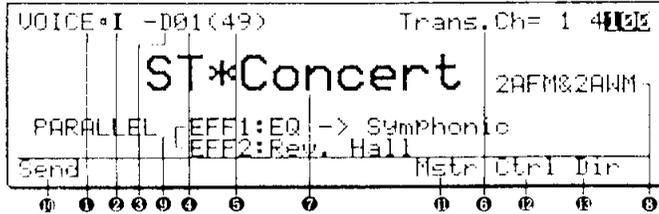# REFERENCE SECTION

VOICE PLAY MODE

VOICE PLAY MODE

You will normally play the SY99 in Voice Play mode. In Voice Play mode you can do the following things.

- Select voices from preset, internal, or card memory.
- View a directory of the 16 voices in the currently selected bank of internal, card, or preset memory.
- Copy the currently selected voice to any internal or card memory.
- View the controller assignments for the currently selected voice.
- Send a program change to an external device.

Voice select

Press VOICE to enter voice play mode. The following LCD will appear:

```
UOICE◦I  -D01(49)        Trans.Ch= 1  4
     ┌─┘
      ST*Concert       2AFM&2AWM
PARALLEL  ┌EFF1:EQ  -> Symphonic
          └EFF2:Rev. Hall
Send                     Mstr Ctrl Dir
```

❶ VOICE indicates that you are in Voice Play mode.

❷ Voice memory (I, C, P1, P2): This indicates the voice memory: Internal, Card, Preset 1, or Preset 2.

❸ Bank (A–D): This indicates the voice memory bank.

❹ Voice number in individual bank (1–16): This indicates the number of the voice in the bank.

❺ Voice number in banks A–D (1–64): This indicates the voice as a number between 1 (voice 1 of bank A) to 64 (voice 16 of bank D).

❻ Transmit channel (1–16): This indicates the transmit channel you selected in *MIDI Utility 1. Setting* (JUMP #807). The SY99 keyboard will transmit data from MIDI OUT on this channel, except when a master control setup is selected. You can also set the transmit channel at any time by holding SHIFT and pressing a voice select key 1–16.

❼ Voice name: The voice name is displayed in large characters.

❽ Voice mode: This indicates the type and number of elements used by this voice. For details refer

to *Voice Edit mode, Voice Mode Select* (page 95).

❾ Effect settings: This area displays the effect mode (OFF, SERIAL, or PARALLEL), and the effect type for each of the two effect units. For details refer to *Voice edit, Common data 10.Effect set,* page 104.

❿ Press F1 to send bank select and program change messages via MIDI. Refer to the following section *Send bank select and program change* (page 88).

⓫ Press F6 to jump to the master control select display. Refer to the following section *Master control select* (page 89).

⓬ Press F7 to view the controller assignments for the currently selected voice. Refer to the following section *Controller view* (page 87).

⓭ Press F8 to view the voice directory. Refer to *Voice directory,* below.

To select a voice use the following procedure. The voice will not actually change until you specify the voice number 1–16. If you want to play a different voice in the same bank, simply specify a different number 1–16.

1. Select the voice memory: INTERNAL, CARD (only if a card is inserted into the DATA slot), PRESET 1, or PRESET 2. The selected LED will blink.
2. Select a bank A, B, C, or D. The selected LED will blink.
3. Select a voice 1–16. The selected LED will light, and the LCD display will show the newly selected voice name.
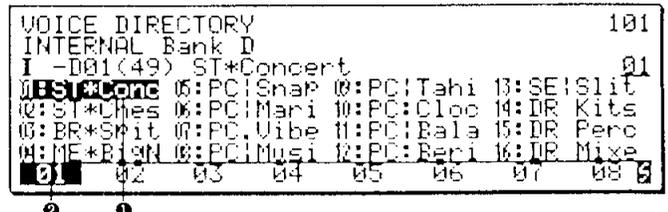
Voice directory

Summary: This function allows you select voices while viewing a directory of the sixteen voices in the currently selected voice bank.

Procedure:

From: voice play mode (JUMP #100)
Select: F8 (Dir) (JUMP #101)
Specify: one of the displayed voices
To quit: and return to the voice play display press EXIT.

```
VOICE DIRECTORY                    101
INTERNAL Bank D
I -D01(49) ST*Concert              01
 ST*Conc  05:PC Snap 09:PC Tahi 13:SE Slit
02:ST*Ches 06:PC Mari 10:PC Cloc 14:DR Kits
03:BR*Spit 07:PC Uibe 11:PC Bala 15:DR Perc
04:ME*Bign 08:PC Musi 12:PC Beri 16:DR Mixe
 01    02   03   04   05   06   07   08
 ❷  ❶
```

❶ The first seven characters of each ten-character voice name will be displayed. When you select a

different voice memory (internal, card, preset 1, or preset 2) and voice bank (A–D) the sixteen voices in the newly selected bank will be displayed. In addition to the usual methods of selecting a voice, you can also use the arrow keys to select a voice. When the voice directory is displayed, pressing a memory select button or bank select button will immediately select a voice.

❷ Pressing F1–F8 (01)–(08) will select a voice 1–8 from the displayed voice bank. Holding SHIFT and pressing F1–F8 (09)–(16) will select a voice 9–16 from the displayed voice bank.

To return to the voice play display with the voice name displayed in large characters press EXIT.

Copy voice

Summary: You can copy the currently selected voice to another voice memory anytime you are in voice play mode.
Procedure:
From: voice play mode   (JUMP #100)
Press: COPY
Specify: the destination to which the voice will be copied.
To execute: the copy operation press F8 (Go).
To quit: without executing press EXIT.

```
COPY VOICE
•I -D01(49) ST*Concert
INTERNAL Bank A                      01
█:Rocks█ 05:EP|76St 09:PL|Rock 13:KY|Smok
02:AP|CrsK 06:EP|Clas 10:EP|DXis 14:KY|CrsC
03:AP|Conc 07:EP|Nite 11:EP|GrnD 15:KY|Clav
04:AP|StrL 08:EP|Relr 12:EP|VoxL 16:KY|Reso
                                     Go
```

The names of the sixteen voices in the currently selected bank of Internal or Card memory are displayed as explained in *Voice Directory*. Press INTERNAL or CARD, press a bank button A–D, and press a memory select button 1–16 to specify the copy destination.

After specifying the copy destination press F8 (Go). You will be asked "Are you sure?" If you are sure you want to copy the voice, press YES and the data will be copied. To quit without copying press NO.

Controller view
JUMP #102

Summary: This function allows you to view the controller assignments for the voice as a reminder of how the voice can be controlled.
Procedure:
From: voice play mode   (JUMP #100)
Select: F7 (Ctrl)   (JUMP #102)
To quit: and return to voice play mode press EXIT.

```
CONTROLLER VIEW                  102
Pitch Bend Wheel:Range= 2
After Touch:Md= all    Pnt=C 3  PB=+ 0
P Mod  |:MW1      |Pan LFO :off
A Mod  |:off      |Pan Bias:off
F Mod  |:off      |EG Bias :off
Cutoff |:013 MW2  |Volume  :off
|EF1 Parl:off      EF1 Parl:off
```

❶ The left side of each column displays the parameter which is being controlled. The actual effect that a controller will have on the parameter to which it is assigned will depend on the depth that is specified for each controller assignment as explained in *Voice Common job 12. Controller* (page 127).
❷ The right side of each column displays the controller which has been assigned to control the parameter ❶. Controllers which have standard definitions will be displayed as an abbreviation (see below). Other controllers will be indicated by their MIDI control change number.
In cases where the controller has been assigned but will have no effect (such as when the control range is 0), an inverse "X" will be displayed.

❸ Pitch Bend Wheel Range: This displays the range over which the PITCH wheel can raise or lower the pitch.

❹ After Touch: This area displays the zoned after-touch mode, the split point, and the aftertouch pitch bend setting.

❺ The bottom line displays the two effect parameters which have been selected for realtime control, and the controller which is affecting each effect parameter.

Controller abbreviations: The following abbreviations will be displayed to indicated commonly-used control sources

MW1	Modulation Wheel
MW2	Assignable Modulation Wheel

BC	Breath Controller
VOL	Volume
FC	Foot Controller
DE	Data Entry Slider
SUS	Sustain Switch
FS	Assignable Foot Switch
AFT	Aftertouch
VEL	Velocity
SCL	Scaling
LFO	Effect LFO

This function only allows you to view the controller assignments. To edit them, refer to *Voice Common job 12. Controller* (page 127), and *Voice Common job 10.5 Effect control* (page 123).

Send bank select and program change

Summary: While in voice play mode you can transmit bank select and program change messages from MIDI OUT without affecting the SY99's own tone generator. This allows you to switch a tone generator module connected to the SY99 MIDI OUT to another memory without changing the SY99's own memory selection. (An identical function is available in multi play mode.)

Procedure:

From:	voice play mode	(JUMP #100)
Select:	F1 (Send)	
Specify:	a bank select number (1–16,384) and a program change number (1–128).	
To transmit:	the bank select and program change messages press ENTER.	
To quit:	without sending a bank select or program change message, press EXIT.	

1. Use the numeric key pad to enter a bank number between 1 and 16,384, then press ENTER to move the cursor to the program change item. (To send a program change message but no bank select message, simply press ENTER.)
2. Use the numeric keypad to enter a program change number between 1 and 128.

3. Press ENTER and the specified bank select and program change messages will be transmitted on the keyboard transmit channel (Kyb Trans Ch) specified in *MIDI Utility job 1.Setting* (JUMP #807).
   If, for the program change, you enter a number below 1 it will be transmitted as 1. If you enter a number above 128, it will be transmitted as 128.
   In addition to the program change message transmitted by this function, a program change message will be transmitted every time you select a SY99 voice or multi unless Program Change has been turned off using *MIDI utility job 1.Setting,* page 258.

Remark: Refer to the *MIDI Data Format* booklet for details regarding the use of MIDI bank select numbers.

Note: If a master control setup is activated, the transmit filter for that setup may prevent the sending of bank select and program change messages using this function. Refer to the explanation of the Master control utility on page 284 for further details.

Master control select

Summary: While the SY99 is in voice play mode, you can jump to the master control select display (JUMP #832) by pressing a single function key. This feature makes it easy to use the MIDI master control function while playing the SY99.

Procedure:

>   From: voice play mode   (JUMP #100)
>   Select: F6 (Mstr)

The controller select display will appear, just as if you had pressed JUMP, entered 832 using the numeric keypad, and then pressed ENTER. This display can be used to send a variety of control information to MIDI instruments connected to the SY99.

If you perform live using the SY99, you will probably want to use the master control function often while playing the SY99's keyboard. You will probably find the master control function especially convenient because it is available with the press of a single button. See page 284 for details.

VOICE EDIT MODE

This section explains the details of all voice edit parameters.

Contents of this section   **page**

VOICE EDIT MODE

The organization of Voice Edit mode will depend on whether the voice is a normal voice or a drum voice.

Normal voice (voice modes 1–10)

F1 (Mode)	**F2** (Com)	**F3** (E1) **F4** (E2)	**F5** (E3) **F6** (E4)
Specify the Voice Mode	Common data edit job directory	AFM element edit job directory OR	AWM element edit job directory
1. 1AFM mono	1. Element level	1. AFM algorithm	1. ____
2. 2AFM mono	2. Element detune	2. AFM oscillator	2. AWM waveform set
3. 4AFM mono	3. Element note shift	3. AFM EG	3. AWM EG
4. 1AFM poly	4. Element note limit	4. AFM operator output	4. AWM output
5. 2AFM poly	5. Element velocity limit	5. AFM sensitivity	5. AWM sensitivity
6. 1AWM poly	6. Element dynamic pan	6. AFM LFO	6. AWM LFO
7. 2AWM poly	7. Output group select	7. AFM pitch EG	7. AWM pitch EG
8. 4AWM poly	8. Random pitch	8. AFM filter	8. AWM filter
9. 1AFM&1AWM poly	9. Portamento		
10. 2AFM&2AWM poly	10. Effect set		
11. Drum set	11. Micro tuning set		
	12. Controller set		
	13. Voice name		
	...	...	...
	15. Initialize voice	15. Initialize AFM element	15. Initialize AWM element
	16. Recall voice	16. Recall AFM element	16. Recall AWM element

Drum voice (voice mode 11)

F1 (Mode)	**F2** (Com)
Specify the Voice Mode	Drum Set edit job directory
1. 1AFM mono	1. Voice volume
2. 2AFM mono	2. Wave data set
3. 4AFM mono	3. Effect set
4. 1AFM poly	4. Controller set
5. 2AFM poly	5. Name
6. 1AWM poly	...
7. 2AWM poly	7. Initialize
8. 4AWM poly	8. Recall
9. 1AFM&1AWM poly	
10. 2AFM&2AWM poly	
11. Drum set	

Compare

When you are in edit mode but have have not yet modified the data, a small square □ is displayed at the left of the voice number to indicate that the voice has not yet been edited. If the data is edited in any way, this will change to a inverse "E".

If you want to see and hear the original data press EDIT (COMPARE) and the inverse "E" will change to a "C" indicating that you are in compare mode.
To return to edit mode press EDIT (COMPARE) once again and the "C" will change back to an "E".

Note:
- *The Compare function is not available in the job directory displays, nor while editing Dynamic Pan, Micro Tuning, or waveform data.*
- *If the Voice Mode has been changed, the Compare function will not be available.*
- *While comparing, it is not possible to modify parameter values. (However there are some exceptions.)*
- *If you compare while editing a card voice, a card error will cancel compare after displaying an error message.*
- *While comparing, EXIT, mode select, page, cursor, JUMP, COPY, and some of F1–F8 will not function.*

Store voice

When you press EXIT or use the JUMP button to exit Voice Edit mode after editing the data, the top line of the display will blink "AUTO-STORE VOICE"

```
AUTO-STORE VOICE   Push Return/Quit/Store
BI -D01(49) ST*Concert
INTERNAL Bank D                         01
01:ST*Conc 05:PC|Snap 09:PC|Tahi 13:SE|Slit
02:ST*Ches 06:PC|Mari 10:PC:Cloc 14:DR Kits
03:BR*Spit 07:PC.Vibe 11:PC|Bala 15:DR Perc
04:ME*BiaN 08:PC|Musi 12:PC:Peri 16:DR Mixe
                             Ret  Quit Stor
```

Note 1:
Four-element voices, i.e., voices using voice mode 3 (4AFM mono), 8 (4AWM poly), or 10 (2AFM&2AWM) occupy extra memory, and can be stored only in bank D. The AUTO-STORE display for such voices will automatically show bank D, and blink "Use bank D" in the bottom line as a reminder.
Voices which use other voice modes can be stored in bank D as well.
Drum voices may be stored in any of the four banks A through D. However, since these voices contain a large volume of data, only the data for notes C1 to C6 will be saved if a drum voice is stored in banks A, B, or C. Store drum voices in bank D if you wish to save the data for the full range of notes from E0 to G6.

Note 2:
When storing a voice which uses an AWM waveform card, make sure that the correct card is inserted when you store, since the waveform card ID number is stored as part of the voice.
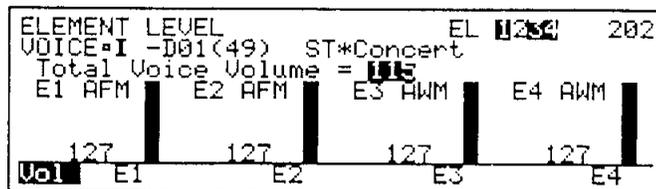
The LCD will show the first seven characters of the voice names in the currently selected bank of voices. The voice name displayed in inverse indicates the voice memory into which the edited data will be stored.

1. Use INTERNAL or CARD to specify the voice memory, select a bank A–D, and select the voice memory 1–16 in which you want to store your newly edited voice.
2. Press F8 (Stor), and the bottom line will ask "Are you sure ? (Yes or No)".
3. If you are sure you want to store the edited voice, press +1/YES and the bottom line of the LCD will show "Store completed". If you decide not to store, press –1/NO and the bottom line of the LCD will show "Store cancelled".
4. You will then return to voice play mode or the jump destination.

Element on/off

When editing a voice which uses two or more elements, it is often useful to hear only the element being edited. At any time while editing a normal voice, pressing the ELEMENT ON/OFF buttons located at the upper right of the front panel will turn individual elements off/on. When editing voice common data, the number of elements used by the voice will be shown in the upper right corner of the display. Elements that are on will be displayed in inverse. In addition the LEDs above the ELEMENT ON/OFF buttons will light if the element is on and be darkened when the element is turned off. In the following LCD, element 2 has been turned off, and will not be heard.

Element 2 has been turned off.

```
ELEMENT LEVEL           EL ⬛2⬛    202
VOICE■I -D01(49)  ST*Concert
 Total Voice Volume = ⬛⬛⬛
 E1 AFM▐  E2 AFM▐  E3 AWM▐  E4 AWM▐
   127      127      127      127
⬛Vol▐  E1      E2       E3      E4
```

When editing Drum Set data the ELEMENT ON/OFF buttons will have no effect.

When you move to the Voice Mode Select display, the element on/off settings will automatically be cancelled.

Element select

At any time while editing the element data of a normal voice, you can use the ELEMENT SELECT buttons located at the upper right of the front panel to select an element to edit. This is often faster than returning to the top level of voice edit mode and pressing F3–F6 to select the job directory of a different element.

When editing Voice Common data, Drum Set data, or waveforms, the ELEMENT SELECT buttons will have no effect.

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Voice mode select

Summary: The voice mode setting determines whether a voice will consist of one, two, or four AWM or AFM elements (modes 1–10), or 76 AWM waves (mode 11).

Procedure:

From: the top level of voice edit mode

(JUMP #200, #201, #230, #256)

Press: F1 (Mode) to get the following display.

(JUMP #200)

Specify: the desired voice mode.

```
VOICE EDIT E1:AFM  E3:AWM      200
               E2:AFM  E4:AWM
 ■I  -D01(49)   ST*Concert              10
 01:1AFM  mono  05:2AFM  Poly  09:1AFM&1AWM
 02:2AFM  mono  06:1AWM  Poly  10:2AFM&2AWM
 03:4AFM  mono  07:2AWM  Poly  11:Drum Set
 04:1AFM  Poly  08:4AWM  Poly
 Mode  Com    E1    E2    E3    E4
```

❶ This area shows the number (1, 2, or 4) and type (AWM or AFM) of elements in the selected voice mode.

❷ Move the cursor to the desired voice mode 1–11. The selected voice mode will become effective immediately.

01: 1AFM mono: The voice consists of one AFM element.

02: 2AFM mono: The voice consists of two AFM elements.

03: 4AFM mono: The voice consists of four AFM elements. (See note)

04: 1AFM poly: The voice consists of one AFM element.

05: 2AFM poly: The voice consists of two AFM elements.

06: 1AWM poly: The voice consists of one AWM element.

07: 2AWM poly: The voice consists of two AWM elements.

08: 4AWM poly: The voice consists of four AWM elements. (See note)

09: 1AFM&1AWM: The voice consists of one AFM and one AWM element.

10: 2AFM&2AWM: The voice consists of two AFM and two AWM elements. (See note)

11: Drum Set: The voice consists of seventy-six AWM samples.

Mono modes (1–3): Voices which use modes 1–3 are monophonic. Only one note can be produced at a time. If a note is played while the previous note is still sounding, the previous note will be cut off. Mono mode is useful when simulating instruments that naturally produce only one note at a time. Mono mode also allows you to use a special type of portamento; *fingered portamento.* For details refer to *Voice Common 9. Portamento* (page 104).

Polyphonic modes (4–10): Voices which use modes 4–10 are polyphonic, and will allow you to play chords of as many notes as can be produced by the SY99's tone generator. The AWM and AFM tone generators can each produce up to 16 simultaneous notes. For some voice modes more than one element may be sounded by a single key, and this will correspondingly reduce the number of simultaneous notes you can play.

Drum Set mode (11): Drum set voices use only the AWM tone generator, and up to 16 AWM samples can be sounded simultaneously.

Note: Four-element voices (modes 3, 8, and 10) can be stored only in bank D.

Drum voices may be stored in any of the four banks A through D. However, since these voices contain a large volume of data, only the data for notes C1 to C6 will be saved if a drum voice is stored in banks A, B, or C. Store drum voices in bank D if you wish to save the data for the full range of notes from E0 to G6.

A slight delay may occur in the sounding of some notes when a large number of notes are played simultaneously (either manually or in response to MIDI note on messages) using four-element voices. To avoid this delay in such cases, you may wish to use a voice using fewer elements, or reduce the number of notes being played simultaneously.
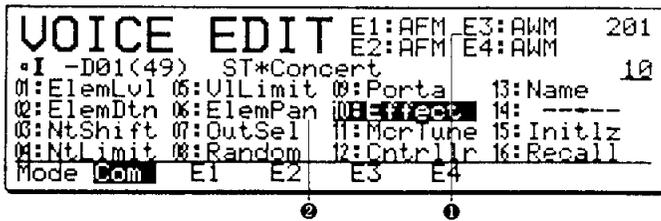
Common data

Common data job directory

Summary: This job directory shows the jobs containing data that affects all elements in the voice.

Procedure:
From: the top level of voice edit mode
When: editing a normal voice
Press: F2 (Com)   (JUMP #201)
Select: the desired job

```
VOICE EDIT E1:AFM E3:AWM    201
           E2:AFM E4:AWM
•I -D01(49)  ST*Concert          10
01:ElemLvl 05:VlLimit 09:Porta  13:Name
02:ElemDtn 06:ElemPan 10:Effect 14: -----
03:NtShift 07:OutSel  11:McrTune 15:Initlz
04:NtLimit 08:Random  12:Cntrllr 16:Recall
Mode Com   E1   E2   E3   E4
```
          ❷   ❶

❶ This area shows the number (1, 2, or 4) and type (AWM or AFM) of elements in the selected voice mode.

❷ Move the cursor in this area to select a job:

01: ElemLvl (Element level): Total voice volume, and element level

02: ElemDtn (Element detune): Fine tuning for each element

03: NtShft (Element note shift): Transpose each element

04: NtLimt (Element note limit): Range of notes that play each element

05: VlLimt (Element velocity limit): Range of key-on velocities that play each element

06: ElemPan (Element dynamic pan): Dynamic panning table for each element

07: OutSel (Output group select): Output group for each element

08: Random (Random pitch): Random pitch variation for entire voice

09: Porta (Portamento): Portamento mode and time

10: Effect (Effect set): Effect set job directory

11: McrTune (Micro tuning): Micro tuning select for entire voice, and micro tuning on/off for each element.

12: Ctrllr (Controller set): Controller assignments and depth for pitch bend, modulation, pan, etc.

13: Name (Voice name): Ten-character voice name

15: Initlz (Initialize voice): Initialize the voice common data being edited

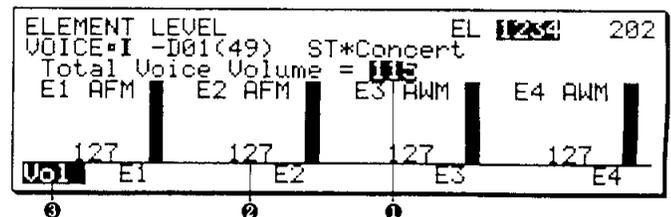16: Recall (Recall voice): Recall all data (common and element) of the previously edited voice

1. Element level

Summary: Adjust the overall volume of the entire voice, and the volume of individual elements 1–4.

Procedure:
From: voice common job directory   (JUMP #201)
Select: job 01:ElemLvl   (JUMP #202)
Specify: the total voice volume and the levels of each element

```
ELEMENT LEVEL            EL 1234   202
VOICE•I -D01(49)  ST*Concert
Total Voice Volume = 115
E1 AFM    E2 AFM    E3 AWM    E4 AWM

  127      127      127      127
Vol  E1       E2       E3       E4
```
  ❸   ❷   ❶

❶ Total voice volume (0...127): This determines the overall volume of the entire voice.

❷ Element level (0...127) E1–E4: These determine the volume level of each element. Press F2, F4, F6, F8 to move the cursor to elements 1–4. The level of each element is displayed as a vertical bar graph.

❸ Pressing F1 will move the cursor to Total Voice Volume. Pressing F2, F4, F6, F8 will move the cursor to elements 1–4.

Remarks: Since the total voice volume setting is part of the voice data, it can be used to even out the volume differences between voices. This is important when editing a set of voices for live performance, and allows you to avoid any sudden jumps in volume when a voice is selected.
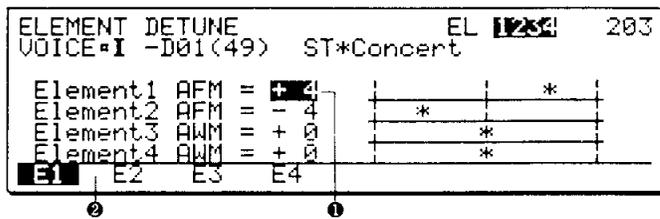

COMMON DATA

2. Element detune

JUMP #203

Summary: Adjust the fine tuning of individual elements 1–4.

Procedure:

From: voice common job directory (JUMP #201)
Select: job 02:ElemDtn (JUMP #203)
Specify: the tuning of each element

```
ELEMENT DETUNE          EL ▉▉▉  203
VOICE=I -D01(49)  ST*Concert

Element1 AFM = ▉▉4─┐ │      │  * │
Element2 AFM = - 4 ├──│──*──│───│
Element3 AWM = + 0 ├──│──│─*─│───│
Element4 AWM = + 0 ├──│──│─*─│───│
▉▉ │E2   E3   E4 │
    ❷           ❶
```

❶ Detune (–7...+7) E1–E4: When this is set to 0, the element will play the correct pitch for the key that was pressed. Negative settings will lower

the pitch, and positive settings will raise the pitch. The tuning of each element is indicated graphically by the position of the asterisk on a horizontal scale.

❷ Pressing F1–F4 will move the cursor to elements 1–4.

Remarks: If you are creating a voice that plays two or more elements for a single note, slightly detuning the elements will create a natural chorus effect, giving a richer quality to the sound.

Element detune is intended to change the *relative* pitch of two or more elements. Setting all elements to the same detune value will not be useful, nor will this setting be useful if the voice contains only one element.
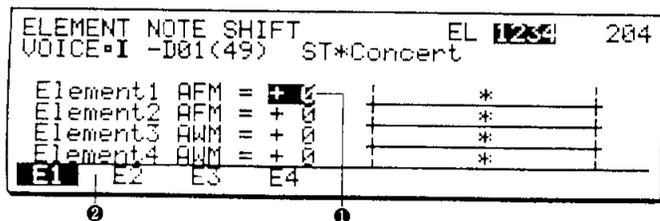

COMMON DATA

3. Element note shift

JUMP #204

Summary: Transpose the pitch of individual elements 1–4.

Procedure:

From: voice common job directory (JUMP #201)
Select: job 03:NtShft (JUMP #204)
Specify: the transposition of each element

```
ELEMENT NOTE SHIFT      EL ▉▉▉  204
VOICE=I -D01(49)  ST*Concert

Element1 AFM = ▉▉5─┐ │      *  │
Element2 AFM = + 0 ├──│──│──*:─│
Element3 AWM = + 0 ├──│──│──*:─│
Element4 AWM = + 0 ├──│──│──*:─│
▉▉ │E2   E3   E4 │
    ❷           ❶
```

❶ Note Shift (–64...+63) E1–E4: When this is set to 0, the element will play the correct pitch for the key that was pressed. This setting adjusts the pitch in semitone increments. For example if set to –12 the pitch will be one octave lower than normal, and if set to +24 the pitch will be two octaves higher than normal.

❷ Pressing F1–F4 will move the cursor to elements 1–4.

Remarks: The note shift setting can be useful when you need play notes that are beyond the range of the SY99's 76-note keyboard. For voices which play two or more elements for each key, note shift can be used to create automatic parallel harmony.

COMMON DATA

4. Element note limit

JUMP #205

Summary: Specify the range of notes that will play each element.

Procedure:

From: voice common job directory   (JUMP #201)

Select: job 04:NtLimt   (JUMP #205)

Specify: the note range for each element

```
ELEMENT NOTE LIMIT          EL ██  205
VOICE■I -D01(49)  ST*Concert
                   |  Low   |  High
 Element1 AFM  |   C -2  |  G 8
 Element2 AFM  |   C -2  |  G 8
 Element3 AWM  |   C -2  |  G 8
 Element4 AWM  |   C -2  |  G 8
 E1    E2    E3    E4              Kbd
```

    ❷   ❶   ❸

❶ **Low Note Limit (C-2...G8) E1-E4:** This specifies the lowest note that will be played by the element.

❷ **High Note Limit (C-2...G8) E1-E4:** This specifies the highest note that will be played by the element.

❸ Pressing F1-F4 will move the cursor to elements 1-4.

Remarks: After moving the cursor to the parameter you want to set, you can modify the data in the usual way or press F8 (Kbd) and then press a key of the SY99's keyboard to enter a note. (The notes of the SY99 keyboard are E0-G6.)

If you want to play an element over the entire range of the keyboard, leave this parameter set at Low=C-2 and High=G8.

This parameter can be used to create keyboard split effects where different elements are played by different keyboard areas. For example in a two-element voice where element 1 is a

bass sound and element 2 is a piano sound, set element 1 to Low=C1 and High=B2 and set element 2 to Low=C3 and High=C5. With these settings, notes below middle C will play bass (element 1) and notes above middle C will play piano (element 2).

Element 1 Bass	Element 2 Piano

▼ C1   B2 ▼▼ C3   C5 ▼
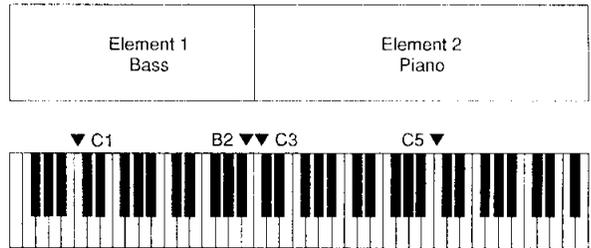
It is possible to set the low limit above the high limit. In this case, the element will be played by notes above the low limit and below the high limit. The following diagram shows the keyboard range that would play an element set to Low=C4 and High=C2.

High = C2   Low = C4
←   →

▼ C1   ▼ C2   C4 ▼   C5 ▼
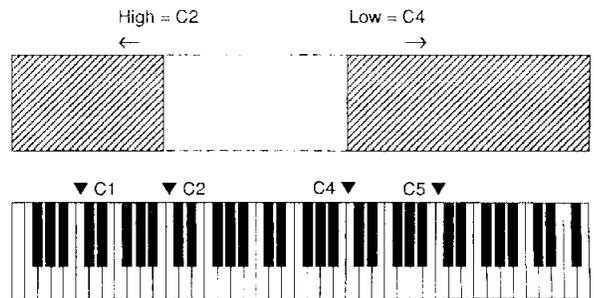
Note: This note limit setting will be ignored if the voice mode is mono (voice mode 1:1AFM mono, 2:2AFM mono, and 3:4AFM mono).

COMMON DATA

5. Element velocity limit

JUMP #206

Summary: Specify the range of key-on velocities that will play each element.

Procedure:

From: voice common job directory   (JUMP #201)

Select: job 05:VlLimit   (JUMP #206)

Specify: the range of velocities for which the element will sound

```
ELEMENT VELOCITY LIMIT      EL ██  206
VOICE■I -D01(49)  ST*Concert
                   |  Low   |  High
 Element1 AFM  |    1    |  127
 Element2 AFM  |    1    |  127
 Element3 AWM  |   20    |  127
 Element4 AWM  |    1    |  127
 E1    E2    E3    E4
```

    ❷   ❶   ❸

❶ Low Velocity Limit (1...127): This is the lowest key-on velocity for which the element will sound.

❷ High Velocity Limit (1...127): This is the highest key-on velocity for which the element will sound.

❸ Press F1–F4 to move the cursor to elements 1–4.
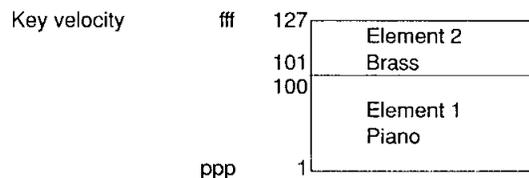
Remarks: If you want to play an element over the full range of key velocities, leave this parameter set at Low=1 and High=127. This parameter can be used to make strongly played notes play different elements than softly played notes. For example in a two-element voice where element 1 is a piano sound and element 2 is a brass sound, set element 1 to Low=1 and High=100 and set element 2 to Low=101 and High=127. With these settings, soft notes will play the piano (element 1) and strong notes will play brass (element 2). If desired, you could overlap the velocity limits of the elements, or use more than two elements.

It is possible to set the low limit above the high limit. In this case, the element will be sounded by key-on velocities outside the limits. The following diagram shows the velocity range that would play an element set to Low=100 and High=40.
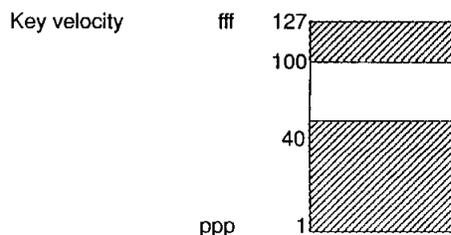
COMMON DATA

6. Element dynamic pan

JUMP #207

Summary: Select the Dynamic Pan data used by each element. The selected dynamic pan data will determine how the stereo position of the element will change over time.

Procedure:

From: Voice Common job directory (JUMP #201)

Select: job 06:ElemPan (JUMP #207)

Specify: the Dynamic Pan data used by each element

```
ELEMENT DYNAMIC PAN        EL  I2X!  207
VOICE·I -D01(49)  ST*Concert
                   Dynamic Pan Select
  Element1 AFM      P- 3 Right 5
  Element2 AFM      P- 9 Left 5
  Element3 AWM      P- 1 Center
  Element4 AWM      P- 1 Center
  E1   E2   E3   E4
```

❶ Dynamic Pan Select (I1...32, C1...32, P1...64): This specifies the dynamic pan data that will move the stereo position of this element over time. The number and name of the selected pan data will be displayed. For an internal voice, select a pan data memory from Internal or Preset. For a card voice, select a pan data memory from Card or Preset.

❷ Pressing F1–F4 will move the cursor to elements 1–4.

❸ Press F8 to edit the currently selected pan data. (Only Internal pan data can be edited.)

Remarks: Each Dynamic Pan memory contains the following data.

● a Pan Source which allows the panning movement to be controlled by velocity, note number, or LFO

● EG settings which determine panning movement over time

● a Pan Name

64 preset dynamic pan memories are provided, as explained in the following table. In addition, 32 internal memories are provided for you to store your own pan data, and a RAM card can accommodate 32 more pan data memories. The following section 6.0 Dynamic Pan Edit explains how to edit the Dynamic Pan data.

Preset Dynamic Pan data

#	Name	Description
1	Center	fixed at center
2	Right 6	fixed full right
3	Right 5	...
4	Right 4	...
5	Right 3	...
6	Right 2	...
7	Right 1	fixed slightly right
8	Left 6	fixed full left
9	Left 5	...
10	Left 4	...
11	Left 3	...
12	Left 2	...
13	Left 1	fixed slightly left
14	L>R slow	slowly move L→R
15	L>R	move L→R
16	L>R fast	quickly move L→R
17	R>L slow	slowly move R→L
18	R>L	move R→L
19	R>L fast	quickly move R→L
20	C>R slow	slowly move C→R
21	C>R	move C→R
22	C>R fast	quickly move C→R
23	C→R slow	pause at center then slowly move C→R
24	C→R	pause at center then move C→R
25	C→R fast	pause at center then quickly move C→R
26	C>L slow	slowly move C→L
27	C>L	move C→L
28	C>L fast	quickly move C→L
29	C→L slow	pause at center then slowly move C→L
30	C→L	pause at center then move C→L
31	C→L fast	pause at center then quickly move C→L
32	L<>R slow	start at L then slowly move between LR
33	L<>R	start at L then move between LR
34	L<>R narrow	start at L then move (narrowly) between LR
35	L<>R fast	start at L then move quickly between LR

#	Name	Description
36	R<>L slow	start at R then slowly move between RL
37	R<>L	start at R then move between RL
38	R<>L narrow	start at R then move narrowly between RL
39	R<>L fast	start at R then move quickly between RL
40	C>R<>L slw	start at C then move slowly between RL
41	C>R<>L s&n	start at C then move slowly and narrowly between RL
42	C>R<>L	start at C then move between RL
43	C>R<>L fst	start at C then move quickly between RL
44	C→R<>L sl	pause at C then move slowly between RL
45	C→R<>L	pause at C then move between RL
46	C→R<>L fs	pause at C then move quickly between RL
47	C>L<>R slw	start at C then move slowly between LR
48	C>L<>R s&n	start at C then move slowly and narrowly between LR
49	C>L<>R	start at C then move between LR
50	C>L<>R fst	start at C then move quickly between LR
51	C→L<>R sl	pause at C then move slowly between LR
52	C→L<>R	pause at C then move between LR
53	C→L<>R fs	pause at C then move quickly between LR
54	LFO MWheel	controller regulates the width (initially 0) of LFO panning
55	LFO wide	broad panning by LFO
56	Note wide	broad panning by note number
57	Note narrw	narrow panning by note number
58	Notew+EG n	broad panning by note number + narrow LR movement
59	Noten+EG w	narrow panning by note number + broad LR movement
60	Vel wide	broad panning by key velocity
61	Vel narrow	narrow panning by key velocity
62	Vel w+EG n	broad panning by key velocity + narrow LR movement
63	R&L 1	variation of repeated LR movement
64	R&L 2	variation of repeated LR movement

COMMON DATA / ELEMENT DYNAMIC PAN

6.0 Dynamic pan edit

Summary: This function allows you to edit the currently selected Dynamic Pan data.
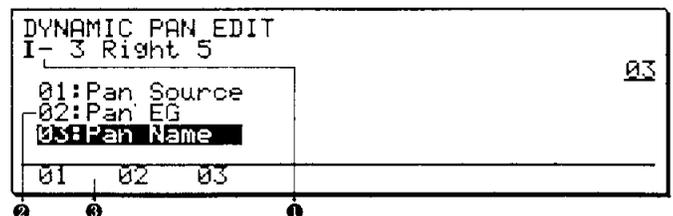
Procedure:

From: Voice Common job 06.ElemPan

(JUMP #207)

When: an Internal dynamic pan memory is selected

Press: F8 (Edit)

Select: the Dynamic Pan parameter you wish to edit

Editing is possible only when an Internal pan memory is selected. If you want to edit one of the preset pan memories, press COPY to copy it to an Internal pan memory as explained in the following section 6.0.1 Copy Pan Data.

```
DYNAMIC PAN EDIT
I- 3 Right 5                    03

  01:Pan Source
 ┌02:Pan EG
 │03:Pan Name
 │
 └ 01   02   03
  ❷    ❸         ❶
```

❶ The name and number of the currently selected Dynamic Pan data are displayed.

