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SEGA OF AMERICA, INC.
Consumer Products Division

SCSP Waveform Editor Technical Specifications

Doc. # ST-67-121593

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This software is a waveform editing tool that has three main functions:

- Waveform Retrieval
- Waveform Editing
- Waveform Output

1.0 Waveform Retrieval

Waveforms may be retrieved from a file or the SCSP. The retrieved waveform is displayed on-screen.

Retrieving Waveforms from a File
This program can edit waveforms retrieved from Audio Interface File Format (AIFF) files stored on a Macintosh computer. The AIFF format consists of a header and wave data. The header contains data such as number of channels, number of samples, sampling rate, sample bit resolution, loop start point, loop end point, and base note.

Sampling Waveforms with the SCSP
This editor can also sample sounds onto a hard disk through the SCSP's *Digital In* terminal. The data that is retrieved from the SCSP is written onto the Macintosh hard disk and can be displayed on-screen for editing.

2.0 Waveform Editing

The waveform that is displayed on-screen can be edited in many ways. The editing functions include:

- Cut & paste
- Waveform mixing
- Looping (editing of loop start and loop end points)
- Single-byte level wave data editing
- Resampling
- Pitch shifting
- Waveform Scaling
- Low-pass, high-pass, and band-pass filting
- Crossfade, fade in, fade out

3.0 Waveform Output

This editor saves the modified wave data in the Macintosh as AIFF data. It can also play back the saved data using the SCSP or the Macintosh. The following data is saved in the file:

- Wave data
- Sampling rate
- Number of samples
- Sample bit resolution
- Loop start point
- Loop end point
- Note
- Loop mode

4.0 Starting the Editor

From the Finder, double-click the icon for the Waveform Editor. The system downloads the 68000 program used by the Editor into the target and then executes it. If the program has already been downloaded, (For example, by the prior use of the Waveform or Sound Editors) the download is not performed. The ProgramReady flag determines whether or not the program is downloaded..

After downloading and executing the program, the system starts the Waveform Editor. When the tool is started, the menu and the control window are displayed.

What Is Seen on Screen
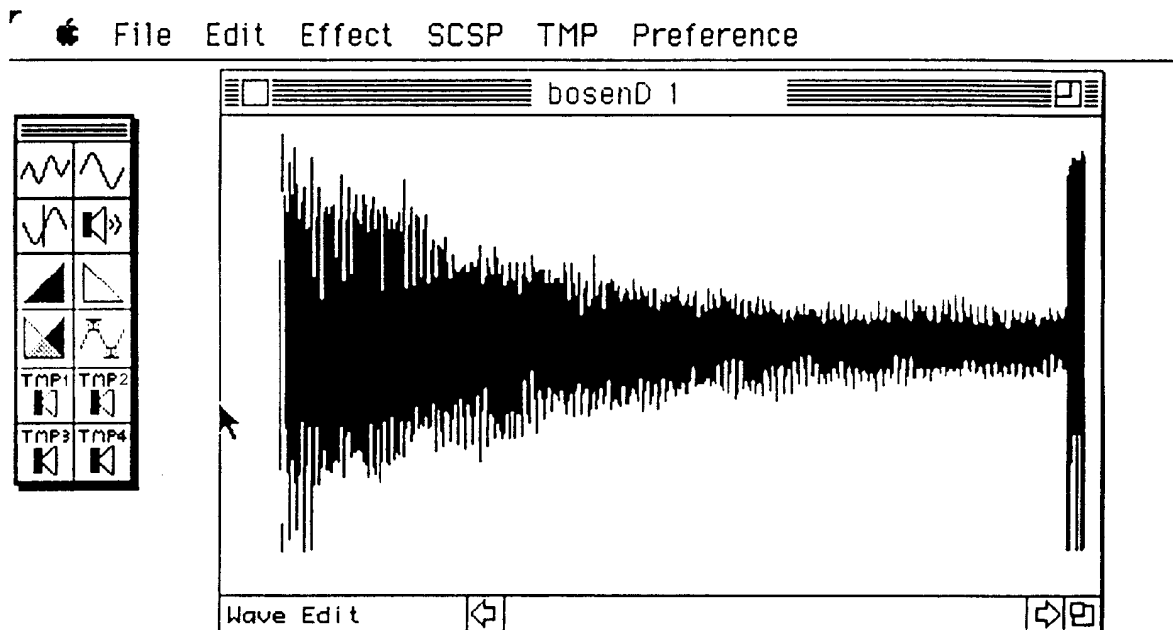
The Editor's screen layout is shown in the figure above. The basic operations of this software are managed through menus, a Control Window (window on the left), and an Edit Window (window on the right). The use of these components are described in the following sections. (Please note that this document does not describe basic Macintosh operations, such as working with windows.)
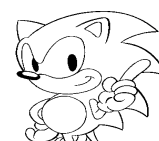
5.0 Control Window

The Control Window is available for the quick execution of frequently used menu items by pointing and clicking the mouse. Clicking the icons is the same as performing the following menu operations:

Zoom out

Reduces (zooms out) the size of the waveform display when the Wave Edit screen is in the Edit Window. When the active Edit Window is not the Wave Edit screen, using this function switches the window to the Wave Edit screen. This software supports up to 32,768 ZoomIn and ZoomOut levels.

Zoom in

Enlarges (zooms in) the size of the waveform display when the Wave Edit Screen is in the Edit Window. When the Edit Window is not the Wave Edit screen, using this function switches the window to the Wave Edit screen. This software supports up to 32,768 ZoomIn and ZoomOut levels.

Loop Edit

Switches the Edit Window to the Loop Edit screen.

Play Audio

Uses the Macintosh or the SCSP to play back the waveform being edited. If a section of a waveform is selected, this function plays only the selected portion. Looping does not occur during the selective waveform playback.

Fade in

Fades in the selected portion of the waveform. The beginning of the selected portion is set as 0% and the end as 100%. Linear scaling is then performed between the two points.

