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Consumer Products Division

# Tone Editor User's Manual Addendum: File Formats

Doc. # ST-235-030795

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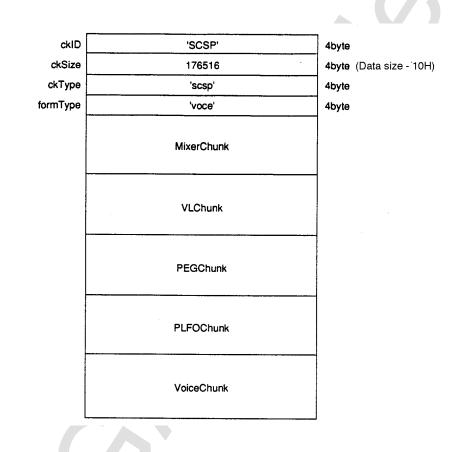
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## Tone Editor User's ManuaAddendum: File Formats

This supplement describes the SCSP file format on the Macintosh that contains detailed information, and the SCSPBIN file format that only includes data transferred to the 68000's sound memory and the Macintosh file resource data.

### **SCSP** Format

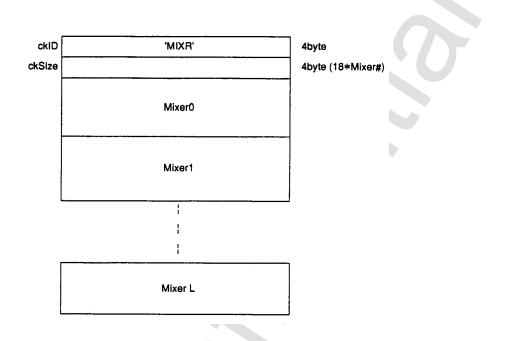


The SCSP format is as follows.

First, SCSP is entered as an ID in 4 bytes of ASCII code, after which the total number of bytes of the MixerChunk and VoiceChunk is contained as a 4 byte long word. Next, VOCE is entered in 4 bytes of ASCII code as Type. The MixerChunk and VoiceChunk data follow.



### MixerChunk



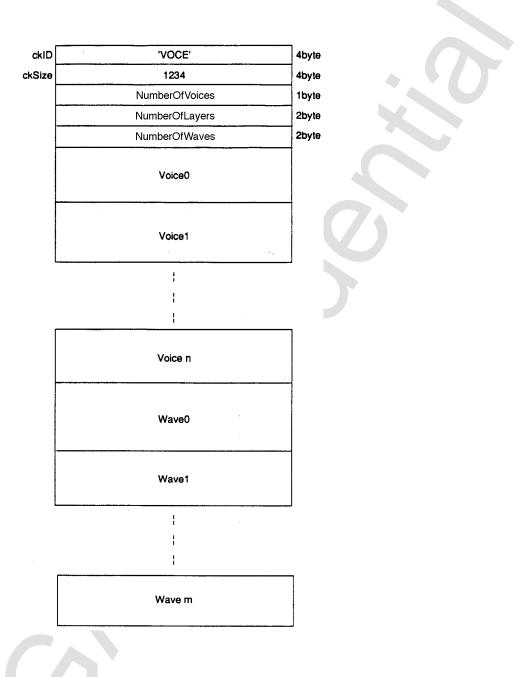
This data is equivalent to the 16 channels of the mixer, and becomes the MixerChunk data with the header data. MIXR takes up 4 bytes in ASCII code for the header ID, after which the number of mixer data bytes is entered in 4 bytes. It can have multiple mixers.

Mixer

EFSDL0[2:0]	EFPAN0[4:0]	1byte
EFSDL1[2:0]	EFPAN1[4:0]	1byte
	·····	
EFSDL17[2:0]	EFPAN17[4:0]	1byte

Bits 0~4 are pan data and 5~7 are send/return data. This configuration is the same as the SCSP register, and is equivalent to 100017H if slot 0.