❷ Move the cursor in this area to select a job.

01: Pan Source: Select a control source (velocity, note number, or LFO) to affect dynamic panning. (See 6.1 Pan Source)

02: Pan EG: Set the panning EG. (See 6.2 Pan EG)

03: Pan Name: Assign a ten-character name to the pan data. (See 6.3 Pan Name)

❸ Pressing F1–F3 will select the corresponding job.

COMMON DATA / ELEMENT DYNAMIC PAN

6.0.1 Copy pan data

Summary: This function copies dynamic pan data from another memory into an Internal pan data memory.

Procedure:

When: editing dynamic pan data

Press: COPY to get the following display.

Specify: the source and destination pan.

To copy: the pan data press F8.

To quit: without copying press EXIT.

```
COPY PAN DATA
┌Source Pan       = I- 3 Right 5
│Destination Pan = I- 1 C>L<>R
│
└                                    Go
```
❶   ❷   ❸
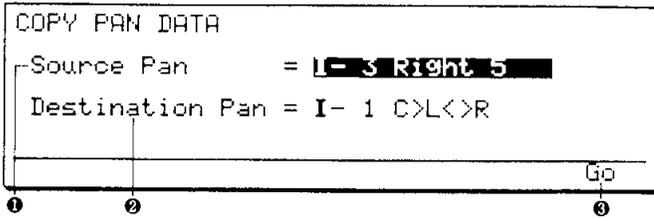
❶ Source Pan: Select the dynamic pan data to copy.

❷ Destination Pan: Select the dynamic pan data (internal 1–32) into which to copy the Source Pan data.

❸ After selecting Source Pan and Destination Pan, press F8 (Go) to copy the data. You will be asked "Are you sure?". Press YES and the data will be copied.

Remarks: Only Internal Pan Data memories can be edited. If you want to edit one of the preset pan tables, use this function to copy it into an Internal pan memory.

COMMON DATA / ELEMENT DYNAMIC PAN

6.1 Pan source

Summary: This determines how the dynamic panning will be affected: either by Velocity, or Note Number, or LFO.
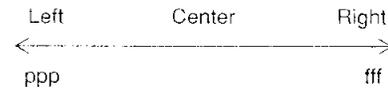
Procedure:

From: Dynamic Pan Edit job directory

Select: 01:Pan Source

Specify: the pan source and depth

```
PAN SOURCE
PAN:I- 3 Right 5

 Pan Source   = LFO
 Source Depth =  0
```
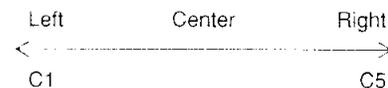   ❷   ❶
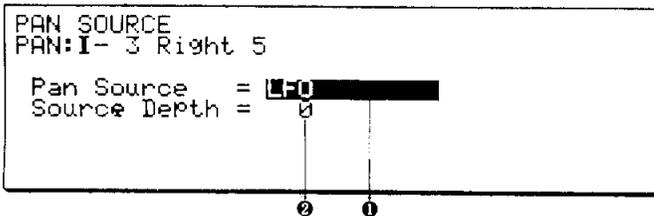
❶ Pan Source (Velocity, Key Note Number, LFO): Select the control source which will affect dynamic panning. When velocity is selected, the strength at which each note is played will affect panning. When note number is selected, notes above middle C will be panned increasingly right, and notes below middle C will be panned increasingly left. When LFO is selected, the LFO of the element will continuously pan the sound.

❷ Source Depth (0...127): This determines how much the selected Pan Source will affect panning. When this is set to 0, the selected pan source will have no effect. When this is set to 127, the selected pan source will pan the element from full left to full right.
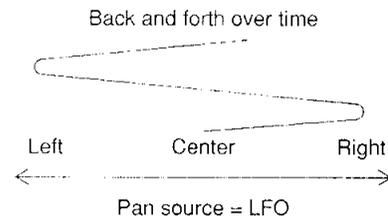
Pan source = Velocity

```
   Left         Center        Right
  <---------------------------------->
   ppp                          fff
```

Pan source = Key note number

```
   Left         Center        Right
  <---------------------------------->
   C1                           C5
```

Pan source = LFO

Back and forth over time


```
   Left         Center        Right
  <---------------------------------->
         Pan source = LFO
```

Remarks: Dynamic panning is controlled by two factors working together; the Pan Source and the Pan EG. Refer to the diagram in 6.2 Pan EG for an example of this.

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COMMON DATA / ELEMENT DYNAMIC PAN

6.2 Pan EG

Summary: Specify how the element will be panned over time, starting when each note is played.
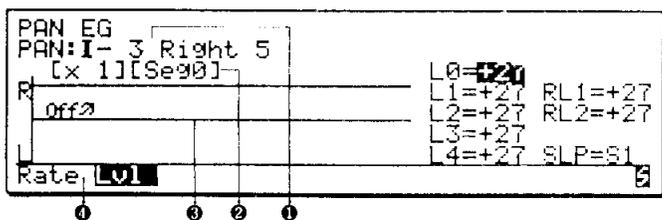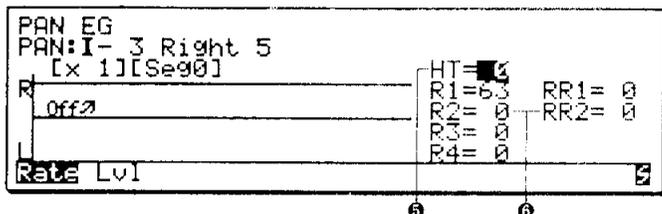
Procedure:
From: Dynamic Pan Edit job directory
Select: 02:Pan EG.
Press: F1 (Rate) to set pan EG rates.
Press: F2 (Lvl) to set pan EG levels.

```
PAN EG
PAN:I- 3 Right 5
  [x 1][Seg0]              HT= 
R                          R1=63   RR1= 0
   Off                     R2= 0   RR2= 0
                           R3= 0
L                          R4= 0
Rate Lvl                                    
        ❺        ❻
```

```
PAN EG
PAN:I- 3 Right 5
  [x 1][Seg0]              L0=+20
R                          L1=+27  RL1=+27
   Off                     L2=+27  RL2=+27
                           L3=+27
L                          L4=+27  SLP=S1
Rate Lvl
    ❶      ❸ ❷   ❼
```

❶ The number and name of the currently selected Dynamic Pan data are displayed.

❷ This indicates the displayed segment and range of the EG graphic display. To change the range, hold SHIFT and press F1–F6 (x1, x2, x5, x10, x20, x50). To shift the EG graphic display to a different segment, hold SHIFT and press F7 or F8 to select Seg0–Seg4, Rel1.

❸ The pan EG is graphically displayed.

❹ Press F1 (Rate) to set EG rates. Press F2 (Lvl) to set EG levels.

❺ HT (Keyon Delay Time 63...0): When this is set to 0, the pan EG will begin immediately after a key is pressed. For higher settings, there will be an increasingly longer delay before the pan EG begins.

❻ R1–R4, RR1–RR2 (Keyon Rates, Release Rates 0...63): Keyon Rates 1–4 and Release Rates 1–2 determine the speed of the pan EG. Higher settings result in faster change. Refer to the diagram below.

❼ L0–L4, RL1–2 (Keyon Levels, Release Levels –32...+32): Keyon Levels 0–4 and Release Levels 1–2 determine the panning direction and distance of the pan EG. Negative settings move left, and positive settings move right. Refer to the following diagram.

❽ SLP (Loop Point S1–S4): This specifies the segment from which the EG will continue looping if a key remains depressed after the EG has come to the end. Refer to the following diagram.
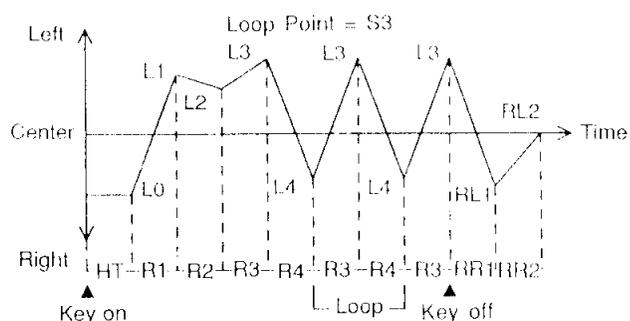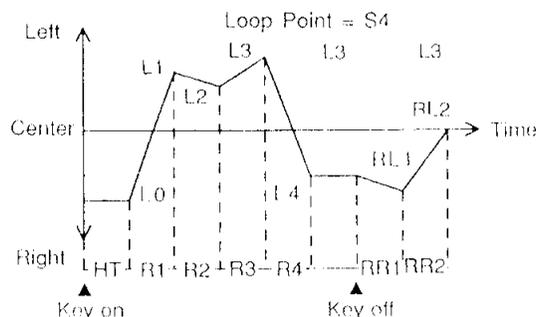
When you press a key, the sound will be output at the pan position of L0. When the specified hold time (HT) has elapsed, the pan position will change at the rate of R1 to level L1. When the pan position reaches L1, it will change at the rate of R2 to the position of L2. When the pan position reaches L2, it will change at the rate of R3 to the position of L3. When the pan position reaches L3, it will change at the rate of R4 to the position of L4. When the pan position reaches L4, the EG will begin looping from the specified segment (in the above diagram, SLP=S3).

When you release the key, the pan position will change at the rate of RR1 to the position of RL1. When the pan position reaches RL1, it will change at the rate of RR2 to the position of RL2.

Remarks: Hold Time (HT) is a *time* setting, but the various Rates are *speed*. Higher settings for Hold Time will result in a longer delay before the pan EG begins, but higher settings for Rates will result in faster change. The final result of the Pan EG will depend on the Pan Source settings.

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COMMON DATA / ELEMENT DYNAMIC PAN

6.3 Pan name

Summary: Specify a ten-character name for the internal Pan data memory being edited.

Procedure:
From: Dynamic Pan Edit job directory
Select: 03:Pan Name
Specify: a name for the pan memory

```
PAN NAME
                   ↓
              [Right 5   ]

Clr  Uppr Lowr
  ❷    ❸    ❹         ❶
```

❶ Enter a ten-character name for the Pan data.
❷ To clear the currently entered name press F1 (Clr).
❸ To switch to upper-case characters press F2 (Uppr).
❹ To switch to lower-case characters press F3 (Lowr).

Methods of entering character data are explained in *How to enter character data*, on page 30.
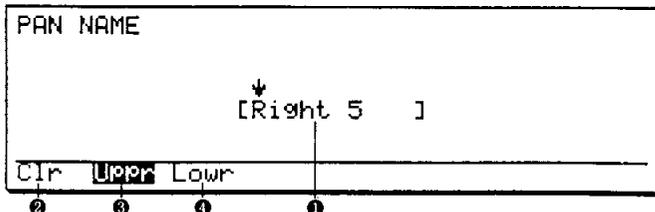
COMMON DATA

7. Output group select

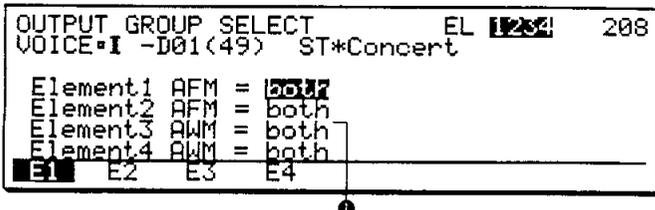JUMP #208

Summary: Specify the output group for each element.

Procedure:
From: voice common job directory   (JUMP #201)
Select: job 07:OutSel   (JUMP #208)
Specify: the output group for each element

```
OUTPUT GROUP SELECT        EL I23!   208
VOICE=I -D01(49)   ST*Concert

  Element1 AFM = both
  Element2 AFM = both
  Element3 AWM = both
  Element4 AWM = both
  E1   E2   E3   E4
               ❶
```

❶ Element 1–4 (off, grp1, grp2, both): Each of the elements in a voice must be assigned to one or both output groups. The element is then panned as specified by the dynamic pan table, and the stereo signal is sent to the corresponding output channel.

If you turn off the output group select for an element, that element will not be sent to the effect unit.

Remarks: The effect wet:dry setting determines the mix between the effect processed sound from each effect unit and the stereo signal from the dynamic pan tables. If the wet:dry setting is 100:0, the stereo pan will have no effect, since all the output sound will be coming from the effect unit. If the wet:dry setting is 0:100, the sound from the effect unit will not be heard. Refer to the figure in *10.Effect set*, page 104.

COMMON DATA

8. Random pitch

JUMP #209

Summary: Specify the amount of random pitch variation for the voice.

Procedure:
From: voice common job directory   (JUMP #201)
Select: job 08:Random   (JUMP #209)
Specify: the amount of random pitch variation

```
RANDOM PITCH               EL I23!   209
VOICE=I -D01(49)   ST*Concert

  Random Pitch Depth = 0
```
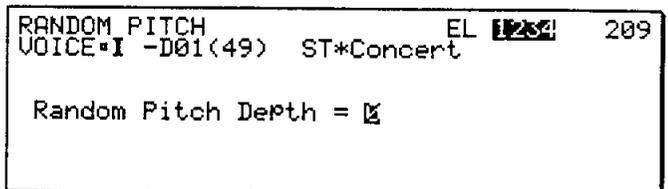
❶ Random Pitch Depth (0...7): For a setting of 0, a key will produce the same pitch each time it is pressed. For settings of 1...7, a key will produce a random deviation in pitch. Higher settings result in greater deviation from the standard key pitch.

Remarks: This parameter is helpful when simulating instruments which have a naturally varying pitch.

The random pitch deviation is applied separately to each element in the voice, meaning that pitch differences may appear between elements.

COMMON DATA

9. Portamento

JUMP #210

Summary: Specify the Portamento mode and time. Portamento creates a smooth glide in pitch between one note and the next.

Procedure:
From: voice common job directory   (JUMP #201)
Select: job 09:Porta   (JUMP #210)
Specify: the portamento mode and time

```
PORTAMENTO              EL ▉▉▉   210
VOICE∎I -D01(49)   ST*Concert

 Portamento Mode = follow
 Portamento Time = ▉▉

 *Portamento affects only AFM elements.*
 Mode Time
```
            ❷ ❶

❶ Portamento Mode: If the currently selected voice mode is polyphonic (voice modes 4–10), the portamento mode is fixed at Follow mode. If the currently selected voice mode is monophonic (voice modes 1–3), the portamento mode can be set either to Fingered or Fulltime.

Fingered portamento: Portamento is applied only if you press a note before releasing the previous one; i.e., when you play legato.

Full Time portamento: Portamento is applied between all notes.

❷ Portamento Time (0...127): This determines the time of the pitch glide between notes. Higher settings result in a longer (slower) glide.

Remarks: If you do not want portamento, set Portamento Time to 0 so that the pitch change between notes is instantaneous.

As noted in the display, portamento applies only to AFM elements. It will have no effect on voices which use only AWM elements (voice modes 6–8). If a voice uses both AFM and AWM elements (voice modes 9 and 10), portamento will apply only to the AFM elements in the voice.

COMMON DATA

10. Effect set

JUMP #212

Summary: Specify how the effect units are connected, how the sound from each element of the voice is sent to the effect units, parameters for each effect unit, and how the effect parameters are controlled in realtime.

Procedure:
From: voice common job directory   (JUMP #201)
Select: job 10:Effect   (JUMP #212)
Select: the effect parameter you wish to edit

```
EFFECT SET              EL ▉▉▉   212
VOICE∎I -D01(49)   ST*Concert
 01:Effect Mode Select            01
 02:Effect Send
 03:Effect 1 Parameter
 04:Effect 2 Parameter
 05:Effect Control
 01   02   03   04   05
```
❶   ❷

❶ Move the cursor in this area to select a job.
01: Effect Mode Select: Specify how the two effect units are connected, the effect type, effect output level, and wet:dry balance. Refer to *10.1 Effect Mode Select.*

02: Effect Send: Specify how the sound of each element of the voice will be sent to the effect units. Refer to *10.2 Effect Send*.

03: Effect 1 Parameter: Make settings for effect unit 1. Refer to *10.3 Effect 1 Parameter*.

04: Effect 2 Parameter: Make settings for effect unit 2. These parameters are exactly the same as for Effect 1. Refer to *10.3 Effect 1 Parameter*.
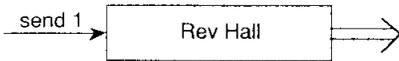
05: Effect Control: Specify how effect parameters will be affected by control change messages, aftertouch, velocity, key scaling, and LFO. Refer to *10.5 Effect Control*.

❷ Pressing F1–F5 will select the corresponding job.

The following figure shows how the signal flow of a normal voice is related to the effect system.
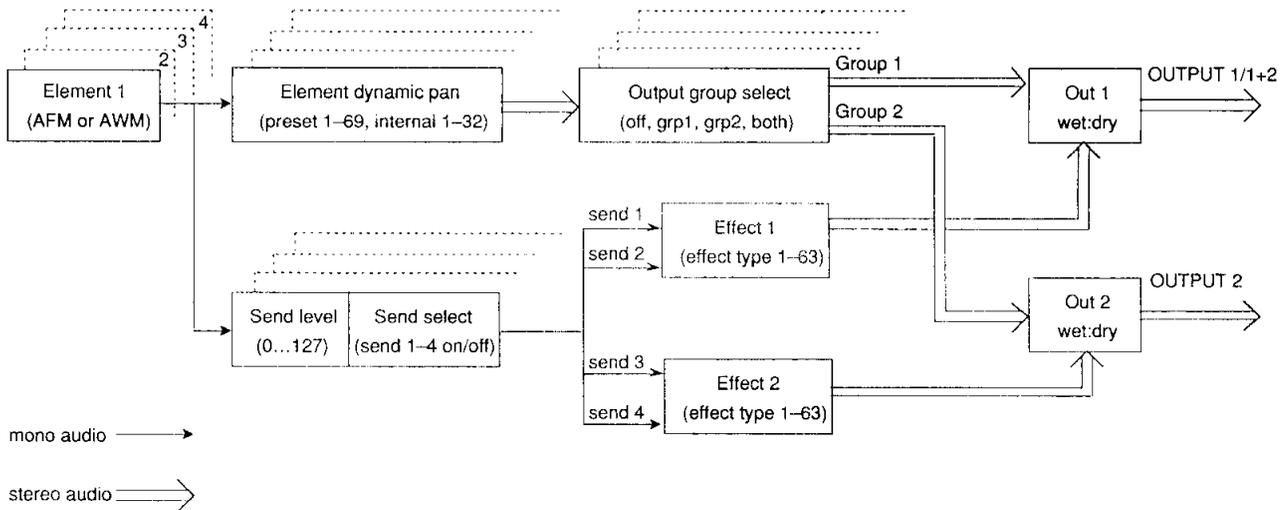
Effect type = 1–29 (single type)
ex., 1. Rev Hall

Effect type = 30–51 (cascade type)
ex., 30. Echo→Rev
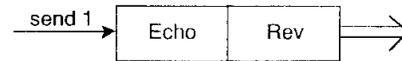
Effect type = 52–63 (dual type)
ex., 52. Hall&Plate
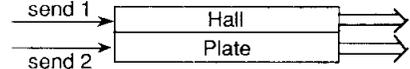
COMMON DATA / EFFECT SET

10.0.1 Copy voice effect

Summary: This function copies Effect data from another voice into the effect data of the currently edited voice.

Procedure:

When: editing Effect data (jobs 10.0–10.5)

Press: COPY to get the following display.

Specify: the voice from which to copy the effect data

To copy: the data press F8 (Go)

To quit: without copying press EXIT

❶ Use the voice memory buttons, bank button A–D, and voice select buttons 1–16 to select a source voice from which to copy the Effect data.

❷ Press F8 (Go) and you will be asked "Are you sure?". If you are sure you want to copy the effect data, press YES and the effect data will be copied from the selected voice to the voice being edited.

Note: The effect send settings (see 10.2 Effect send) will not be copied.

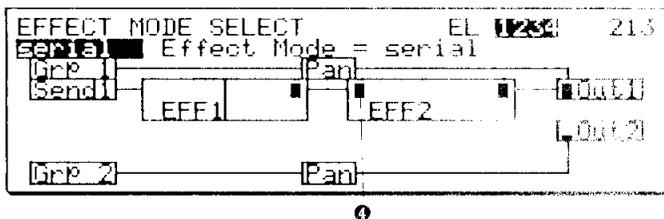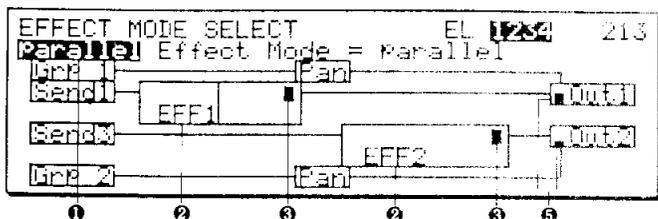COMMON DATA / EFFECT SET

10.1 Effect mode select

JUMP #213

Summary: Specify the effect mode to determine how the two effect units are connected, the effect type for each unit, effect output levels, and the volume balance between processed and unprocessed sound.

Procedure:

From: Effect Set job directory   (JUMP #212)
Select: 01:Effect Mode Select   (JUMP #213)
Specify: the effect mode, effect types, and effect levels, and wet:dry balance.

```
EFFECT MODE SELECT      EL PXX    213
Parallel Effect Mode = Parallel
Grp 1                Pan
Send1          EFF1    ■         ■Out1
Send3                    EFF2  ■  ■Out2
Grp 2                Pan
```
❶ ❷ ❸ ❹ ❺ ❻

```
EFFECT MODE SELECT      EL PXX    213
Serial  Effect Mode = serial
Grp 1                Pan
Send1    EFF1    ■  ■ EFF2    ■  Out1
                              Out2
Grp 2              Pan
```
❹

❶ Effect Mode (off, serial, parallel): This determines how the two effect units will be connected. The effect mode will be graphically shown in the display.

When the Effect Mode is set to Off, the effect units will not be used. No effect processed sound will be added to the sound sent to output groups 1 and 2 from the two stereo groups.

When the Effect Mode is set to Serial, the audio signal from the sends (one, two, or three, depending on the type of effect selected for each effect unit) will be sent to the two effect units as shown in the display. The output of effect 1 will be sent through effect 2; i.e., the effect units will be connected in "series".

When the Effect Mode is set to Parallel, the audio signal from the sends (one, two, three, or four, depending on the type of effect selected for each effect unit) will be sent to the two effect units as shown in the display.

❷ Effect 1 Type, Effect 2 Type (1...63): These determine the type of effect for each of the two effect units. A list of the 63 effects and their parameters is given in the following section *10.3 Effect 1 parameter* (page 108).

❸ EFF1/EFF2 Output level 1, 2 (0...100%): These determine the output level of each effect. The level is indicated as a number and also as a bar graph. If a dual-type effect (52–63) is selected, the output level can be set independently for each effect. At a setting of 0% the effect unit will output no sound, and at a setting of 100% the output of the effect unit will be at full volume.

❹ Effect 2 Mix Level (0...100%): This will appear only if the Effect Mode is set to Serial. It determines the amount of Effect 2 that is added to the effect chain.

❺ Out1/Out2 wet:dry (100:0...0:100): These determine the mix between the processed (wet) and unprocessed (dry) sounds for each output 1 and 2. When set to 100:0, only the processed sound from the effect unit will be heard. When set to 0:100, only the unprocessed sound from the dynamic pan will be heard.

If the wet:dry balance is set to 100:0, the sound from the stereo pan will not be heard, meaning that the element dynamic pan settings will have no effect.

Single type effects
01. Rev Hall
02. Rev Room 1
03. Rev Room 2
04. Rev Room 3
05. Rev Stage 1
06. Rev Stage 2
07. Rev Plate

08. Rev White Room
09. Rev Tunnel
10. Rev Canyon
11. Rev Basement

12. Early Reflection 1
13. Early Reflection 2
14. Gate Rev
15. Reverse

16. Delay L,R
17. Delay L,C,R
18. Stereo Echo

19. Pitch Change 1
20. Pitch Change 2
21. Pitch Change 3

22. Aural Exciter®*

23. EG Flange
24. EG Chorus
25. EG Symphonic
26. EG Phasing

27. Rotary SP

28. Ring Modulator
29. D. Filter (Wah)

Cascade type effects
30. Echo → Rev
31. Delay L,R → Rev
32. Flange → Rev

33. Chorus → Rev
34. Sympho → Rev
35. Phase → Rev
36. Aural Exciter®* → Rev
37. Dist → Rev
38. Dist → Dly L,R
39. Dist → St.Echo
40. EQ → Rev 1 (Hall)
41. EQ → Rev 2 (Room)
42. EQ → Delay L,R
43. EQ → St.Echo
44. EQ → St.Flange
45. EQ → St.Chorus
46. EQ → Symphonic
47. EQ → St.Phasing
48. St.Flange → Delay L,R
49. St.Chorus → Delay L,R
50. Symphonic → Delay L,R
51. St.Phasing → Delay L,R

Dual type effects
52. Hall & Plate
53. Echo & Rev
54. Delay & Rev
55. St.Flange & St.Chorus
56. St.Flange & Symphonic
57. Symphonic & St.Chorus
58. St.Flange & Rev
59. St.Chorus & Rev
60. Symphonic & Rev
61. St.Flange & Delay L,R
62. St.Chorus & Delay L,R
63. Symphonic & Delay L,R

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COMMON DATA / EFFECT SET

10.2 Effect send

JUMP #219

Summary: Specify how the sound from each element of the voice will sent to each of the one, two, three, or four effect sends.

Procedure:
From: Effect Set job directory   (JUMP #212)
Select: job 02:Effect Send   (JUMP #219)
Specify: the effect send settings for each element

```
EFFECT SEND                     EL ▓▓▓   219
VOICE=I  -D01(49)    ST*Concert
         |Send Sel|Level |Vel Sens|Scaling
E1:AFM |  1 - 3 - | 127 |   +0   |   +0
E2:AFM |  1 - 3 - | 127 |   +0   |   +0
E3:AWM |  1 - 3 - | 127 |   +0   |   +0
E4:AWM |  1 - 3 - | 127 |   +0   |   +0
 E1    E2   E3   E4
       ❶        ❺ ❷      ❸        ❹
```

❶ Send Sel (send select 1–4): Specify whether or not to send the sound from the element to each effect send 1–4. The number of effect sends available will depend on the effect mode and the effect type. Non-existent sends will be indicated by a dash (–), and cannot be selected. In the above display, effect sends 1 and 2 are available. If an effect send is turned on, its number will be displayed, and the sound of the element will be sent to that effect send. If an effect send is turned off, a period (.) will be displayed, and the sound of the element will not be sent to that effect send. In the above display, element 1 is being sent to effect sends 1 and 3 only.

❷ Level (0...127): Specify how much sound will be sent from the element to the effect unit.

❸ Vel Sens (–7...+7): Specify how key velocity will affect the effect send level of the element. For positive settings (+1...+7), more sound will be sent to the effect unit for strongly played notes. For negative settings (–1...–7), less sound will be sent to the effect unit for strongly played notes.

❹ Scaling (–7...+7): Specify how key position will affect the effect send level of the element. For positive settings (+1...+7), higher notes will send more sound to the effect unit. For negative settings (–1...–7), higher notes will send less sound to the effect unit.

❺ Pressing F1–F4 will move the cursor to elements 1–4.

COMMON DATA / EFFECT SET

10.3 Effect 1 parameter

JUMP #214

Summary: Set effect parameters for the effect type selected for effect 1. This explanation also applies to effect 1.

Procedure:

From: Effect Set job directory   (JUMP #212)
Select: job 03:Effect 1 Parameter   (JUMP #214)
Specify: parameter settings for the selected effect.

```
EFFECT 1 PARAMETER        EL ▮▮▮▮  214
Parallel EFF1 Type = 46:EQ -> Symphonic
 01:Low Frequency      =  ▮▮▮▮▮ Hz
 02:Low Gain           =    +02  dB
 03:Mid Frequency    ┊ =    2.0  KHz
 04:Mid Gain           =    -10  dB
 05:High Frequency   ┊ =   12.0  KHz
▮▲▮   ▼
```
     ❷   ❶

❶ The number and type of effect parameters will depend on the selected Effect Type. Refer to the following effect parameter tables. Parameter numbers which do not exist for the selected effect type will be displayed as a dash (–).

❷ Press F1 or F2 to move between effect parameters 1–5 and effect parameters 6–10.

Effect parameters: Many of the effect types have similar parameters. Commonly-appearing parameters are explained below. Parameters unique to a specific effect type will be explained after the parameter list for that effect type.

AM Depth: the amount of amplitude modulation

Delay Time: the delay before the processed sound is heard

Density: the density of reverberation

Diffusion: the spatial spread of the reverberant sound

Feedback Delay (FB Delay Time): the interval between repeated echoes

Feedback Gain: the volume ratio of each echo to the previous one (negative settings will invert the phase)

Fine (Pitch Fine): fine adjustment in cents (1/100th of a semitone) to the pitch change

High (Rev High): the proportion at which high frequency reverb will decay in relation to the overall reverb time

High Control: the proportion at which high frequencies will be retained in each successive feedback echo

High Gain: boost or cut of the high frequencies

HPF (high-pass filter): frequencies above this setting will be allowed to pass

Initial Delay: the delay before the processed sound will be heard

Low Gain: boost or cut of the low frequencies

LPF (low-pass filter): frequencies below this setting will be allowed to pass

PM Depth: the amount of pitch modulation

Modulation Delay: the time delay before the modulation begins to occur

Modulation Depth: the amount of modulation (flanging, chorusing, etc.)

Modulation Frequency: the speed of modulation (flanging, chorusing, etc.)

Pitch: the amount of pitch change in semi-tones

Reverb Time: the time during which the level of the reverb sound will decrease by 60 dB

Single type effects

1:Rev Hall, 2:Rev Room 1, 3:Rev Room 2, 4:Rev Room 3, 5:Rev Stage 1, 6:Rev Stage 2, 7:Rev Plate

No.	Parameter Name	Range
1	Reverb Time	0.3 ... 30.0 sec
2	High	0.1 ... 1.0
3	Diffusion	0 ... 10
4	Initial Delay	0.1 ... 200.0 ms
5	Rev Delay	0.1 ... 200.0 ms
6	Density	0 ... 4
7	ER/Rev Balance	0 ... 100 %
8	Low Gain	−12 ... +12 dB
9	High Gain	−12 ... +12 dB
10	LPF	1 ... 16 kHz, Thru

```
DIRECT      ┌─ ER
SOUND       │
                   ┌ REV
```

INI DLY REV DLY
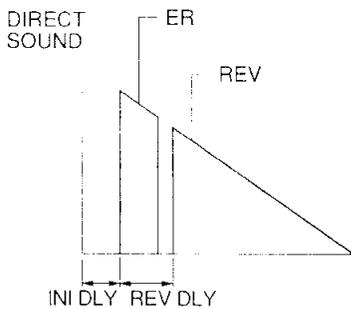
Initial Delay: This parameter sets the time delay before the early reflections begin.

Rev Delay: This parameter sets the delay between the beginning of the early reflections and the beginning of the reverb.

ER/Rev Balance: This determines the level balance between early reflections and reverb. At a setting of 0%, only the reverb will be heard. At a setting of 100%, only the early reflections will be heard.

8:Rev White Room, 9:Rev Tunnel, 10:Rev Canyon, 11:Rev Basement

No.	Parameter Name	Range
1	Reverb Time	0.3 ... 30.0 sec
2	High	0.1 ... 1.0
3	Diffusion	0 ... 10
4	Initial Delay	0.1 ... 200.0 ms
5	Width	0.5 ... 30.2 m
6	Height	0.5 ... 30.2 m
7	Depth	0.5 ... 30.2 m
8	Wall Vary	0 ... 30
9	HPF	Thru, 32 ... 1000 Hz
10	LPF	1 ... 16 kHz, Thru

Width, Height, Depth: These parameters determine the size of the simulated room in units of meters.

Wall Vary: This parameter determines the irregularity of the wall surfaces. At a setting of 0, the walls will be perfectly regular. Higher settings will simulate more irregular walls, creating more complex reverberation.

12:Early Ref. 1, 13:Early Ref. 2

No.	Parameter Name	Range
1	Type	S-Hall, L-Hall, Random, Reverse, Plate, Spring
2	Room Size	0.1 ... 20.0
3	Liveness	0 ... 10
4	Diffusion	0 ... 10
5	Initial Delay	0.1 ... 400.0 ms
6	ER Number	1 ... 19
7	Feedback Delay	0.1 ... 800.0 ms
8	Feedback Gain	−99 ... +99 %
9	HPF	Thru, 32 ... 1000 Hz
10	LPF	1 ... 16 kHz, Thru

Room Size: This parameter determines the size of the simulated room in arbitrary units. Higher settings will result in a larger room with more space between reflections.
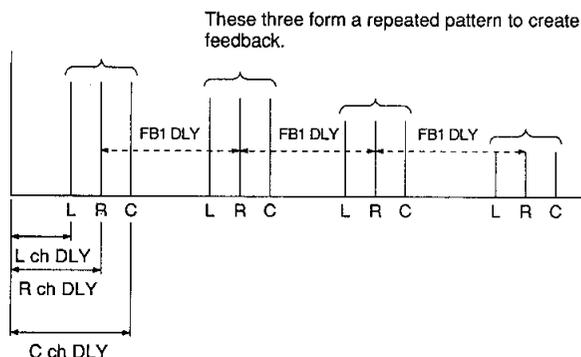
Liveness: This parameter determines how early reflections will decay. Higher settings will result in a more live sound.

ER Number: This parameter determines the number of early reflections that will occur.
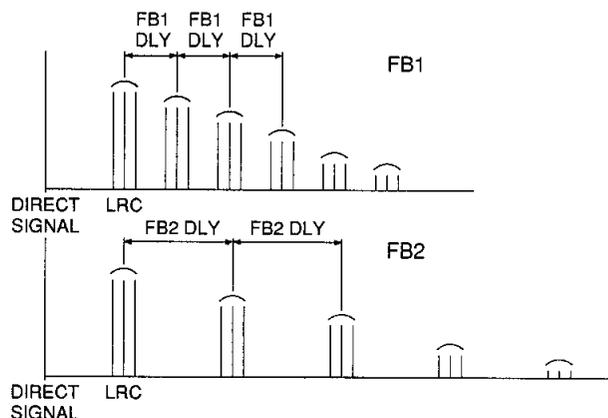
14:Gate Reverb, 15: Reverse Gate

No.	Parameter Name	Range
1	Type	Type A, Type B
2	Room Size	0.1 ... 20.0
3	Liveness	0 ... 10
4	Diffusion	0 ... 10
5	Initial Delay	0.1 ... 400.0 ms
6	ER Number	1 ... 19
7	Feedback Delay	0.1 ... 800.0 ms
8	Feedback Gain	–99 ... +99 %
9	HPF	Thru, 32 ... 1000 Hz
10	LPF	1 ... 16 kHz, Thru

16:Delay L,R

No.	Parameter Name	Range
1	Lch Delay Time	0.1 ... 1360.0 ms
2	Rch Delay Time	0.1 ... 1360.0 ms
3	—	—
4	FB1 Delay Time	0.1 ... 1360.0 ms
5	FB2 Delay Time	0.1 ... 1360.0 ms
6	FB Gain	–99 ... +99 %
7	FB1 High Control	0.1 ... 1.0
8	FB2 High Control	0.1 ... 1.0
9	HPF	Thru, 32 ... 1000 Hz
10	LPF	1 ... 16 kHz, Thru
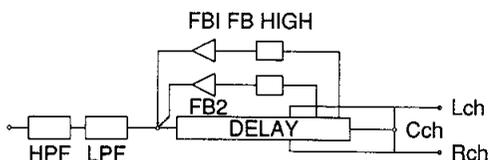
These delay programs provide a dual delay (16.Delay L,R) or triple delay (17.Delay L,C,R) with two feedback loops. The following diagram shows the pattern created by the two/three delay times, and the effect of FB1.