Fade out

Fades out the selected portion of the waveform. The beginning of the selected portion is set as 100% and the end as 0%. Linear scaling is then performed between the two points.

◩ Cross Fade

Crossfades a selected portion of the waveform and a waveform in the Clipboard. The selected portion of the waveform is faded in and the waveform in the Clipboard is faded out.

◩ Scale

Scales the selected portion of the waveform. When selected, a dialog box is displayed. Enter a scaling rate (0 to 200%) to execute scaling. When the scaling method is 100%, the largest data of the selected waveform is replaced with the maximum value for the bits (127 for 8-bit data and 32,767 for 16-bit data). The rate is also assigned to other data. The other percentages are based on the 100% data. If 100% is exceeded, the maximum value for the bits is exceeded. In this case, however, the value is replaced with the maximum value for the bits.

◩ TMP1Play

Plays back the data stored in the TMP1 file. The playback method is the same as that of the PlayAudio function.

◩ TMP2Play

Plays back the data stored in the TMP2 file. The playback method is the same as that of the PlayAudio function.
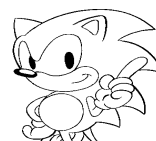
◩ TMP3Play

Plays back the data stored in the TMP3 file. The playback method is the same as that of the PlayAudio function.

◩ TMP4Play

Plays back the data stored in the TMP4 file. The playback method is the same as that of the PlayAudio function.

6.0 Edit Windows

This software has three Edit Windows:

- Wave Edit Window
- Loop Edit Window
- Hex Edit Window

Wave Edit Window
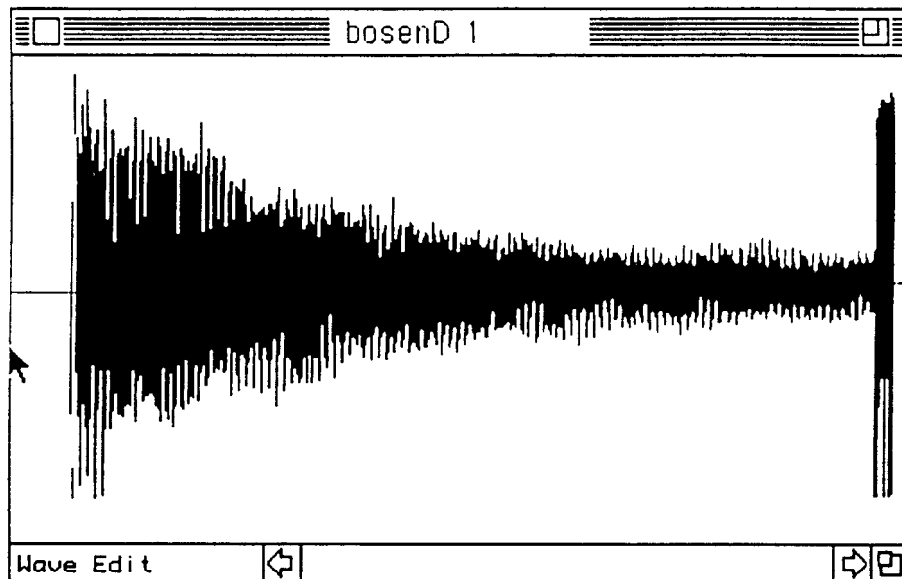
The layout of the Wave Edit Window is as shown in the figure above. The title bar displays the name of the wave. At the bottom of the screen are the title of the Wave Edit screen and the control bar for waveform scrolling. This screen also shows the number of data samples for this waveform, the loop start cursor, and the loop end cursor.

The main function of the Wave Edit Window is to select a waveform (other edit functions are accessed via the menus), change the loop start and loop end points, and scroll through the waveform. All of these operations are executed at the zero cross point.

7.0 Loop Edit Window

The layout of the Loop Edit Window is as shown in the figure above. The title bar
displays the name of the wave, the title of the Loop Edit Window, and the control
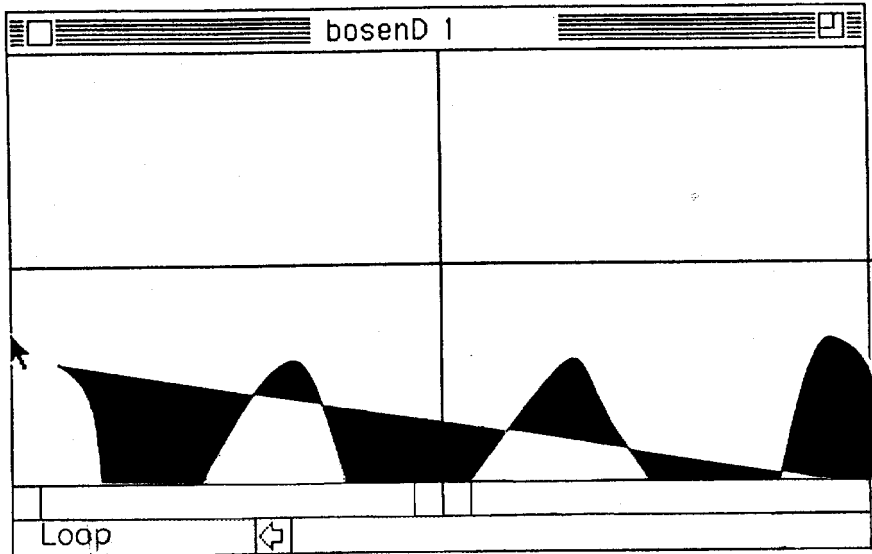bar for waveform scrolling. The screen also shows the amount of the data used by
the waveform. The end of the waveform in the left side of the window is the loop
end point. The beginning of the waveform in the right window is the loop start
point. Make fine adjustments to the loop point by scrolling through the right/left
windows to move the loop point. The end loop point (rightmost point in the left
window) can be scrolled from the start loop point to the end of the waveform. The
start loop point (leftmost point in the right window) can be scrolled from the begin-
ning of the waveform to the end loop point.

