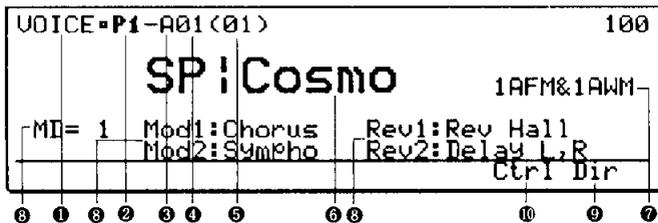# REFERENCE SECTION

VOICE PLAY MODE

You will normally play the TG77 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.
- Hold down the SHIFT key and press the keys of the numeric keypad to play the notes of the octave using the selected voice.

Voice select

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

```
VOICE=P1-A01(01)              100
        SP!Cosmo      1AFM&1AWM
 MD= 1   Mod1:Chorus   Rev1:Rev Hall
         Mod2:Sympho   Rev2:Delay L,R
                            Ctrl Dir
 ❸ ❶ ❸ ❷ ❸❹ ❺    ❻❸        ❿    ❾   ❼
```

❶ VOICE: This 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 Voice name: The voice name is displayed in large characters.

❼ Voice mode: This indicates the type and number of elements used by this voice. For details refer to *Voice Edit mode, Voice Mode Select.*

❽ Effect settings: This area indicates the effect mode (off, 1–3) and type of effect selected by this voice for each of the four DSP units; Modulation 1 and 2, and Reverb 1 and 2. For details refer to *Voice Edit mode, Common Data job 10. Effect set.*

❾ Refer to the following section *Voice directory.*

❿ Refer to the following section *Controller view.*

To select a voice use the following buttons. The voice will change immediately when a new memory or bank is selected.

- To select a voice memory (internal, card, preset 1, or preset 2) press MEMORY.
- To select a bank A–D, press BANK/SELECT.
- To select the next or previous voice in the selected voice memory, press the –1 or +1 keys.
- To directly select a voice 1–64 from the selected voice memory, use the numeric keypad to enter a one or two digit number and press ENTER.


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
PRESET1   Bank A
P1-A01(01)  SP!Cosmo           01
01:SP!Cosm 05:SP!Aria 09:SP.Padf 13:AP!CP7
02:SP!Metr 06:SP!Sawp 10:SP!Twil 14:AP!Bri9
03:SP!Diam 07:SP!Dark 11:SP!Anna 15:AP!Hamm
04:SP.Sorp 08:SP!Must 12:AP.Ivor 16:AP!Gran
 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.
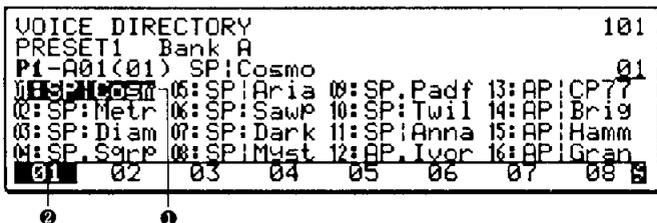
❷ Pressing F1–F8 (01)–(08) will select a voice 1–8 from the displayed voice bank. Holding SHIFT and pressing F1–F8 (09)–(16) will select a voice 9–16 from the displayed voice bank.

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

Copy voice

Summary: Anytime in voice play mode you can copy the currently selected voice to another voice memory.

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
▪P1-A01(01) SP¦Cosmo
INTERNAL Bank C                      16
01:ME:St.M  05:ME:Pikl  09:WN.Bluh  13:WN¦Moot
02:ME¦Blad  06:ME¦Aqua  10:WN¦Teno  14:WN¦Saxi
03:ME¦Fore  07:ME:Alps  11:WN¦Clar  15:WN.Flut
04:ME.Gard  08:ME.Cycl  12:WN¦Alto  16:New
                                       Go
```

The names of the sixteen voices in the currently selected bank of Internal or Card memory are displayed as explained in *Voice Directory*. Specify the copy destination in the same way as when selecting a voice.

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

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   (JUMP #100)
> Select: F7 (Ctrl)   (JUMP #102)
> To quit: and return to voice play mode press EXIT.