These three form a repeated pattern to create feedback.

The following diagram shows how the pattern of the two/three delayed sounds (Lch Delay Time, Rch Delay Time, Center Delay Time) is repeated at intervals of the feedback time values FB1 and FB2.

17:Delay L,C,R

No.	Parameter Name	Range
1	Lch Delay Time	0.1 ... 1360.0 ms
2	Rch Delay Time	0.1 ... 1360.0 ms
3	Center Delay Time	0.1 ... 1360.0 ms
4	FB1 Delay Time	0.1 ... 1360.0 ms
5	FB2 Delay Time	0.1 ... 1360.0 ms
6	FB Gain	–99 ... +99 %
7	FB1 High Control	0.1 ... 1.0
8	FB2 High Control	0.1 ... 1.0
9	HPF	Thru, 32 ... 1000 Hz
10	LPF	1 ... 16 kHz, Thru

18:Stereo Echo

No.	Parameter Name	Range
1	Lch Init Dly Time	0.1 ... 680.0 ms
2	Lch FB Delay Time	0.1 ... 680.0 ms
3	Lch FB Gain	−99 ... +99 %
4	Rch Init Dly Time	0.1 ... 680.0 ms
5	Rch FB Delay Time	0.1 ... 680.0 ms
6	Rch FB Gain	−99 ... +99 %
7	Lch FB High con.	0.1 ... 1.0
8	Rch FB High con.	0.1 ... 1.0
9	HPF	Thru, 32 ... 1000 Hz
10	LPF	1 ... 16 kHz, Thru
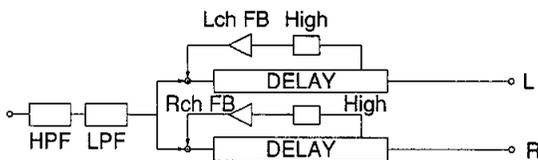
This effect type provides two independent delays with independent feedback.

19:Pitch Change 1

No.	Parameter Name	Range
1	1 Pitch	−24 ... +24
2	1 Fine	−100 ... +100
3	1 Delay	0.1 ... 650.0 ms
4	1 FB Gain	−99 ... +99 %
5	1 Level	0 ... 100 %
6	2 Pitch	−24 ... +24
7	2 Fine	−100 ... +100
8	2 Delay	0.1 ... 650.0 ms
9	2 FB Gain	−99 ... +99 %
10	2 Level	0 ... 100 %
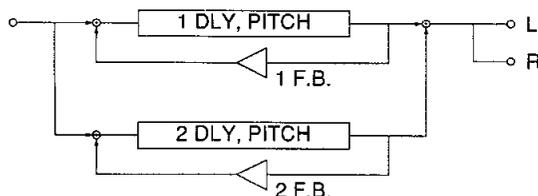
This effect type provides two independent pitch changes, each with delay and feedback. The sound of both pitch changes is combined into both the left and right outputs.

20:Pitch Change 2

No.	Parameter Name	Range
1	L Pitch	−24 ... +24
2	L Fine	−100 ... +100
3	L Delay	0.1 ... 650.0 ms
4	L FB Gain	−99 ... +99 %
5	R Pitch	−24 ... +24
6	R Fine	−100 ... +100
7	R Delay	0.1 ... 650.0 ms
8	R FB Gain	−99 ... +99 %
9	—	—
10	—	—
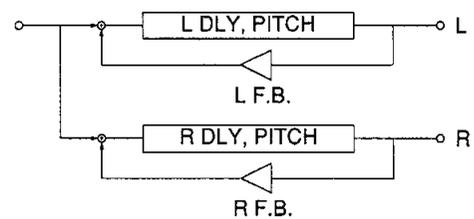
This effect type provides two independent pitch changes, each with delay and feedback. The sound of each pitch change is sent independently from the left and right outputs.

21:Pitch Change 3

No.	Parameter Name	Range
1	1 Pitch	−24 ... +24
2	1 Fine	−100 ... +100
3	1 Delay	0.1 ... 1300.0 ms
4	2 Pitch	−24 ... +24
5	2 Fine	−100 ... +100
6	2 Delay	0.1 ... 1300.0 ms
7	3 Pitch	−24 ... +24
8	3 Fine	−100 ... +100
9	3 Delay	0.1 ... 1300.0 ms
10	—	—
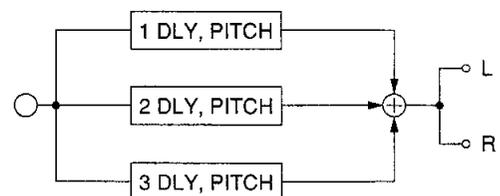
This effect type provides three independent pitch changes, each with delay. The sound of all three pitch changes is combined into both left and right outputs.

22: Aural Exciter®*

No.	Parameter Name	Range
1	HPF	500 Hz ... 16 kHz
2	Enhance	0 ... 100 %
3	Mix Level	0 ... 100 %
4	Delay Time	0.1 ... 650 ms
5	—	—
6	—	—
7	—	—
8	—	—
9	—	—
10	—	—

This effect adds new harmonics to a sound to make it "stand out" in the mix.

HPF: Overtones will be added to frequencies above this frequency.

Enhance: Higher settings of this value will increase the level of the newly generated harmonics.

Mix Level: This determines the mix of the direct sound and the sound produced by the exciter. Higher settings will increase the amount of sound from the exciter.

Delay: This determines the delay which will be applied to the sound produced by the exciter.

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23:EG Flange

No.	Parameter Name	Range
1	Attack Time	2.0 ... 22000 ms
2	Attack Level	0 ... 100 %
3	Release Time	2.0 ... 22000 ms
4	EG Target	0:M.Freq, 1:M.Dep
5	Low Gain	–12 ... +12 dB
6	High Gain	–12 ... +12 dB
7	Modulation Freq.	0.05 ... 40 Hz
8	Modulation Depth	0 ... 100 %.
9	Modulation Delay	0.1 ... 100.0 ms
10	Mod. FB Gain	0 ... 99 %

This effect provides a Flanger whose modulation frequency or modulation depth can be controlled over time by a simple envelope.

EG Target: This determines which parameter will be controlled by the envelope. If "M.Freq" is selected, the envelope will increase and then decrease the modulation frequency over time. If "M.Dep" is selected, the envelope will increase and then decrease the modulation depth over time. Attack Time, Attack Level, Release Time: These parameters determine the shape of the envelope. This envelope is re-started each time a note is played, and will go through its full contour regardless of whether the note is held or released.
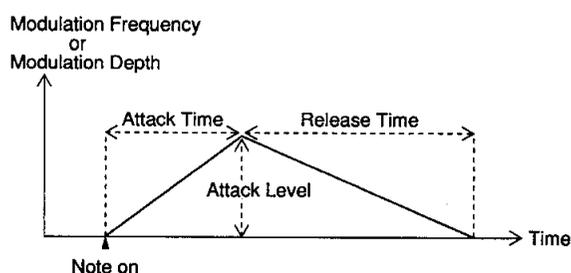
24:EG Chorus

No.	Parameter Name	Range
1	Attack Time	2.0 ... 22000 ms
2	Attack Level	0 ... 100 %
3	Release Time	2.0 ... 22000 ms
4	EG Target	0:M.Freq, 1:M.Dep
5	Low Gain	–12 ... +12 dB
6	High Gain	–12 ... +12 dB
7	Chorus Mod. Freq.	0.05 ... 40 Hz
8	Chorus PM Depth	0 ... 100 %
9	Chorus AM Depth	0 ... 100 %
10	—	—

This effect provides a Chorus whose modulation frequency or modulation depth can be controlled over time by a simple envelope. For details, refer to the explanation of 23.EG Flange.

25:EG Symphonic

No.	Parameter Name	Range
1	Attack Time	2.0 ... 22000 ms
2	Attack Level	0 ... 100 %
3	Release Time	2.0 ... 22000 ms
4	EG Target	0:M.Freq, 1:M.Dep
5	Low Gain	–12 ... +12 dB
6	High Gain	–12 ... +12 dB
7	Modulation Freq.	0.05 ... 40.0 Hz
8	Modulation Depth	0 ... 100 %
9	—	—
10	—	—

This effect provides a Symphonic effect whose modulation frequency or modulation depth can be controlled over time by a simple envelope. For details, refer to the explanation of 23.EG Flange. Symphonic is an effect that is similar to chorusing, but with multiple modulation and more delay time modulation.

26:EG Phase

No.	Parameter Name	Range
1	Attack Time	3.0 ... 22000 ms
2	Attack Level	0 ... 100 %
3	Release Time	3.0 ... 22000 ms
4	EG Target	0:M.Freq, 1:M.Dep
5	Low Gain	–12 ... +12 dB
6	High Gain	–12 ... +12 dB
7	Modulation Freq.	0.05 ... 40 Hz
8	Modulation Depth	0 ... 100 %
9	Modulation Delay	0.1 ... 5.0 ms
10	—	—

This effect provides a Phasing effect whose modulation frequency or modulation depth can be controlled over time by a simple envelope. For details, refer to 23.EG Flange (page 112).

27:Rotary Speaker

No.	Parameter Name	Range
1	Mid Speed	0.05 ... 40 Hz
2	Depth	0 ... 100 %
3	Transition Time	2 ... 22000 ms
4	L/M/H Speed Diff.	0.05 ... 5.80 Hz
5	Switch L/M/H	0:Low, 1:Mid, 2:High
6	Low Gain	–12 ... +12 dB
7	High Gain	–12 ... +12 dB
8	—	—
9	—	—
10	—	—

This effect simulates a rotary speaker that can be made to change smoothly between high, mid and low speeds. By assigning a controller to affect parameter 5 (Switch L/M/H) of this effect, you can switch between slow and fast rotor speeds as you play.

Mid Speed: This determines the mid rotor speed.

Transition time: This determines the time over which the rotor will speed up or slow down when switched between low, mid, and high speed.

L/M/H Speed Diff.: The high speed is faster than mid speed, and the low speed is slower than mid speed, by this amount.

Switch L/M/H: This switch is used to select low, mid, or high rotor speed. It may be useful musically to assign a controller to affect this parameter.

28:Ring Modulator

No.	Parameter Name	Range
1	Wave PM Depth	0 ... 100 %
2	Wave PM Frq.	0.05 ... 40.0 Hz
3	Wave AM Depth	0 ... 100 %
4	Wave AM Frq.	0.05 ... 40.0 Hz
5	Low Gain	–12 ... +12 dB
6	High Gain	–12 ... +12 dB
7	—	—
8	—	—
9	—	—
10	—	—

This effect modifies the input waveform by multiplying it with a sine wave. The pitch and amplitude characteristics of this sine wave may be altered freely.

Wave PM Depth: This determines the depth of sine wave pitch modulation depth.

Wave PM Frq.: This determines the depth of sine wave pitch modulation frequency.

Wave AM Depth: This determines the depth of sine wave amplitude modulation depth.

Wave AM Frq.: This determines the depth of sine wave amplitude modulation frequency.

29:D. Filter (Wah)

No.	Parameter Name	Range
1	Filter Frq.	125 Hz ... 14 kHz
2	Filter 1 Q	1.0 ... 5.0
3	Filter 1 Gain	0 ... +12 dB
4	Filter 2 Q	0.1 ... 0.7
5	—	—
6	—	—
7	—	—
8	—	—
9	—	—
10	—	—

This effect applies a wah-wah effect to the input sound using two filters. Filter 1 is a presence filter; Filter 2 is a band pass filter (BPF).

Filter Frq.: This determines the frequencies of Filters 1 and 2.

Filter 1 Q: This determines the width characteristic of Filter 1.

Filter 1 Gain: This determines the gain of Filter 1.

Filter 2 Q: This determines the width characteristic of Filter 2.

30:Echo → Rev

No.	Parameter Name	Range
1	Echo Lch Delay	0.1 ... 320.0 ms
2	Echo Lch FB Gain	−99 ... +99 %
3	Echo Rch Delay	0.1 ... 320.0 ms
4	Echo Rch FB Gain	−99 ... +99 %
5	Reverb Time	0.3 ... 30.0 sec
6	Rev High	0.1 ... 1.0
7	Rev ER/Rev Balance	0 ... 100 %
8	Rev Mix Level	0 ... 100 %
9	HPF	Thru, 32 ... 1000 Hz
10	LPF	1 ... 16 kHz, Thru

This effect type provides an echo effect which is then fed into a reverb effect. For details refer to 18.Stereo Echo (page 111) and 1.Rev Hall (page 109).

Rev Mix Level: This determines the proportion between echo and reverb sound. At a setting of 0%, only the echo sound will be heard. At a setting of 100%, only the reverb sound will be heard.

31:Delay L,R → Rev

No.	Parameter Name	Range
1	Dly Lch Delay	0.1 ... 640.0 ms
2	Dly Rch Delay	0.1 ... 640.0 ms
3	Dly FB Gain	−99 ... +99 %
4	Dly FB High	0.1 ... 1.0
5	Reverb Time	0.3 ... 30.0 sec
6	Rev High	0.1 ... 1.0
7	Rev ER/Rev Balance	0 ... 100 %
8	Rev Mix Level	0 ... 100 %
9	HPF	Thru, 32 ... 1000 Hz
10	LPF	1 ... 16 kHz, Thru

This effect type provides an delay effect which is then fed into a reverb effect. For details refer to 16.Delay L,R (page 110) and 1.Rev Hall (page 109).

Rev Mix Level: This determines the proportion between delay and reverb sound. At a setting of 0%, only the delay sound will be heard. At a setting of 100%, only the reverb sound will be heard.

32:Flange → Rev

No.	Parameter Name	Range
1	Modulation Freq.	0.05 ... 40 Hz
2	Modulation Depth	0 ... 100 %
3	Modulation Delay	0.1 ... 100.0 ms
4	Mod. FB Gain	0 ... 99 %
5	Reverb Time	0.3 ... 30.0 sec
6	Rev High	0.1 ... 1.0
7	Rev Initial Delay	0.1 ... 200.0 ms
8	Rev Mix Level	0 ... 100 %
9	HPF	Thru, 32 ... 1000 Hz
10	LPF	1 ... 16 kHz, Thru

This effect type provides a flange effect which is then fed into a reverb effect. For details refer to 23.EG Flange (page 112) and 1.Rev Hall (page 109).

Rev Mix Level: This determines the proportion between flange and reverb sound. At a setting of 0%, only the flange sound will be heard. At a setting of 100%, only the reverb sound will be heard.

33:Chorus → Rev

No.	Parameter Name	Range
1	Chorus Mod. Freq.	0.05 ... 40 Hz
2	Chorus PM Depth	0 ... 100 %
3	Chorus AM Depth	0 ... 100 %
4	—	—
5	Reverb Time	0.3 ... 30.0 sec
6	Rev High	0.1 ... 1.0
7	Rev Initial Delay	0.1 ... 200.0 ms
8	Rev Mix Level	0 ... 100 %
9	HPF	Thru, 32 ... 1000 Hz
10	LPF	1 .. 16 kHz, Thru

This effect type provides a chorus effect which is then fed into a reverb effect. For details refer to 24.EG Chorus (page 112) and 1.Rev Hall (page 109).

Rev Mix Level: This determines the proportion between chorus and reverb sound. At a setting of 0%, only the chorus sound will be heard. At a setting of 100%, only the reverb sound will be heard.

34:Sympo → Rev

No.	Parameter Name	Range
1	Modulation Freq.	0.05 ... 40 Hz
2	Modulation Depth	0 ... 100 %
3	—	—
4	—	—
5	Reverb Time	0.3 ... 30.0 sec
6	Rev High	0.1 ... 1.0
7	Rev Initial Delay	0.1 ... 200.0 ms
8	Rev Mix Level	0 ... 100 %
9	HPF	Thru, 32 ... 1000 Hz
10	LPF	1 ... 16 kHz, Thru

This effect type provides a symphonic effect which is then fed into a reverb effect. For details refer to 25.EG Symphonic (page 113) and 1.Rev Hall (page 109).

Rev Mix Level: This determines the proportion between symphonic and reverb sound. At a setting of 0%, only the symphonic sound will be heard. At a setting of 100%, only the reverb sound will be heard.

35:Phaser → Rev

No.	Parameter Name	Range
1	Modulation Freq.	0.05 ... 40.0 Hz
2	Modulation Depth	0 ... 100 %
3	Modulation Delay	0.1 ... 5.0 ms
4	—	—
5	Reverb Time	0.3 ... 30.0 sec
6	Rev High	0.1 ... 1.0
7	Rev Initial Delay	0.1 ... 200.0 ms
8	Rev Mix Level	0 ... 100 %
9	HPF	Thru, 32 ... 1000 Hz
10	LPF	1 ... 16 kHz, Thru

This effect type provides a phase effect which is then fed into a reverb effect. For details refer to 26.EG Phase (page 113) and 1.Rev Hall (page 109).

Rev Mix Level: This determines the proportion between phase and reverb sound. At a setting of 0%, only the phase sound will be heard. At a setting of 100%, only the reverb sound will be heard.

36:Aural Exc → Rev (Aural Exciter®*)

No.	Parameter Name	Range
1	Ex. HPF	500 Hz ... 16 kHz
2	Ex. Enhance	0 ... 100 %
3	Ex. Mix Level	0 ... 100 %
4	Reverb Time	0.3 ... 30.0 sec
5	Rev High	0.1 ... 1.0
6	Rev Diffusion	0 ... 10
7	Rev Initial Delay	0.1 ... 400.0 ms
8	Rev Mix Level	0 ... 100 %
9	HPF	Thru, 32 ... 1000 Hz
10	LPF	1 ... 16 kHz, Thru

This effect type provides an exciter effect which is then fed into a reverb effect. For details refer to 22.Aural Exciter (page 112) and 1.Rev Hall (page 109).

Rev Mix Level: This determines the proportion between exciter and reverb sound. At a setting of 0%, only the exciter sound will be heard. At a setting of 100%, only the reverb sound will be heard.

* *Aural Exciter® is a registered trademark and is manufactured under license from APHEX Systems Ltd.*

37:Dist → Rev

No.	Parameter Name	Range
1	Distortion Level	0 ... 100 %
2	Middle Frequency	315 Hz ... 6.3 kHz
3	Mid Gain	–12 ... +12 dB
4	Treble Gain	–12 ... +12 dB
5	Reverb Time	0.3 ... 30.0 sec
6	Rev High	0.1 ... 1.0
7	Rev Initial Delay	0.1 ... 400.0 ms
8	Rev Mix Level	0 ... 100 %
9	HPF	Thru, 32 ... 1000 Hz
10	LPF	1 ... 16 kHz, Thru

This effect type provides a distortion effect which is then fed into a reverb effect. For details of the reverb parameters, refer to 1.Rev Hall (page 109).

Distortion Level: This determines the degree of distortion. At higher settings, the sound will be strongly distorted.

Rev Mix Level: This determines the proportion between distortion and reverb sound. At a setting of 0%, only the distortion sound will be heard. At a setting of 100%, only the reverb sound will be heard.

38:Dist → Dly L,R

No.	Parameter Name	Range
1	Distortion Level	0 ... 100 %
2	Middle Frequency	315 Hz ... 6.3 kHz
3	Mid Gain	–12 ... +12 dB
4	Treble Gain	–12 ... +12 dB
5	Dly Lch Delay	0.1 ... 1360.0 ms
6	Dly Rch Delay	0.1 ... 1360.0 ms
7	Dly FB Gain	–99 ... +99 %
8	Delay Mix Level	0 ... 100 %
9	HPF	Thru, 32 ... 1000 Hz
10	LPF	1 ... 16 kHz, Thru

This effect type provides a distortion effect which is then fed into a delay effect. For details refer to 36.Dist→Rev above and 16.Delay L,R (page 110).

Delay Mix Level: This determines the proportion between distortion and delay sound. At a setting of 0%, only the distortion sound will be heard. At a setting of 100%, only the delay sound will be heard.

39:Dist → Echo

No.	Parameter Name	Range
1	Distortion Level	0 ... 100 %
2	Middle Frequency	315 Hz ... 6.3 kHz
3	Mid Gain	–12 ... +12 dB
4	Treble Gain	–12 ... +12 dB
5	Echo Lch Delay	0.1 ... 680.0 ms
6	Echo Rch Delay	0.1 ... 680.0 ms
7	Echo FB Gain	–99 ... +99 %
8	Echo Mix Level	0 ... 100 %
9	HPF	Thru, 32 ... 1000 Hz
10	LPF	1 ... 16 kHz, Thru

This effect type provides a distortion effect which is then fed into a stereo echo effect. For details refer to 36.Dist→Rev above and 18.Stereo Echo (page 111).

Echo Mix Level: This determines the proportion between distortion and echo sound. At a setting of 0%, only the distortion sound will be heard. At a setting of 100%, only the echo sound will be heard.

40:EQ → Rev 1, 41:EQ → Rev 2

No.	Parameter Name	Range
1	Low Frequency	32 Hz ... 2.0 kHz
2	Low Gain	−12 ... +12 dB
3	Middle Frequency	315 Hz ... 6.3 kHz
4	Mid Gain	−12 ... +12 dB
5	High Frequency	500 Hz ... 16 kHz
6	High Gain	−12 ... +12 dB
7	Reverb Time	0.3 ... 30.0 sec
8	Rev Initial Delay	0.1 ... 400.0 ms
9	Rev ER/Rev Balance	0 ... 100 %
10	Rev Mix Level	0 ... 100 %

These effect types provide a three-band sweepable equalizer which is then fed into a reverb effect. For details refer to 1.Hall Rev (page 109).

42:EQ → Dly L,R

No.	Parameter Name	Range
1	Low Frequency	32 Hz ... 2.0 kHz
2	Low Gain	−12 ... +12 dB
3	Middle Frequency	315 Hz ... 6.3 kHz
4	Mid Gain	−12 ... +12 dB
5	High Frequency	500 Hz ... 16 kHz
6	High Gain	−12 ... +12 dB
7	Dly Lch Delay	0.1 ... 1360.0 ms
8	Dly Rch Delay	0.1 ... 1360.0 ms
9	Dly FB Gain	−99 ... +99 %
10	Delay Mix Level	0 ... 100 %

This effect type provides a three-band sweepable equalizer which is then fed into a delay effect. For details refer to 16.Delay L,R (page 110).

43:EQ → Echo

No.	Parameter Name	Range
1	Low Frequency	32 Hz ... 2.0 kHz
2	Low Gain	−12 ... +12 dB
3	Middle Frequency	315 Hz ... 6.3 kHz
4	Mid Gain	−12 ... +12 dB
5	High Frequency	500 Hz ... 16 kHz
6	High Gain	−12 ... +12 dB
7	Echo Lch Delay	0.1 ... 680.0 ms
8	Echo Rch Delay	0.1 ... 680.0 ms
9	Echo FB Gain	−99 ... +99 %
10	Echo Mix Level	0 ... 100 %

This effect type provides a three-band sweepable equalizer which is then fed into a stereo echo effect. For details refer to 18.Stereo Echo (page 111).

44:EQ → Flange

No.	Parameter Name	Range
1	Low Frequency	32 Hz ... 2.0 kHz
2	Low Gain	−12 ... +12 dB
3	Middle Frequency	315 Hz ... 6.3 kHz
4	Mid Gain	−12 ... +12 dB
5	High Frequency	500 Hz ... 16 kHz
6	High Gain	−12 ... +12 dB
7	Modulation Freq.	0.05 ... 40.0 Hz
8	Modulation Depth	0 ... 100 %
9	Mod. FB Gain	0 ... 99 %
10	Flange Mix Level	0 ... 100 %

This effect type provides a three-band sweepable equalizer which is then fed into a flange effect. For details refer to 23.EG Flange (page 112).

45:EQ → Chorus

No.	Parameter Name	Range
1	Low Frequency	32 Hz ... 2.0 kHz
2	Low Gain	–12 ... +12 dB
3	Middle Frequency	315 Hz ... 6.3 kHz
4	Mid Gain	–12 ... +12 dB
5	High Frequency	500 Hz ... 16 kHz
6	High Gain	–12 ... +12 dB
7	Chorus Mod. Freq.	0.05 ... 40.0 Hz
8	Chorus PM Depth	0 ... 100 %
9	Chorus AM Depth	0 ... 100 %
10	Chorus Mix Level	0 ... 100 %

This effect type provides a three-band sweepable equalizer which is then fed into a chorus effect. For details refer to 24.EG Chorus (page 112).

46:EQ → Symphonic

No.	Parameter Name	Range
1	Low Frequency	32 Hz ... 2.0 kHz
2	Low Gain	–12 ... +12 dB
3	Middle Frequency	315 Hz ... 6.3 kHz
4	Mid Gain	–12 ... +12 dB
5	High Frequency	500 Hz ... 16 kHz
6	High Gain	–12 ... +12 dB
7	Modulation Freq.	0.05 ... 40.0 Hz
8	Modulation Depth	0 ... 100 %
9	—	—
10	Sympho Mix Level	0 ... 100 %

This effect type provides a three-band sweepable equalizer which is then fed into a symphonic effect. For details refer to 25.EG Symphonic (page 113).

47:EQ → Phaser

No.	Parameter Name	Range
1	Low Frequency	32 Hz ... 2.0 kHz
2	Low Gain	–12 ... +12 dB
3	Middle Frequency	315 Hz ... 6.3 kHz
4	Mid Gain	–12 ... +12 dB
5	High Frequency	500 Hz ... 16 kHz
6	High Gain	–12 ... +12 dB
7	Modulation Freq.	0.05 ... 40.0 Hz
8	Modulation Depth	0 ... 100 %
9	Modulation Delay	0.1 ... 5.0 ms
10	Phase Mix Level	0 ... 100 %

This effect type provides a three-band sweepable equalizer which is then fed into a phaser effect. For details refer to 26.EG Phase (page 113).

48:St.Flange → Delay L,R

No.	Parameter Name	Range
1	Modulation Freq.	0.05 ... 40.0 Hz
2	Modulation Depth	0 ... 100 %
3	Modulation Delay	0.1 ... 100.0 ms
4	Mod. FB Gain	0 ... 99 %
5	Delay Lch Delay	0.1 ... 800.0 ms
6	Delay Rch Delay	0.1 ... 800.0 ms
7	Delay FB1 Delay	0.1 ... 800.0 ms
8	Delay FB2 Delay	0.1 ... 800.0 ms
9	Delay FB Gain	–99 ... +99 %
10	Delay Mix Level	0 ... 100 %

This effect type provides a flange effect which is then fed into a stereo delay. For details refer to 23.EG Flange (page 112) and 16.Delay L,R (page 110)

49:St.Chorus → Delay L,R

No.	Parameter Name	Range
1	Modulation Freq.	0.05 ... 40.0 Hz
2	Chorus PM Depth	0 ... 100 %
3	Chorus AM Depth	0 ... 100 %
4	—	—
5	Delay Lch Delay	0.1 ... 800.0 ms
6	Delay Rch Delay	0.1 ... 800.0 ms
7	Delay FB1 Delay	0.1 ... 800.0 ms
8	Delay FB2 Delay	0.1 ... 800.0 ms
9	Delay FB Gain	−99 ... +99 %
10	Delay Mix Level	0 ... 100 %

This effect type provides a chorus effect which is then fed into a stereo delay. For details refer to 24.EG Chorus (page 112) and 16.Delay L,R (page 110)

50:Symphonic → Delay L,R

No.	Parameter Name	Range
1	Modulation Freq.	0.05 ... 40.0 Hz
2	Modulation Depth	0 ... 100 %
3	—	—
4	—	—
5	Delay Lch Delay	0.1 ... 800.0 ms
6	Delay Rch Delay	0.1 ... 800.0 ms
7	Delay FB1 Delay	0.1 ... 800.0 ms
8	Delay FB2 Delay	0.1 ... 800.0 ms
9	Delay FB Gain	−99 ... +99 %
10	Delay Mix Level	0 ... 100 %

This effect type provides a symphonic effect which is then fed into a stereo delay. For details refer to 25.EG Symphonic (page 113) and 16.Delay L,R (page 110)

51:St.Phasing → Delay L,R

No.	Parameter Name	Range
1	Modulation Freq.	0.05 ... 40.0 Hz
2	Modulation Depth	0 ... 100 %
3	Modulation Delay	0.1 ... 5.0 ms
4	—	—
5	Delay Lch Delay	0.1 ... 800.0 ms
6	Delay Rch Delay	0.1 ... 800.0 ms
7	Delay FB1 Delay	0.1 ... 800.0 ms
8	Delay FB2 Delay	0.1 ... 800.0 ms
9	Delay FB Gain	−99 ... +99 %
10	Delay Mix Level	0 ... 100 %

This effect type provides a phaser effect which is then fed into a stereo delay. For details refer to 26.EG Phase (page 113) and 16.Delay L,R (page 110)

Dual type effects

52:Hall & Plate

No.	Parameter Name	Range
1	Hall Reverb Time	0.3 ... 30.0 sec
2	Hall High	0.1 ... 1.0
3	Hall Diffusion	0 ... 10
4	Hall Initial Delay	0.1 ... 200.0 ms
5	Hall LPF	1 ... 16 kHz, Thru
6	Plate Reverb Time	0.3 ... 30.0 sec
7	Plate High	0.1 ... 1.0
8	Plate Diffusion	0 ... 10
9	Plate Initial Delay	0.1 ... 200.0 ms
10	Plate LPF	1 ... 16 kHz, Thru

This effect provides plate reverb and hall reverb in parallel. For details of the parameters, refer to 1.Rev Hall (page 109).

53:Echo & Rev

No.	Parameter Name	Range
1	Echo Lch Delay Time	0.1 ... 320.0 ms
2	Echo Rch Delay Time	0.1 ... 320.0 ms
3	Echo FB Gain	−99 ... +99 %
4	Reverb Time	0.3 ... 30.0 sec
5	Rev High	0.1 ... 1.0
6	Rev Diffusion	0 ... 10
7	Rev Initial Delay	0.1 ... 100.0 ms
8	Rev ER/Rev Balance	0 ... 100 %
9	Rev HPF	Thru, 32 ... 1000 Hz
10	Rev LPF	1 ... 16 kHz, Thru

This effect provides echo and reverb in parallel. For details refer to 18.Stereo Echo (page 111) and 1.Rev Hall (page 109).

54:Delay & Rev

No.	Parameter Name	Range
1	Dly Lch Delay Time	0.1 ... 640.0 ms
2	Dly Rch Delay Time	0.1 ... 640.0 ms
3	Dly FB Gain	−99 ... +99 %
4	Reverb Time	0.3 ... 30.0 sec
5	Rev High	0.1 ... 1.0
6	Rev Diffusion	0 ... 10
7	Rev Initial Delay	0.1 ... 100.0 ms
8	Rev ER/Rev Balance	0 ... 100 %
9	Rev HPF	Thru, 32 ... 1000 Hz
10	Rev LPF	1 ... 16 kHz, Thru

This effect provides delay and reverb in parallel. For details refer to 16.Delay L,R (page 110) and 1.Rev Hall (page 109).

55:Flange & Chorus

No.	Parameter Name	Range
1	Flg Mod. Freq.	0.05 ... 40.0 Hz
2	Flg Mod. Depth	0 ... 100 %
3	Flg Mod. Delay	0.1 ... 100.0 ms
4	Flg Mod. FB Gain	0 ... 99 %
5	—	—
6	Chorus Mod. Freq.	0.05 ... 40.0 Hz
7	Chorus PM Depth	0 ... 100 %
8	Chorus AM Depth	0 ... 100 %
9	—	—
10	—	—

This effect provides flange and chorus in parallel. For details refer to 23.EG Flange (page 112) and 24.EG Chorus (page 112).

56:Flange & Sympho

No.	Parameter Name	Range
1	Flg Mod. Freq.	0.05 ... 40.0 Hz
2	Flg Mod. Depth	0 ... 100 %
3	Flg Mod. Delay	0.1 ... 100.0 ms
4	Flg Mod. FB Gain	0 ... 99 %
5	—	—
6	Sym Mod. Freq.	0.05 ... 40.0 Hz
7	Sym Mod. Depth	0 ... 100 %
8	—	—
9	—	—
10	—	—

This effect provides flange and symphonic in parallel. For details refer to 23.EG Flange (page 112) and 25.EG Symphonic (page 113).

57:Sympho & Chorus

No.	Parameter Name	Range
1	Sym Mod. Freq.	0.05 ... 40.0 Hz
2	Sym Mod. Depth	0 ... 100 %
3	—	—
4	—	—
5	—	—
6	Chorus Mod. Freq.	0.05 ... 40.0 Hz
7	Chorus PM Depth	0 ... 100 %
8	Chorus AM Depth	0 ... 100 %
9	—	—
10	—	—

This effect provides chorus and symphonic in parallel. For details refer to 24.EG Chorus (page 112) and 25.EG Symphonic (page 113).

58:Flange & Rev

No.	Parameter Name	Range
1	Modulation Freq.	0.05 ... 40.0 Hz
2	Modulation Depth	0 ... 100 %
3	Modulation Delay	0.1 ... 100.0 ms
4	Mod. FB Gain	0 ... 99 %
5	Reverb Time	0.3 ... 30.0 sec
6	Rev High	0.1 ... 1.0
7	Diffusion	0 ... 10
8	Initial Delay	0.1 ... 200.0 ms
9	HPF	Thru, 32 ... 1000 Hz
10	LPF	1 ... 16 kHz, Thru

This effect provides flange and reverb in parallel. For details refer to 23.EG Flange (page 112) and 1.Rev Hall (page 109).

59:Chorus & Rev

No.	Parameter Name	Range
1	Chorus Mod. Freq.	0.05 ... 40.0 Hz
2	Chorus PM Depth	0 ... 100 %
3	Chorus AM Depth	0 ... 100 %
4	—	—
5	Reverb Time	0.3 ... 30.0 sec
6	Rev High	0.1 ... 1.0
7	Diffusion	0 ... 10
8	Initial Delay	0.1 ... 200.0 ms
9	HPF	Thru, 32 ... 1000 Hz
10	LPF	1 ... 16 kHz, Thru

This effect provides chorus and reverb in parallel. For details refer to 24.EG Chorus (page 112) and 1.Rev Hall (page 109).

60:Sympho & Rev

No.	Parameter Name	Range
1	Modulation Freq.	0.05 ... 40.0 Hz
2	Modulation Depth	0 ... 100 %
3	—	—
4	—	—
5	Reverb Time	0.3 ... 30.0 sec
6	Rev High	0.1 ... 1.0
7	Diffusion	0 ... 10
8	Initial Delay	0.1 ... 200.0 ms
9	HPF	Thru, 32 ... 1000 Hz
10	LPF	1 ... 16 kHz, Thru

This effect provides symphonic and reverb in parallel. For details refer to 25.EG Symphonic (page 104) and 1.Rev Hall (page 109).

61:Flange & Dly L,R

No.	Parameter Name	Range
1	Modulation Freq.	0.05 ... 40.0 Hz
2	Modulation Depth	0 ... 100 %
3	Modulation Delay	0.1 ... 100.0 ms
4	Mod. FB Gain	0 ... 99 %
5	Delay Lch Delay	0.1 ... 800.0 ms
6	Delay Rch Delay	0.1 ... 800.0 ms
7	Delay FB1 Delay	0.1 ... 800.0 ms
8	Delay FB2 Delay	0.1 ... 800.0 ms
9	Delay FB Gain	−99 ... +99 %
10	LPF	1 ... 16 kHz, Thru

This effect provides flange and delay in parallel. For details refer to 23.EG Flange (page 112) and 16.Delay L,R (page 110).

62:Chorus & Dly L,R

No.	Parameter Name	Range
1	Chorus Mod. Freq.	0.05 ... 40.0 Hz
2	Chorus PM Depth	0 ... 100 %
3	Chorus AM Depth	0 ... 100 %
4	—	—
5	Delay Lch Delay	0.1 ... 800.0 ms
6	Delay Rch Delay	0.1 ... 800.0 ms
7	Delay FB1 Delay	0.1 ... 800.0 ms
8	Delay FB2 Delay	0.1 ... 800.0 ms
9	Delay FB Gain	−99 ... +99 %
10	LPF	1 ... 16 kHz, Thru

This effect provides chorus and delay in parallel. For details refer to 24.EG Chorus (page 112) and 16.Delay L,R (page 110).