The main function of the Loop Edit Window is to give control over the loop start and
end points by the use of the scroll bar (other edit functions are accessed via the
menus). These operations are performed at each respective point. This window
does not allow waveform selection or scrolling, since waveform scrolling would
also shift the loop points.

8.0 Hex Edit Window

```
▤▢▤▤▤▤▤▤▤▤▤▤▤▤▤  1KHZ2.AIF  ▤▤▤▤▤▤▤▤▤▤▤▤▤▤
┌────────┬──────────────────────────────────────────────┬──┐
│Address │+0 +1 +2 +3 +4 +5 +6 +7 +8 +9 +A +B +C +D +E +F│  │
├────────┼──────────────────────────────────────────────┼──┤
│000000  │46 4F 52 4D 00 00 02 16 41 49 46 46 43 4F 4D 4D│⬆ │
│000010  │00 00 00 12 00 01 00 00 00 06 00 10 40 0E 8C 44│▢ │
│000020  │00 00 00 00 00 00 4D 41 52 4B 00 00 00 22 00 02│  │
│000030  │00 01 00 00 00 2C 08 62 65 67 20 6C 6F 6F 70 67│  │
│000040  │00 02 00 00 00 58 08 65 6E 64 20 6C 6F 6F 70 00│  │
│000050  │49 4E 53 54 00 00 00 14 3C 00 00 7F 01 7F 00 00│  │
│000060  │00 01 00 01 00 02 00 00 00 00 00 00 41 50 50 4C│  │
│000070  │00 00 01 0E 00 00 00 00 00 00 00 00 00 00 00 00│  │
│000080  │00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00│  │
│000090  │00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00│  │
│0000A0  │00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00│  │
│0000B0  │00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00│  │
│0000C0  │00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00│  │
│0000D0  │00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00│  │
│0000E0  │00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00│  │
│0000F0  │00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00│⬇ │
├────────┴─────────────────────────────────┬──────┬─────┼──┤
│                                           │ Hex  │1.00»NF│⬚│
└───────────────────────────────────────────┴──────┴─────┴──┘
```

The layout of the Hex Edit Window is as shown in the figure above. The title bar displays the name of the wave. The title of the Hex Edit WIndow appears at the bottom of the screen, and the control bar for data scrolling at the right. The screen also shows the amount of data used by the waveform. This window allows the editing of waveform data as hexadecimal data. The left side of the window lists the waveform addresses in sequence from the beginning. The values at the top of the window are the offsets from the addresses, and the main section of the window displays the hex data. The loop start point and the loop end point are displayed in bolface type (the loop end point follows the loop start point).
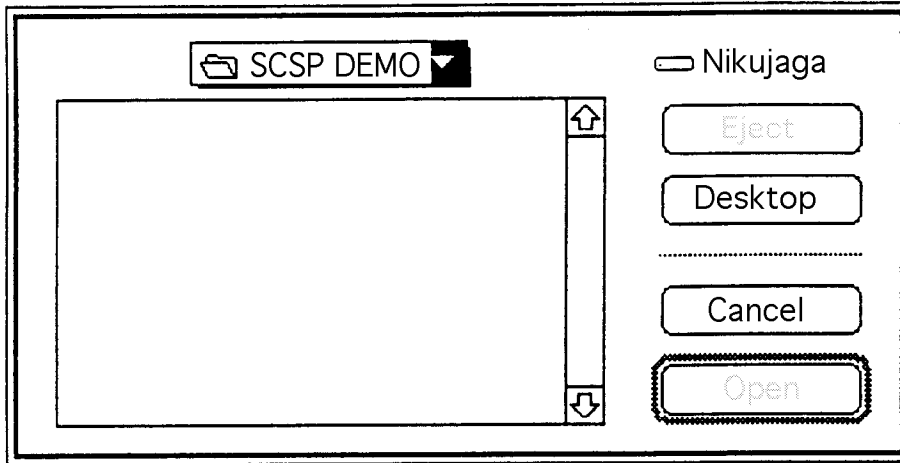
9.0 Menus

File Menu

New
Opens an empty Wave Edit window. The menu item is for sampling a waveform from the SCSP.
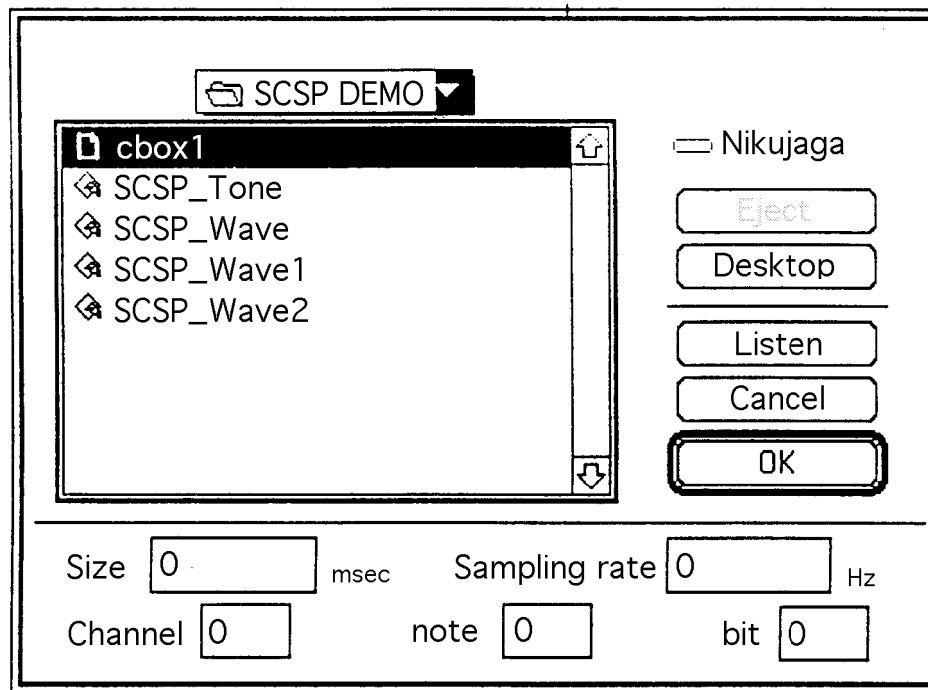
Open...

