] - [Interactive]

Sets mode to interactive mode. The ‘save to.....’ file specification panel is displayed at conversion.

Supporting MIDI in Sound Library

Setting VAB Attribute Data using Control Change

NRPN data is so defined that NRPN for MIDI standard Control Change can be used to set the VAB attribute data.

Operation

Sequentially sending

bnH 99 data1 (NRPN MSB)

bnH 98 data2 (NRPN LSB)

bnH 06 data3 (Data Entry)

when using the sequence to create an SMF file enables VAB attribute data to be set.

Given below is a description of data1, data2 and data3.

The tone number ranges from 0 to 15. When changing attributes for all tones, set a number of 16.

Because of hardware specifications, however, only one set of such factors as reverb depth can be set by SPU. The reverb type, depth and the feedback amount cannot be set for each channel for tones and MIDI.

The reverb can be turned on and off only for each voice.

This setting requires that the reverb switch on the ADSR setting screen for SoundDelicatessen be checked. ‘Mode’ for NRPN can be used to change setting in real time from the MIDI sequence.

Table 4–2: Data Descriptions

Attribute	Data1 (CC99)	Data2 (CC98)	Data3 (CC06)
Priority	Tone Number	0	0-15
Mode	“	1	0-4 (*)
Limit low	“	2	0-127
Limit high	“	3	“
ADSR (AR-L)	“	4	“
ADSR (AR-E)	“	5	“
ADSR (DR)	“	6	“
ADSR (SL)	“	7	“
ADSR (SR-L)	“	8	“
ADSR (SR-E)	“	9	“
ADSR (RR-L)	“	10	“
ADSR (RR-E)	“	11	“
ADSR (SR-±)	“	12	0-64:+ , 65-127:-
Vibrate time	“	13	0-255
Portamento depth	“	14	0-127
Reverb type	16	15	0-9 (**)
Reverb depth	16	16	0-127
Echo feed back	16	17	“
Echo delay time	16	18	“
Delay delay time	16	19	“
Vibrate depth	Tone Number	21	0-127
Portamento time	“	22	0-255

(*) Mode Type
(**) Reverb Type

Table 4–3: Vibration Types

Number	Mode
0	Off
1	Vibrato
2	Portamento
3	1 & 2 (Vibrato & Portamento on)
4	Reverb

Table 4–4: Reverb Type

Number	Mode
0	Off
1	Room
2	Studio A
3	Studio B
4	Studio C
5	Hall
6	Space
7	Echo
8	Delay
9	Pipe

Repeated Setting in Music using Control Change

A music part repetition function has been implemented by NRPN data. Repetition symbol “|l:” serves for Loop1, while “:l|” serves for Loop2. The function can be used in a music piece as many times as you desire. A nest of (Loop1...(Loop1’...Loop2’) ...Loop2) for repetition cannot be used.

Table 4–5: Repetition Functions

Attribute	Data1 (CC99)	Data3 (CC06)
Loop1 (start)	20	0-127 (***)
Loop2 (end)	30	

(***) For endless repetition, set a value of 127(0x7f).

Note 1:

For some sequencers, even when the order is input correctly there is the possibility that the order can become changed during conversion into SMF if the data has been set under the same Delta Time. Therefore, try to avoid setting the same Delta Time. Values for VAB attribute data settings become valid from the key-on immediately after Data Entry has been read.

Note 2:

Until now Loop1 settings were CC99 and CC98, however, from this point onwards they will be CC99 and CC06. Because SMF which were created under CC99 and CC98 are compatible, there is no need to modify the data.

Marking Function using Control Change

A function which can mark places with music has been implemented by the NRPN data. In the library, a function which registers the function being called is provided when this mark is detected. Below is the marking format.

Table 4–6: Marking Function

Attribute	Data1(CC99)	Data3(CC06)
Mark	40	Value of 0 to 127 (Passed to the callback function)