63:Sympho & Dly L,R

No.	Parameter Name	Range
1	Modulation Freq.	0.05 ... 40.0 Hz
2	Modulation Depth	0 ... 100 %
3	—	—
4	—	—
5	Delay Lch Delay	0.1 ... 800.0 ms
6	Delay Rch Delay	0.1 ... 800.0 ms
7	Delay FB1 Delay	0.1 ... 800.0 ms
8	Delay FB2 Delay	0.1 ... 800.0 ms
9	Delay FB Gain	−99 ... +99 %
10	LPF	1 ... 16 kHz, Thru

This effect provides symphonic and delay in parallel. For details refer to 25.EG Symphonic (page 113) and 16.Delay L,R (page 110).

COMMON DATA / EFFECT SET

10.4 Effect 2 parameter

JUMP #216

Summary: Specify effect parameters for the effect type selected for Effect 2.

Procedure:
From: Effect Set job directory (JUMP #212)
Select: job 04:Effect 2 Parameter (JUMP #216)
Specify: parameter settings for the selected effect.

Remark: Effect selection and parameter settings for Effect 2 are made in the same manner as those for Effect 1. Please refer to the explanation in the preceding section, *10.3 Effect 1 parameter* (page 108).

COMMON DATA / EFFECT SET

10.5 Effect control

Summary: Specify how two selected parameters of the effect unit will be controlled in realtime.

Procedure:

From: Effect Set job directory   (JUMP #212)

Select: job 05:Effect Control   (JUMP #218)

Specify: the parameters to be controlled and the controller for each

```
EFFECT CONTROL            EL IYXXI   218
Parallel EFF1 Type = 46:EQ -> SymPhonic
         EFF2 Type = 01:Rev. Hall
      |Param  |Ctrl# & Device     |Mi|Ma|
 Cnt1 |EF1 Par1|        off        |0 |99|
 Cnt2 |EF1 Par1|        off        |0 |99|
 LFO  |Wv=triangle - Sp=65 Dl= 0 Ph=free|
 Cnt1 Cnt2 LFO
      ⑥        ①       ⑥ ②              ❸ ❹
```

❶ **Param** (see below): Select any two of the following effect parameters to be controlled. The selected controller will affect ...EF1 Par1–10: a parameter 1–10 of effect unit 1.
EF1 Level1/2: the effect level 1 or 2 of effect unit 1.
EF2 Mix Level: the amount of Effect 2 that is present in the effect chain. (This parameter is meaningful only when the Effect Mode is Serial.)
EF2 Par1–10: a parameter 1–10 of effect unit 2.
EF2 Level1/2: the effect level 1 or 2 of effect unit 2.
Out1/2 w:d: the wet:dry balance of output 1 or 2.
Cnt1 MIN: the percentage of a parameter's full range that will result when a controller moves to its minimum position (see ❸).
Cnt1 MAX: the percentage of a parameter's full range that will result when a controller moves to its maximum position (see ❹).
LFO Wave: the waveform of the Effect LFO (see ❺).
LFO Spd: Control the speed of the Effect LFO (see ❺).
LFO Dly: Control the delay time of the Effect LFO (see ❺).
LFO Phs: Control the initial phase of the Effect LFO (see ❺).

❷ **Ctrl# & Device** (001...120, Aftertouch, Velocity, Key Scale, LFO): Select the control source which will affect the selected effect parameter.001 Modulation ... 120 Non-Assign: This control change message will affect the effect

parameter selected in ❶. (Control numbers 000 and 032 are reserved for the Bank Select message, and are not available.) For more details on controllers, refer to *Common data 12.(F2) Controller set (Modulation).*
Aftertouch: Pressing down on the keyboard after playing a note will affect the effect parameter selected in ❶.
Velocity: The key-on velocity of the most recently played note will affect the effect parameter selected in ❶.
Key Scale: The keyboard position of the most recently played note will affect the effect parameter selected in ❶. If "Mi" ❸ is below "Ma" ❹, higher notes will result in a higher parameter setting.
LFO: The Effect LFO will affect the effect parameter selected in ❶. See ❺ below.

❸ **Mi** (0...99): When the controller is at minimum position (e.g., the modulation wheel is moved fully toward you, no aftertouch pressure is being applied, etc.), the parameter will be set to this percentage of its maximum value. (See also "Ma" ❹.)

❹ **Ma** (0...99): When the controller is at maximum position (e.g., the modulation wheel is moved fully away from you, the maximum aftertouch pressure is being applied, etc.), the parameter will be set to this percentage of its maximum value.

You can set the "Mi" value above the "Ma" value to reverse the effect of the controller. For example if "Mi" is 99 and "Ma" is 50, and you have set the "Ctrl# & Device" to be "001 Modulation", the selected parameter will be at 100% of its full range when the modulation wheel is moved fully toward you, and at 50% of its full range when the modulation wheel is moved fully away from you.

❺ **LFO**: A special Effect LFO is provided for controlling the effect parameters you select in ❶. You can set the waveform (WV= triangle, saw down, saw up, square, sine, sample&hold), the speed (Sp= 0...99), the delay (Dl= 0...99), and the initial phase (Ph= 0...99, free) of the Effect LFO. For a detailed explanation of these parameters, refer to *AFM element data 6.(F1) AFM*

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LFO (Main) (page 146), which is essentially identical to this Effect LFO.

The initial phase parameter determines the point of the LFO waveform from which the LFO will begin each time a key is pressed. When this is set to "free", the Effect LFO will not be restarted for each note.

This Effect LFO is independent of the LFO which provides the "modulation" for some effect types. For example, you could even use this Effect LFO to modulate the modulation frequency of a chorus effect.

❻ Pressing F1–F3 will move the cursor to the Control 1, Control 2, or LFO area.

Remark: The assignment of some effect parameters to realtime control can result in noise. Should this happen, try modifying the settings.

COMMON DATA

11. Micro tuning set

JUMP #221

Summary: Select a micro tuning for the entire voice, and specify whether or not each element will use this micro tuning.

Procedure:
From: Voice Common job directory (JUMP #201)
Select: job 11:McrTune (JUMP #221)
Specify: the micro tuning, and element micro tuning on/off

```
MICRO TUNING SET          EL I┃┃  221
VOICE■I -D01(49)  ST*Concert
 Micro Tuning Select = ┃━┃ Equal┃
 Element1 AFM         = off
 Element2 AFM         = off
 Element3 AWM         = off
 Element4 AWM         = off
 Sel    E1    E2   E3    E4
        ❸           ❷   ❶
```

❶ Micro Tuning Select (I-1, I-2, C-1, C-2, P-1...P-64): Select a micro tuning to be used by the voice. 64 micro tuning memories are preset inside the SY99 (see the following remarks). Two of your own micro tunings can be stored in Internal memory, and a card can accommodate another two micro tunings. Internal voices cannot use card micro tunings, nor can card voices use internal micro tunings.

❷ Element 1–4 (off, on): When this is turned on, the element will use the micro tuning selected by Micro Tuning Select. When this is turned off, the element will use equal temperament scale instead of the selected micro tuning.

❸ Pressing F1 (Sel) will move the cursor to Micro Tuning Select. Pressing F2–F5 will move the cursor to Element 1–4.

Remarks: As with Pan data, Micro Tuning data is not part of the voice. This Micro Tuning Select setting merely specifies which micro tuning will be used.

The sixty-four micro tunings preset inside the SY99 are as follows.

01 Equal temperament: The "compromise" tuning used for most of the last 200 years of Western music, and found on most electronic keyboards. Each half step is exactly 1/12th of an octave, and music can be played in any key with equal ease. However, none of the intervals are perfectly in tune.

02–13 Pure major (C...B): This tuning is designed so that most of the intervals (especially the major third and perfect fifth) in the major scale are pure. This means that other intervals will be correspondingly out of tune. You need to specify the key (C...B) you will be playing in.

14–25 Pure minor (A...G#): The same as Pure Major, but designed for the minor scale.

26–37 Mean tone (C...B): This is an adjustment of the Pure and Pythagorean tunings. The interval between the root and fifth is tuned slightly flat, so that the interval between the root and second degree is exactly halfway between a major and minor pure second; i.e., an average or "mean".

38–49 Pythagorean (C...B): This scale is derived by tuning pure perfect fifths upward from the root. This causes the octave to be flat, so one of the fourths is mistuned to compensate. (In the key of C, the Ab – Eb interval.)

50 Werckmeister: Andreas Werckmeister, a contemporary of Bach, designed this tuning so that keyboard instruments could be played in any key. Each key has a unique character.

51 Kirnberger: Johan Philipp Kirnberber was also concerned with tempering the scale to allow performances in any key.

52 Vallotti & Young: Francescantonio Vallotti and Thomas Young (both mid-1700s) devised this adjustment to the Pythagorean tuning in which the first six fifths are lower by the same amount.

53 1/4 shifted equal: This is the normal equal tempered scale shifted up 50 cents.

54 1/4 tone: Twenty-four equally spaced notes per octave. (Play twenty-four notes to move one octave.)

55 1/8 tone: Forty-eight equally spaced notes per octave. (Play forty-eight notes to move one octave.)

56 JustAdjust: This is a special tuning used to make fine adjustments in the pitch of an AWM waveform.

57 Big Chord: The pitch is adjusted down one octave for every 8 half notes, allowing chords to be played anywhere without becoming overly heavy.

58 Log Equal: A variation of conventional equal temperament.

59 1/4 Tonelo: The same as micro tuning 54, but lower in pitch.

60 Harmonic A: The white keys will play the harmonic series beginning on A, and the black keys will play the harmonic series beginning on E.

61 Reverse: The conventional equal tempered scale is inverted.

62 Far East: The black keys and white keys will each play a different eastern scale.

63 Blue: The white keys will play the blues scale. The black keys add a blue flavor

64 Question-1: Play the white keys consecutively upwards starting from C2.
Play the black keys consecutively upwards starting from C#1.

Editing: To edit the currently selected Internal micro tuning, press F8 (Edit). Preset or Card micro tunings cannot be edited. If you want to edit a preset or card micro tuning, you must first copy it to an internal micro tuning memory.

COMMON DATA / MICRO TUNING SET

11.0 Micro tuning edit

JUMP #222

Summary: This function allows you to edit the currently selected Micro Tuning data.

Procedure:

From: Voice Common job 11. Micro Tuning Set
(JUMP #221)

When: an Internal micro tuning is selected

Press: F8 (Edit) (JUMP #222)

Select: the micro tuning data you wish to edit

Editing is possible only when an Internal micro tuning memory is selected. If you want to edit a Preset or Card micro tuning memory, press COPY to copy it to an Internal micro tuning memory as explained in the following section *11.0.1 Copy Micro Tuning Data*.

```
MICRO TUNING EDIT            222
I- 1 Far East
                             01
01:Micro Tuning Data
02:Micro Tuning Name

 01   02
```
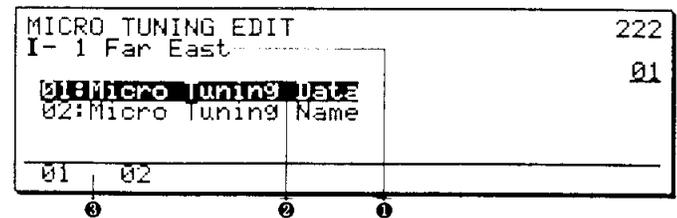
❶ The number and name of the currently selected Micro Tuning data are displayed.

❷ Move the cursor in this area to select a job, and press ENTER.
01: Micro Tuning Data: Edit the tuning for each note of the scale. See 11.1 Micro Tuning Data
02: Micro Tuning Name: Assign a ten-character name to the micro tuning data. See 11.2 Micro Tuning Name.

❸ Pressing F1 or F2 will select the corresponding job.

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COMMON DATA / MICRO TUNING SET

11.0.1 Copy micro tuning

Summary: This function copies micro tuning data from another memory into an Internal micro tuning memory.

Procedure:

When: editing micro tuning data
(JUMP #223, #224)
Press: COPY to get the following display.
Select: the micro tuning copy source and destination
To copy: the data press F8
To quit: without copying press EXIT

```
COPY MICRO TUNING

  Source Tuning    = P- 2 P Major C

  Destination Tuning = I- 2 Blue

                                   Go
```
        ❷   ❶   ❸

❶ Source Tuning (I-1, I-2, C-1, C-2, P-1...P-64): Select the micro tuning data to copy. C-1 and C-2 (card) can be selected only if a VOICE card is

❷ Destination Tuning (I-1, I-2): Select the micro tuning (internal 1 or 2) into which to copy the Source Tuning data.

❸ After selecting Source Tuning and Destination Tuning, press F8 (Go) to copy the data. You will be asked "Are you sure?". Press YES and the data will be copied.

Remarks: Only Internal micro tuning data can be edited. If you want to edit one of the preset or card micro tunings, use this function to copy it into an Internal micro tuning memory.

COMMON DATA / MICRO TUNING SET
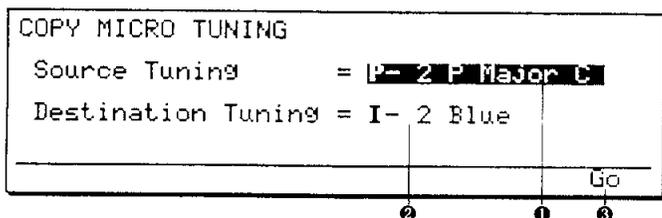
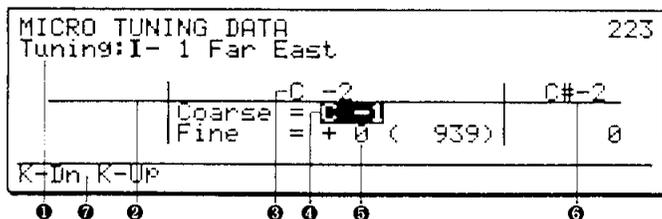# 11.1 Micro tuning data

JUMP #223

Summary: Edit the tuning for each note of the selected micro tuning data.

Procedure:

From: Micro Tuning Edit job (JUMP #222)
directory
Select: 01:Micro Tuning Data (JUMP #223)
Specify: the tuning for each note

```
MICRO TUNING DATA                223
Tuning:I- 1 Far East
              ┌─C -2        │ C#-2
──────────────┼──────────────┼────
         │Coarse│ = C -1 │
         │Fine  │ = + 0 (  939)│        0
K-Dn K-Up                  │
```
❶ ❼ ❷   ❸ ❹ ❺   ❻

❶ The number and name of the micro tuning data being edited are displayed.

❷ The previous note and its absolute tuning value.

❸ The note whose tuning you are editing.

❹ Coarse Tuning (C#-1...G8): With the cursor located at Coarse, adjust the tuning of the currently edited note in half steps.

❺ Fine Tuning (-43 or -42...+42): With the cursor located at Fine, adjust the tuning of the currently

edited note in fine steps of 1.171875 cents. The absolute tuning value displayed in parentheses indicates the number of these steps starting from 0 steps at C#-2. The lowest setting of this parameter will be either -43 or -42 depending on the Coarse Tuning value.

❻ The next note name and its absolute tuning value.

❼ Pressing F1 (K-Dn) or F2 (K-Up) will move to the previous or next note. You can also play a note on the keyboard to select a note at any time.

Remarks: First use F1 (K-Dn) and F2 (K-Up) to select the note you want to edit. You can also use the SY99 keyboard to select the note. The currently edited note will appear in the center of the display, with the previous note shown at left and the next note shown at right.

Next set the Coarse and Tune tuning for the selected note. If you adjust Fine Tuning beyond the range of ±42, the Coarse Tuning will be moved up or down as appropriate.

COMMON DATA / MICRO TUNING SET

11.2 Micro tuning name

Summary: Specify a ten-character name for the internal Micro Tuning memory being edited.
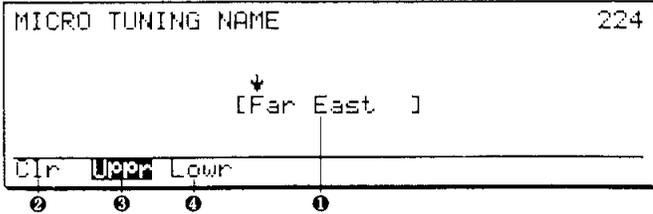
Procedure:

From: Micro Tuning Edit job   (JUMP #222)
      directory
Select: 02:Micro Tuning Name   (JUMP #224)
Specify: a name for the micro tuning data

```
MICRO TUNING NAME              224

              ↓
           [Far East   ]

Clr  Uppr Lowr
 ❷    ❸    ❹        ❶
```

❶ Enter a ten-character name for the Micro Tuning data.

❷ To clear the currently entered name press F1 (Clr).

❸ To switch to upper-case characters press F2 (Uppr).

❹ To switch to lower-case characters press F3 (Lowr).

Remarks: Methods of entering character data are explained in *How to enter character data,* on page 30.

COMMON DATA

12. (F1) Controller set (Pitch bend)

Summary: Specify the range over which the PITCH wheel will affect the pitch.

Procedure:

From: Common Data job directory (JUMP #201)
Select: job 12:Ctrllr
Press: F1 (PB)
Specify: the range of the pitch bend wheel

```
CONTROLLER SET          EL ▮▰▰  225
VOICEⒷI -D01(49)   ST*Concert
 Pitch Bend Wheel

 Pitch Bend Range = ▮2

*PB depends on ZONED AFTER TOUCH MODE.*
 PB  Aftr Mod  Pan  Othr
 ❷              ❶
```

❶ Pitch Bend Range (0...12): This determines the range (0...12 half steps) over which the PITCH wheel will affect the pitch. When this is set to 12, the PITCH wheel will move the pitch one octave up or down. When this is set to 0, the PITCH wheel will have no effect.

❷ To make controller settings for Aftertouch, Modulation, Pan, or Other, press F2, F3, F4, or F5. Refer to sections 12.(F2), 12.(F3), 12.(F4), or 12.(F2).

Note: The action of the PITCH wheel may be modified using the Zoned Aftertouch settings, described in the following section. This allows for more sophisticated usage of the PITCH wheel.
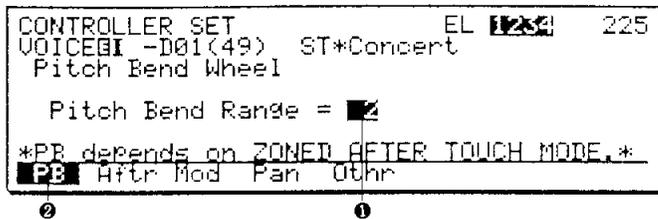
COMMON DATA

12. (F2) Controller set (Aftertouch)

Summary: Specify how aftertouch will affect the pitch and any other parameters to which it is assigned.
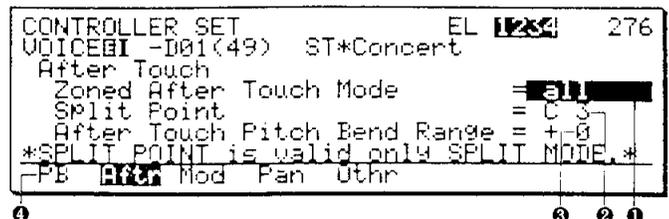
Procedure:

From: Common Data job directory (JUMP #201)
Select: job 12:Ctrllr
Press: F2 (Aftr)
Specify: the aftertouch mode, split point, and bend range

```
CONTROLLER SET          EL ▮▰▰  276
VOICEⒷI -D01(49)   ST*Concert
 After Touch
  Zoned After Touch Mode    =▮▰▮
  Split Point               = C 3
  After Touch Pitch Bend Range = +.0
*SPLIT POINT is valid only SPLIT MODE.*
 PB  Aftr Mod  Pan  Othr
 ❹                    ❸ ❷ ❶
```

❶ Zoned After Touch Mode (all, top, bottom, split hi, split lo): This setting determines which notes of the voice will be affected by aftertouch. Note that this includes aftertouch pitch bend set in ❸ and also any Modulation, Pan, or Other parameter controlled by aftertouch. For example, if you have assigned pitch modulation to be affected by aftertouch, pressure on the keyboard will increase the pitch modulation only for the note(s) determined by this Zoned After Touch Mode setting. Refer to the following sections 12.(F3)– 12.(F5).

All: Aftertouch will affect all notes of the voice.

Top: Aftertouch will affect only the highest of the currently played notes.

Bottom: Aftertouch will affect only the lowest of the currently played notes.

Split hi: Aftertouch will affect only notes at or above the split point specified in ❷.

Split lo: Aftertouch will affect only notes below the split point specified in ❷.

❷ Split Point (C-2...G8): This determine the split point for Zoned After Touch Mode settings of "split hi" or "split lo". If the Zoned After Touch Mode is set to "all", "top", or "bottom, this Split Point setting will have no effect.

❸ After Touch Pitch Bend Range (–12...+12): This determines how aftertouch will affect the pitch. Pressing strongly down on the keyboard after playing a note will move the pitch down one octave (for a setting of –12) or up one octave (for a setting of +12).

❹ To make controller settings for Pitch Bend, Modulation, Pan, or Other, press F1, F3, F4, or F5. Refer to sections 12.(F1), 12.(F3), 12.(F4), or 12.(F5).

Keyboard: When the cursor is located at Split Point, you can press F8 (Kbd) and then press a note to set the split point.

COMMON DATA

12. (F3) Controller set (Modulation)

JUMP #226

Summary: Specify the controller device that will add vibrato (pitch modulation), tremolo (amplitude modulation), and wah-wah (filter modulation).

Procedure:

From: Common Data job directory (JUMP #201)

Select: job 12:Ctrllr

Press: F3 (Mod) (JUMP #226)

Specify: the controller and depth for each parameter

```
CONTROLLER SET           EL ████  226
VOICE▊I -D01(49)  ST*Concert
 Modulation Depth
        |Depth|MIDI Ctrl No. & Device
 Pitch  |  ██  | 001 Modulation
 Amplitude| -0- |    off
 Filter   | -0- |    off
 PB  Aftr ▊Mod▊ Pan  Othr
❺        ❶ ❷ ❸    ❹
```

❶ Pitch Modulation Depth (0...127): This setting determines the range over which the specified device will add vibrato (pitch modulation). For a setting of 127, the selected controller will be able to add the maximum amount of vibrato. For a setting of 0, the selected controller will not be able to add vibrato.
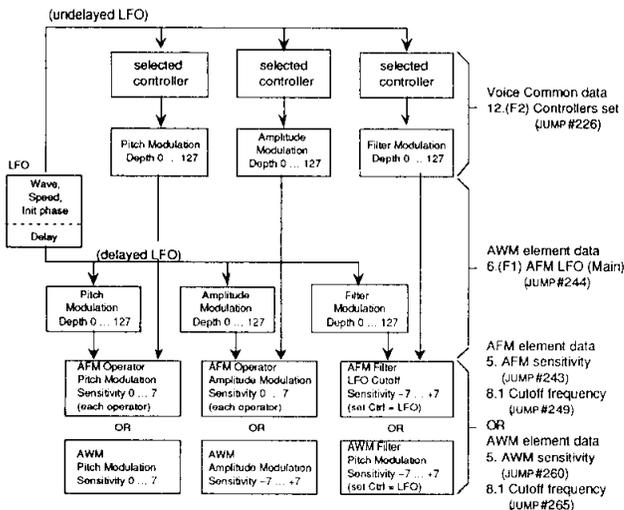
❷ Amplitude Modulation Depth (0...127): This setting determines the range over which the specified device will add tremolo (amplitude modulation). Details are the same as in ❶.

❸ Filter Modulation Depth (0...127): This setting determines the range over which the specified device will add wah-wah (filter modulation). Details are the same as in ❶.

❹ MIDI Ctrl No. & Device (1...120, After Touch): These settings determine the controller devices that will add Pitch modulation, Amplitude modulation, and Filter modulation. The selected MIDI control number (1...120) is displayed at left, and the function which is defined for that number is displayed at right. Control numbers 0 and 32 are reserved for the Bank Select message, and cannot be selected here.

❺ To make controller settings for Pitch Bend, Aftertouch, Pan, or Other, press F1, F3, F4, or F5. Refer to sections 12.(F1), 12.(F3), 12.(F4) or 12.(F5).

Remarks: As shown by the following diagram, the controllers selected here will be able to *add* pitch, amplitude, and filter modulation *in addition to* the pitch, amplitude, and filter modulation specified by the PModDepth, AModDepth, and FModDepth settings of each element LFO. The effect of the resulting modulation will depend on the *sensitivity* settings of each element.

(undelayed LFO)

selected controller	selected controller	selected controller	Voice Common data 12.(F2) Controllers set (JUMP #226)
Pitch Modulation Depth 0 .. 127	Amplitude Modulation Depth 0 ... 127	Filter Modulation Depth 0 ... 127	

LFO
Wave, Speed, Init phase
Delay

(delayed LFO)

Pitch Modulation Depth 0 ... 127	Amplitude Modulation Depth 0 ... 127	Filter Modulation Depth 0 ... 127	AWM element data 6.(F1) AFM LFO (Main) (JUMP #244)
AFM Operator Pitch Modulation Sensitivity 0 ... 7 (each operator)	AFM Operator Amplitude Modulation Sensitivity 0 .. 7 (each operator)	AFM Filter LFO Cutoff Sensitivity -7 ... +7 (sel Ctrl - LFO)	AFM element data 5. AFM sensitivity (JUMP #243) 8.1 Cutoff frequency (JUMP #249)
OR	OR	OR	OR
AWM Pitch Modulation Sensitivity 0 ... 7	AWM Amplitude Modulation Sensitivity -7 ... +7	AWM Filter Pitch Modulation Sensitivity -7 ... +7 (sel Ctrl - LFO)	AWM element data 5. AWM sensitivity (JUMP #260) 8.1 Cutoff frequency (JUMP #265)

Fixed controllers: The control numbers transmitted by the following five controllers built into the SY99 are fixed, and cannot be changed. When these controllers are moved, they will transmit MIDI control messages of the corresponding number. When the following control numbers are selected, these built-in controllers will regulate the assigned function. The official MIDI standard defines Aftertouch not as a control number but as a different type of message, so it is not given a control number.

001: The MODULATION 1 wheel located at the left of the keyboard

002: An optional breath controller connected to the rear panel BREATH jack

004: An optional foot controller connected to the rear panel FOOT CONTROLLER jack

006: Data entry slider

007: Foot volume

064: An optional foot switch connected to the rear panel SUSTAIN jack

Aftertouch: (i.e., pressing down on the keyboard after playing a note)

Assignable controllers: In addition to these five controllers which have fixed functions, the SY99 has the following two assignable controllers. With the factory settings, the MODULATION 2 wheel is assigned MIDI control number 13, and the FOOT SWITCH is assigned control number 65. The control number transmitted by these controllers can be changed by the setting in *Utility mode System Utility 3. Controllers* (JUMP #803).

● The MODULATION 2 wheel located at the left of the keyboard (initially set to transmit control number 013:Non-assigned)

● An optional foot switch connected to the rear panel FOOT SWITCH jack (initially set to transmit control number 065:Portamento Switch)

MIDI controllers: The specified MIDI Ctrl No.& Device applies both to the built-in controllers of the SY99 and to incoming MIDI control data received at MIDI IN. For example if you have specified that Amplitude Modulation Depth be regulated by 001:Modulation Wheel, it will be regulated by incoming MIDI Control Change 001 messages in addition to movements of the SY99's own MODULATION 1 wheel.

The official MIDI standard does not define the purpose of all of the MIDI Control Change messages 1–120. If the selected control number has not been defined, the LCD will show "Non-assigned no.". You can use these control numbers just like any other control number. For example you might assign an assignable controller (see *Utility mode System Utility 3. Controllers*, page 254) to one of these numbers, and then select that control number to regulate Pitch Modulation depth. "Non-assigned no." simply means that there is no official agreement as to the use of that control number.

COMMON DATA

12. (F4) Controller set (Pan)

JUMP #227

Summary: Specify the controller device that will regulate the depth of the cyclical panning movement (Pan LFO), and the controller that will directly adjust the pan position (Pan Bias).

Procedure:
From: Voice Common job directory (JUMP #201)
Select: job 12:Ctrllr
Press: F4 (Pan) (JUMP #227)
Specify: the controller and depth for each parameter

```
CONTROLLER SET            EL 1234  227
VOICE8I -D01(49)  ST*Concert
Pan Control
          |Depth|MIDI Ctrl No. & Device
Pan LFO   |  5  |       off
Pan Bias  |  0  |       off

 PB  Aftr Mod  Pan  Othr
 ❹        ❷❶      ❸
```

❶ **Pan LFO Depth (0...127):** This determines the range over which the specified controller will regulate the depth of the Pan LFO. When this is set to 127, the selected controller will regulate LFO panning over the full range from no LFO panning to maximum LFO panning. When this is set to 0, the selected controller will have no effect on LFO panning.

❷ **Pan Bias Depth (0...127):** This determines the range over which the specified controller will affect pan position.

❸ **MIDI Ctrl No. & Device (0...120, After Touch):** These settings determine which controllers will regulate the depth of LFO panning and Pan Bias.

❹ To make controller settings for Pitch Bend, Aftertouch, Modulation, or Other, press F1, F2, F3, or F5. Refer to sections 12. (F1), 12. (F2), 12. (F3), or 12. (F5).

MIDI Ctrl No. & Device: For details refer to *12. (F3) Controller set (Modulation)*.

Remarks: Since the MODULATION 2 wheel is detented at the center position, it is especially useful for controlling pan. Since the MODULATION 2 wheel is assignable, to use it you must select the MIDI Ctrl No. to which it has been assigned. Check the *Utility mode System Utility 3. Controllers* (JUMP #803) settings to see the MIDI Control Number to which the assignable wheel has been set. For example if the assignable wheel has been set to its initial setting of MIDI Control Number 13, you would select "013:Non-assigned no." for the Pan Bias control number in order to use WHEEL 2 to control panning.

Note: When a voice is used in Multi Play mode, these Pan Control settings will be effective only if the Static Pan is set to Voice. Refer to Multi Edit 5. Voice static pan (JUMP #408, #409).

COMMON DATA

12. (F5) Controller set (Other)

JUMP #228

Summary: Specify controller devices that will regulate the volume, the EG bias and the Cutoff Frequency of the filters in each element of the voice.

Procedure:
From: Voice Common job directory (JUMP #201)
Select: job 12:Ctrllr
Press: F5 (Othr) (JUMP #228)
Specify: the controller and depth for each parameter

```
CONTROLLER SET            EL 1234  228
VOICE8I -D01(49)  ST*Concert
Volume, EG bias, & Filter Cutoff Freq.
              |Value|MIDI Ctrl No. & Device
VolLowLimit   |  5  |       off
EGbiasDepth   |  0  |       off
CutoffDepth   | 127 |  013 Non-assigned no.
 PB  Aftr Mod  Pan  Othr
 ❺        ❶❷   ❸    ❹
```

❶ **VolLowLimit (Volume Low Limit 0...127):** This determines the lowest volume that can be set by the specified controller. For example when this is set to 80, the controller will reduce the volume

no lower than 80. When this is set to 0, the controller can reduce the volume to silence. When this is set to 127, the controller will have no effect on the volume. In addition to the controller specified here, the volume can always be controlled over its full range by an optional foot controller connected to the rear panel VOLUME jack.

❷ EGbiasDepth (Eg Bias Depth 0...127): This determines the range over which the specified controller will control the EG bias. The result of controlling EG Bias for an AFM element will depend on the AModSens setting for each operator. If AModSens is set for carrier operators, the controller assigned to EG Bias will affect the volume of an AFM element. If AModSens is set for modulator operators, the controller assigned to EG Bias will affect the tone of an AFM element. For details refer to *Voice AFM Element job 5. Sensitivity* (page 145). For an AWM element, this setting will affect the Volume.

❸ CutoffDepth (Filter Cutoff Depth 0...127): This determines the range over which the specified controller will increase the cutoff frequency specified for the filters of each element. Higher settings will allow the controller to brighten the tone. If the filter cutoff frequencies are already at maximum, this will have no effect.

❹ MIDI Ctrl No. & Device (0...120, Aftertouch): These settings determine which controllers will regulate each parameter.

❺ To make controller settings for Pitch Bend, Modulation, or Pan, press F1, F2, or F3. Refer to sections 12. (F1), 12. (F2), or 12. (F3).

MIDI Ctrl No. & Device: For details refer to *12. (F2) Controllers set (Modulation).*

Filter Cutoff Depth: The controller assigned to CutoffDepth can be used in two ways to affect the filter, depending on the Control Source setting of each filter. Refer to *Voice AFM Element 8.3 Cutoff EG* (page 153) or *Voice AWM Element 8.3 Cutoff EG* (page 169).
- Continuously control the filter cutoff: If the Control Source of a filter is set to LFO then the controller assigned to CutoffDepth can be used to continuously control the cutoff frequency even while a note is sounding.
- Control the filter cutoff at key-on: If the Control Source of a filter is set to EG or EG-VA then the controller assigned to CutoffDepth will be used only at the instant the note is played; i.e., after playing a note you can move the controller without affecting the sound. This can be used to give different filter cutoffs to individual notes as you play them.

COMMON DATA

13. Voice name

JUMP #229

Summary: Specify a ten-character name for the voice being edited. In voice play mode, this voice name will be displayed in large characters.

Procedure:

From: Voice Common job   (JUMP #201)
        directory
Select: job 13:Name   (JUMP #229)
Specify: the voice name

```
VOICE NAME                           229
VOICEBI  -I01(49)
                  ↓
              [ST*Concert]


Clr  Uppr  Lowr
 ❷    ❸    ❹        ❶
```

❶ Enter a ten-character name for the voice.
❷ To clear the currently entered name press F1 (Clr).
❸ To switch to upper-case characters press F2 (Uppr).
❹ To switch to lower-case characters press F3 (Lowr).

Remarks: Methods of entering character data are explained in *How to enter character data,* on page 30.

COMMON DATA

15. Initialize voice

Summary: Initialize the Voice Common data being edited to a set of standard values. The Voice Mode will not change.

Procedure:

From: Voice Common job directory (JUMP #201)

Select: job 15:Init

To execute: initialization press YES

To quit: without initializing press NO

```
INITIALIZE VOICE

  ARE YOU SURE ?
       (Yes or No)
```

This function sets all voice common data values to the minimum or simplest possible settings. When creating your own new voices, it is usually best to begin by editing an existing voice. However if you want to start from scratch, this Initialize function can often be helpful.

If you are sure you want to initialize the voice data, press YES and the voice common data of the voice being edited will be set to the values shown below. If you decide not to initialize, press NO.

This function initializes only Voice Common data. Other initialize functions are provided for initializing AFM Element or AWM Element data. Refer to *Voice AFM Element 15. Initialize* (page 154) or *Voice AWM Element 15. Initialize* (page 170).

Initialized settings for Voice Common Data

01 Element Levels
Voice Volume = 127
Element level = 127 (all elements)

02 Element Detune
Element detune = ±0 (all elements)

03 Element Note Shift
Shift   = ±0 (all elements)

04 Element Note Limit
Low Limit = C-2 (all elements)
High Limit = G8 (all elements)

05 Element Velocity Limit
Low Limit = 1
High Limit = 127

06 Element Dynamic Pan
Element Preset 1-01 "Center" (all elements)
(Pan Source = velocity, Source Depth = 0,
Pan EG; HT=0, R1–RR2=63, L0–RL2=0,
SLP=S1)

07 Output Select
Output Group = Both (all elements)

08 Random Pitch
Random Pitch Depth = 0

09 Portamento
Mode   = Follow (poly)/ Fingered
       (mono)
Speed   = 0

10 Effect Set
Effect Mode = off
Effect Type = 01:Rev.Hall (both effect units)
Output Level = 100% (both effect units)
Effect 2 Mix Level = 100%
wet:dry   = 50:50 (both effect units)
Control Parameter = EFF1 par1
       (both effect units)
Control Device = off (both effect units)
Control MIN   = 0% (both effect units)
Control MAX   = 99% (both effect units)
Effect LFO Wave = triangle
Effect LFO Speed = 65
Effect LFO Delay Time = 0
Effect LFO Initial Phase = free
Effect send select   = all on (all elements)
Effect send level   = 127
       (both effect units)
Effect send vel sense = 0 (both effect units)
Effect send level scale = 0 (both effect units)

11 Micro Tuning Set
Preset–01 Equal Temperament
Element   = off (all elements)

12 Controller Set
Pitch Bend Wheel Depth   = 2
Zoned Aftertouch Mode   = all
Zoned Aftertouch Split Point = C3
Aftertouch Pitch Bend Depth   = 0
Pitch Modulation Depth   = 64
Pitch Modulation Device   = 1
Amplitude Modulation Depth   = 64
Amplitude Modulation Device = 12
Filter Modulation Depth   = 0
Filter Modulation Device   = 1

Pan LFO Depth   = 64
Pan LFO Device   = 13
Pan Bias Depth   = 0
Pan Bias Device   = 10
Volume Low Limit   = 0
Volume Low Device   = 14
EG Bias Depth   = 0
EG Bias Device   = 2
Filter Cutoff Frequency Depth   = 0
Filter Cutoff Frequency Device = 12

13 Name Voice
Name = INIT VOICE

COMMON DATA

16. Recall voice

Summary: Recall the previously edited voice data.
Procedure:

    From: Voice Common job   (JUMP #201)
           directory
    Select: job 16:Recall
    To recall: the data press YES
    To quit: without recalling press NO

```
RECALL VOICE

  ARE YOU SURE ?
      (Yes or No)
```

If after editing a voice you exit voice edit mode without storing, the edited voice data will be lost. In such cases, you can use this function to recall the previously edited voice data into the editing buffer.