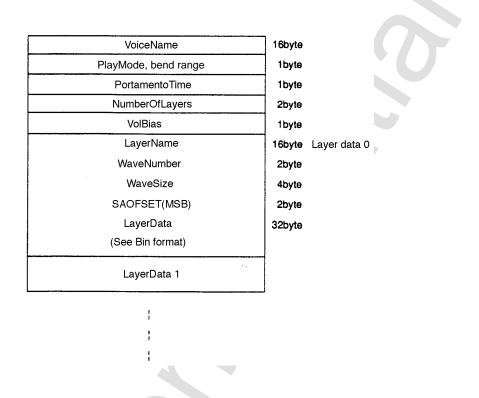
### VoiceChunk



The VoiceChunk data is composed of the layer data that contains voice parameter data as well as PCM data. The VoiceChunk data is completed with the addition of the header data.

VOCE takes up 4 bytes in ASCII code as the header ID. The total number of bytes for the voice data, layer data and wave data (PCM data) are then entered in 4 bytes, after which the number of voices (number of voice patches) is entered.





This is voice data. The 16 bytes of ASCII code is used for the VoiceName data at the beginning, and the data below follows.

• Play Mode: Specifies the poly, mono, legato, portamento, legato &

portamento play back mode.

specified as signed data.

- Specifies the pitch bend range up to 14 steps ( $0 \sim D$ ). • Bend Range:
- Portamento time: Specifies the time in 128 steps  $(0 \sim $7F.)$
- NumberOfLayers: Number of layers used in this voice. Specifies the volume of the layer within the voice. It can be
- VolBias:
- LayerName:
- Name of the layer that is being used. • WaveNumber:
- WaveSize:

Ń

The wave number used in this layer is entered here. The wave size used in this layer is entered here.

#### Wave

WaveName	32byte
SamplingRate	2byte
Bit	1byte
PCM Data	

**2byte** Wave data 0

• WaveName:

The source AIFF file name incorporating this waveform

SamplingRate:Bit:

Sampling rate of this wavform.

The bit resolution of this waveform (8 bits or 16 bits). PCM data.

• PCM data:

### VLChunk

4byte 4byte 1byte 6byte	
1 byte 6byte	
6byte	
fbyte	
lbyte	
lbyte	Data 0
1 byte	Dala U
1 byte	
İbyte	
Ibyte	



### **PEG Chunk**

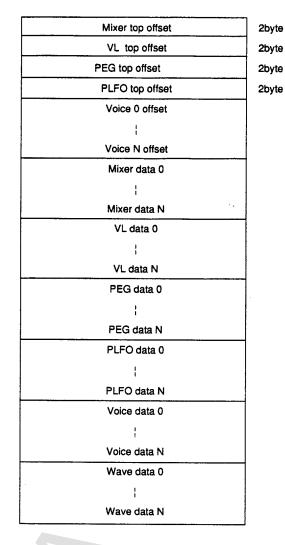
	-		
"SPEG"	4byte		
CkSize	4byte		
PEGNumber	1byte		
PEGName	16byte		
DLY	1byte		
OL	1byte		
AR	1byte		
AT	1byte		
DR	1byte	Data 0	
DT	1byte		
SR	1byte		
ST	1byte		
RR	1byte		P
RT	1byte		
Data 1			
Data 2			

### **PLFO Chunk**

"PLFO"	4byte		
ckSize	4byte		
PLFONumber	1byte		
PLFOName	16byte		
DLY	1byte		
AMP	1byte	Data 0	
LMT	1byte		
FDCNT	1byte		
Data 1			
Data 2			

### **SCSPBIN Format**

The SCSPBIN format is as follows.