This function reads a waveform from any Macintosh Audio Interface File Format (AIFF) file, regardless of the original application (Alchemy ,Sound Designer II, and so on) that was used to create the file. Valid data includes the wave data, as well as the number of channels, the number of samples, the sampling rate, the sample bit resolution, the loop start point, the loop end point, and the base note.

The above data is used by this Editor, and is displayed in the Wave Edit Window. Other data items are described below.

- Number of channels: The software recognizes one or two channels. For two channels, the software displays two Wave Edit Windows and sets the window titles as *file-name*-L and *file-name*-R.
- Number of samples: The Editor uses this data item when it refers to the number of bytes used by the waveform. For 8-bit data, the number of bytes equals the number of samples. For 16-bit data, the number of bytes is twice the number of samples.
- Sampling rate: The application uses this value when it resamples. When the Resampling dialog box is displayed, this rate is the initial value that is automatically entered into the Now field.
- Sample bit resolution: The application uses this data item to determine whether the wave data is 8-bit or 16-bit data.
- Loop start point and loop end point: The application refers to these values in the Wave Edit and Loop Edit Windows. In the Wave Edit Window, the cursor is placed at the beginning of the wave data specified by these points. In the Loop Edit Window, the waveform is displayed so that the loop end point is located on the right side of the left window, and the loop start point is on the left side of the right window.
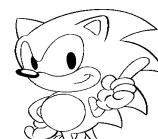
Open Special...

This menu item is an expanded version of the **Open...** menu. When selecting a file, use this menu to view the AIFF header data. The data items displayed here are:

- Size: Number of samples in the data
- Sampling rate: Sampling frequency
- Channel: Number of channels
- note: The waveform's frequency shown as a MIDI note number.
- bit: Sample bit resolution of the wave data

Save

Saves the wave data displayed in the currently active window to a file. The data is saved to the file name that was specified when the file was opened. The following data is saved: wave data, number of channels, number of samples, sampling rate, sample bit resolution, loop start point, loop end point, and base note. If a new Edit Window is opened using the **New...** command, **Save** operates in the same manner as **Save as...**.

Save as...

```
┌─────────────────────────────────────────────┐
│  ┌──────────────────────┐                    │
│  │ 🗁 SCSP DEMO ▼        │      ○ 8bit        │
│  ┌─────────────────────┐                     │
│  │ 🗋 cbox1         ⇧ │      ● 16bit         │
│  │ ⌁ SCSP_Tone       │                       │
│  │ ⌁ SCSP_Wave       │      ▭ Nikujaga       │
│  │ ⌁ SCSP_Wave1      │    ┌────────────┐      │
│  │ ⌁ SCSP_Wave2    ⇩ │    │   Eject    │      │
│  └─────────────────────┘    └────────────┘    │
│  Save File As:              ┌────────────┐   │
│  ┌─────────────────────┐    │  Desktop   │   │
│  │ │                   │    └────────────┘   │
│  └─────────────────────┘    ┌────────────┐   │
│                             │   Cancel   │   │
│                             └────────────┘   │
│                             ┌────────────┐   │
│                             │    Save    │   │
│                             └────────────┘   │
└─────────────────────────────────────────────┘
```
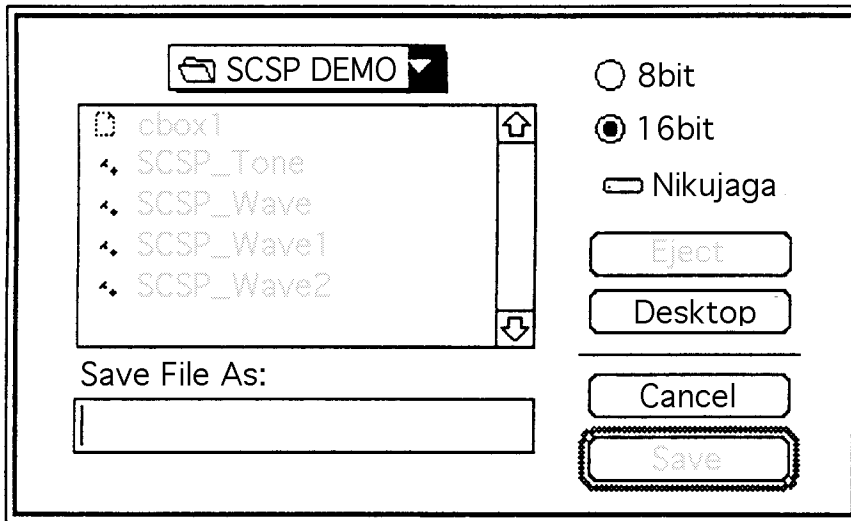
Saves the wave data displayed in the currently active window to a file. The data is saved to a new file specified in the **Save as...** dialog box. The dialog box provides the option of saving the data as 8-bit or 16-bit data. Select the button specifying the desired number of bits and save the data.

Close

Closes the currently active window. If the wave being edited in the window was edited since the wave was opened or saved, a dialog box gives you the option of saving the data before the window is closed.

- Cancel: Cancels the close operation.
- Don't Save: Closes the window without saving the data.
- Save: Executes Save (see the description of the Save command above), then closes the window.

Quit

Quits the Editor. If Edit Windows are open when this option is selected, the system executes **Close** for all Edit Windows (see the description of the **Close** command above). It then terminates the application.

Edit Menu

Undo

Cancels the previous operation. The operations that can be canceled are: modification of the loop start or loop end point, resampling, pitch shift, scaling, filtering, fade in, fade out, crossfade, mix, cut, copy, paste.

Cut...