If you are sure you want to recall, press YES and the previously edited voice data will be recalled into the editing buffer. If you decide not to recall, press NO.

This function recalls all voice data; element data as well as common data. The same function is also available when editing AFM Element or AWM Element data.

AFM element data

AFM element job directory

Summary: This job directory shows the editing jobs for an AFM element.

Procedure:

From: voice edit mode   (JUMP #200 or #201)

When: editing a normal voice that contains AFM elements

Select: an AFM element F3–F6   (JUMP #230)
(E1–E4).

```
VOICE EDIT E1:AFM E3:AWM   230
           E2:AFM E4:AWM
BI -D01(49)  ST*Concert        01
01:Algrthm 05:Sensitv 09: -----  13: -----
02:Osclltr 06:LFO     10: -----  14: -----
03:EG      07:PitchEG 11: -----  15:Initlz
04:Output  08:Filter  12: -----  16:Recall
Mode Com   E1   E2   E3   E4
```
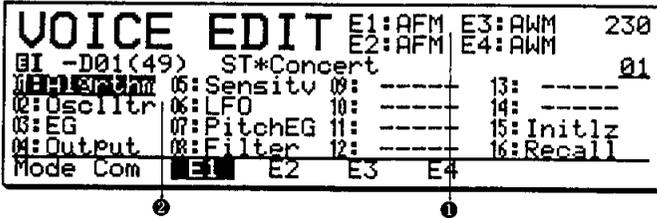
❶ This area shows the number (1–4) and type (AFM or AWM) of elements in the selected voice mode.

❷ Move the cursor in this area to select a job and press ENTER to go to the selected job.

01:Algrthm (AFM algorithm):

F1; The algorithm determines how the six operators are connected. Three feedback sources can be selected and sent to other operators.

F2; Each operator can be modulated from an external source such as an AWM waveform or the noise generator.

F3; Each operator has two inputs In1 and In2 with input level settings for each input.

02:Osclltr (AFM oscillator): The frequency produced by each operator can either be fixed or made to change according to the note played.

03:EG (AFM operator EG):

F1; Make operator EG settings for an individual operator while viewing a graphic display.

F2; Make operator EG settings for all operators.

04:Output (AFM operator output):

F1; The output level of each operator can be made to vary across the keyboard.

F2; The output level of each operator can be set.

05:Sensitv (AFM sensitivity): The output level and frequency of each operator can be affected by key-on velocity or the LFO, and the EG rates of each operator can also be affected by key-on velocity.

06:LFO (AFM LFO):

F1; The Main LFO is used to create tremolo (amplitude modulation), vibrato (pitch modulation), or wah-wah (filter modulation).

F2; The Sub LFO is used to create vibrato (pitch modulation).

07:PitchEG (AFM pitch EG): The pitch EG creates a fixed shape of pitch change over time for each note, and can be switched on/off for each operator.

08:Filter (AFM filter): The two filters of each element can be used to control the tone in various ways. The filter EG creates a fixed pattern of tonal change over time, and a periodic signal from the LFO can be applied to the filter to create wah-wah.

15:Initlz (Initialize AFM element): The AFM element data being edited can be set to the minimum or simplest possible setting as a convenience when creating an element from scratch.

16:Recall (Recall voice): All data of the previously edited voice.

AFM ELEMENT DATA

Operator on/off

Summary: Any time while editing an AFM element, you can turn the output of each operator off/on. This is useful when you want to hear how each operator affects the others, or when you want to hear only certain operators.

Procedure:

From: any job in the AFM job directory

Press: the OPERATOR ON/OFF buttons (memory select buttons 9–14) to turn operators 1–6 on/off.

The on/off condition of each operator is shown in the upper right of the LCD when editing an AFM ele-ment, and also indicated by the OPERATOR ON/OFF LEDs. Operators that are on are displayed in inverse. In the following LCD all operators are on.

Remarks: If you turn off all the carrier operators there will be no sound.

This function is provided as a help in editing. Operator on/off settings are not stored as part of voice data.

When you select a different AFM or AWM element or exit element editing, all operators you turned off will be turned back on.

AFM ELEMENT DATA

AFM algorithm

JUMP #234

Summary: You can view a graphic display of the current algorithm at any time while editing an AFM element and select a different algorithm if you wish. Since the algorithm determines how each operator functions, you should always be aware of the algorithm when editing AFM operator data.

Procedure:

From: any job in the AFM job directory   (JUMP #231–#255)

Press: F8 (Alg)   (JUMP #234)

To exit: to the previous editing job press EXIT


```
AFM ALGORITHM                    234

Algorithm = 5
```
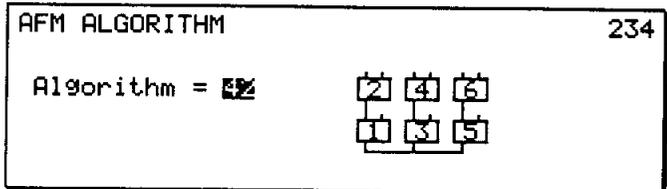
To return to the previous display, press EXIT.

Note: When you select an algorithm, all settings which modify the routings in the algorithm (feedback, input, etc.) will be cleared to their initial settings.
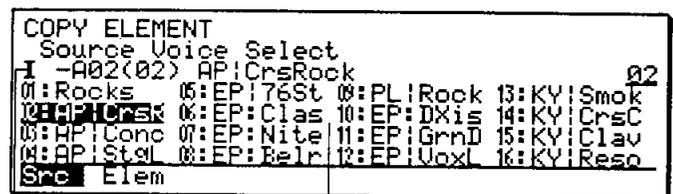

AFM ELEMENT DATA

Copy element

Summary: While editing AFM element parameters other than EG, Output, Filter, or Effect, you can copy data from an element of another voice to the element you are now editing.

Procedure:

From: AFM element job 1, 2, 6, or 7

Press: COPY

Press: F1 (Src) and select the source voice

Press: F2 (Elem) and select the source element

To execute: the copy operation press F8 (Go)

❶ **Source Voice Select:** Specify the memory (internal, card, preset 1 or preset 2), the bank A–D, and the number 1–16 of the voice from which you want to copy element data.

❷ **Source Voice:** The number and name of the selected source voice is displayed.

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Source Element Type: The type (AWM or AFM) of each element in the selected voice is displayed.

Destination Element Number: Specify the element 1–4 of the selected Source Voice which you want to copy into the currently edited element. The type (AWM or AFM) of the selected element will be displayed in the Element Type line above. The selected source element must be the

same type as the currently edited element. If not, the bottom line will show "Element type mismatch!"

After specifying the source voice and element, press F8 (Go). The display will ask "Are you sure?". If you are sure you want to copy the element data then press YES, and the data will be copied.

AFM ELEMENT DATA

Copy operator

Summary: While editing the parameters for operator EG or Output, you can copy EG and Output data from one operator to another.

Procedure:

From: AFM element job 3 or 4
(JUMP #236–242)
Press: COPY
Select: the data type, source operator, and destination operator
To execute: the copy operation press F8 (Go)

```
COPY OPERATOR

Data Type   = EG&OUTPUT

Source      = OP 4
Destination = OP 1
                                Go
```
❸   ❷ ❶

❶ Data Type: Select one of the following types of data to be copied.
EG&OUTPUT: Envelope generator, output level and scaling
EG: Envelope generator
OUTPUT: Output level and scaling
❷ Source: The specified data will be copied from this operator.
❸ Destination: The specified data will be copied to this operator.

Remarks: It is often the case that many or all operators in a voice have similar settings, especially for EG parameters. In such cases you can save time by setting the average EG for the voice on one operator, and then copying it to the others.

AFM ELEMENT DATA

1. (F1) AFM algorithm (Form)

JUMP #231

Summary: Select the Algorithm and specify feedback routings between operators.

Procedure:

From: AFM Element job directory (JUMP #230)
Select: job 01:Algrthm., and press (JUMP #231)
F1 (Form)
Specify: the algorithm number, and feedback sources and destinations

```
AFM ALGORITHM          OP PHASE  231
VOICE8I -D01(49)  ST*Concert(E1/HFM)
Algorithm Number = 42

     Src   Dst  OP1  OP2  OP3  OP4  OP5  OP6
FB1  OP6        in2  use  use  off  use  in1
FB2  OP4             use  use  use  in1  in2  off
FB3  OP2             use  in1  in2  off  use  off
Form Extn Inpt                           A1g
```
❷   ❸   ❹   ❶

❶ Algorithm Number (1...45): Select the algorithm to determine the "arrangement" of the six operators in an AFM element. Refer to the chart of the 45 algorithms on page 302. When you change the Algorithm, the Src ❸ and Dst ❹ settings explained below and the external input settings explained in the following section will be initialized.
❷ FB1–FB3: Feedback can be drawn from three of the operators in the algorithm and applied to any operator that has an unused input.
❸ Src 1–3 (OP1...OP6): Select the source of feedback for the three feedback routings. Any operator can be selected as the source of feedback. In some algorithms, one or more feedback

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sources may be fixed by the choice of algorithm, and cannot be changed. In such cases, an "F" will be displayed after the Source (e.g., OP3F) and the Destination operator explained in ❹ will be displayed in uppercase characters (e.g., IN1).

❹ Dst OP1...OP6 (in1, in2): Select the destination of each feedback source. Each feedback source can be sent to as many destinations as you like. Each operator has two inputs, and an operator can be selected as a feedback destination only if at least one of its inputs is free. It makes no difference whether in1 or in2 is used, but remember that the input levels of each operator are set independently for in1 and in2. Refer to the following section 1.3 Algorithm Input.

If both inputs of an operator are already used by the algorithm connection, "-" will be displayed. If both inputs are already used because of a feedback assignment, "use" will be displayed. If the algorithm has a fixed feedback loop, the feedback destination operator will be displayed in uppercase characters (e.g., IN1). The cursor cannot be moved to the Dst setting for such operators.

Having three selectable feedback sources which can be sent to any or all other operators allows you to connect the operators in very complex ways. The following diagrams show how the operators would be connected for algorithm 40 when feedback sources and destinations are set as shown in the following table. Thin lines indicate the connections defined by the algorithm, and heavy lines indicate the feedback connections. Whether a connection between two operators is the result of the algorithm or the result of feedback routing has no influence on the sound.
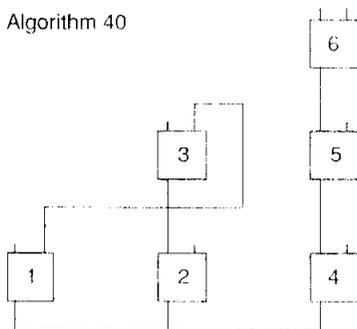
Algorithm 40

Feedback settings

FB	SRC	DST OP1	OP2	OP3	OP4	OP5	OP6
FB1	OP3F	off	use	IN2	off	off	use
FB2	OP6	off	use	off	off	off	in1
FB3	OP5	off	in2	off	off	off	in2

Resulting connections
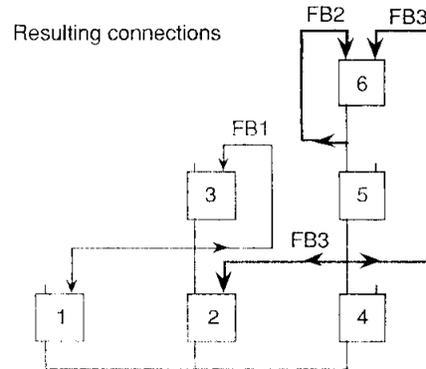
Remarks: In previous Yamaha 6-operator FM synthesizers, you had a choice of 32 algorithms each of which included one feedback loop. The SY99 provides broader possibilities with 45 algorithms, and three feedback loops that can be sent to more than one operator. In addition, operators can be modulated by external waveforms.

Feedback from a carrier: The output level of carrier operators is automatically adjusted according to the number of carriers in the algorithm, in order to keep the resulting output volume consistant. If the nominal output of a one-carrier algorithm is considered to be 0 dB, each carrier in a two-carrier algorithm will be reduced -3.010 dB, in a three-carrier algorithm -8.278 dB, in a four-carrier algorithm -9.783 dB, in a five-carrier algorithm -12.041 dB, and in a six-carrier algorithm -14.299 dB.

If you use a carrier operator as a feedback source, be aware that even if the output level of the carrier operator is the same, the actual output (and therefore the amount of feedback produced by the carrier operator) will depend on the number of carriers in the algorithm.

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Free Algorithm: By sending exclusive messages from a computer with the appropriate software to the SY99, it is possible to select a "free algorithm" in which all algorithm routings can be specified arbitrarily.

    If the free algorithm has been selected, algorithm-related parameters can be edited only by system exclusive parameter change messages from MIDI IN, and cannot be modified from the SY99 front panel.

It is not possible to select or edit the free algorithm from the SY99 itself. This display will never appear unless you are programming the SY99 from a personal computer with editing software that takes advantage of this capability.

AFM ELEMENT DATA

1. (F2) AFM algorithm (External input)

JUMP #232

Summary: Modulate an operator from an external source such as an AWM waveform or the noise generator.

Procedure:

    From: AFM Element job directory (JUMP #230)
    Select: job 01:Algrthm., and press (JUMP #232)
    F2 (Extn)
    Specify: noise and/or AWM input for each operator

```
AFM ALGORITHM          OP         232
VOICEBI -D01(49)  ST*Concert(E1/AFM)
 Input | OP1  OP2  OP3  OP4  OP5  OP6
 Noise | use  use  use  off  use  off
 AWM   | use  in2  use  off  use  off

Form Extn Inpt                   Alg
```

❶   ❷

❶ **Noise (off, in1, in2):** The SY99 contains a noise generator which produces a type of white noise. This can be sent to any free operator input to modulate the operator.

❷ **AWM (off, in1, in2):** If the voice contains both AFM and AWM elements (ie., if the voice mode is either 9:1AFM&1AWM or 10:2AFM&2AWM), an AWM waveform can be received at any free operator input to modulate the operator.

    For voice mode 9:1AFM&1AWM, the waveform of AWM element 2 will be used to modulate AFM element 1. For voice mode 10:2AFM&2AWM, the waveform of AWM element 3 will be used to modulate AFM element 1, and the waveform of AWM element 4 will be used to modulate AFM element 2.

❶ and ❷: If both inputs of an operator are already used by the algorithm connection, "—" will be displayed. If both inputs are already used because of a feedback assignment, "use" will be displayed. The cursor cannot be moved to the Dst setting for such operators.

Element 1 (AFM)

Element 2 (AWM)
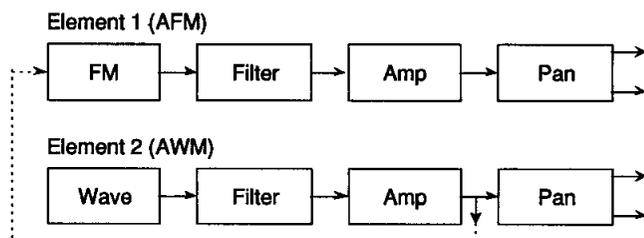
Remarks: Noise modulation makes it possible to create sounds that were difficult for previous FM synthesizers.

    By using an AWM waveform to modulate one or more AFM operators, new harmonics can be added to the AWM sample. A simple example of this is given in *Using RCM Hybrid Synthesis* in the appendix.

AFM ELEMENT DATA

1. (F3) AFM algorithm (Input level)

JUMP #233

Summary: Set input levels In1 and In2 for each operator.

Procedure:
From: AFM Element job directory (JUMP #230)
Select: job 01:Algrthm. and press (JUMP #233)
F3 (Inpt)
Specify: the input level for each operator input

```
AFM ALGORITHM        OP ▓▓▓▓▓  233
VOICE▓I -D01(49)  ST*Concert(E1/HFM)
        OP1  OP2  OP3  OP4  OP5  OP6
┌In1 Src OP2 FB▶2 OP4 FB▶4 OP6 FB▶6
│  Level  0    7   0    ▓   0    7
│In2 Src FB▶6 AWM FB▶2 off FB▶4 off
│  Level  7    3   7    -   7    -
├Form Extn ▓▓▓▓            A19
```

❶ **In1 Src, In2 Src:** This displays the input sources for input In1 and In2 of each operator, as determined by Algorithm and Feedback settings (F1) and External input settings (F2). The input sources cannot be changed from this job.

❷ **In1 Level, In2 Level (0...7):** Adjust the input level of In1 and In2 for each operator.
If an operator input is not used, the Src will display "off" and the "Level will display "–". The cursor cannot be moved to the Level setting for such operators.

Remarks: Previous FM synthesizers allowed you to set only the output level of each operator. However on the SY99, the input levels In1 and In2 of each operator can also be set. If the input source is the feedback from another operator, the input level setting functions as the feedback level.
Correct adjustment of input levels is especially important when bringing in AWM to AFM as a modulator.

AFM ELEMENT DATA

2. AFM oscillator

JUMP #235

Summary: Set frequency-related parameters for each operator.

Procedure:
From: AFM Element job directory (JUMP #230)
Select: job 02:Osclltr (JUMP #235)

```
AFM OSCILLATOR       OP ▓▓▓▓▓  235
VOICE▓I -D01(49)  ST*Concert(E1/HFM)
┌OP 4
│Freq Mode = ▓▓▓▓▓┬Waveform    = 1
│Coarse = 1.00    │             ∿
│Fine┐            ┌Phase Sync = on
│Detune = + 0┘    │Init Phase =  60
                              A19
```

❶ **Operator (1–6):** This displays the operator being edited. To move to another operator, use the OPERATOR SELECT buttons OP1...OP6.

❷ **Freq Mode (fixed, ratio):** When "fixed" is selected the operator will produce the same pitch regardless of what note is played. When "ratio" is selected the operator pitch will depend on the note that is played

❸ **Coarse/Fine** (0 Hz...9762 Hz in Fixed Frequency mode, 0.5...61.69 in Ratio Frequency mode): This setting specifies the pitch produced by the operator. By moving the cursor to coarse or fine you can adjust the pitch in large steps or in small steps. When the Freq Mode is set to "fixed" the range is 0 Hz...9762 Hz. When the Freq Mode is set to "ratio" the range is 0.5...61.69. (In "ratio" mode with a Coarse/Fine setting of 1.0 the A3 key will produce the standard pitch of 440 Hz.)
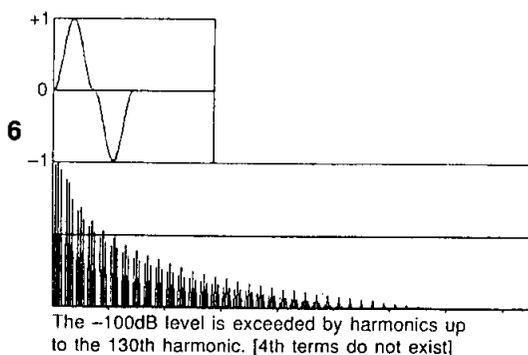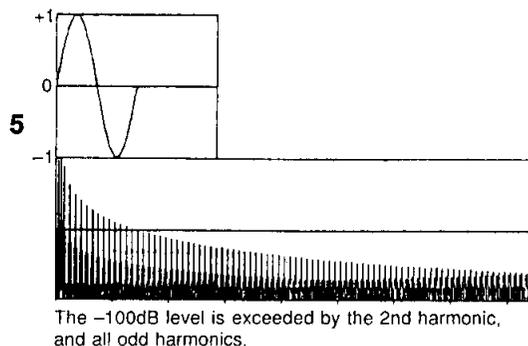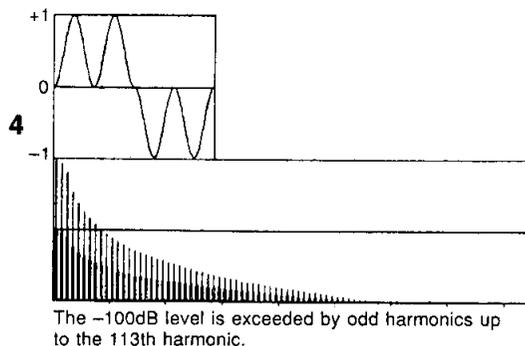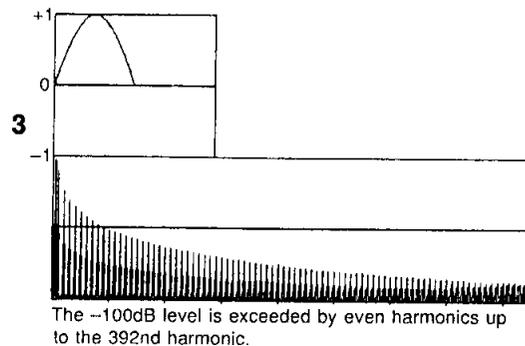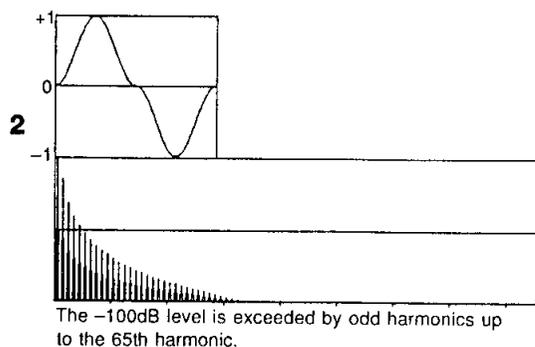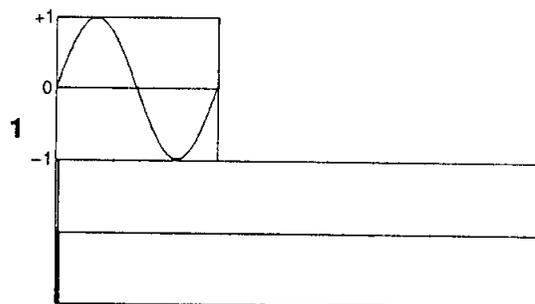
❹ **Detune (−15...+15):** The pitch of each operator can be adjusted in fine steps of 1.171875 cents.

❺ **Waveform (1...16):** Each operator can produce sixteen different waveforms; a sine wave with no harmonics, and fifteen other more complex waveforms containing additional harmonics. This allows you to create complex waveforms using fewer operators. A graphic display of the selected waveform is shown below the waveform number. The table below shows the harmonic content of each waveform.

❻ **Phase Sync (on, off):** When phase sync is on, the selected waveform will be re-started each time a key is pressed.
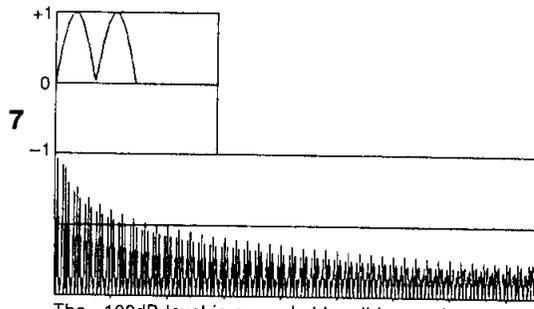
❼ Init Phase (0...127): This determines the initial phase position from which the selected waveform will be re-started when phase sync is on. The init phase range of 0...127 corresponds to a range of 0...360 degree starting phase. This setting is effective only when Phase Sync is on.
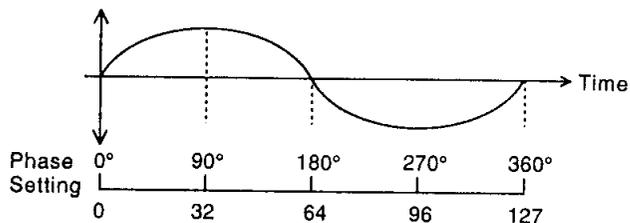

Waveform: The sixteen waveforms that can be produced by each operator are not modeled after any "real" instrument but are mathematical transformations of sinewaves. The following chart shows the harmonic content of each waveform. The amplitude of each harmonic partial is given as a percentage of the fundamental.

1

2

The –100dB level is exceeded by odd harmonics up to the 65th harmonic.

3

The –100dB level is exceeded by even harmonics up to the 392nd harmonic.

4

The –100dB level is exceeded by odd harmonics up to the 113th harmonic.

5

The –100dB level is exceeded by the 2nd harmonic, and all odd harmonics.

6

The –100dB level is exceeded by harmonics up to the 130th harmonic. [4th terms do not exist]
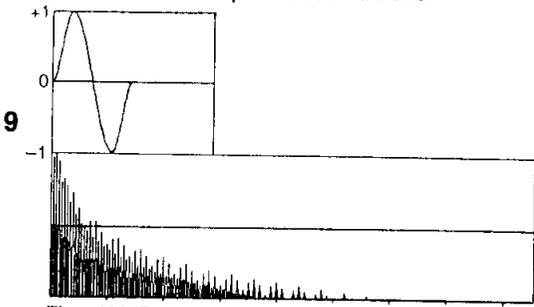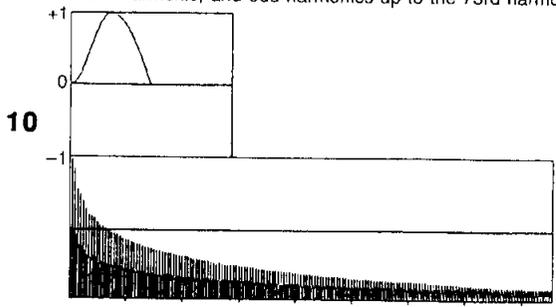
140

7

The –100dB level is exceeded by all harmonics except (4n-2) terms which do not exist.
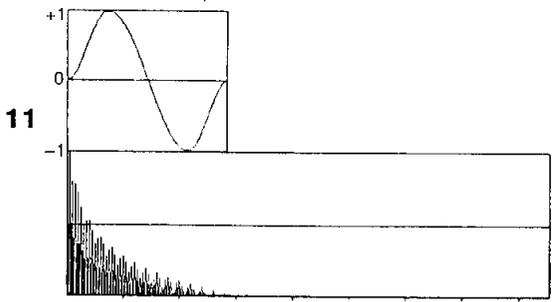
8
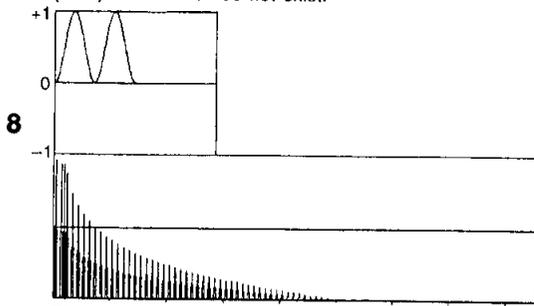
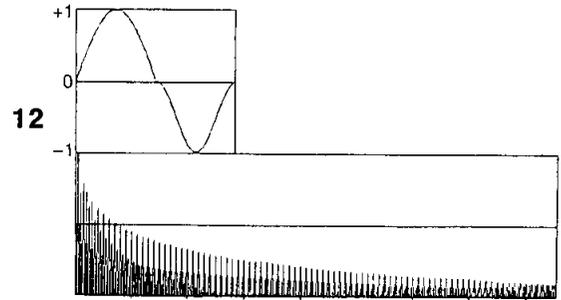The –100dB level is exceeded by the 4th harmonic, and odd harmonics up to the 99th harmonic.

9

The –100dB level is exceeded by even harmonics up to the 112th harmonic, and odd harmonics up to the 73rd harmonic.

10

The –100dB level is exceeded by all harmonics up to the 270th harmonic.

11

The –100dB level is exceeded by harmonics up to the 66th harmonic.

12

The –100dB level is exceeded by even harmonics up to the 310th harmonic, and odd harmonics up to the 49th harmonic.

13

The –100dB level is exceeded by the 21nd harmonic, and odd numbered harmonics up to the 63rd harmonic.

14

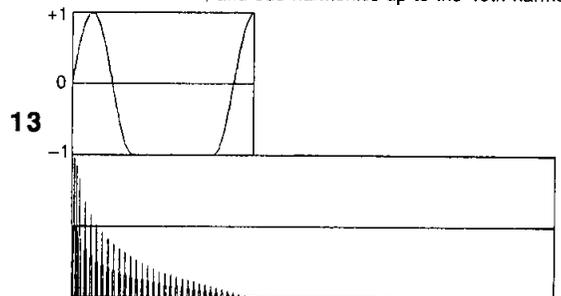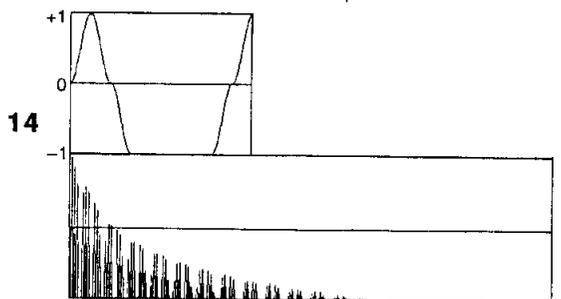The –100dB level is exceeded by harmonics up to the 105th harmonic. [4th terms do not exist]

15

The –100dB level is exceeded by all harmonics up to the 300th harmonic.

16

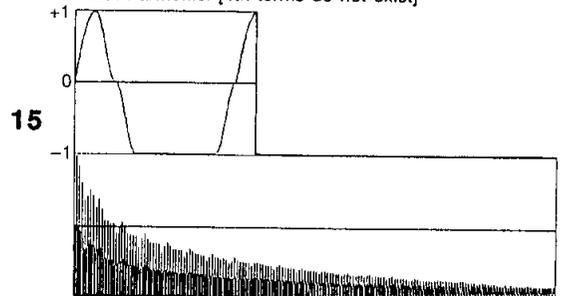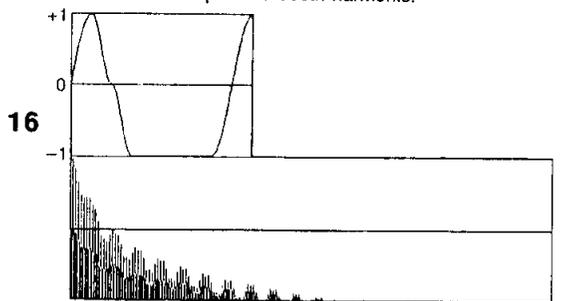The –100dB level is exceeded by harmonics up to the 91st harmonic.

AFM ELEMENT DATA

3. (F1) AFM operator EG (Each operator)

JUMP #236

Summary: Make EG settings for a single operator while viewing a graphic display of the operator envelope.
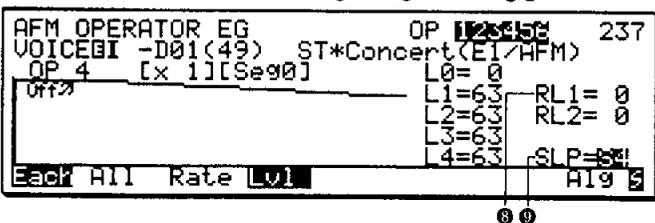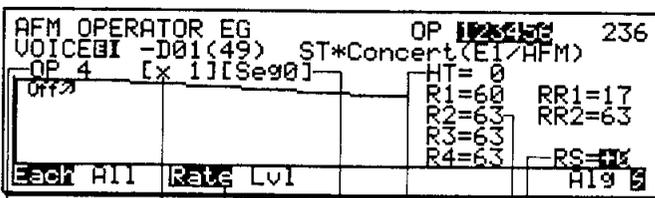
Procedure:
From: AFM Element job directory (JUMP #230)
Select: job 03:EG and press F1 (Each)
EG rates press F3 (Rate) (JUMP #236)
EG levels press F4 (Lvl) (JUMP #237)
Specify: envelope parameters for the selected operator

```
AFM OPERATOR EG         OP ████   236
VOICEBI -D01(49)   ST*Concert(E1/HFM)
 OP 4   [x 1][Seg0]      HT= 0
[Off]                    R1=60   RR1=17
                         R2=63   RR2=63
                         R3=63
                         R4=63    RS=██
Each All  Rate Lvl            AI9 █
```
❶   ❷ ❹   ❸   ❺   ❻❼

```
AFM OPERATOR EG         OP ████   237
VOICEBI -D01(49)   ST*Concert(E1/HFM)
 OP 4   [x 1][Seg0]      L0= 0
[Off]                    L1=63   RL1= 0
                         L2=63   RL2= 0
                         L3=63
                         L4=63    SLP=██
Each All  Rate Lvl            AI9 █
```
❽ ❾

❶ The number of the currently selected operator is displayed. To move to another operator, use the OPERATOR SELECT buttons OP1...OP6.

❷ This indicates the time range of the EG graphic display. A range of "x1" shows the shortest time and gives the greatest detail. To change the range, hold SHIFT and press F1–F6 (x1, x2, x5, x10, x20, x50).

❸ This indicates the segment from which the EG graphic display begins. To shift the display to a different segment, hold SHIFT and press F7 or F8 to select Seg0–Seg4 or Rel1.

❹ Press F3 (Rate) to set EG rates. Press F4 (Lvl) to set EG levels.

❺ HT (Keyon Delay Time 63...0): When this is set to 0, the operator EG will begin immediately after a key is pressed. For higher settings, there will be an increasingly longer delay before the operator EG begins.

❻ R1–R4, RR1–RR2 (Keyon Rates, Release Rates 0...63): Keyon Rates 1–4 and Release Rates 1–2 determine the speed of the operator EG. Higher settings result in faster change.

❼ RS (Rate Scaling –7...+7): Rate Scaling allows the operator EG rates to be increased or decreased depending on the key that is played. For positive settings the EG rates will increase as you play higher notes, resulting in shorter envelopes. For negative settings the EG rates will decrease as you play higher notes, resulting in longer envelopes.

❽ L0–L4, RL1–2 (Keyon Levels, Release Levels 0...63): Keyon Levels 0–4 and Release Levels 1–2 determine the levels of the operator EG.

❾ SLP (Segment Loop Point S1...S4): This specifies the segment from which the EG will continue looping if a key remains depressed after the EG has arrived at level L4.

Rates and Levels: When you press a key, the operator output will be at the level of L0. When the specified hold time (HT) has elapsed, the level will change at the rate of R1 to level L1. When the level reaches L1, it will change at the rate of R2 to the level of L2. When the level reaches L2, it will change at the rate of R3 to the level of L3. When the level reaches L3, it will change at the rate of R4 to the level of L4. When the level reaches RL1, the EG will begin looping from the specified segment.

When you release the key, the level will change at the rate of RR1 to the level of RL1. When the level reaches RL1, it will change at the rate of RR2 to the level of RL2.

Remember that Hold Time (HT) is a *time* setting, but the various Rates are *speed* settings. Higher settings for Hold Time will result in a longer delay before the operator EG begins, but higher settings for Rates will result in faster change.
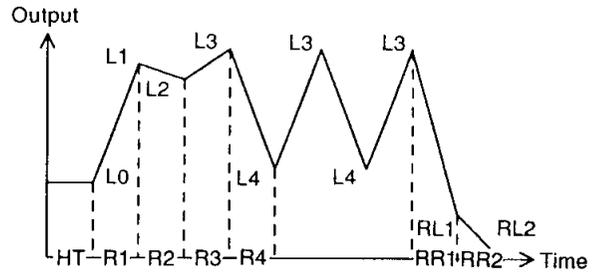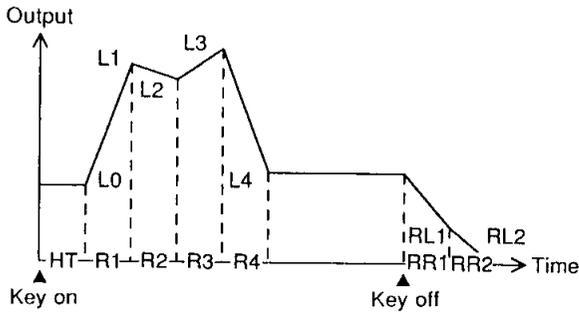
Segment Loop Point: The SLP setting determines the Level from which the EG will loop. If you continue holding a note after Level 4 is reached, when SLP is set to ...

SLP=S1 the level will change L4 → L1 → L2 → L3 → L4 → L1 → ...

SLP=S2 the level will change L4 → L2 → L3 → L4 → L2 → ...