- Mixer top of fset:
- VL top offset:
- PEG top offset:
- PLFO top offset:
- Voice offset:
- Mixer data:
- VL data:
- PEG data:
- PLFO data:
- Voice data:
- Wave data:

- The offset address of mixer data start location.
- The offset address of velocity level conversion data start location.
- The offset address of PEG data start location.
- The offset address of PLFO data start location.
  - The offset address of each Voice data.
- Mixer data
  - Velocity level conversion data
  - Pitch envelope data
  - Pitch LFO data
  - Voice data
- Wave data

### Mixer Data 0

EFSDL EFPAN	1 byte e
	a total o
EFSDL EFPAN	]
EFSDL EFPAN	

byte each, for total of 18 bytes

### VL Data 0

	_
Slope (gradient) signed value 0	1 byte each
Velocity Point 0	
Level 0	
Slope (gradient) signed value 1	
Velocity Point 1	
Level 1	
Slope (gradient) signed value 2	
Velocity Point 2	
Level 2	]
Slope (gradient) signed value 3	

PEG Data 0

PEG DLY	1 byte each
OL	
AR	
AL	
DR	
DL	
SR	
SL	
RR	
RL	
	1

PLFO Data 0

PLFO DLY	1 byte each
FRQR	
НТ	
FDCT	

### Voice Data 0

$\square$	Play mode bend range width	1byte
$\square$	Portamento time	
$\square$	Number of layers- 1	1byte
	Signed Volume Bias	1byte
	Layer data 0 *1	
	ţ	
	Layer data N	
La		

#### \*1: Layer Data

	· · · · · · · · · · · · · · · · · · ·		
$\geq$	Start Midi Note	1byte	
	End Midi Note		
SCSP register 0			
1			
SCSP register 22			
Base note			
Signed fine tune			
GN	GN Layer number inside FM connection Voice		
GN Layer number inside FM connection Voice		1byte	
	VL conversion number	1byte	
PEG number			
PLFO number			

### Wave Data 0

Wave data 0	
) 1	
Wave data N	

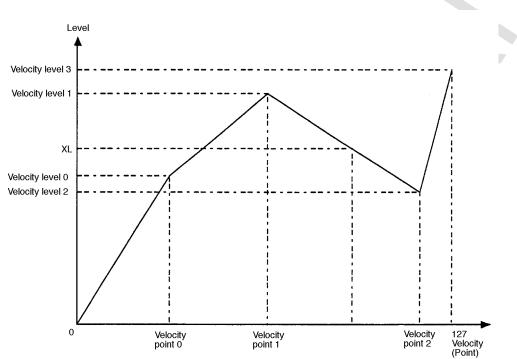
### **VL** Conversion

Approximation value:

This is the approximation value table number used for velocity data. It is determined by calculating the velocity points 0~3 and the velocity levels 0~3.



#### **Calculation Method**



The relationship between the velocity point and velocity level data is as shown below. The curve of the levels is drawn as shown above for velocities 0~127. The D6-D3 that is closest to one of the slope values out of these four curves is determined from the table on the following page and entered in the Approximation Value Table. The slope value is determined as follows.

Approximation value 0:

	Velocity level 0
	Velocity point 0
Approximation value 1:	
	Velocity level 1 - Velocity level 0
	Velocity point 1 - Velocity point 0
Approximation value 2:	
	Velocity level 2 - Velocity level 1
	Velocity point 2 - Velocity point 1
Approximation value 3:	
	127 - Velocity level 2
	127 - Velocity point 2

### Approximation a/lue Table

l								· · · · · ·
	0	D6	D5	D4	D3	D2	DI	<b>D</b> 0

The bit relationship of the Approximation Value Table is as follows.

D2-D0	Slope
0	±∞
1	1 <slope<+∞< th=""></slope<+∞<>
2	1
3	0 <slope<+1< th=""></slope<+1<>
4	0
5	-1 <slope<0< th=""></slope<0<>
6	-1
7	-∞ <slope<-1< th=""></slope<-1<>

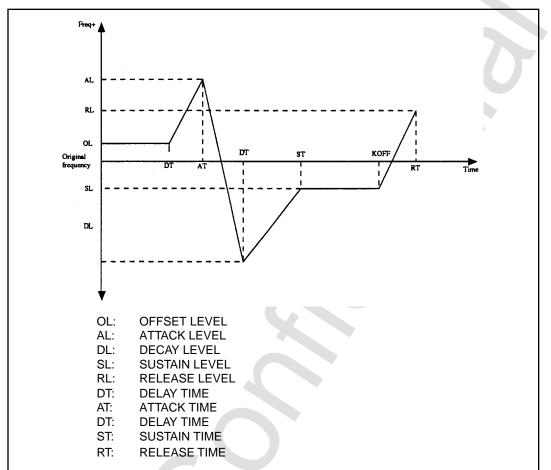
The following two tables are referred to when determining the D6-D3 value of the Approximation Value Table.