Cuts the selected waveform data and saves it to the Clipboard. This function can be used when the active window is either the Wave Edit or the Hex Edit Window. When you select this function, a dialog box provides the option to optimize (pack) the vacant area left by the cut, or fill it with zeros.

Cut other

Cuts the waveform data that was not selected. The cut data is not saved to the Clipboard. This function can be used when the active window is the Wave Edit or Hex Edit Window.

Copy

Copies the selected waveform data and saves it to the Clipboard. This function can be used when the active window is the Wave Edit or Hex Edit Window.

Paste...

Inserts the data saved in the Clipboard. The Clipboard data is inserted at the cursor position. This function can be used when the active window is the Wave Edit or Hex Edit Window. When this function is selected, a dialog box opens asking whether to insert the Clipboard data at the paste position or overwrite the existing data instead.

Zoom in

Enlarges the size of the waveform display with the cursor as the center of magnification. This function can be used when the active window is the Wave Edit Window.

Zoom out

Reduces the size of the waveform display with the cursor as the center of magnification. This function can be used when the active window is the Wave Edit Window.
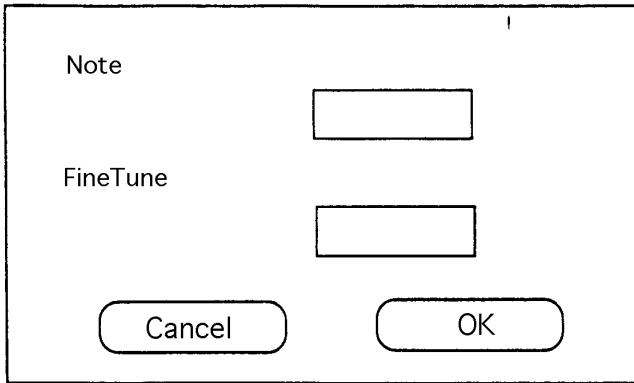
Select all

Selects all waveform data. This function can be used when the active window is the Wave Edit or Hex Edit Window.

Select loop

Selects the loop portion of the waveform data. The loop portion is the data between the loop start and loop end points. This function can be used when the active window is the Wave Edit or Hex Edit Window.

Note...

This function opens the dialog box shown in the figure above. This dialog box shows the current note and fine tune values. To change a value, enter a new value and click the OK button.

Mix...

Mixes the waveform stored in the Clipboard with the waveform data being edited and displays the resulting waveform. The waveform stored in the Clipboard is mixed in with the cursor location as the starting point of the mix.
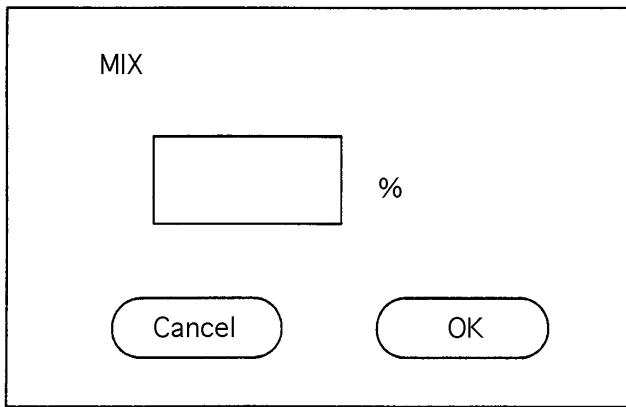
Enter the mix rate as a percentage. The possible values are 0 to 100%

<u>**Mixing Method**</u>

The mixing method employed by this Editor treats the waveforms as data when mixing waveforms. Thus, it does not recognize differences in sampling rates. The data displayed in the window determines the bit resolution. If the waveform in the window has 8-bit data and the mix file has 16-bit data, the lower 8 bits of the mix file data are deleted. If the window has 16-bit data and the mix file has 8-bit data, the mix file data is increased 256-fold before being mixed. If the data entered in the MIX field of the dialog box is M, the file wave data as X_n, and the window wave data as Y_n, the data after mixing, Z_n, is as follows:

```
Zn = Xn * M/100 + Yn * (100 - M)/100
```

Differences in the number of samples between the Clipboard wave data and the window wave data are processed as follows:

- If the Clipboard wave data is longer: Mixing stops where the wave data in the window ends.
- If the window wave data is longer: Mixing continues until the end of the file data. The subsequent data remains unchanged.

Wave Edit
Changes the active window to the Wave Edit Window.

Loop Edit
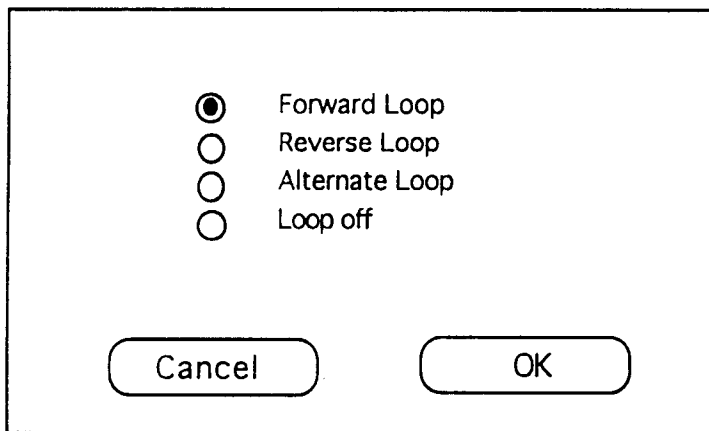Changes the active window to the Loop Edit Window.

Hex Edit
Changes the active window to the Hex Edit Window.