SLP=S3 the level will change L4 → L3 → L4 → L3 → ...

SLP=S4 the level will remain at L4

The following diagram shows how EG levels would change when SLP=S3

Rate Scaling: On most acoustic instruments, high notes have a naturally shorter attack and decay. This can be simulated by setting rate scaling to a positive value (+1...+7). The following diagram shows how higher notes will have faster rates (shorter EGs). Negative settings will have the opposite effect.

AFM ELEMENT DATA

3. (F2) AFM operator EG (All operators)

JUMP #238

Summary: Make operator EG settings for all operators while viewing the data for all operator EGs in a single screen.

Procedure:

From: AFM Element job directory (JUMP #230)
Select: job 03:EG and press F2 (All)
Specify: EG key-on rates (R1–R4) (JUMP #238)
EG key-on levels (L1–L4) (JUMP #239)
EG key-off rates and (JUMP #240)
levels (RR1–2, RL1–2)

❶ HT (Keyon Delay Time 63...0): This specifies the time by which the beginning of the EG will be delayed after a key is pressed.

❷ R1–R4 (Keyon Rates 0...63): Keyon Rates 1–4 determine the speed of the operator EG while a key is being pressed.

❸ RS (Rate Scaling –7...+7): Rate Scaling determines how the key position will affect the operator EG rates.

❹ L0–L4 (Keyon Levels 0...63): These determine the levels to which the operator EG will move while a key is being pressed.

❺ LP (Segment Loop Point S1...S4): This specifies the segment from which the EG will continue looping if a key remains depressed after the EG has arrived at level L4.

❻ R1, R2 (KeyOff Rates 0...63): These determine the speed with which the operator EG will change levels after a key is released.

❼ L1, L2 (KeyOff Levels 0...63): These determine the levels to which the operator EG will change after a key is released.

The meaning of these EG parameters is explained in the previous section *3.1 Operator EG*.

In this *AFM operator EG (All)* display, the OPERATOR SELECT buttons cannot be used to select operators.

AFM ELEMENT DATA

4. (F1) AFM operator output (Each)

JUMP #241

Summary: Set output level and scaling for a single operator while viewing a graphic display of the scaling.

Procedure:
From: AFM Element job directory (JUMP #230)
Select: job 04:Output and press (JUMP #241)
F1 (Each)
Specify: the output level and scaling for the selected operator

❶ Output Level (0...127): The output level of the operator

❷ BP1–4 (Break Point 1–4): Note (C-2...G-8) and Offset (–127...#127) of each Break Point determine how the output level of each operator will vary across the keyboard. When the cursor is located at note, you can press F7 (Kbd) and press a key to enter the new note setting.

Output Level: This sets the output level of each operator. The output level of a carrier operator will affect the volume, and the output level of a modulator operator will affect the tone. Remember that the input levels of each operator input In1 and In2 can also be adjusted as explained in *1. (F3) Algorithm (Input level)* (JUMP #233). Even if the output level of an operator is raised, it will have no effect on another operator to which it is connected if the corresponding input level of the operator is set at 0.

Break Point: The operator output level can be made to vary depending on the note that is played. On most acoustic instruments, notes differ in volume and tone depending on the range in which they are played. For example the low notes of a piano are more tonally complex and louder than the high notes.

Use the four break points to specify how the operator output level will be adjusted across the keyboard.

● Offset (–127...+127) determines the output level adjustment for each of the four points specified by Note.

● The four note settings must be in ascending order. It is not possible to set a break point to a note lower or higher than the note settings of the neighboring break points.

The following diagram shows how the operator output level would be adjusted across the keyboard for the settings shown in the above LCD.

Each offset is added to the overall operator output level of 80. For example the offset at break point 1 (E1) is –4, so the resulting operator output level at E1 is 76. The resulting operator output level is limited to the range of 0...127.

AFM ELEMENT DATA

4. (F2) AFM operator output (All)

JUMP #242

Summary: Set operator output level while viewing output levels for all operators. (Output scaling cannot be set in this job.)

Procedure:
From: AFM Element job directory (JUMP #230)
Select: job 04:Output and press (JUMP #242)
F2 (All)
Specify: the output level of each operator

```
AFM OPERATOR OUTPUT     OP ▦▦▦▦  242
VOICEBI -D01(49)  ST*Concert(E1/HFM)
 Output Level
  OP1 | OP2 | OP3 | OP4 | OP5 | OP6
  127 | 104 | 127 | 103 | 127 | 106

Each █All█                        A1g
```
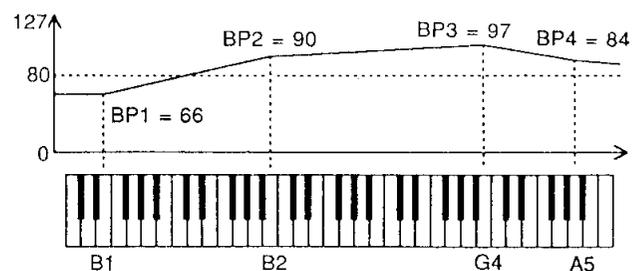
❶

❶ Output Level OP1–OP6 (0...127): Set the output level of each operator. This is the same setting as explained in ❶ of the previous section *4. (F1) AFM operator output.* The difference is that here you can view and set the output level for all six operators at once. However, break point Levels and Offsets cannot be set here.

Remarks: Refer to *4. (F1) AFM operator output* for details.

Note: In algorithms with two or more carriers, some Velocity Sensitivity settings may cause distortion. In this case, reduce carrier levels.

AFM ELEMENT DATA

5. AFM sensitivity

JUMP #243

Summary: These settings determine how each operator will be affected by key-on velocity and by the LFO.

Procedure:
From: AFM Element job directory (JUMP #230)
Select: job 05:Sensitv (JUMP #243)
Specify: the sensitivity of each operator

```
AFM SENSITIVITY         OP ▦▦▦▦  243
VOICEBI -D01(49)  ST*Concert(E1/HFM)
         | OP1| OP2| OP3| OP4| OP5| OP6
 Velocity| +3 | +1 | +3 | +1 | +3 | +1
 Rate Vel| on | on | on | on | on | on
 AModSens|  0 |  0 |  0 |  0 |  0 |  0
 PModSens|  0 |  0 |  3 |  3 |  3 |  0
 █KVS█ Rate AMS  PMS               A1g
```
❶❷❸❹   ❺

❶ Velocity (–7...+7): This determines how the output level of each operator will be affected by key-on velocity. For positive settings (+1...+7) the output level will increase as you play more strongly. For negative settings (–1...–7) the output level will decrease as you play more strongly.

❷ Rate Velocity (on/off): When the Rate Velocity switch is "on", key-on velocity will affect the operator EG R1. The result will depend on the Velocity setting.

Velocity = +1...+7: If Rate Velocity is on, strongly played notes will cause the operator EG R1 to increase, resulting in a faster attack. For notes played with maximum velocity, R1 will be at the value specified by the EG settings.

Velocity = –1...–7: If Rate Velocity is on, strongly played notes will cause the operator EG R1 to decrease, resulting in a slower attack. To hear the effect of negative settings you will need to lower the operator output level.

When the Rate Velocity switch is "off", the operator EG R1 will not be affected by key-on velocity.

❸ AModSens (0...7): Amplitude Modulation Sensitivity determines how greatly the output level of each operator will be affected by Amplitude Modulation from the LFO.

❹ PModSens (0...7): Pitch Modulation Sensitivity determines how greatly the pitch of each operator will be affected by Pitch Modulation from the LFO.

❺ Pressing F1 (KVS), F2 (Rate), F3 (AMS), or F4 (PMS) will move the cursor to Velocity, Rate Vel, AModSens, or PModSens.

AModSens and PModSens: These settings deter-mine the *sensitivity* of each operator to the Ampli-tude Modulation Depth (AMD) and/or Pitch Modu-lation Depth (PMD) produced by the LFO. Refer to *6.(F1) AFM LFO (Main)* (JUMP #244). If the LFO settings for AMD and/or PMD are set to 0, these AModSens and PModSens settings will have no effect.

PModSens determines the sensitivity of each operator to PMD from the Main LFO. Independently of this, the pitch of an AFM element can also be affected by the Sub LFO. Refer to *6. (F2) AFM LFO (Sub)* (JUMP #245).

In this *AFM sensitivity* display, the OPERATOR SELECT buttons cannot be used to select operators.
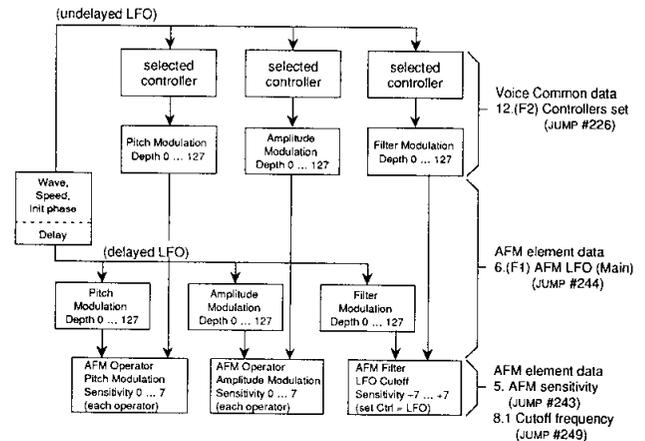
AFM ELEMENT DATA

6. (F1) AFM LFO (Main)

JUMP #244

Summary: The Main LFO creates a periodic control signal that can be used to create tremolo (ampli-tude modulation), vibrato (pitch modulation), and wah-wah (filter modulation).

Procedure:

From: AFM Element job directory   (JUMP #230)
Select: job 06:LFO and press   (JUMP #244)
  F1 (Main)
Specify: parameters for the main LFO
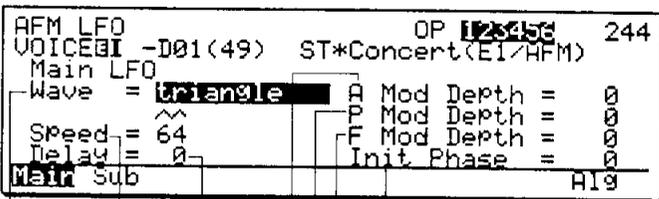
❶ Wave (triangle, saw down, saw up, square, sine, sample&hold): This selects the wave (shape of modulation) produced by the Main LFO. The selected wave is graphically displayed in the LCD. When sample&hold is selected, the LFO will produce a control signal whose level will change randomly at intervals of time deter-mined by the Speed setting.
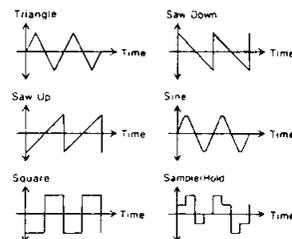
❷ Speed (0...99): The speed of the LFO modula-tion. Higher settings result in faster modulation. At a setting of 0, one cycle will be approximately 34 seconds.

❸ Delay (0...99): The time delay before the LFO modulation begins.

❹ Init Phase (0...99): Initial Phase determines the point of the waveform from which the LFO will begin when a key is pressed. The LFO wave-form always starts over again from this initial phase point when each note is played. An initial phase setting of 0...99 corresponds to a phase of 0...360 degrees.

❺ A Mod Depth (0...127): Amplitude Modulation Depth determines how much the LFO will affect the output level (amplitude) of the operators. For this setting to have an effect, the AModSens (amplitude modulation sensitivity) of an operator must be set above 0. Refer to *5. AFM sensitivity.*

⑥ P Mod Depth (0...127): Pitch Modulation Depth determines how much the LFO will affect the pitch of the operators. For this setting to have an effect, the PModSens (pitch modulation sensitivity) of an operator must be set above 0. Refer to *5. AFM sensitivity.*

⑦ F Mod Depth (0...127): Filter Modulation Depth determines how much the LFO will affect the cutoff frequency of the filter. For this setting to have an effect, the Ctrl setting of a filter must be set to "LFO", and the LFO Cutoff Sens setting must not be 0. Refer to *8.1 Cutoff frequency.*
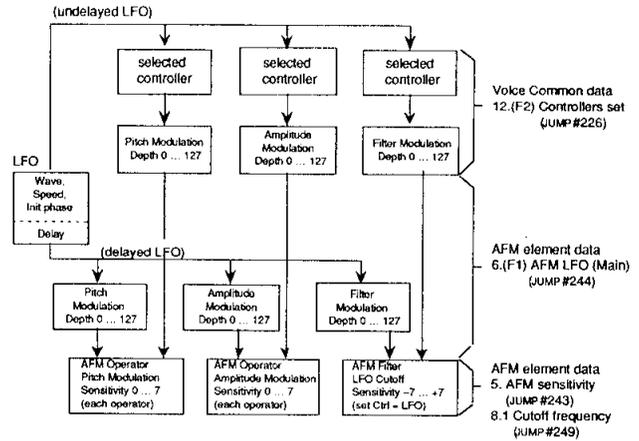
AFM ELEMENT DATA

6. (F2) AFM LFO (Sub)

JUMP #245

Summary: The Sub LFO is completely independent of the Main LFO, but can be used only to create vibrato (pitch modulation). This will apply equally to all operators, and is not affected by pitch modulation sensitivity.

Procedure:

From: AFM Element job directory   (JUMP #230)
Select: job 06:LFO and press   (JUMP #245)
F2 (Sub)
Specify: parameters for the sub LFO

```
AFM LFO              OP ▓▓▓▓▓  245
VOICE8I  -D01(49)  ST*Concert(E1/HFM)
 Sub LFO for Pitch
 Mode = delay         ┌Speed = 35
 Wave = triangle      ├Time  =  0
       ∧∧             │P Mod Depth =  0
Main Sub                              A19
```

❷ ❶ ❸❹   ❺
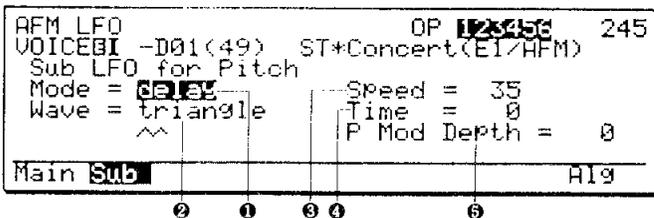
❶ Mode (delay, decay): When this is set to "delay", the Sub LFO will begin after the time delay specified by ❹ Time. When this is set to "decay", the Sub LFO will begin fading out after the time specified by ❹ Time.

❷ Wave (triangle, saw down, square, sample& hold): The wave produced by the Sub LFO.

❸ Speed (0...99): The speed of the LFO modulation. Higher settings result in faster modulation. The speed of the sample&hold wave will be faster than the other waves.

❹ Time (0...99): The time length used for Sub LFO delay or decay.

❺ P Mod Depth (0...127): The depth of pitch modulation produced by the Sub LFO.

Wave: The following four waveforms can be selected for the Sub LFO.

Triangle   Saw Down

Square   Sample/Hold
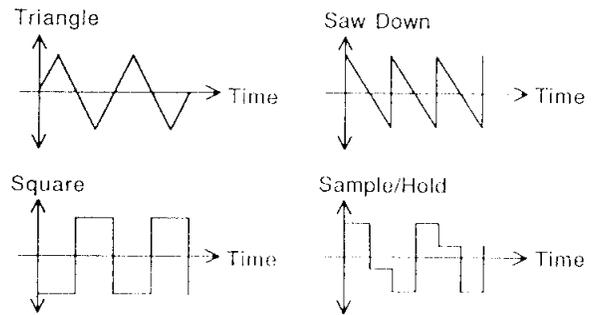
Mode and Time: The mode and time settings work together to determine how the Sub LFO will begin or end. When Mode=delay the Sub LFO will begin after the time delay specified by ❹ Time. When Mode=decay the Sub LFO will affect the sound beginning immediately from when the key is pressed, but will gradually die out after the time delay specified by ❹ Time.

Mode = Delay

Mode = Delay
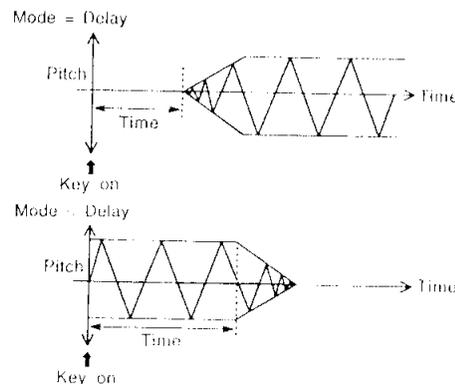
AFM ELEMENT DATA

7. (F1) AFM pitch EG (Switch)

JUMP #246

Summary: The pitch change over time created by the pitch EG can be switched on/off for each operator. To set the shape of the pitch EG, see *7. (F2) AFM pitch EG (EG settings).*

Procedure:

From: AFM Element job directory   (JUMP #230)

Select: job 07:PitchEG and press   (JUMP #246)
        F1 (Sw)

Specify: pitch EG switches, scaling, and range

```
AFM PITCH EG          OP IVXCEG   246
VOICEⵔI  -Dⵔ1(49)   ST*Concert(E1/AFM)
         |OP1 |OP2 |OP3 |OP4 |OP5 |OP6
 PEG Sw     off| off| on | on | off| off
 Rate Scaling = + 0
 Velocity Sw = on
 PEG Range    = 2 oct
  Sw   EG                          AI9
```
❶   ❹ ❸ ❷
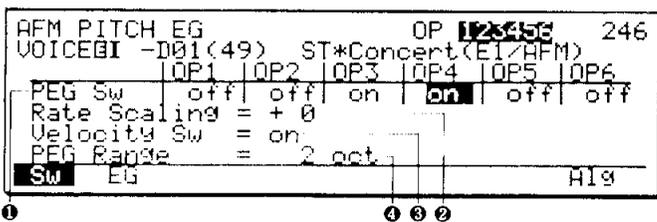
❶ **PEG Sw (off, on):** When the Pitch EG Switch is "off" for an operator, it will not be affected by the pitch EG.

❷ **Rate Scaling (–7...+7):** Pitch EG Rate Scaling determines how pitch EG rates will change according to the note played. When this is set to +1...+7, the pitch EG will be faster for higher notes. When this is set to –1...–7, the pitch EG will be slower for higher notes. When this is set to 0, the pitch EG will be the same rate for all notes.

❸ **Velocity Sw (off, on):** When this is on, strongly played notes will cause the pitch EG to change over a greater range.

❹ **Range (1/2 oct, 1 oct, 2 oct, 8 oct):** This determines the maximum range of the AFM pitch EG, from 1/2 octave to 8 octaves.

PEG Sw: When using the Pitch EG to make the pitch of a sound change over time, you will normally turn the PEG switch on for *all* operators. If the pitch of a modulator operator changes while the pitch of another operator it is modulating remains constant (or vice versa), the *carrier:modulator* ratio will shift during the duration of the sound, changing the overtone structure. This can be an interesting effect in its own right.

Rate Scaling: This setting determines how Pitch EG Rates (the speed of pitch change) will be affected by the key number of each note. The following diagram shows the result when Pitch EG Rate Scaling is set to +7. Notice that high notes have a shorter pitch EG (faster EG rates) than lower notes.
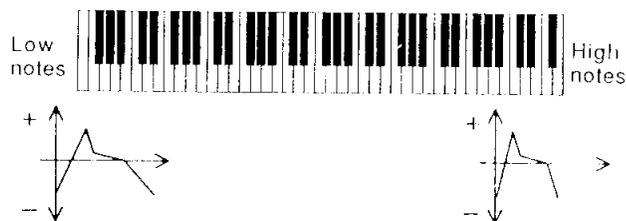
Velocity Sw (velocity switch): When this is "on", strongly played notes will cause the pitch EG to change over a greater range.

AFM ELEMENT DATA

7. (F2) AFM pitch EG (EG settings)

JUMP #247

Summary: The pitch EG creates a fixed shape of pitch change over time for each note. To switch the pitch EG on/off for each operator, see *7. (F1) AFM pitch EG (Switch).*

Procedure:

From: AFM Element job directory   (JUMP #230)

Select: job 07:PitchEG and press   (JUMP #247)
        F2 (EG)

Specify: pitch EG parameters
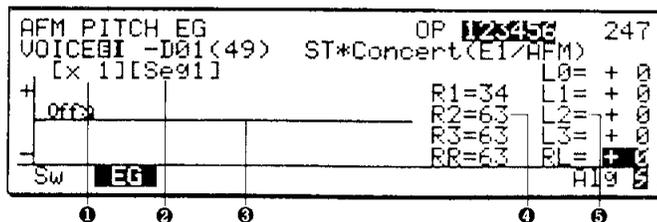
```
AFM PITCH EG             OP IVXCEG   247
VOICEⵔI  -Dⵔ1(49)   ST*Concert(E1/AFM)
   [x 1][Seg1]                    L0= + 0
                         R1=34    L1= + 0
  Off                   R2=63     L2= + 0
                         R3=63     L3= + 0
                         RR=63     RL= + 0
  Sw   EG                          AI9
```
❶   ❷   ❸   ❹   ❺

❶ This indicates the time length shown by the graphic display. To change this, hold SHIFT and press F1–F6 (x1, x2, x5, x10, x20, x50). The exact length of time will depend on the range. When the pitch EG range is 1 octave, the graphic display will cover approximately 0.5 seconds at "x1" and approximately 5 seconds at "x50".

❷ This indicates the EG segment ("seg1–3" or "rel1") from which the pitch EG graphic display begins. If the EG is too long to be fully shown in the LCD, hold SHIFT and press F7 or F8 to move the pitch EG graphic display to a different segment.

❸ The pitch EG is graphically displayed.

❹ R1–R3, RR1 (0...63): Keyon Rates 1–3 and the Release Rate determine the speed of the pitch EG. Higher settings result in faster change. A rate of 63 will make the pitch jump instantly to the next level.

❺ L0–L3, RL (–64...+63): Keyon Levels 0–3 and the Release Level determine the levels of the pitch EG. Positive settings raise the pitch and negative settings lower the pitch.

Rates and Levels: When you press a key, the pitch will begin at the level of L0, and will change at the rate of R1 to level L1. When the level reaches L1, the pitch will change at the rate of R2 to the level of L2. When the pitch reaches L2, it will change at the rate of R3 to the level of L3 and will stay at L3 as long as the key is pressed.

When the key is released, the pitch will change at the rate of RR to the level of RL.
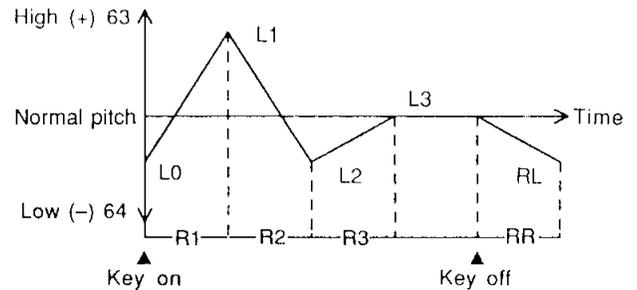
Note: Even if the AFM pitch EG and the AWM pitch EG have identical Rate settings, there will be slight differences in the timing of the pitch change.

AFM ELEMENT DATA

8. AFM filter

JUMP #248

Summary: The two filters of each element can be used to control the tone in various ways.

Procedure:

From: AFM Element job directory (JUMP #230)
Select: job 08:Filter (JUMP #248)
Specify: the desired job and press ENTER
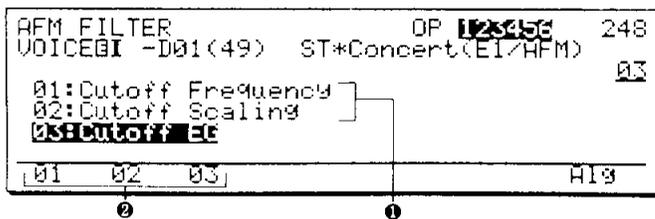
❶ Move the cursor in this area to select a job and press ENTER to move to the selected job.

01: Cutoff Frequency: Make overall settings for the filters.

02: Cutoff Scaling: Specify how each filter will be adjusted across the keyboard.

03: Cutoff EG: Specify how each filter will change over time.

❷ Pressing F1–F3 will select the corresponding job.

AFM ELEMENT DATA / AFM FILTER

8.0 Copy filter

Summary: Any time while editing a filter, you can copy the data from one filter to the other filter.

Procedure:

From: 8.1 Cutoff Frequency   (JUMP #249)
8.2 Cutoff Scaling   (JUMP #250)
8.3 Cutoff EG   (JUMP #252–#255)

Press: COPY

Select: the copy direction (1→2 or 2→1)

To execute: the copy operation press F8 (Go)

To quit: without copying press EXIT

```
COPY FILTER

Copy Direction = 1→2
                                      Go
```
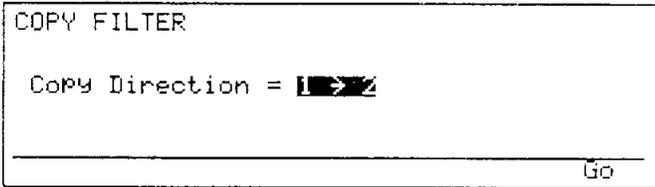
Specify whether to copy the data from filter 1 to filter 2 (1→2) or from filter 2 to filter 1 (2→1). Press F8 (Go) and the data will be copied. If you decide not to copy the data, press EXIT to exit without copying.

The filter type (HPF/LPF/THRU) will not be copied.

AFM ELEMENT DATA / AFM FILTER

8.1 Cutoff frequency

JUMP #249

Summary: Each filter can be set to a different type, cutoff frequency, and control source. Overall resonance, velocity sensitivity, and LFO Cutoff Sensitivity can also be specified.

Procedure:

From: AFM Element job   (JUMP #248)
directory 8. AFM filter

Select: 01:Cutoff Frequency   (JUMP #249)

Specify: parameters for filters 1 and 2

```
CUTOFF FREQUENCY       OP         249
VOICEB1 -D01(49) ST*Concert(E1/HFM)
        │Type│   │Cutoff Freq│Ctrl│
Filter1 │LPF │   │699.2 Hz ( 59)│EG│
Filter2 │LPF │   │699.2 Hz ( 59)│EG│
Resonance =   0   Velocity Sens  = +1
                  LFO Cutoff Sens = +7
                         Sync     HIG
```
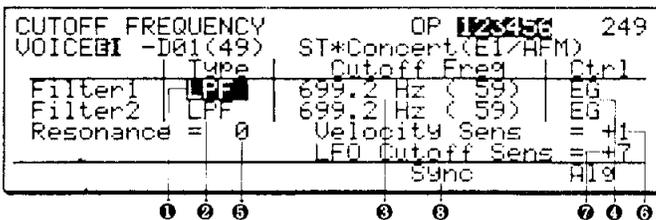
① Filter 1 Type (Thru, LPF, HPF): Filter 1 can be used either as a Low Pass Filter (LPF) or as a High Pass Filter (HPF). When "Thru" is selected the filter will have no effect.

② Filter 2 Type (Thru, LPF): Filter 2 can be used only as a LPF.

③ Cutoff Freq (HPF = 0 Hz ... 11.66 kHz (0...114); LPF = 0 Hz ... 22.43 kHz (0...127): The cutoff frequency of each filter can be adjusted independently. The number 0...127 displayed in parentheses indicates the data value input when using the numeric keypad. Note that the highest HPF setting is 11.66 kHz.

④ Ctrl (EG, LFO, EG-VA): Each of the two filters can be controlled in a different way. For details, see the explanations below for *Ctrl = EG, Ctrl = LFO, Ctrl = EG-VA*.

⑤ Resonance (0...99): Higher settings of resonance will result in a more pronounced peak of emphasis at the cutoff frequency. This setting will apply to both filters 1 and 2.

⑥ Velocity Sens (-7...+7): This determines how the cutoff frequency of both filters will be affected by key-on velocity. For positive settings (+1...+7) the cutoff frequency will increase as you play more strongly, resulting in a brighter sound. For negative settings (-1...-7) the cutoff frequency will decrease as you play more strongly, resulting in a darker sound.

⑦ LFO Cutoff Sens (-7...+7): This determines how Filter Modulation from the Main LFO will affect the filters. This setting also determines how sensitive the filters will be to the controller assigned to Filter Bias in *Voice common data 12. (F5) Controller set (Other)* (JUMP #228) (page 130). Negative settings will reverse the effect of the assigned controller.

⑧ Sync: This is not a parameter, but a convenience that allows you to adjust both filters together. When you press F6 (Sync), the "Sync" display will be inverted, and all adjustments you make to either filter 1 or filter 2 will be automatically

set for the same parameter of the other filter. This is useful when you are using the two filters in tandem to act as a steep 24 dB/octave filter or as a 12 dB/octave band pass filter. See the following explanation *Type and Cutoff Freq*. Press F6 once again to cancel filter sync editing mode.

Type and Cutoff Freq: Filter 1 can be used either as a Low Pass Filter (LPF) or as a High Pass Filter (HPF), and filter 2 can be used only as a LPF.

When set to LPF, filters 1 and 2 will allow sound lower than the cutoff frequency to pass unchanged, and will diminish the sound above the cutoff frequency. When set to HPF, filter 1 will allow sound higher than the cutoff frequency to pass, and will diminish the sound below the cutoff frequency.

Low Pass Filter (LPF)   High Pass Filter (HPF)

Level   Level

Frequency   Frequency
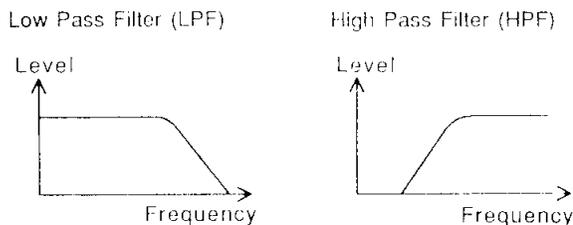
By setting filter 1 to HPF and filter 2 to LPF, you can create a Band Pass Filter that passes only a central band of frequencies.

HPF   +   LPF   =   BPF
(Filter1)   (Filter2)   (result)
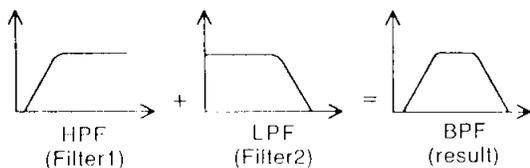
Each of the SY99's filters has a slope of 12 dB/octave. This means that if the cutoff frequency of an LPF is 1 kHz, frequencies at 2 kHz will be reduced by 12 dB and frequencies at 4 kHz will be reduced by 24 dB. If you set both filters 1 and 2 to LPF, set both to the same cutoff frequency, and set both filter EGs in the same way, the result will be the equivalent of a single 24 dB/octave filter. The filter copy function explained in *8.0 Copy filter* is a quick way to give both filters the same settings.

12 dB/octave   +   12 dB/octave   =   24 dB/octave
(Filter1)   (Filter2)   (result)
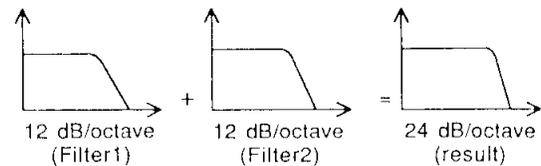
24 dB/octave filtering creates a sharp cutoff which is quite obvious, while 12 dB/octave filtering is a more subtle effect. Analog synthesizers of the past have used both types. 12 dB/octave filtering was considered especially suitable for strings, and 24 dB/octave filtering was commonly used for brass or synth bass sounds.

Resonance: Resonance lowers the level of sound below the cutoff frequency, creating an increased peak of emphasis. (This may reduce the overall volume.) High settings of resonance will make changes in cutoff frequency quite easy to notice. When the two filters are being used in tandem as a Band Pass Filter (i.e., when filter 1 is set to HPF), resonance will have no effect.

Resonance = 0   Resonance = 20
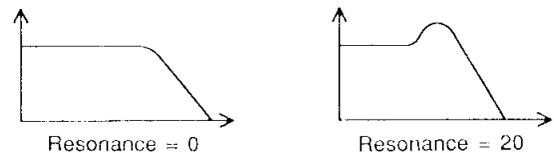
Extremely high settings of filter resonance will make the filter oscillate so that it produces a pitch of its own. This is a technique often used on analog synthesizers of the past.

Ctrl = LFO: When Ctrl is set to LFO, the filter will be controlled both by the Main LFO and by the controller which has been assigned to Filter Cutoff Depth. (Refer to *Voice common data 12. (F4) Controller set (Pan)*, page 130.) Key velocity will shift the cutoff frequency.

Ctrl = LFO
Filter Modulation Depth
(Common 12. (F2) Controllers set
(Pitch bend))
Filter Modulation Depth
(AFM element 5. LFO (Main))

Filter Cutoff Depth
12. (F4) Controllers set
(Other)

(LFO) → LFO Cutoff Sensitivity −7 ... +7 (for both filters) ← (direct offset bias)
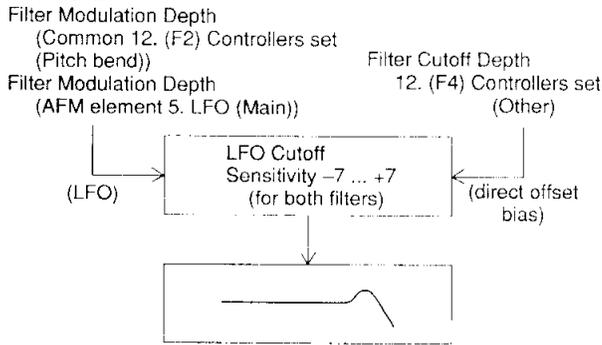
Ctrl = EG: When Ctrl is set to EG, the filter will be controlled by its own filter EG as explained in the following section *8.3 Filter EG*. If Velocity Sense is set to a value other than 0, key velocity will shift the overall offset of the EG. The position of the controllers assigned to Filter Modulation Depth and Filter Cutoff Depth will be sampled at the beginning of the note (key on), but will have no effect *during* the note.

Ctrl = EG-VA: When Ctrl is set to EG-VA (EG voice attack), the filter will be controlled by its own filter EG as explained in the following section *8.3 Filter EG*. If Velocity Sense is set to a value other than 0, key velocity will modify L1 (level 1) and R1 (rate 1) of the filter EG.

Ctrl = EG or Ctrl = EG – VA
Filter Modulation Depth
(Common 12. (F2) Controllers set
(Pitch bend))
Filter Modulation Depth
(AFM element 5. LFO
(Main))

Filter Cutoff Depth
12. (F4) Controllers set
(Other)

(LFO) → LFO Cutoff Sensitivity −7 ... +7 (for both filters) ← (direct offset bias)
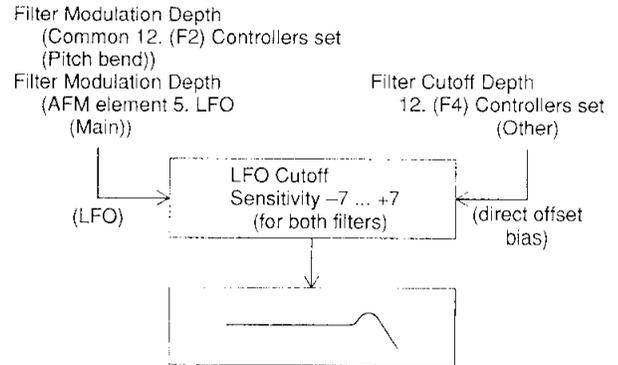
Note: When Ctrl=EG or Ctrl=EG-VA, the effect of the controller on the cutoff frequency will be fixed when the note is played. Moving the controller after playing the note will have no effect.

AFM ELEMENT DATA / AFM FILTER

8.2 Cutoff scaling

JUMP #250

Summary: The cutoff frequency of each filter can be adjusted across the keyboard.

Procedure:

From: AFM element job   (JUMP #248)
     directory 8. AFM filter
Select: 02:Cutoff Scaling
     filter 1 press F1 (Flt1)   (JUMP #250)
     filter 2 press F2 (Filt2)   (JUMP #251)
Specify: filter scaling parameters

```
CUTOFF SCALING         OP ▮▷▚▜▚  250
VOICE▮P1-A01<01>  AP!Rocks  <E1/HFM)
┌LPF COF = 2.047kHz< 80)    ▕Note▕Offset▏
│                          BP1│B 1 │ −  4
│      _____        BP2│B 2 │ + 10
│     /          \        BP3│G 4 │ + 17
│____/            \___    BP4│▮▮5▮│ +  4
▮▮▮▮ Flt2                  Sync Kbd  Hig
```

❶   ❸   ❷

❶ This indicates the type of the filter being edited, and its cutoff frequency. The cutoff frequency can be modified from this job, but to modify the type of filter you must use job *8.1 Filter cutoff*.

❷ BP1–4 (Break Point): Note (C-2...G-8) and Offset (−127...+127) of each Break Point determine

how the cutoff frequency level of the filter will vary across the keyboard. When the cursor is located at note, you can press F7 (Kbd) and press a key to enter the new note setting.

❸ Sync: Press F6 to turn filter sync editing mode on or off. For details, refer to ❸ Sync on page 150.