```
CONTROLLER VIEW                      102
▪P1-A01(01) SP¦Cosmo
 P Mod :AT        Pan LFO :---
 A Mod :+--       Pan Bias:---
 F Mod :+--       EG Bias :---
 Cutoff:MW        Volume  :---
 Pitch Bend Range
  Wheel = 2   After Touch = + 0
 ❶       ❷   ❸
```

❶ **Parameter:** 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 set.*

❷ **Controller:** The right side of each column displays the controller which is assigned to control each parameter. Controllers which are commonly supported on most MIDI devices will be displayed. '–' will be displayed to indicate all other controllers, or to indicate that the parameter's depth has been set in such a way that the controller has no effect. (Refer to Voice Common, Controller set.) The range is not displayed.

❸ **Pitch Bend Range:** This area shows the range over which the PITCH wheel can raise or lower the pitch, and the maximum pitch change that will result when you press down on the keyboard after playing a note (Aftertouch).

This function allows you to only view the controller assignments. To edit them, refer to *Voice Common job 12. Controller set.*

VOICE EDIT MODE

This section explains the details of all Voice Edit parameters.

Contents of this section

VOICE EDIT MODE

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

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. Algorithm	1. AWM waveform set
2. 2AFM mono	2. Element detune	2. Oscillator	2. AWM EG
3. 4AFM mono	3. Element note shift	3. AFM EG	3. AWM output
4. 1AFM poly	4. Element note limit	4. AFM operator output	4. AWM sensitivity
5. 2AFM poly	5. Element velocity limit	5. AFM sensitivity	5. AWM LFO
6. 1AWM poly	6. Element dynamic pan	6. AFM LFO	6. AWM pitch EG
7. 2AWM poly	7. Output select	7. AFM pitch EG	7. AWM filter
8. 4AWM poly	8. Random pitch	8. AFM 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		
	14. Individual output select	...	...
	15. Initialize voice	15. Initialize AFM element	15. Initialize AWM element
	16. Recall voice	16. Recall AFM element	16. Recall AWM element

Note:

At any time in voice edit mode, you can hold down the SHIFT key and press the keys of the numeric keypad to play the notes of the middle C octave using the voice currently being edited or compared. This may sometimes be more convenient than reaching for a keyboard to hear the results of your editing.

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 or Micro Tuning.*
- *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 the F1–F8 keys 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
GP1-A01(01) SP¦Cosmo
INTERNAL Bank A                    01
█SP:Cosm 05:SP¦Aria 09:SP.Padf 13:AP¦CP7
02:SP:Metr 06:SP:Sawp 10:SP:Twil 14:AP¦Brig
03:SP:Diam 07:SP:Dark 11:SP¦Anna 15:Slow Pi
04:SP.Sqrp 08:SP¦Must 12:AP.Ivor 16:AP¦Gran
                            Ret  Quit  Go
```

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.

Note 2:

When storing a voice which uses an AWM wave-form 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. Press MEMORY to specify internal or card memory, and specify a voice memory 1–64 in which you want to store your newly edited voice.
2. Press F8 (Go), 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 to return to the store destination select display.
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, you can hold the ELEMENT button and press numeric keys 1–4 to turn the corresponding element off or on. The on/off status of each element is shown in the LCD. Elements which are turned on are displayed in inverse. In the following LCD, element 2 has been turned off, and will not be heard.

Element 2 has been turned off.

```
AFM ALGORITHM        OP123456  EL12      233
VOICEBP1-A01(01)   SP:Cosmo   (E1/AFM)
              OP1   OP2   OP3   OP4   OP5   OP6
 In1 Src     OP2 FB2  OP4 FB4  OP6 FB6
   Level       6    7    0    7    0    7
 In2 Src     FB6  off FB2  off FB4  off
   Level       7    -    7    -    7    -
Form Extn  Inst                        A19
```

When editing a drum voice, it is not possible to turn elements off/on.

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 hold the BANK/SELECT button and repeatedly press ELEMENT to cycle through the elements of the voice. The LCD shows the number and type of the currently selected element.

It is possible to move to another element by returning to the top level of voice edit mode, but it is faster to use BANK/SELECT + ELEMENT.