D6-D3	Slope (D2-D0=1 or 7)	Slope (D2-D0=3 or 5)
0	Prohibited	Prohibited
1	1.5	1/1.5
2	2	1/2
3	3	1/3
4	4	1/4
5	6	1/6
6	8	1/8
7	12	1/12
8	16	1/16
9	24	1/24
A	32	1/32
В	48	1/48
С	64	1/64
D	96	1/96
E	128	1/128
F	Prohibited	Prohibited

The approximation values include  $\pm \infty$ , 1, 0 and the values indicated in the above table. Determine a value that is closest to the actual slope in absolute difference terms. The resulting D0-2 and D6-3 values are set as the approximation value.



#### **PEG Related**



#### DLY:

This is the table number of the time table for the PEG delay time. The time table contains the number of counts per time unit. The number of counts is first determined from the delay time input in the Tone Editor. That value is then compared with the count values contained in the Time Table. A difference of the two values are taken. The number of counts in the Time Table that produces the smallest difference in absolute terms is determined and its Time Table number is set here. Number of counts = delay time (msec. unit time)

OL:

This is the offset level from the key on note when the key is activated. (OFFSET LEVEL)

#### AR:

This is the level change range per unit time. =ATTACKLEVEL/AT

AT:

This is the time table number that is used for the attack level time. The time table contains the number of counts per time unit. The number of counts is determined first from the ATTACK TIME input in the Tone Editor. Then the closest number of counts is obtained from a time table by the absolute difference of the two count values.

The resulting value is set here. Number of counts=ATTACK TIME/2 (msec) DR:

This is the level change range per time unit. =DECAYLEVEL/DT

DT:

This is the time table number that is used for the decay level time. The time table contains the number of counts per time unit. The number of counts is determined first from the DECAY time input in the Tone Editor. Then the closest number of counts is obtained from a time table by the absolute difference of the two count values. The resulting value is set here.

Number of counts=DECAY TIME(msec)

SR:

This is the level change range per time unit. =SUSTAIN LEVEL/ST

ST:

This is the time table number that is used for the sustain level time. The time table contains the number of counts per time unit. The number of counts is determined first from the SUSTAIN time input in the Tone Editor. Then the closest number of counts is obtained from a time table by the absolute difference of the two count values. The resulting value is set here.

Number of counts=SUSTAIN TIME(msec)

RR:

This is the level change range per time unit. =RELEASE LEVEL/RT

RT:

This is the time table number that is used for the release level time. The time table contains the number of counts per time unit. The number of counts is determined first from the RELEASE time input in the Tone Editor. Then the closest number of counts is obtained from a time table by the absolute difference of the two count values. The resulting value is set here.

Number of counts=RELEASE TIME(msec)

Delay:

This is the time table number that is used for the PLFO delay time. The time table contains the number of counts per time unit. The number of counts is determined first from the PLFO DELAY time input in the Tone Editor. Then the closest number of counts is obtained from a time table by the absolute difference of the two count values. The resulting value is set here.

Count value=PLFO DELAY TIME(msec unit time)

FRQ:

This is increment/decrement range per unit time of a PLFO triangle wave. =DEPTH LEVEL/FRQ TIME (msec unit time) FDR: This is the change range of the fade-in amplitude per unit time. =DEPTH LEVEL/FADE TIME\*2 (msec unit time)

FDT:

This is the time table number that is used for the fade-in time. The time table contains the number of counts per time unit. The number of counts is determined first from the PLFO FADE time input in the Tone Editor. Then the closest number of counts is obtained from a time table by the absolute difference of the two count values. The resulting value is set here.

Count value = PLFO FADE TIME (msec unit time)