Break Point: The filter cutoff frequency can be made to vary depending on the note that is played. On most acoustic instruments, notes differ in tone depending on the range in which they are played.

Use the four break points to specify how the filter cutoff frequency will be adjusted across the keyboard. Offset (−127...+127) determines how the cutoff frequency will be adjusted at each of the four points specified by Note (C-2...G-8).

The four note settings must be in ascending order. It is not possible to set a break point to a note lower or higher than the note settings of the neighboring break points.

The following diagram shows how the filter cutoff frequency would be adjusted across the keyboard for the values in the LCD above.
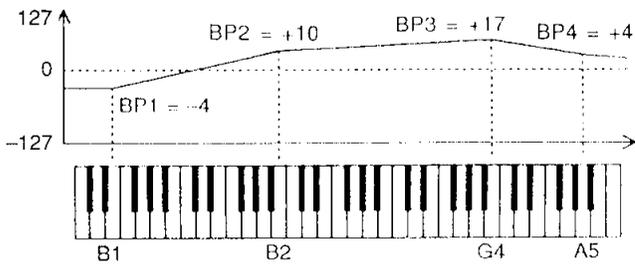
The offset at each break point is added to the cutoff frequency of 80. For example the offset at break point 1 (E1) is –4, so the resulting cutoff frequency at E1 is 76. The resulting cutoff frequency is limited to the range of 0...127.

AFM ELEMENT DATA / AFM FILTER

8.3 Cutoff EG

JUMP #252

Summary: The cutoff frequency of each filter can be moved over time by its own EG to make the tone change.

Procedure:

From: AFM element job directory   (JUMP #248)
      8. AFM filter

Select: 03:Cutoff EG
       filter 1 rates press   (JUMP #252)
       F1 (Flt1), F3 (Rate)
       filter 1 levels press   (JUMP #253)
       F1 (Flt1), F4 (Lvl)
       filter 2 rates press   (JUMP #254)
       F2 (Flt2), F3 (Rate)
       filter 2 levels press   (JUMP #255)
       F2 (Flt2), F4 (Lvl)

Specify: filter EG parameters
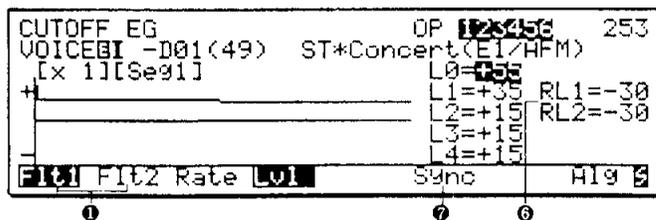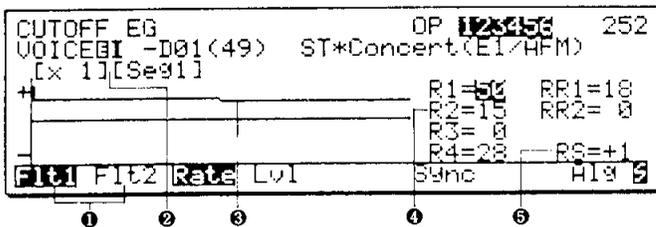
❶ This indicates whether you are editing the EG of filter 1 or 2.

❷ This indicates the displayed segment and range of the EG graphic display. To change the display range, hold SHIFT and press F1–F6 (x1, x2, x5, x10, x20, x50). To shift the display to a different segment, hold SHIFT and press F7 or F8 (Seg1...Seg4, Rel1).

❸ The filter EG is graphically displayed.

❹ R1–R4, RR1–RR2 (Keyon Rates, Release Rates 0...63): Keyon Rates 1–4 and Release Rates 1–2 determine the speed of the filter EG. Higher settings result in faster change.

❺ RS (Rate Scaling –7...+7): Rate Scaling allows the filter EG rates to be increased or decreased depending on the key that is played. For positive settings the EG rates will increase as you play higher notes, resulting in shorter envelopes. For negative settings the EG rates will decrease as you play higher notes, resulting in longer envelopes.

❻ L0–L4, RL1–2 (Keyon Levels, Release Levels –64...+63): Keyon Levels 0–4 and Release Levels 1–2 determine how the filter EG will increase or decrease the cutoff frequency specified for the filter.

❼ Sync: Press F6 to turn filter sync editing mode on or off. For details, refer to ❽ Sync on page 150.

Rates and Levels: The levels of the filter EG do not directly determine the cutoff frequency of the filter, but rather *adjust* the filter cutoff frequency you set in *8.1 Filter cutoff.*

When a note is played, the filter cutoff will be adjusted by the amount of L0, and will change at the rate of R1 to level L1. When the level reaches L1, it will change at the rate of R2 to the level of L2. When the level reaches L2, it will change at the rate of R3 to the level of L3. When the level reaches L3, it will change at the rate of R4 to the level of L4. The filter cutoff frequency will remain at the level of L4 as long as you continue pressing the key.

When you release the key, the filter cutoff frequency will change at the rate of RR1 to the level of RL1. When the level reaches RL1, it will change at the rate of RR2 to the level of RL2.
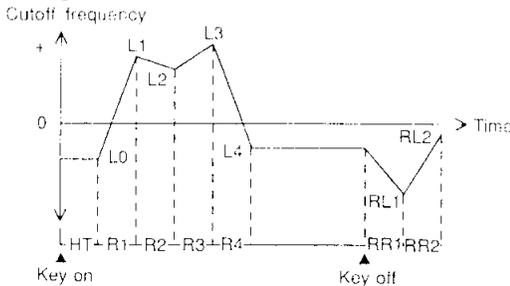
Rate Scaling: On most acoustic instruments, high notes have a naturally shorter attack and decay. This can be simulated by setting rate scaling to a positive value (+1...+7). The following diagram shows how higher notes will have faster rates (shorter EGs). Negative settings will have the opposite effect.

AFM ELEMENT DATA

15. Initialize AFM element

Summary: Initialize the AFM element data being edited to a set of basic values.

Procedure:
From: AFM Element job (JUMP #230) directory
Select: job 15:Initlz
To execute: the initialize operation press YES
To quit: without executing press NO or EXIT

```
INITIALIZE AFM ELEMENT

  ARE YOU SURE ?
       (Yes or No)
```

This function sets all AFM element data values to the minimum or simplest possible settings. When creating your own new voices it is usually best to begin by editing an existing voice. However if you want to start from scratch, this Initialize function can be helpful.

If you are sure you want to initialize the AFM element data, press YES. The AFM element data being edited will be set to the values shown below. If you decide not to initialize, press NO or EXIT.

This function initializes only AFM element data. Other initialize functions are provided for initializing Voice Common data and AWM element data. Refer to *Voice Common 15* (page 132). *Initialize voice* or *AWM element 15. Initialize AWM element* (page 170).

Initialized settings for AFM element data

01 Algorithm Set

Algorithm number	= 30
Feedback 1	= none (free)
Feedback 2	= none (free)
Feedback 3	= none (free)
Input Level 1	= 7 (operator 1–5)
Input Level 1	= 0 (operator 6)
Input Level 2	= 0 (all operators)
Noise	= Off (all operators)
AWM Wave	= Off (all operators)

02 Operator Oscillator (all operators)
Freq.Mode   = Ratio
Freq   = 1.00
Detune   = ±0
Waveform   = 1 (sine)
Phase Sync   = On
Init Phase   = 0

03 Operator EG (all operators)
Keyon Hold Time = 0
Keyon Rates 1–4 = 63
Keyoff Rates 1–2 = 63
Rate Scaling   = ±0
Keyon Level 0   = 0
Keyon Levels 1–4 = 63
Keyoff Levels 1–2 = 0
Loop Point   = S4

04 Operator Output
Output Level   = 127 (operator 1)
Output Level   = 0 (operators 2–6)
Break Point 1 Note = C1
Break Point 2 Note = G2
Break Point 3 Note = E4
Break Point 4 Note = C6
Break Point Levels = 0 (break points 1–4)

05 Operator Sensitivity (all operators)
Keyon Velocity Sens = 0
Rate Velocity Switch = off
AMS   = 0
PMS   = 3

06 LFO
Main LFO
Wave   = triangle
Speed   = 35
Delay Time   = 0
AMD, PMD, FMD = 0
Init Phase   = 0

Sub LFO
Mode   = delay
Wave   = triangle
Speed = 80
Time   = 0
PMD   = 0

07 Pitch EG
Operator On/Off   = on (all operators)
Rate Scaling   = ±0
Velocity Switch   = off
Range   = 8 oct
Keyon Rates 1–3   = 63
Keyoff Rate 1   = 63
Keyon Levels 1–3 = ±0
Keyoff Level 1   = ±0

08 Filter
Resonance   = 0
Cutoff Mod Sens   = ±0
Keyon Velocity Sens = ±0
*** following data is same for both filters ***
Filter Type   = thru
Filter Control   = LFO
Cutoff Frequency = 127
Break Point 1 Note = C1
Break Point 2 Note = G2
Break Point 3 Note = E4
Break Point 4 Note = C6
Break Point Offset = 0 (BP 1–4)
Keyon Rates 1–4   = 63
Keyoff Rates 1–2 = 63
Rate Scaling   = ±0
Keyon Levels 0–4 = ±0
Keyoff Levels 1–2 = ±0

AFM ELEMENT DATA

16. Recall voice

Summary: Recall all data of the previously edited voice.

Procedure:
From: AFM Element job   (JUMP #230)
        directory
Select: job 16:Recall voice
To execute: the recall operation press YES
To quit: without executing press NO or EXIT.

Note: This operation recalls all voice data, not just AFM element data, and is also available while editing Common data, AWM Element data, or Drum Set data. For details refer to Voice Common 16. Recall voice. page 133.

AWM element data

AWM element job directory

JUMP #256

Summary: This directory shows the jobs which edit AWM element data.

Procedure:

From: voice edit mode (JUMP #200 or #201)

When: editing a normal voice that contains AWM elements

Select: an AWM element F3–F6 (JUMP #256) (E1–E4)

```
VOICE EDIT E1:AFM E3:AWM 256
             E2:AFM E4:AWM
∎I -D01(49) ST*Concert          02
01: -----   05:Sensitv 09: ----+ 13: -----
02:WaveSet  06:LFO      10: ----+ 14: -----
03:EG       07:PitchEG  11: ----+ 15:Initlz
04:Output   08:Filter   12: ----+ 16:Recall
Mode Com    E1    E2      E3    E4
```
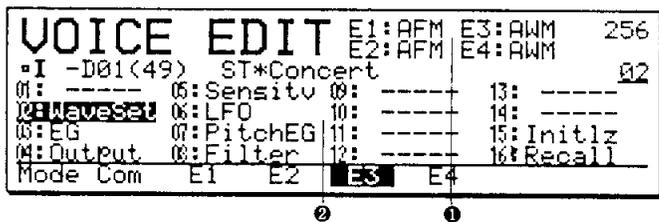
❶ This area shows the number (E1–E4) and type (AFM or AWM) of elements in the selected voice mode.

❷ Move the cursor in this area to select a job and press ENTER to go to the selected job.

02:WaveSet (AWM waveform set): Select an AWM sampled waveform and specify the pitch at which it will sound.

03:EG (AWM EG): The AWM Amplitude EG determines how the volume of each note will change over time.

04:Output (AWM output): The output level of an AWM element can be adjusted across the keyboard.

05:Sensitv (AWM sensitivity): Key-on velocity can affect the volume or the speed of attack and decay. The control signal from the AWM LFO can create vibrato, tremolo, or wah-wah.

06:LFO (AWM LFO): The AWM element LFO creates a cyclically changing control signal that can be used for tremolo, vibrato, or wah-wah.

07:PitchEG (AWM pitch EG): The pitch of each note can be made to change in a fixed way over time.

08:Filter (AWM filter): The tone of an AWM element can be made to change in a fixed way over time, or can be controlled by a controller or the LFO.

15:Initlz (Initialize AWM element): When you are creating a voice from scratch, it is sometimes convenient to set all AWM element data to the basic or minimum values.

16:Recall (Recall voice): All data of the previously edited voice can be recalled.

Copy element

Summary: While editing any AWM parameter (except for 8. AWM filter), you can copy data from an AWM element of another voice into the AWM element you are now editing.

Procedure:

From: AWM element job 2, 3, 4, 5, 6, or 7

Press: COPY

Press: F1 (Src) and select the source voice

Press: F2 (Elem) and select the source element

To execute: the copy operation press F8 (Go).

- This copy operation is identical to the operation explained in *AFM element data, Copy element* (page 135). Please refer to that section for details.
- This copy operation is possible only while *inside* one of the AWM editing jobs. It is not available from the AWM job directory.

- Pressing COPY while editing 8. *AWM filter* will access the Copy Filter operation. For details, refer to *AFM element data, 8.0 Copy filter*, page 150.

AWM ELEMENT DATA

2. AWM waveform set

JUMP #257

Summary: Select an AWM waveform and specify the pitch at which it will sound.

Procedure:

From: AWM Element job directory (JUMP #256)
Select: job 02:WaveSet (JUMP #257)
Specify: the waveform and frequency

```
AWM WAVEFORM SET               257
VOICE∎I -D01(49)   ST*Concert(E3/AWM)

Waveform      = Prset1  31 Strings2
Frequency Mode = normal
Frequency Fine = + 0

Pre1 Pre2 Card Intr AFM
      ❺              ❸ ❷    ❶
```

```
AWM WAVEFORM SET               257
VOICE∎I -D01(49)   ST*Concert(E3/AWM)

Waveform      = Prset1  31 Strings2
Frequency Mode = fixed
Frequency Fine = + 0
Fixed Note    = C 3

              ❹ ❷
```

❶ Waveform: Select an AWM waveform from internal preset memory (Pre1, Pre2), a wave-form card (Card), a waveform consisting of user-loaded samples (Intr), or the waveform produced by the output of the AFM element (AFM). When the cursor is located at Waveform, you can press a function key F1–F5 to select the waveform type. For details, refer to the following explanations of *Waveform=*.

❷ Frequency Mode (normal, fixed): When this is set to "normal", each note of the keyboard will play the selected waveform at a different pitch. When this is set to "fixed", the waveform will be played back at the pitch specified by ❹ Note Number regardless of which note was played.

❸ Frequency Fine (–64...+63): This is a fine adjustment of the waveform pitch.

❹ Note Number (C-2...G8): This setting will appear only if frequency mode ❷ has been set to "fixed". This setting determines the pitch at which the selected waveform will be played back. When the cursor is located at Note Number, you can press F8 (Kbd) and then press a key to specify the note number.

❺ When the cursor is located at Waveform ❶, you can press a function key F1–F5 to select the waveform type. Pressing F1–F3 will select Preset 1, Preset 2, or Card waveforms. If the contents of a waveform card have been loaded into sample memory by the *Card utility 4.Load from wave card* operation (page 264), or if you have created waveforms from samples that were loaded into sample memory from disk or via MIDI sample dump, pressing F4 (Intr) will select these waveforms. If the voice mode is 09:1AFM&1AWM or 10:2AFM&2AWM, pressing F5 (AFM) will select the waveform produced by the output of the AFM element. For details, refer to the following explanations of *Waveform=*.

Waveform = Preset 1/2: The 8 Mbytes (4 Mwords) of preset waveforms in internal ROM are organized as follows.

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VOICE EDIT MODE

Preset 1

No.	WaveForm	No.	WaveForm	No.	WaveForm	No.	WaveForm
1	Piano	40	Celesta	79	EG Harm1	118	Ride
2	Trumpet	41	Harpsi	80	EG Harm2	119	Choke
3	MuteTp 1	42	Pipe Wv	81	EG Mute	120	Claps 1
4	MuteTp 2	43	AnlgBrs1	82	EG Comp	121	Claps 2
5	Horn	44	AnlgBrs2	83	EG Dist	122	Cowbell1
6	Flugel	45	AnlgBrs3	84	EG Pluk1	123	Cowbell2
7	Trombone	46	Pad 1	85	EG Pluk2	124	Tambrn
8	Tuba	47	Pad 2	86	BD 1	125	Shaker
9	Brass	48	AnlgBass	87	BD 2	126	FngrSnap
10	BrsFall	49	FrtlsSyn	88	BD 3	127	AnlgPerc
11	Tenor1	50	Chorus	89	BD 4	128	NoisePrc
12	Tenor2	51	Chorus L	90	BD 5	129	Scratch
13	Alto Sax	52	Chorus R	91	BD 6	130	Agogo
14	Baritone	53	Itopia	92	BD 7	131	Berimbau
15	Soprano	54	Choir	93	BD 8	132	Bongo
16	Tenors	55	OohChoir	94	SD 1	133	Cabasa
17	Flute	56	Vibe	95	SD 2	134	Cga Hi
18	Clarinet	57	Marimba	96	SD 3	135	CgaHiSlp
19	Piccolo	58	Tubular	97	SD 4	136	Cga Lo
20	Reed Wv	59	Xylophon	98	SD 5	137	CgaLoSlp
21	Basoon	60	Glocken	99	SD 6	138	Clave
22	Recorder	61	SteelDrm	100	SD 7	139	Guiro 1
23	MtReedWv	62	HandBell	101	SD 8	140	Guiro 2
24	PanFlute	63	Shamisen	102	SD 9	141	Maracas
25	Violin	64	Koto	103	SD Side	142	SD roll
26	Cello	65	Harp	104	Tom 1	143	Tabla Hi
27	ContraBs	66	Sitar	105	Tom 2	144	Tabla Lo
28	Pizz	67	E.Bass 1	106	Tom 3	145	Temple
29	SectPizz	68	E.Bass 2	107	Tom 4	146	Timbale1
30	Strings1	69	E.Bass 3	108	Tom 5	147	Timbale2
31	Strings2	70	ThmpBass	109	Tom 6	148	Timpani
32	StringsL	71	SlapBass	110	HH foot	149	Whisle
33	StringsR	72	Fretless	111	HH light	150	Belltree
34	Organ 1	73	WoodBass	112	HH mid	151	BDs Wv
35	Organ 2	74	GtrSteel	113	HH heavy	152	SDs Wv
36	E.P.Wv1	75	GtrNylon	114	HH open	153	Toms Wv
37	E.P.Wv2	76	12string	115	HHclAnlg	154	CymbalWv
38	Clavi 1	77	EG Sng1	116	HHopAnrg	155	Drums Wv
39	Clavi 2	78	EG Humbk	117	Crash		

Preset 2

No.	WaveForm	No.	WaveForm	No.	WaveForm	No.	WaveForm
1	Piano Np	29	Typist	57	DigiVox2	85	Stuff 20
2	E.P. Np	30	BellRing	58	DigiVox3	86	Stuff 21
3	Vibe Np	31	SeqLatin	59	DigiVox4	87	Stuff 22
4	DmpPiano	32	EleMagic	60	DigiVox5	88	Stuff 23
5	Bottle 1	33	Vox Bell	61	Pluse 10	89	Stuff 24
6	Bottle 2	34	Mellow	62	Pluse 25	90	Stuff 25
7	Bottle 3	35	BigSyn L	63	Pluse 50	91	Stuff 26
8	Tube	36	BigSyn R	64	Tri	92	Stuff 27
9	Vocal Ga	37	VoxGrace	65	DigiWild	93	Stuff 28
10	Vocal Ba	38	Cry Bell	66	Stuff 1	94	Stuff 29
11	Sax tran	39	Voices	67	Stuff 2	95	Stuff 30
12	Bow tran	40	AnlgSaw1	68	Stuff 3	96	Stuff 31
13	Blub	41	AnlgSaw2	69	Stuff 4	97	Stuff 32
14	Tear	42	CS Saw	70	Stuff 5	98	Stuff 33
15	Bamboo	43	CS Sqr	71	Stuff 6	99	Stuff 34
16	Cup Echo	44	Digital1	72	Stuff 7	100	Stuff 35
17	Digi Atk	45	Digital2	73	Stuff 8	101	Stuff 36
18	Temp Ra	46	Digital3	74	Stuff 9	102	Stuff 37
19	Giri	47	Digital4	75	Stuff 10	103	Stuff 38
20	Water	48	Digital5	76	Stuff 11	104	Stuff 39
21	Steam	49	Digital6	77	Stuff 12	105	Stuff 40
22	Narrow	50	Digital7	78	Stuff 13	106	Stuff 41
23	Airy	51	Digital8	79	Stuff 14	107	Stuff 42
24	Styroll	52	Digital9	80	Stuff 15	108	Stuff 43
25	Noise	53	Digitl10	81	Stuff 16	109	Stuff 44
26	Bell Mix	54	Digitl11	82	Stuff 17	110	Stuff 45
27	Haaa	55	Digitl12	83	Stuff 18	111	Stuff 46
28	OhAttack	56	DigiVox1	84	Stuff 19	112	Stuff 47

AWM ELEMENT DATA

2.0 Waveform edit

Summary: Using these functions, you can edit the samples that have been loaded into the internal sample memory, and assign them as waveforms.

Procedure:

When: internal waveforms have been selected by pressing F4 from waveform set

(JUMP #257)

Press: F8 (Edit).

Select: a waveform to edit.

Specify: the first and last samples used by the waveform.

To clear: the sample assignments for the waveform, press F5 (Init).

To rename: the waveform, press F7 (Name).

To edit: sample data, press F8 (Smpl).

```
WAVEFORM EDIT
                                    01
Waveform name      From      To
01:MY Piano        01        03
02:New Wave        03        03
03:INT-WAVE        --        --
04:INT-WAVE        --        --
 ▲      ▼           Init      Name Smpl
 ❶       ❷    ❹    ❺  ❸            ❻
```

❶ This area displays the names and numbers of internal waveforms (1-64). Move the cursor or use the numeric keys to select a waveform. If necessary, press F1 or F2 to scroll the display.

❷ Move the cursor to the "From" column to specify the first sample used by the selected waveform.

❸ Move the cursor to the "To" column to specify the first sample used by the selected waveform. (The samples used by a waveform must be consecutive.)

❹ To initialize the currently selected waveform, press F7 (Init). For details refer to the following section *Initialize waveform.*

❺ To rename the currently selected waveform, press F7 (Name). For details refer to the following section *Waveform name.*

❻ To edit samples or change the sample assignment for the currently selected waveform, press F8 (Smpl). Refer to the following section *Sample assign.*

To copy samples: Samples may be copied within the sample memory using the sample utility function (JUMP #827) described in *Sample utility 1.Sample directory,* page 275.

To load samples: To load samples via MIDI sample dump, simply connect the MIDI OUT of the transmitting device to the MIDI IN of the SY99, and make the transmitting device transmit a sample dump. The SY99 can receive sample dumps at any time, regardless of the mode it is in.

To load sample data from a floppy disk, use the operation described in *Sample utility 3.Load from disk,* page 277. To load waveform data from a waveform card, use the operation described in *Card utility 4.Load from wave card,* page 264. Samples from disks and waveform cards may be edited; keep in mind, however, that sample data loaded to the SY99 from waveform cards and copy-protected disks cannot be saved to disk or output via MIDI sample dump.

Before samples can be used in an AWM element, they must be assigned to a waveform. Refer to the following section *Sample assign.*

Remarks: When referring to this and the following sections, keep in mind the difference between samples and waveforms:

A sample is a piece of digitally recorded sound. You can load up to 99 user samples from disk or via MIDI sample dump, and adjust the pitch, volume, and loop mode of each sample. (It is not possible to edit the samples of a preset or card waveform.)

A waveform consists of one or more samples assigned across the keyboard. You can create 64 user waveforms by specifying a range of samples to assign to the waveform, the key range sounded by each sample, and the key at which each sample will sound its original recorded pitch. (It is not possible to edit preset or card waveforms.) Refer to the following section *2. (F8) Sample assign.*

AWM ELEMENT DATA / WAVEFORM EDIT
2. (F5) Initialize waveform

Summary: You can initialize the currently selected waveform using this function.

Procedure:

From: Waveform edit

Press: F7 (Name)

To execute: initialization press YES.

To quit: without initializing press NO.

```
INITIALIZE WAVEFORM

    ARE YOU SURE ?

       (Yes or No)
```

This function initializes all sample assignments for the currently selected waveform.

If you are sure you want to initialize the waveform, press YES.

When a waveform is initialized, it is renamed "INT-WAVE" automatically. Dashes are displayed in the "From" and "To" columns for initialized waveforms when the Waveform edit function is selected.

Remark: This function initializes the settings for a single waveform only. It does not initialize the SY99's internal sample memory. To initialize sample memory, use the initialize sample procedure described in *Sample utility 5.Initialize sample*, page 278.

AWM ELEMENT DATA / WAVEFORM EDIT
2. (F7) Waveform name

Summary: You can use this function to change the names of internal waveforms.

Procedure:

From: Waveform edit

Press: F7 (Name)

Specify: the waveform name.

```
WAVEFORM NAME
              ↓
          [My Piano]


Clr  Uppr  Lowr
 ❷    ❸    ❹      ❶
```

❶ Enter an eight-character name for the waveform.

❷ To clear the currently entered name press F1 (Clr).

❸ To switch to upper-case letters press F2 (Uppr).

❹ To switch to lower-case letters press F3 (Lowr).

Remarks: Methods of entering character data are explained in *How to enter character data*, page 30.

AWM ELEMENT DATA / WAVEFORM EDIT
2. (F8) Sample assign

Summary: Here you can edit the original key, key range, volume, pitch, and loop settings for each sample.

Procedure:

From: waveform edit

Press: F8 (Smpl)

Select: one of the samples assigned to the currently selected waveform.

Specify: the original, low key, and high key assignments for the selected sample.

To rename: the sample, press F7 (Name).

To edit: the volume, pitch and loop settings for the sample, press F8.

```
SAMPLE ASSIGN
  Waveform : 01 My Piano              01
                Original  Low key  High key
01: PianoLow     C 3      C#-2      B 1
02: PianoMid     C 3      C 2       B 4
03: PianoHi      C 3      C 5       G 8
 ▲    ▼                  Name  Asgn  Data
 ❶          ❷   ❸           ❹
```

❶ This area displays the names and numbers of the samples that are contained in the SY99's internal sample memory. Move the cursor or use the numeric keys to select a sample. If necessary, press F1 or F2 to scroll the display.

❷ To edit the original key and key range assignments of a sample, move the cursor to one of the columns labelled "Original," "Low key," and "High key." For details, refer to the following *Sample assign* explanation.

❸ To rename the selected sample press F6 (Name). For details, refer to *How to enter character data,* page 30.

❹ To edit the currently selected sample press F8 (Data). For details refer to the following section, *Sample edit.*

Sample assign: After selecting a sample, move the cursor to one of the columns labelled "Original," "Low key," and "High key" to edit the key range and original pitch key assignments of each sample in the waveform. The "Kbd" label will appear for function key F5, as shown below:

```
SAMPLE ASSIGN
  Waveform : 01 My Piano              01
                Original  Low key  High key
01: PianoLow     C 3      C#-2      B 1
02: PianoMid     C 3      C 2       B 4
03: PianoHi      C 3      C 5       G 8
 ▲    ▼             Kbd  Name  Asgn  Data
 ❶           ❷  ❺  ❸  ❼    ❻   ❹   ❽
```

❶ This area displays the names and numbers of the samples that are contained in the SY99's internal sample memory.

❷ Original (C-2...G8): The sample will be played back at its original recorded pitch at this key.

❸ Low key (C#-2...G8): This is the lowest key of the range for which this sample will be played back.

❹ High key (C#-2...G8): This is the highest key of the range for which this sample will be played back. Note that the high key of a sample is always one key below the low key of the next sample. It is not possible to overlap samples in a waveform or to leave gaps between them.

❺ If five or more samples have been assigned to the currently selected waveform, use F1 (△) or F2 (▽) to scroll the display through the samples in the waveform.

❻ To set a parameter in ❷, ❸, or ❹, you can press F7 and then press a note to enter it as the new setting.

❼ To rename the selected sample press F6 (Name). For details, refer to *How to enter character data,* page 30.

❽ To edit the currently selected sample press F8 (Data). For details refer to the following section, *Sample edit.*

When you finish making key assignments for a sample, press EXIT to return to the *Waveform assign* display.

Sample edit: After selecting a sample, press F8 (Edit) to set the pitch, volume, loop type, and loop mode of the sample. A display similar to the following will appear:

```
SAMPLE DATA
  Sample : 01  PianoLow  (16bit:33.3kHz)
  Volume = 127
  Pitch  = + 0
  Loop   = Forward Loop
  Mode   = Normal
                         Name  Asgn  Data
 ❶ ❷    ❺ ❹ ❸              ❻     ❼
```

❶ This area displays the number and name of the sample. If the sample is not copy-protected, its resolution and sampling rate will be displayed here as well.

❷ Volume (+0...+127): Adjust the sample volume.

❸ Pitch (-5376...+5376): Adjust the pitch of the sample. (The range in which the pitch can be adjusted may be smaller for certain samples.)

❹ Loop type. One of the following four loop types may be selected: forward once, forward loop, backward once, or backward loop. Specify the direction (forward or backward) in which the sample will be played back, and whether the sample will play once ("...once") or continue looping as long as a key is pressed ("...loop").

❺ Loop mode. This parameter will appear on the display only if a "...loop" mode was selected in ❹. If "normal" looping is selected, the sample will play back continuously in the specified direction. If "alter" looping is selected, the sample will play back alternately forward and backward.

For a sample of "abc", the loop type and mode settings would produce the following results:

Forward only:	abc
Backward only:	cba
Forward loop (normal):	abcabcabca...
Backward loop (normal):	cbacbacbac...
Forward loop (alter):	abccbaabccba...
Backward loop (alter):	cbaabccbaabc...

❻ To rename the selected sample press F6 (Name). For details, refer to *How to enter character data,* page 30.

❼ To return to *Sample assign* to change the key assignments for the currently selected sample, press F7 (Asgn). For details refer to the preceding section, *Sample assign.*

When you finish editing sample data, press EXIT to return to the *Waveform assign* display.

Remark: Some samples loaded from external devices may produce noise when played using the SY99. Try changing the parameter settings of such samples using the external devices.

AWM ELEMENT DATA

3. AWM EG

JUMP #258

Summary: This determines how the volume of an AWM element will change over time.

Procedure:

From: AWM Element job directory (JUMP #256)

Select: job 03:EG. (JUMP #258)

Specify: volume EG parameters
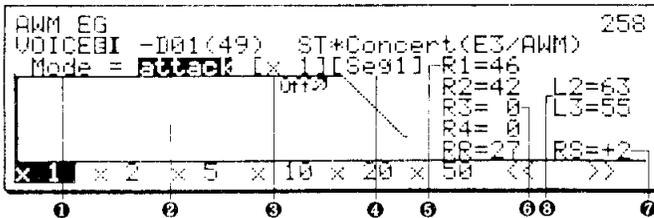
❶ EG Mode (Mode = hold, attack): This setting determines whether the first segment of the AWM EG will begin from level 0 (attack mode) or from maximum level (hold mode).

❷ The AWM EG is graphically displayed.

❸ This indicates the time range of the EG graphic display; "x1" displays the shortest time with the greatest detail. To change the time range, press F1–F6 (x1, x2, x5, x10, x20, x50).

❹ This indicates the segment from which the EG is displayed. To begin the graphic display from a different segment, press F7 or F8 to select Seg1...Seg4 or Rel1.

❺ Hold Time or Rate 1 (HT=63...0 or R1=0...63): If the EG Mode is set to "hold" this will deter-

mine the Hold Time for which the level of the waveform is held at maximum. A setting of HT=63 results in the longest time. If the EG Mode is set to "attack" this will determine Rate 1 of the EG. A R1 setting of 63 results in the fastest attack.

❻ Keyon Rate 2–4, Release Rate (R2–R4 = 0...63, RR = 0...63): These settings determine the speed of the operator EG. Higher values result in faster change.

❼ Rate Scaling (RS = –7...+7): Rate Scaling allows the operator EG rates to be increased or decreased depending on the key that is played. For positive settings the EG rates will increase as you play higher notes, resulting in shorter envelopes. For negative settings the EG rates will decrease as you play higher notes, resulting in longer envelopes.

❽ Keyon Levels 2–3 (L2–L3 = 0...63): These determine the levels of the AWM EG. There is no L1 setting since the AWM EG either begins from 0 and moves toward maximum level (in attack mode), or begins at maximum level and stays there until the hold time has elapsed (hold mode). Nor is there a L4 setting since the level of the AWM EG immediately begins to move toward 0 after reaching L3. If you want the sound to continue sustaining as long as you

163

press a key, set R4 to 0. However some AWM waveforms naturally decay to zero, so setting R4 to 0 will not make these waveforms sustain.

Rates and Levels: The AWM EG will function in two ways depending on the Mode setting.

Mode = attack
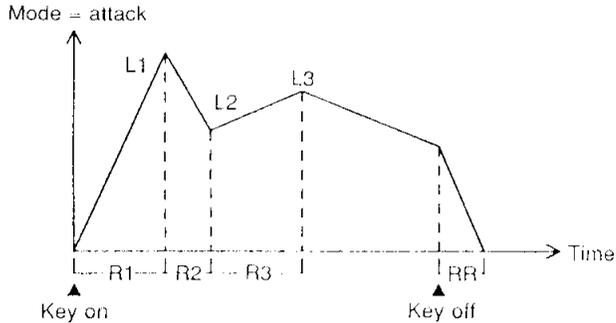
In normal mode the AWM EG level will begin from 0 and rise at the rate of R1 to maximum level. When maximum level is reached it will move at the rate of R2 to level L2. When level L2 is reached it will move at the rate of R3 to level L3. When level L3 is reached it will begin moving at the rate of R4 to 0. (If rate R4 is 0, the sound will move at an infinitely slow rate toward zero; i.e., it will sustain at level L3 as long as the key is pressed.)

When you release the key, the level will move at the rate of RR to a level of 0.
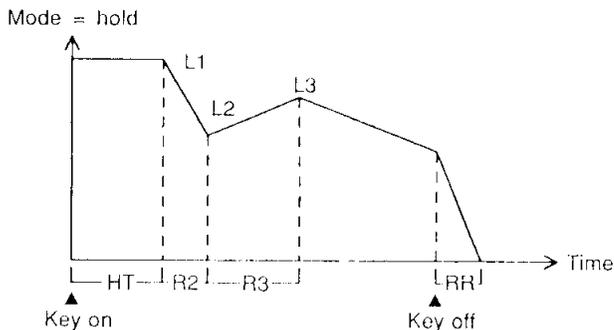
Mode = hold

In hold mode the AWM EG level will begin at maximum and stay there for the duration of the specified hold time HT. When the hold time has elapsed, the level will change at the rate of R2 to level L2. The rest of the EG is the same as for normal mode.

Using the AWM EG in hold mode is especially effective when you are using an AWM waveform which includes a definite attack. Keeping the level at maximum for a while allows the natural attack of the AWM sample to be heard. After the natural sampled attack is over the AWM waveform will continue sustaining,

and you can use the remaining AWM EG parameters to create an appropriate decay and release.

Rate 4 and Release Rate: Rate 4 (R4) and Release Rate (RR) can be used in conjunction to create a variety of AWM EG shapes.

● If R4 is greater than 0 and you continue holding a note, after the level reaches L3 it will decrease at the rate R4 and will move to 0 even though you continue holding the note.
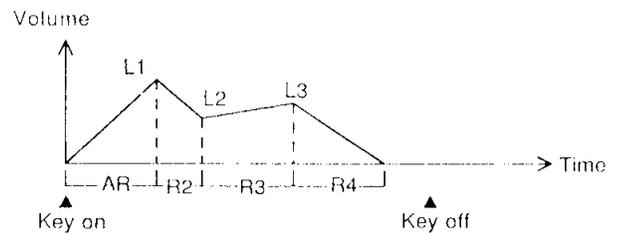
● If R4=0 and you continue holding a note, after the level reaches L3 it will stay at L3 as long as you hold the note. When you release the note, the level will decrease at the rate of RR to a level of 0.
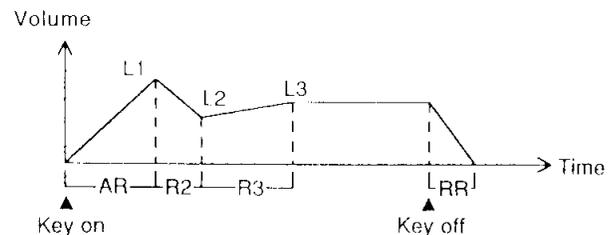
● After reaching L3 the level will decrease at the rate R4, but when you release the note the level will begin decreasing at the rate RR.
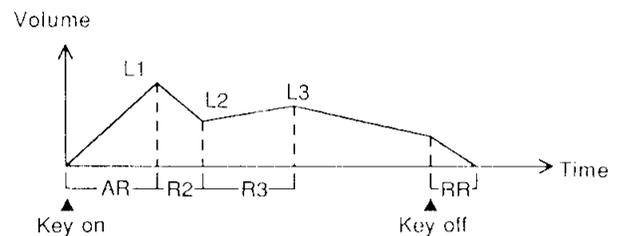
Rate Scaling: On most acoustic instruments, high notes have a naturally shorter attack and decay. This can be simulated by setting rate scaling to a positive value (+1...+7). The following diagram shows how higher notes will have faster rates (shorter EGs). Negative settings will have the opposite effect.
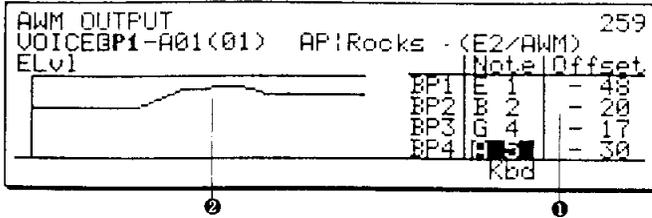

AWM ELEMENT DATA

4. AWM output

JUMP #259

Summary: The output level of an AWM element can be adjusted across the keyboard.