While editing Voice Common data or Drum Set data, it is not possible to select elements.

element 1 is selected

```
AFM ALGORITHM        OP123456  EL12      233
VOICEBP1-A01(01)   SP:Cosmo   (E1/AFM)
              OP1   OP2   OP3   OP4   OP5   OP6
 In1 Src     OP2 FB2  OP4 FB4  OP6 FB6
   Level       6    7    0    7    0    7
 In2 Src     FB6  off FB2  off FB4  off
   Level       7    -    7    -    7    -
Form Extn  Inst                        A19
```

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 61 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 ▉1▉AFM  E3: -      200
                   ▉2▉AWM  E4: -
 ▪P1-A01<01>  SP|Cosmo              09
 01:1AFM mono 05:2AFM Poly ▉9▉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
```

                              ❶   ❷

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 sixty-one 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.*

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 TG77. 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.

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       E3: -        201
■P1-A01<01>  SP!Cosmo              01
01:ElemLvl 05:VlLimit 09:Porta  13:Name
02:ElemDtn 06:ElemPan 10:Effect 14:IndOut
03:NtShift 07:OutSel  11:McrTune 15:Initlz
04:NtLimit 08:Random  12:Cntrllr 16:Recall
Mode Com   E1    E2
```

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: NtShift (Element note shift): Transpose each element

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

05: VlLimit (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 element off/on

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

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

14: IndOut (Individual output select): Select an individual output 1–8 from which to output the un-panned, un-processed sound of the voice

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

---

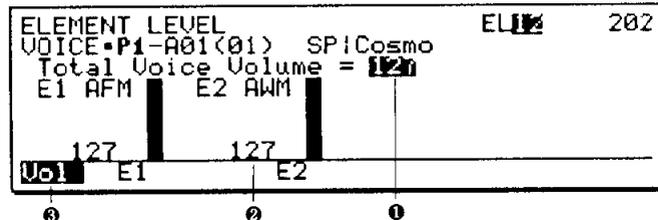## 1. Element level

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                    ELLv    202
VOICE■P1-A01<01>  SP!Cosmo
  Total Voice Volume = 127
  E1 AFM      E2 AWM

     127        127
Vol   E1         E2
```

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          ELI▨   203
VOICE▪P1-A01<01>  SP¦Cosmo

 Element1 AFM = ⊞5⌐  ┤      *    ├
 Element2 AWM = + 0  ┤      *    ├

▐E1▌  E2
```

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 displayed as a horizontal bar graph.

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:NtShift (JUMP #204)
Specify: the transposition of each element

```
ELEMENT NOTE SHIFT      ELI▨   204
VOICE▪P1-A01<01>  SP¦Cosmo

 Element1 AFM = ⊞5⌐  ┤    *    ├
 Element2 AWM = +24  ┤      *  ├

▐E1▌  E2
```

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 units of a half step. 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.
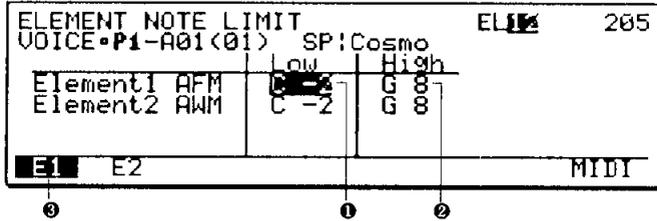
❷ Pressing F1–F4 will move the cursor to elements 1–4.

Remarks: 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:NtLimit　(JUMP #205)
Specify: the note range for each element

```
ELEMENT NOTE LIMIT          EL▮▮    205
VOICE▪P1-A01(01)   SP!Cosmo
                     Low      High
Element1 AFM      ▮▮▮▮▮      G 8
Element2 AWM      C -2       G 8

▮E1▮  E2                             MIDI
  ❸              ❶      ❷
```

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 (MIDI) and then press a key of your MIDI keyboard to enter a note.