Loop Mode...

```
┌─────────────────────────────────────────────┐
│                                             │
│        ◉   Forward Loop                     │
│        ○   Reverse Loop                     │
│        ○   Alternate Loop                   │
│        ○   Loop off                         │
│                                             │
│                                             │
│    ( Cancel )            (    OK    )        │
│                                             │
└─────────────────────────────────────────────┘
```

Allows the selection of the loop mode to be used when wave data is played with the Play Audio function. The Alternate Loop option cannot be used for playback on the Macintosh.
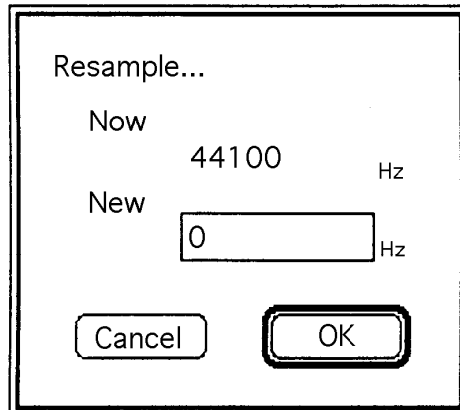
Effect Menu

The Effect menu can be operated when the active menu is the Wave Edit or the Hex Edit Window.

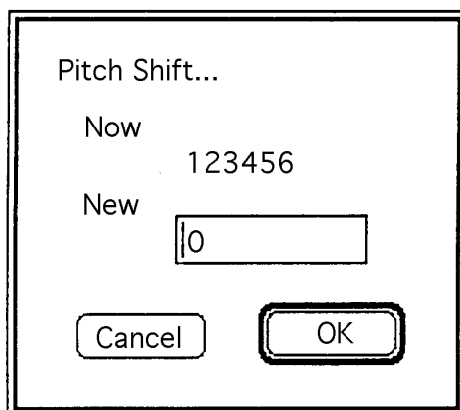**Resample...**
Resamples the waveform being edited.

```
Resample...
  Now
            44100
                      Hz
  New
          [0]
                   Hz

  ( Cancel )    (   OK   )
```

The value displayed in the Now field is the current sampling rate. This rate is the sampling rate included in the AIFF header or the sampling rate that was converted by a previous resampling operation.

The values that can be entered in the New field are 1 to 65,535 hertz. (The resampling method is explained in a separate document.)

Pitch Shift...
Changes the pitch of the waveform being edited.

```
Pitch Shift...
  Now
            123456
  New
          [0]

  ( Cancel )    (   OK   )
```

The value displayed in the Now field is the current pitch (note). This pitch is the note included in the AIFF header or the note that was converted by a previous pitch shift operation. The values that can be entered in the New field are 1 to 127. (The pitch shift method is explained in a separate document.)

Size Shift...

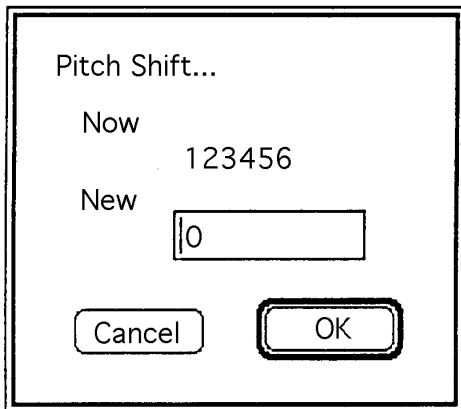Pitch Shift...

Now

123456

New

0

Cancel   OK

The value displayed in the **Now** field is the current size. This value is the size included in the AIFF header or the size that was produced by a previous size shift. (The size shift method is explained in a separate document.)

Scale
Scales the selected portion.
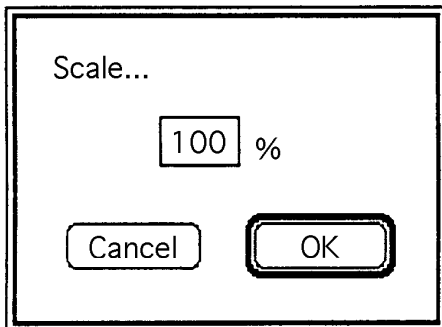
Scale...

100 %

Cancel   OK

Enter a scaling rate (0 to 200%) to execute scaling. When the scaling method is 100%, the largest data of the selected waveform is replaced with the maximum value for the bits (127 for 8-bit data and 32,767 for 16-bit data). The rate is also assigned to other data. The other percentages are based on the 100% data. If 100% is exceeded, the maximum value for the bits is exceeded. In this case, however, the value is replaced with the maximum value for the bits.

16
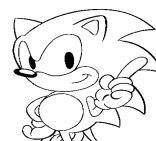
Filter...

```
┌─────────────────────────────────────────┐
│  ┌───────────────────────────────────┐  │
│  │  Filter...                    ¦    │  │
│  │                                    │  │
│  │    Frequency 1                     │  │
│  │      ┌──────────────┐              │  │
│  │      │0             │ Hz           │  │
│  │      └──────────────┘              │  │
│  │    Frequency 2         Filter Type:│  │
│  │      ┌──────────────┐     ○ LPF    │  │
│  │      │100           │ Hz  ○ HPF    │  │
│  │    Cut               └─   ◉ BPF    │  │
│  │      ┌──────────────┐              │  │
│  │      │0             │ dB           │  │
│  │      └──────────────┘              │  │
│  │      ┌────────┐   ┌──────────┐     │  │
│  │      │ Cancel │   │    OK    │     │  │
│  │      └────────┘   └──────────┘     │  │
│  └───────────────────────────────────┘  │
└─────────────────────────────────────────┘
```

Executes low-pass, high-pass, or band-pass filtering. Use the radio buttons to select a filter type and enter data in the following fields:

- Frequency 1 and Frequency 2 (1 to 65,535): Frequency at which filter cutoff processing starts. Frequency 2 is used for band-pass filtering but not for the other filter types.
- Cut (1 to 255): Enter in decibels the volume at which sounds are lowered per octave.

(The filtering methods are explained in a separate document.)

CrossFade
Executes a crossfade between a selected portion of the waveform and a waveform in the Clipboard. The crossfade method fades in the selected portion of the waveform and fades out the waveform in the Clipboard. For information on the fade in and fade out methods, see the explanations below.

Fade in
Fades in the selected portion of the waveform. The fade in method sets the beginning of the selected portion as 0% and the end as 100%. Linear scaling is then performed between the two points.