Procedure:
From: AWM Element job directory (JUMP #256)
Select: job 04:Output. (JUMP #259)
Specify: the output level scaling

❶ Break Point 1–4 (BP1–4): Note (C-2...G8) and Offset (–127...+127) of each break point determine how the level specified in *Voice common data, 1. Element level* (JUMP #202) (page 96) will be adjusted across the keyboard. When the cursor is located at note, you can press F7 (Kbd) and press a key to enter it as the new note setting.

❷ The keyboard level scaling is graphically displayed.

Break Point: The AWM output level can be adjusted according to the note that is played. On most acoustic instruments, notes differ in volume and tone depending on the range in which they are played. For example, the low notes of a piano are louder than the high notes.

Use the four break points to specify how the AWM output level will be adjusted across the keyboard. Offset (–127...+127) determines the output level adjustment for each of the four points specified by the note (C-2...G8).

The four note settings must be in ascending order. It is not possible to set a break point to a note lower or higher than the note settings of the neighboring break points.

The following diagram shows how the AWM output level would be adjusted across the keyboard for the settings shown in the above LCD.
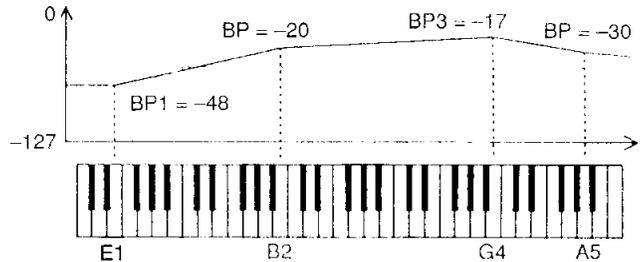
Each offset is added to the element level (80 in this example). For example the offset at break point 1 (E1) is –4, so the resulting element level at E1 is 76. The resulting element level is limited to the range of 0...127.

5. AWM sensitivity

Summary: These settings determine how the AWM element will be affected by key-on velocity and by the LFO.

Procedure:

From: AWM Element job directory (JUMP #256)
Select: job 05:Sensitv (JUMP #260)
Specify: sensitivity to velocity and modulation

```
AWM SENSITIVITY            260
VOICEBI -D01(49)  ST*Concert(E3/AWM)

Velocity Sens    = Dx
Rate Vel Switch  = on
Amp Mod Sens     = +0
Pitch Mod Sens   = 3
                   ❹❸❷❶
```

❶ **Velocity Sensitivity (–7...+7):** This determines how the output level of the AWM element will be affected by key-on velocity. For positive settings (+1...+7) the output level will increase as you play more strongly. For negative settings (–1...–7) the output level will decrease as you play more strongly. For negative settings to have an effect the element level must be lowered.

❷ **Rate Velocity Switch (on, off):** When the Rate Velocity switch is on, key-on velocity will affect the AWM EG attack rate (R1). The effect will depend on the Velocity Sensitivity setting.

Velocity = +1...+7: If Rate Velocity is on, strongly played notes will cause the AWM R1 to increase, resulting in a faster attack. For the strongest possible velocity, the EG attack will change at the speed specified by the EG R1 setting.

Velocity = –1...–7: If Rate Velocity is on, strongly played notes will cause the AWM R1 to decrease, resulting in a slower attack.

When the Rate Velocity switch is off, the AWM EG attack rate will not be affected by key-on velocity.

❸ **Amplitude Modulation Sensitivity (Amp Mod Sens = –7...+7):** Amplitude Modulation Sensitivity determines how greatly the output level of the AWM element will be affected by Amplitude Modulation from the LFO. Increasingly higher positive settings (+1...+7) will allow the LFO to have a greater effect.

Negative settings (–1...–7) are effective only for EG Bias. When Amplitude Modulation Sensitivity is set to a negative value, the controller assigned to EG Bias by the setting in *Voice common data, 12. (F4) Controller set* (JUMP #228) (page 130) will decrease the amplitude of the AWM element, and the LFO will have no effect. For example, two AWM elements in a voice might be given opposite Amplitude Modulation Sensitivity settings, so that the controller assigned to *EGbiasDepth* would crossfade between the two elements.

❹ **Pitch Modulation Sensitivity (Pitch Mod Sens = 0...7):** Pitch Modulation Sensitivity determines how greatly the pitch of the AWM element will be affected by Pitch Modulation from the LFO.

Amplitude Modulation Sensitivity and Pitch Modulation Sensitivity: These settings determine the *sensitivity* of the AWM element to the Amplitude Modulation Depth (AMD) and/or Pitch Modulation Depth (PMD) produced by the AWM element LFO. If the LFO settings for AMD and/or PMD are set to 0, these settings will have no effect.
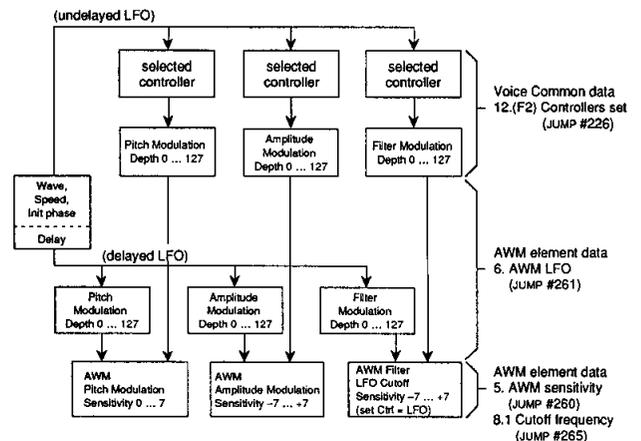
AWM ELEMENT DATA

6. AWM LFO

Summary: The AWM element LFO creates a cyclically changing control signal that can be used to create tremolo (Amplitude modulation), vibrato (pitch modulation), and wah-wah (filter modulation).

Procedure:

From: AWM Element job directory (JUMP #256)
Select: job 06:LFO   (JUMP #261)
Specify: the LFO parameters

```
AWM LFO                                    261
VOICEBI -D01(49)  ST*Concert(E3/AWM)

Wave  = Triangle   ┌─A Mod Depth =    0
         ∧∧        │ P Mod Depth =──12
Speed = 58──┐      │ F Mod Depth =──0
Delay = 46─┐│      │ Init Phase  =  0─┐

          ❸ ❷  ❶   ❹            ❺ ❻  ❼
```

❶ Wave (triangle, saw down, saw up, square, sine, sample&hold): This selects the wave (shape of modulation) produced by the AWM LFO. The selected wave is graphically displayed in the LCD. When sample&hold is selected, the LFO will produce a control signal whose level will change randomly at intervals of time determined by the Speed setting.

❷ Speed (0...99): The speed of the LFO modulation. Higher settings result in faster modulation. At a setting of 0, one cycle will be approximately 34 seconds.

❸ Delay (0...99): The time delay before the LFO modulation begins.

❹ Amplitude Modulation Depth (0...127): This determines how greatly the LFO will affect the output level (amplitude) of the operators.

❺ Pitch Modulation Depth (0...127): This determines how greatly the LFO will affect the pitch of the operators.

❻ Filter Modulation Depth (0...127): This determines how greatly the LFO will affect the cutoff frequency of the filter.

❼ Initial Phase (0...99): This determines the point of the LFO waveform from which the LFO will start each time a key is pressed.

Wave, Speed, Delay, Initial Phase: Detailed explanations and diagrams of these parameters are given in *AFM element job 6.1 LFO (Main)* (page 146).

Amplitude Modulation Depth and Pitch Modulation Depth: For these setting to have an effect, the AModSens (amplitude modulation sensitivity) or PModSens (pitch modulation sensitivity) of the AWM element must be set above 0. Make these settings in *AWM element job 5. AWM sensitivity* (JUMP #260).

Filter Modulation Depth: For this setting to have an effect, the Ctrl setting of a filter must be set to "LFO", and the LFO Cutoff Sens setting must not be 0. Make these settings in *AWM element data, 8.1 Cutoff frequency* (JUMP #265).
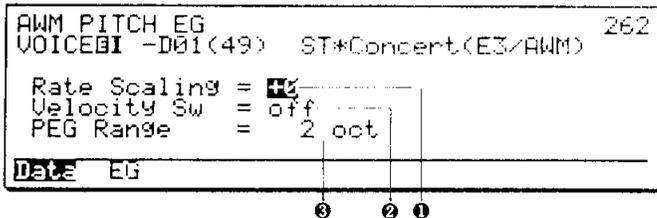
AWM ELEMENT DATA

7. (F1) AWM pitch EG (Data)

JUMP #262
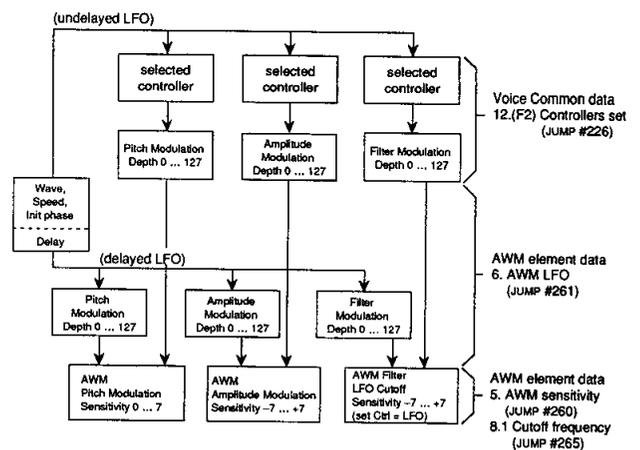
Summary: The pitch change over time created by the pitch EG can be affected by key-on velocity and the speed of pitch change can be adjusted across the keyboard. To set the shape of the pitch EG, see *7. (F2) AWM pitch EG (EG).*

Procedure:

From: AWM Element job directory (JUMP #256)

Select: job 07:PitchEG and press   (JUMP #262)
        F1 (Data)

Specify: pitch EG scaling, velocity, and range

```
AWM PITCH EG                    262
VOICEBI -D01(49)   ST*Concert(E3/AWM)

  Rate Scaling = ▓▓
  Velocity Sw  = off
  PEG Range    =   2 oct

 Data  EG
```

                    ❸   ❷ ❶

❶ Rate Scaling (-7...+7): Pitch EG Rate Scaling determines how pitch EG rates will change according to the note played. When this is set to +1...+7, the pitch EG will be faster for higher notes. When this is set to -1...-7, the pitch EG will be slower for higher notes. When this is set to 0, the pitch EG will be the same rate for all notes.

❷ Velocity Sw (off, on): When this is on, strongly played notes will change in pitch more than softly played notes.

❸ Range (1/2 oct, 1 oct, 2 oct): This determines the maximum range of the AWM pitch EG, from 1/2 octave to 2 octaves. (Note that the 8 octave range of the AFM pitch EG is not available for the AWM pitch EG.)

Rate Scaling: This setting determines how Pitch EG Rates (the speed of pitch change) will be affected by the key number of each note. The following diagram shows the result when Pitch EG Rate Scaling is set to +7. Notice that high notes have a shorter pitch EG (faster EG rates) than lower notes.
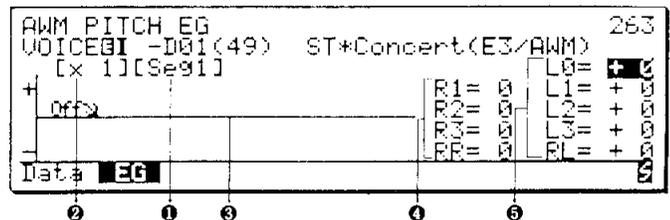

Velocity Sw (velocity switch): When this is on, strongly played notes will change in pitch more than softly played notes.

AWM ELEMENT DATA

7. (F2) AWM pitch EG (EG settings)

JUMP #263

Summary: The pitch EG creates a fixed shape of pitch change over time for each note. To adjust speed of pitch change across the keyboard, see *7. (F1) AWM pitch EG (Data).*

Procedure:

From: AWM Element job directory (JUMP #256)

Select: job 07:PitchEG and press   (JUMP #263)
        F2 (EG)

Specify: pitch EG parameters

```
AWM PITCH EG                         263
VOICEBI -D01(49)   ST*Concert(E3/AWM)
   [x 1][Seg1]                   L0= + ░
  +                          R1= 0  L1= + 0
   Off                       R2= 0  L2= + 0
                             R3= 0  L3= + 0
  -                          RR= 0  RL= + 0

 Data  EG
```

     ❷   ❶ ❸   ❹   ❺

❶ This indicates the time length shown by the graphic display. To change this, hold SHIFT and press F1-F6 (x1, x2, x5, x10, x20, x50). The exact length of time will depend on the range. When the pitch EG range is 1 octave, the graphic display will cover approximately 0.5 seconds at "x1" and approximately 5 seconds at "x50".

❷ This indicates the EG segment ("seg1-3" or "rel1") from which the pitch EG graphic display begins. If the EG is too long to be fully shown in the LCD, hold SHIFT and press F7 or F8 to change the segment from which the display begins.

❸ The pitch EG is graphically displayed.

❹ R1-R3, RR1 (0...63): Keyon Rates 1-3 and the Release Rate determine the speed of the pitch EG. Higher settings result in faster change. A rate of 63 will jump immediately to the following level.

❺ L0-L3, RL (-64...+63): Keyon Levels 0-3 and the Release Level determine the levels of the pitch EG. Positive settings raise the pitch and negative settings lower the pitch.

Rates and Levels: When you press a key, the pitch will begin at the level of L0, and will change at the rate of R1 to level L1. When the level reaches L1, the pitch will change at the rate of R2 to the level of L2. When the pitch reaches L2, it will change at the rate of R3 to the level of L3 and will stay at L3 as long as the key is pressed.

When the key is released, the pitch will change at the rate of RR to the level of RL.
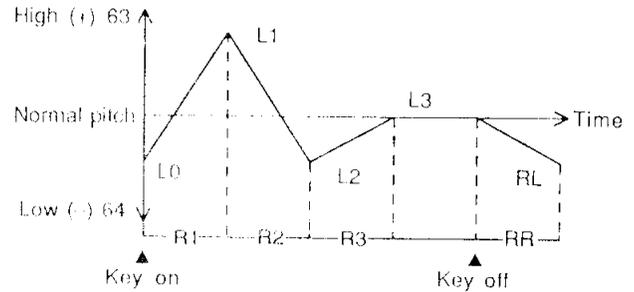
Note: Even if the AWM pitch EG and the AFM pitch EG have identical Rate settings, there will be slight differences in the timing of the pitch change.

AWM ELEMENT DATA

8. AWM filter

JUMP #264

Summary: The two filters of each element can be used to control the tone in various ways.

Procedure:
From: AWM Element job directory (JUMP #256)
Select: job 08:Filter (JUMP #264)
Specify: the desired filter edit job and press ENTER

❶ Move the cursor in this area to select a job and press ENTER to move to the selected job.

01: Cutoff Frequency: Make overall settings for the filters. (JUMP #265)

02: Cutoff Scaling: Specify how each filter will be adjusted across the keyboard. (JUMP #266, #267)

03: Cutoff EG: Specify how each filter will change over time. (JUMP #268, #269, #270, #271)

❷ Pressing F1-F3 will select the corresponding job.

Note: Filter settings for an AWM element are exactly the same as for an AFM element. For details, refer to AFM element job 8. AFM filter, on pages 149-153.

AWM ELEMENT DATA

15. Initialize AWM element

Summary: Initialize the AWM Element data being edited to a set of basic values.

Procedure:

From: AWM Element job   (JUMP #256)

Select: job 15:Initlz

To execute: the initialize operation press YES

To quit: without initializing press NO or EXIT

```
INITIALIZE AWM ELEMENT

ARE YOU SURE ?
        (Yes or No)
```

This function sets all AWM element data values to the minimum or simplest possible settings. When creating your own new voices it is usually best to begin by editing an existing voice. However if you want to start from scratch, it is often useful to start from an initialized setting rather than having to re-set all the parameters.

If you are sure you want to initialize the AWM element data, press YES. The AWM element data being edited will be set to the values shown below. If you decide not to initialize, press NO.

This function initializes only AWM element data. Other initialize functions are provided for initializing Voice Common data and AFM element data. Refer to *Voice Common 15. Initialize* (page 132) and *AFM Element 15. Initialize* (page 154).

Initialized settings for AWM Element data

02 AWM Waveform Select

Waveform	= Preset 65 (triangle wave)
Frequency Mode	= normal
Fixed Mode Note #	= C3
Frequency Fine	= ±0

03 AWM Amplitude EG

Mode	= normal
Keyon Rates 1, 2, 3	= 63
Keyon Rate 4	= 0
Keyoff Rate 1	= 63
Rate Scaling	= ±0
Keyon Level 2, 3	= 63

04 AWM Output

Break Point 1 Note	= C1
Break Point 2 Note	= G2
Break Point 3 Note	= E4
Break Point 4 Note	= C6
BP1–4 Offset	= ±0

05 AWM Sensitivity

Velocity Sens	= ±0
Rate Velocity Switch	= off
AMS	= 0
PMS	= 3

06 AWM LFO

Wave	= Triangle
Speed	= 65
Delay Time	= 0
AMD, PMD, FMD	= 0
Init Phase	= 0

07 AWM Pitch EG

Rate Scaling	= ±0
Velocity Switch	= off
Range	= 2 octaves
Keyon Rates 1–3	= 63
Keyon Levels 0–3	= ±0
Keyoff Rate 1	= 63
Keyoff Level 1	= ±0

08 AWM Filter

Resonance	= 0
Cutoff Mod Sens	= ±0
Keyon Velocity Sens	= ±0

*** following data is same for both filters ***

Filter Type	= thru
Filter Control	= LFO
Cutoff Frequency	= 127
Break Point 1 Note	= C1
Break Point 2 Note	= G2
Break Point 3 Note	= E4
Break Point 4 Note	= C6
Break Point Offset	= 0 (BP 1–4)
Keyon Rates 1–4	= 63
Keyoff Rates 1–2	= 63
Rate Scaling	= ±0
Keyon Levels 0–4	= ±0
Keyoff Levels 1–2	= ±0

AWM ELEMENT DATA

16. Recall voice

Summary: Recall all data of the previously edited voice.

Procedure:

From: AWM Element job (JUMP #256) directory

Select: job 16:Recall

To execute: the recall operation press YES

To quit: without executing press NO or EXIT.

Note: This operation recalls all voice data, not just AWM element data, and is also available while editing Common data, AFM element data, or Drum Set data. For details refer to Voice common data, 16. Recall voice.
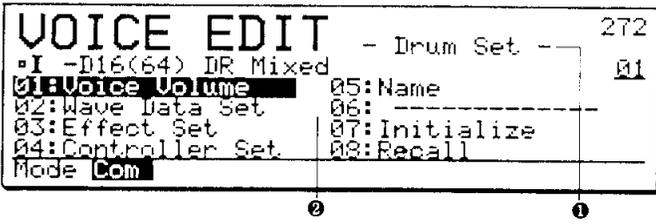
Drum set data

Drum set job directory

Summary: This job directory shows the jobs containing data for a drum voice.

Procedure:

From: voice edit mode (JUMP #200)

When: the Voice Mode is set to 11:Drum Set

Select: the drum set job directory (JUMP #272)
F2 (Com)

```
VOICE EDIT     - Drum Set -   272
■I -D16(64) DR Mixed            01
01:Voice Volume    05:Name
02:Wave Data Set   06:-----------
03:Effect Set      07:Initialize
04:Controller Set  08:Recall
Mode Com
```

❶ This area indicates that "Drum Set" is the selected voice mode.

❷ Move the cursor in this area to select a job and press ENTER to go to the selected job.

01: Voice Volume: Adjust the overall volume of the entire drum voice.

02: Wave Data Set: Select a waveform for each key of the SY99's 76-note keyboard, and specify tuning and pan for each.

03: Effect Set: Specify how the effect units are connected, how the sound from each note of the drum voice is sent to the effect units, parameter settings for each effect unit, and how the effect parameters are controlled in realtime.

04: Controller Set: The overall volume of a drum set voice can be adjusted using a specified controller.

05: Name: Specify a ten-character name for the voice being edited.

07: Initialize: Initialize the drum set data being edited to the basic or minimum settings.

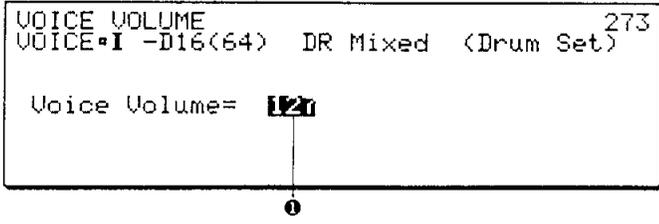08: Recall: Recall the previously edited voice into the editing buffer.

1. Voice volume

Summary: Adjust the overall volume of the entire drum voice.

Procedure:

From: drum set job directory (JUMP #272)

Select: 01:Voice Volume (JUMP #273)

Specify: the volume of the entire drum set

```
VOICE VOLUME                      273
VOICE■I -D16(64)  DR Mixed  (Drum Set)

Voice Volume= 127
```

❶ Voice Volume (0...127): This determines the overall volume of the entire drum voice.

DRUM SET DATA

2. Wave data set

JUMP #274

Summary: Select a waveform for each key of the SY99's 76-note keyboard, and specify tuning and pan for each.

Procedure:

From: drum set job directory   (JUMP #272)
Select: 02:Wave Data Set   (JUMP #274)
Specify: parameters for each key note number

```
WAVE DATA SET                         274
VOICE=I -D16(64)  DR Mixed  (Drum Set)
 ┌─Key Note Number : E 0
 │ ┌─Waveform       = Preset1 108 Tom 5
 │ │┌─Level         = 120 ┌─Note Shift = - 2
 │ ││┌─Alternate    = off │ ┌─Fine Tune  = +24
 │ │││ Output Group = both │ │ Static Pan = +30
 K-Dn K-Up Pre1 Pre2 Card Intr
```

❶ ❷ ❸   ❹   ❺   ❻   ❽   ❼

❶ Key Note Number (E0...G6): Press a key on the SY99 keyboard to select a key note number, and it will be displayed here. (It is not possible to move the cursor here.) You can also press F1 (K-Dn) or F2 (K-Up) to select key note numbers.

❷ Waveform (Preset 1: 1...155, Preset 2: 1...112): Select the AWM sample that will be played by the corresponding Key Note Number. A list of the preset waveforms is given in *AWM element data, 2. AWM Waveform Set* (page 157). (Internal and card waveforms may also be selected. The SY99 may contain a maximum of 64 internal waveforms. The number of waveforms available on a waveform card will vary with the card being used.)

❸ Level (0...127): This determines the volume of the waveform.

❹ Alternate (on, off): When this is "on" for two or more key note numbers, the last-played key will take priority and the waveform of the previously played key will be turned off.

❺ Output Group (off, grp1, grp2, both): Select the output group from which the waveform selected for this key note number will be output.

❻ Note Shift (–48...+36 in half steps): Adjust the tuning of the waveform in half steps.

❼ Fine Tuning (–64...+63 in units of 1.171875 cents): Adjust the tuning of the waveform in fine steps.

❽ Static Pan (–31...+31 = Left...Right): Specify the stereo position for each key note number.

Use the following two steps to make settings ❷–❽ for each note of the keyboard. Repeat the two steps as necessary.

1. Press a key on the SY99 keyboard to select a key note number. The selected key note number will be displayed in ❶.
2. Make settings ❷–❽ for the selected key note number.

Alternate: If two or more waveforms would sound unnatural if they were played at the same time, select alternate "on" for each of these waveforms. For example it is impossible for a real drum set to sound the closed hi-hat and open hi-hat at the same time. By selecting alternate "on" for the two key note numbers that play the closed hi-hat and open hi-hat waveforms, playing the closed hi-hat will make the open hi-hat stop, and vice versa.

There is only one alternate group for the entire drum voice; i.e., it is not possible to specify two or more *pairs* of key note numbers to play alternately. You may select alternate "on" for as many key note numbers as you like but they will all be in the same alternate group, and only one of them will sound at any time.

Static Pan: The stereo position of the waveform played by each key note number is determined by the static pan setting. The "dynamic" pan of AFM or AWM element can be moved over time by an EG or LFO, but the "static" pan for each key note number of a drum voice cannot be moved over time.

When using a drum set voice in a Multi, these static pan settings will be used if the multi static pan is set to "VC" (voice). Refer to *Multi edit, 5. Voice static pan*, page 191.

Output Group: The stereo signal from the static pan of each key note number is sent to output group 1, 2, or both. If output group is set "off" the waveform for that key note number will not be heard. The diagram in the following section *3.2 Effect send* shows how the Output Group setting is part of the signal flow in a drum voice.

DRUM SET DATA

3. Effect set

Summary: Specify how the effect units are connected, how the sound from each note of the drum voice is sent to the effect units, parameters for each effect unit, and how the effect parameters are controlled in realtime.

Procedure:

From: drum set job directory   (JUMP #272)
Select: job 03:Effect Set   (JUMP #212)
Select: the effect job you wish to edit

```
EFFECT SET                        212
VOICE∎I -D16(64)  DR Mixed  (Drum Set)
01:Effect Mode Select           01
02:Effect Send
03:Effect 1 Parameter
04:Effect 2 Parameter
05:Effect Control
 01   02   03   04   05
```

❶ Move the cursor in this area and press ENTER to select a job.

01: Effect Mode Select: Specify how the two effect units are connected, the effect type, and volume balance. This is exactly the same as for a normal voice. Refer to *Common Data job 10.1 Effect Mode Select,* page 106.

02: Effect Send: Specify how the sound of each element of the voice will be sent to the effect units. Refer to the following section *Drum set data 3.2 Effect Send.*

03: Effect 1 Parameter: Make settings for effect unit 1. This is exactly the same as for a normal voice. Refer to *Common Data job 10.3 Effect 1 Parameter,* page 108.

04: Effect 2 Parameter: Make settings for effect unit 2. These parameters are exactly the same as for Effect 1. Refer to *Common Data job 10.3 Effect 1 Parameter,* page 108.

05: Effect Control: Specify how effect parameters will be affected by control change messages. This is exactly the same as for a normal voice. Refer to *Common Data job 10.5 Effect Control,* page 123.

❷ Pressing F1–F5 will select the corresponding job.

Note: Drum voice effect settings differ from normal voice effect settings only in job 2.Effect Send. A normal voice allows you to specify the effect send level for each of the one, two, or four elements. A drum voice allows you to specify the effect send level for each of the 76 keys.

3.1 Effect mode select

Summary: Specify the effect mode to determine how the two effect units are connected, the effect type for each unit, effect output levels, and the volume balance between processed and unprocessed sound.

Procedure:

From: Effect Set job directory   (JUMP #212)
Select: 01:Effect Mode Select   (JUMP #213)

Specify: the effect mode, effect types, and effect levels, and wet:dry balance.

Remarks: This function is exactly the same as that described for normal voices. For details, refer to *Common Data job 10.1 Effect Mode Select,* page 106.

3.2 Effect send

Summary: Specify how the sound from each key of the drum voice will be sent to each of the one, two, three, or four effect sends.

Procedure:

From: Effect Set job directory   (JUMP #212)

When: the voice mode is "Drum"

Select: job 02:Effect Send   (JUMP #220)

Specify: the effect send settings for each of the 76 keys

```
EFFECT SEND                        220
VOICE■I -D16(64)   DR Mixed  (Drum Set)
                 |Send Sel|Level |Vel Sens
 G#5:Guiro 2    |1 - 3 -| 110 |   +3
 A 5:Cabasa     |1 - 3 -| 110 |   +3
 A#5:Shaker     |1 - 3 -| 100 |   +5
 B 5:Whistle    |1 - 3 -| 127 |   +6
 K-Dn K-Up
```
   ❺   ❶   ❷   ❸   ❹

❶ This area displays the key names (E0–G6), and the waveform assigned to each note. (To set the waveform for each key, see *Drum set data 2.Wave data set,* page 157.) To select a key note number, you can press a key on the SY99 keyboard or press F1 (K-Dn) and F2 (K-Up).

❷ Send Sel (send select 1–4): Specify whether or not to send the sound from the key to each effect send 1–4. The number of effect sends available will depend on the effect mode and the effect type. Non-existent sends will be indicated by a dash (–), and cannot be selected. In the above display, effect sends 1 and 2 are available.

If an effect send is turned on, its number will be displayed, and the sound of the waveform assigned to that key will be sent to that effect send. If an effect send is turned off, a period (.) will be displayed, and the sound of the waveform assigned to that key will not be sent to that effect send. In the above display, C3 (SD1) is being sent to effect send 1 only, and C#3 (Tom1) is being sent to effect sends 1 and 3.

❸ Level (0–127): Specify how much sound will be sent from the element to the effect unit.

❹ Vel Sens (–7...+7): Specify how key velocity will affect the effect send level of the element. For positive settings (+1...+7), more sound will be sent to the effect unit for strongly played notes. For negative settings (–1...–7), less sound will be sent to the effect unit for strongly played notes.

❺ You can scroll through the 76 keys E0–G6 by pressing F1 (K-Dn) or F2 (K-Up), or by pressing a key on the SY99 keyboard.

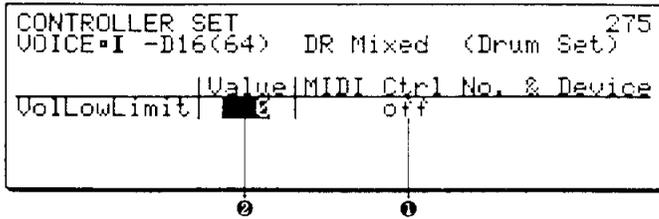**Remark:** The following diagram shows the signal flow for a drum voice.

175
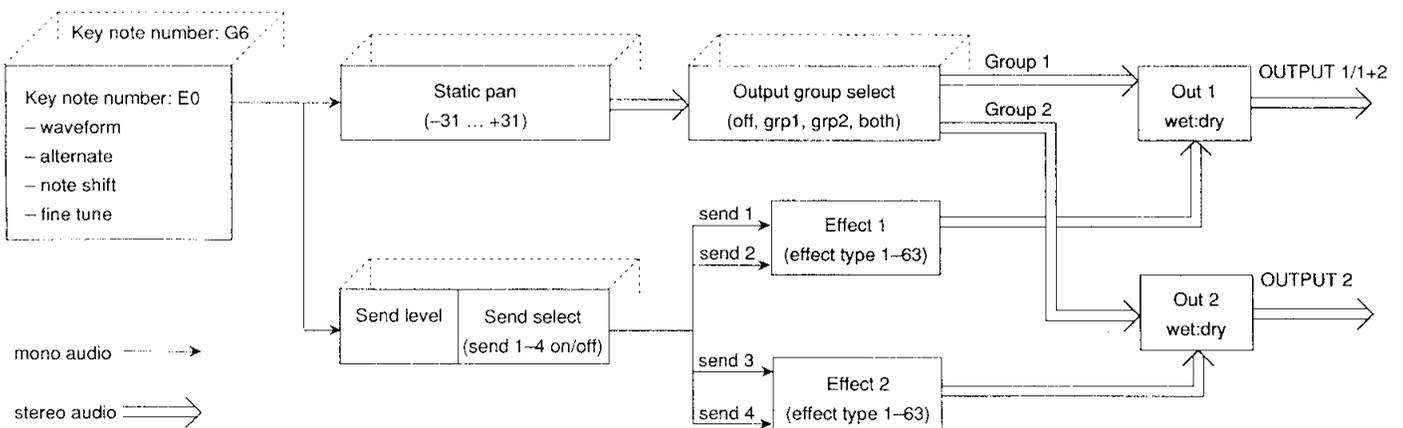
DRUM SET DATA

4. Controller set

JUMP #275

Summary: The overall volume of a drum set voice can be adjusted using a specified controller.

Procedure:

From: drum set job directory   (JUMP #272)

Select: 04:Controller Set   (JUMP #275)

Specify: the minimum level and controller for drum voice volume

```
CONTROLLER SET              275
VOICE■I -D16(64)  DR Mixed  (Drum Set)
           |Value|MIDI Ctrl No. & Device
VolLowLimit|  2  |     off
              ❷            ❶
```

❶ Device (MIDI Control #): Select a controller number 1–120 or aftertouch. For example when "001 Modulation" is selected, the MODULATION 1 wheel will regulate the volume of the drum voice. For a detailed explanation of controller numbers, refer to *Voice Common job 12. (F2) Controllers,* page 127.

❷ Vol Low Limit (Value 0...127): This determines the lowest volume that can be set by the selected controller. For example when this is set to 80, the lowest position of the controller will set the volume of the drum voice to 80. When this is set to 0 the lowest position of the controller will reduce the volume of the drum voice to silence. When this is set to 127 the controller will have no effect on the volume.

Remarks: In addition to the controller specified here, the volume of the entire SY99 can always be controlled over its full range by an optional foot controller connected to the rear panel VOL-UME jack.
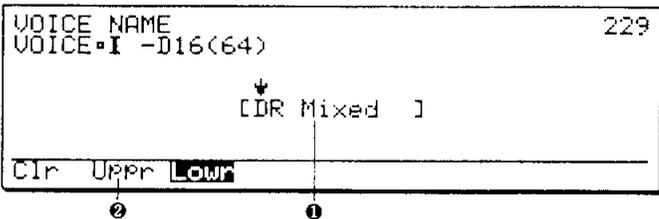
DRUM SET DATA

5. Voice name

JUMP #229

Summary: Specify a ten-character name for the voice being edited. In voice play mode this voice name will be displayed in large characters.

Procedure:

From: drum set job directory   (JUMP #272)

Select: 05:Drum Set Name   (JUMP #229)

Specify: the drum voice name

```
VOICE NAME                  229
VOICE■I -D16(64)
              ↓
           [DR Mixed  ]

Clr  Uppr  Lowr
   ❷      ❶
```

❶ Enter a ten-character name for the drum voice.

❷ To clear the currently entered name press F1 (Clr). To switch to upper-case characters press F2 (Uppr). To switch to lower-case characters press F3 (Lowr).

For a detailed explanation of how to enter character data, refer to *How to enter character data.*

DRUM SET DATA

7. Initialize voice

Summary: Initialize the drum set data being edited
to the basic or minimum settings.
Procedure:
From: drum set job directory   (JUMP #271)
Select: 07:Initialize
To execute: the initialize operation press YES
To quit: without executing press NO or EXIT

```
INITIALIZE VOICE

   ARE YOU SURE ?

     (Yes or No)
```

This function sets all drum set data to the basic or
minimum settings. If you are creating an entirely
new voice, using this initialize function may be
faster than resetting all the parameters by hand.

If you are sure you want to initialize the drum set
data press YES and the data will be set to the values
shown below. If you decide not to initialize, press
NO.

This function initializes only Drum Set data.
Other initialize functions are provided for initializing
Voice Common data, AFM Element data, or AWM
Element data.

Initialized settings for Drum Set data

01 Voice volume
    Voice volume   = 127

02 Wave data set (for each Key Note Number)
    Level   = 127
    Waveform   = preset 1 86 BD1
    Note shift   = 0
    Fine tuning   = 0
    Alternate   = off
    Output group   = both
    Static pan   = 0

03 Effect set
    *** same as normal voice initial data except for
    Effect Send *** (for each Key Note Number)
    Effect send sel   = all on
    Effect send level   = 127
    Effect send velocity sense = 0

04 Controller set
    Volume Low Limit = 0
    Device   = 14

05 Drum set name
    Name   = INIT VOICE

DRUM SET DATA

8. Recall voice

Summary: Recall all data of the previously edited
voice.
Procedure:
From: drum set job directory   (JUMP #271)
Select: 08:Recall
To execute: the recall operation press YES
To quit: without executing press NO or EXIT.

```
RECALL VOICE

   ARE YOU SURE ?

     (Yes or No)
```

If after editing a voice you exit voice edit mode
without storing, the edited voice data will be lost. In
such cases you can use this function to recall the
previously edited data into the editing buffer.

*Note: This operation recalls voice data, not just
Drum Voice data, and is also available while
editing Common data, AFM Element data, or
AWM Element data. For details refer to Voice
Common 16. Recall voice, page 133.*