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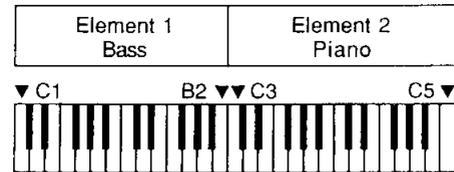
It is possible to set the low limit above the high limit. In this case, the element will be played by notes above the low limit and below the high limit. The following diagram shows the keyboard range that would play an element set to Low=C4 and High=C2.
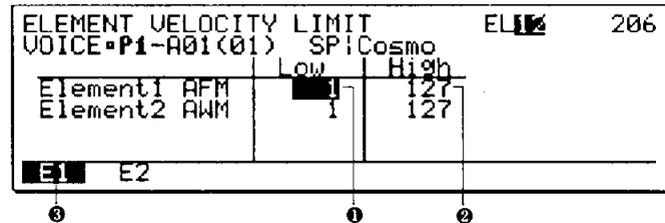
High = C2　　　Low = C4

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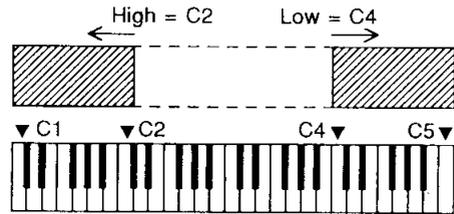
Note: This note limit setting will be ignored if the voice mode is mono (voice mode 1:1AFM mono, 2:2AFM mono, and 3:4AFM mono).

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▪P1-A01(01)   SP!Cosmo
                     Low      High
Element1 AFM      ▮▮▮1       127
Element2 AWM       1        127

▮E1▮  E2
  ❸              ❶      ❷
```

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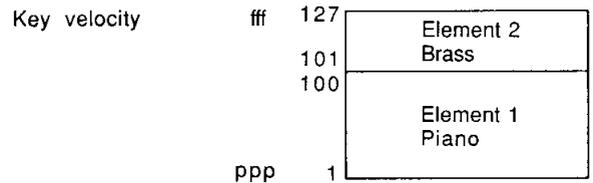
It is possible to set the low limit above the high limit. In this case, the element will be sounded by key-on velocities outside the limits. The following diagram shows the velocity range that would play an element set to Low=100 and High=40.
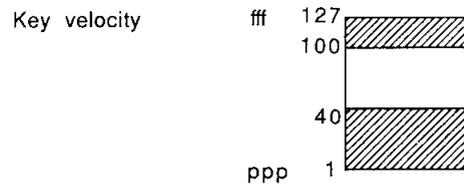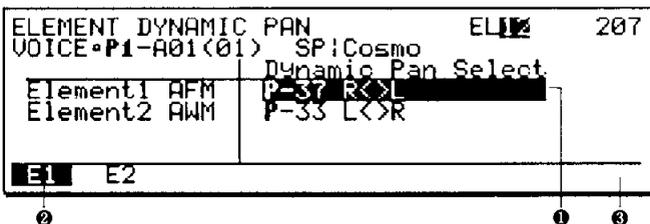

COMMON DATA

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        ELIM    207
VOICE=P1-A01<01>   SP!Cosmo
                   Dynamic Pan Select
Element1 AFM       P-37 R<>L
Element2 AWM       P-33 L<>R

E1  E2
```

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
36	R<>L slow	start at R then slowly move between RL

#	Name	Description
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- 1 Center                    01
01:Pan Source
02:Pan EG
03:Pan Name
01    02    03
```
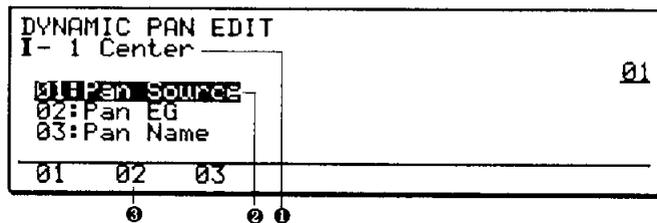
❶ The name and number of the currently selected Dynamic Pan data are displayed.

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.

6.0.1 Copy pan data

Summary: This function copies dynamic pan data from another memory into an Internal pan data memory.
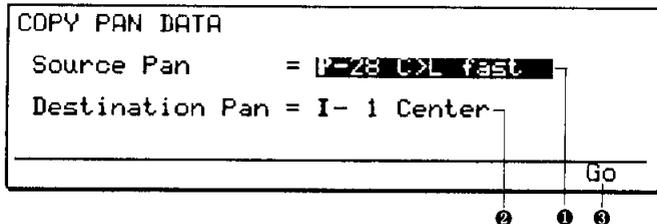
Procedure:
When: editing dynamic pan data
Press: COPY to get the following display.
Specify: the source and destination pan.
To copy: the pan data press F8.
To quit: without copying press EXIT.