Fade out
Fades out the selected portion of the waveform. The fade out method sets the beginning of the selected portion as 100% and the end as 0%. Linear scaling is then performed between the two points.
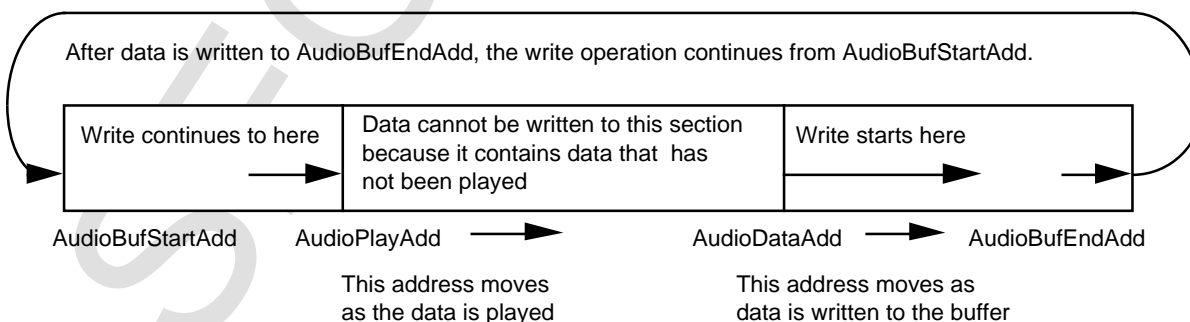
SCSP Menu

Play Audio

Uses the Macintosh or the SCSP to play the waveform being edited. If a waveform is selected, this option plays only the selected portion. Loop playback is not executed during selective waveform playback. If the selected waveform or the entire waveform is in the 68000's audio buffer (size of which to be determined later), a keyboard is displayed on-screen for playback with pitch control. Clicking the desired key on the keyboard will place a dot on the key and change the pitch of the sample for playback. Fine tuning can be changed by using this function as well.
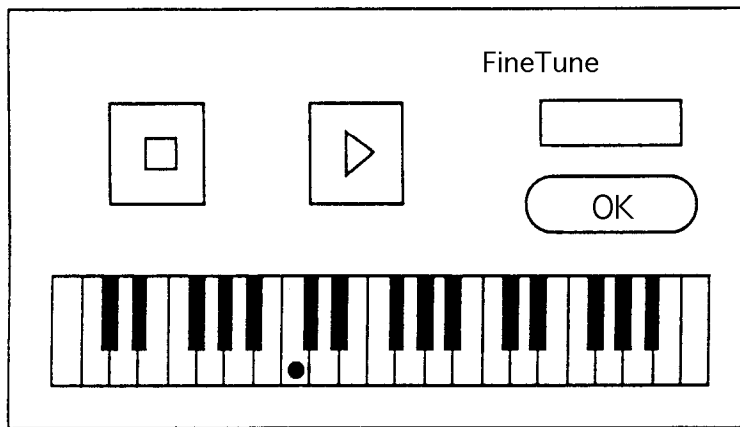
SCSP Audio Play Back Explanation

The Waveform Editor first changes the 68000's task processing to execute **Play Audio** by writing "PlayAudio" into the 68000's Command memory address. The application then checks AudioDataAdd in the memory addresses to find out how much data has accumulated in the 68000's audio playback buffer. It then writes data from the AudioDataAdd position. When the address of the write data reaches AudioBufEndAdd (the buffer end address), the application goes to AudioBufStartAdd (the buffer start address) and starts writing data from that position. When the address of the write data reaches AudioPlayAdd (the address of the data currently being played), the application stops write processing since the buffer is full. When buffer space becomes available, write processing starts again. This process uses the buffer as a ring buffer.

After data is written to AudioBufEndAdd, the write operation continues from AudioBufStartAdd.

| Write continues to here | Data cannot be written to this section because it contains data that has not been played | Write starts here |

AudioBufStartAdd   AudioPlayAdd ⟶   AudioDataAdd ⟶ AudioBufEndAdd

This address moves as the data is played

This address moves as data is written to the buffer

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Audio buffer

As explained earlier, the SCSP plays back wave data as the Editor writes data in the 68000's audio buffer. Loop processing is handled by the Editor because the SCSP's loop processing can only process the waveform in the memory area allocated to the SCSP.

Memory Playback Explanation

When Play Audio is selected, the Waveform Editor performs the following processes while it retrieves the waveform into the audio buffer.

- Data is written from the start of the audio buffer.
- The SCSP hardware plays back the waveform.
- Slot 0 is used.
- KYONB is set to "1" for slot 0, and then sets SA, LSA, and LEA. SA is AudioBufStartAdd, LSA is the AIFF BeginLoop, and LEA is the AIFF EndLoop.
- For 8-bit data, the application writes "1" to PCM8B.
- LPCTL inputs loop information.
- "31(1FH)" is written to AR and RR.
- When a key on the on-screen keyboard is clicked, the application determines OCT and FNS by the number of half steps between the key and the sampled note (see table). The application then sets KYONEX to "1" and plays the sound. When the mouse button is released, the application sets KYONEX to "0" and turns off the sound.

Get Sound
Discards the currently active wave data, saves the data from the SCSP onto the hard disk, and displays the waveform in the window. When this function is selected, a dialog box is displayed.

```
┌─────────────────────────────────────┐
│                                     │
│     ○ Rec                           │
│                                     │
│     ○ Stop          ┌──────────┐    │
│                     │   OK     │    │
│                     └──────────┘    │
│                                     │
└─────────────────────────────────────┘
```
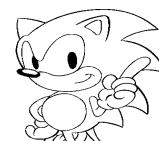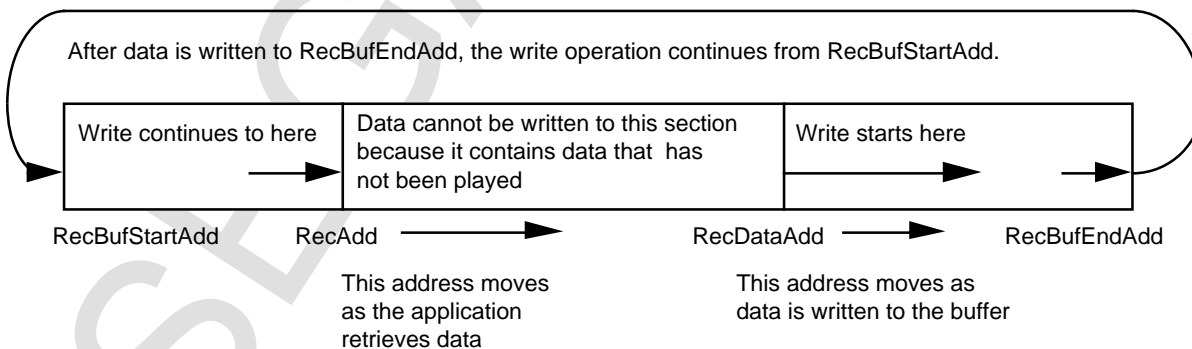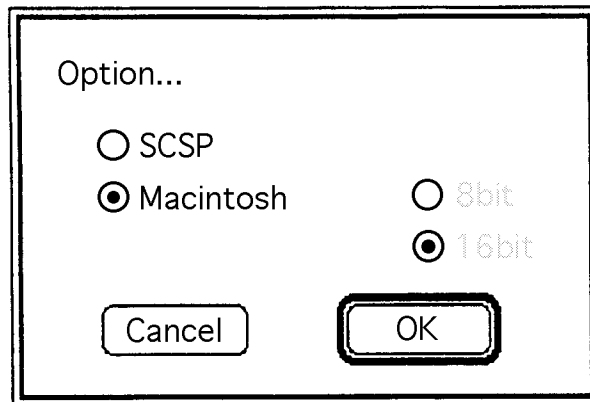
<p align="center">Tentative version</p>

If the Cancel button is pressed at this point, the Waveform Editor terminates the hard disk recording process without discarding the waveform that was being edited. If the **Rec** button is pressed, the tool starts hard disk recording. If the **Stop** button is pressed, the editor stops hard disk recording. The waveform data remains on the hard disk as TEMP. If the **OK** button is pressed, the Editor displays this waveform in the previously active window for editing.

<u>**Hard Disk Recording Explanation**</u>
When the **Rec** radio button is pressed, the Waveform Editor changes the 68000 processing to hard disk recording by writing "RecAudio" to the 68000's Command memory addresses. As soon as the application confirms the RecAudio command, it writes data to the 68000's audio recording buffer at each 44.1KHz interval. The application then checks the RecDataAdd address to find out the amount of data that has been accumulated. The application retrieves data starting from RecAdd, the first address of the previously read data, and writes data to the hard disk. (Initially, the application retrieves data from RecBufStartAdd, the first address of the buffer.) During this operation, the application continues to store data into the buffer. When RecDataAdd reaches RecBufEndAdd, the last address of the buffer, the application goes to RecBufStartAdd and starts writing data from that position. This process uses the buffer as a ring buffer.

After data is written to RecBufEndAdd, the write operation continues from RecBufStartAdd.

Write continues to here	Data cannot be written to this section because it contains data that has not been played	Write starts here

RecBufStartAdd   RecAdd ──────────▶   RecDataAdd ──────▶   RecBufEndAdd

This address moves as the application retrieves data

This address moves as data is written to the buffer

Option...

Option...

    ○ SCSP

    ◉ Macintosh   ○ 8bit

                  ◉ 16bit

[Cancel]   [OK]

Selects the output device used by the **Play Audio** function to play back waveform data. The output choices are Macintosh and SCSP. Either 8-bit or 16-bit playback is possible when using SCSP. When the Macintosh option is selected, playback using the **Alternate Loop** mode is disabled.

TMP Menu

Stock TMP1

Use the **Stock TMP1** command to compare the original and edited sounds. This command saves the wave data being edited to a temporary AIFF-format file called *TMP1*. To hear the original sound while editing this data in the Edit Window, execute the **Play TMP1** command. The TMP1 file is deleted when the application is terminated.

Stock TMP2

Use the **Stock TMP2** command to compare the original and edited sounds. This command saves the wave data being edited to a temporary AIFF-format file called *TMP2*. To hear the original sound while editing this data in the Edit Window, execute the **Play TMP2** command. The TMP2 file is deleted when the application is terminated.

Stock TMP3

Use the **Stock TMP3** command to compare the original and edited sounds. This command saves the wave data being edited to a temporary AIFF-format file called *TMP3*. To hear the original sound while editing this data in the Edit Window, execute the **Play TMP3** command. The TMP3 file is deleted when the application is terminated.

Stock TMP4

Use the **Stock TMP4** command to compare the original and edited sounds. This command saves the wave data being edited to a temporary AIFF-format file called *TMP4*. To hear the original sound while editing this data in the Edit Window, execute the **Play TMP4** command. The TMP4 file is deleted when the application is terminated.

Play TMP1

Plays the data stored in the TMP1 file. The playback method is the same as in the Play Audio function.

Play TMP2

Plays the data stored in the TMP2 file. The playback method is the same as in the Play Audio function.

Play TMP3

Plays the data stored in the TMP3 file. The playback method is the same as in the Play Audio function.

Play TMP4

Plays the data stored in the TMP4 file. The playback method is the same as in the Play Audio function.

Revert TMP1
Restores the data stored in the TMP1 file to the currently active window. The previous data in the window is erased.

Revert TMP2
Restores the data stored in the TMP2 file to the currently active window. The previous data in the window is erased.

Revert TMP3
Restores the data stored in the TMP3 file to the currently active window. The previous data in the window is erased.

Revert TMP4
Restores the data stored in the TMP4 file to the currently active window. The previous data in the window is erased.