```
COPY PAN DATA

Source Pan      = P-28 CXL fast

Destination Pan = I- 1 Center
                                          Go
```

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.

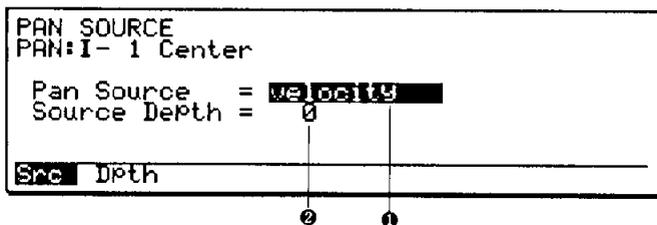COMMON DATA / ELEMENT DYNAMIC PAN

6.1 Pan source

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

Procedure:
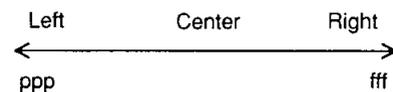From: Dynamic Pan Edit job directory
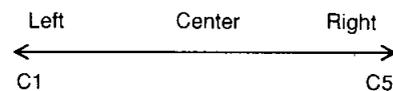Select: 01:Pan Source
Specify: the pan source and depth

```
PAN SOURCE
PAN:I- 1 Center

Pan Source   = Velocity
Source Depth = 0

Src  Dpth
```

❶ Pan Source (Velocity, Key Note Number, LFO): Select the control source which will affect dynamic panning. When velocity is selected, the playing strength of each note will affect panning. When note number is selected, notes above middle C will be panned more to the right, and notes below middle C will be panned more to the 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 pan-

ning. 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 over the range of full left to full right.
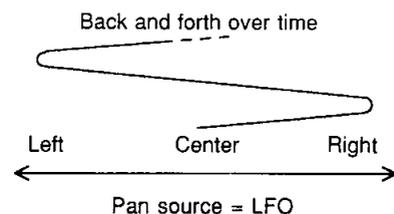
Pan source = Velocity

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

95

❸ Pressing F1–F2 will move the cursor to the corresponding parameter.

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.

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.
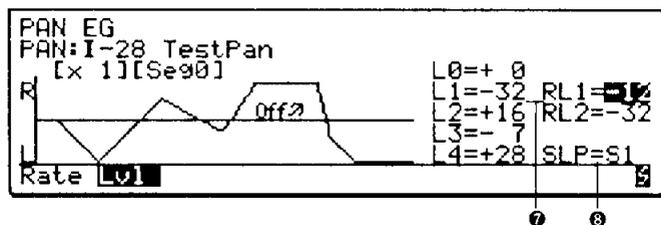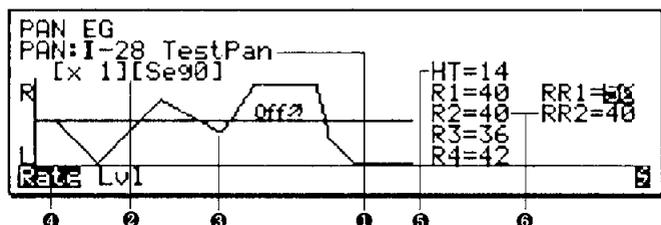
Procedure:
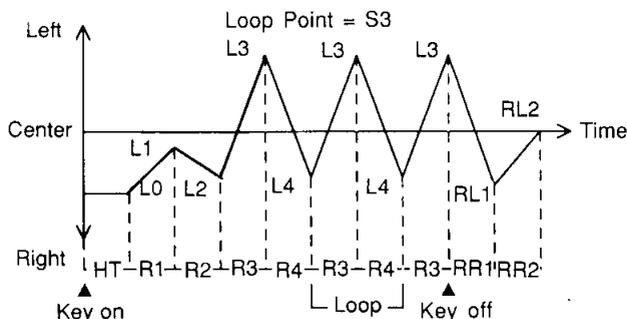From: Dynamic Pan Edit job directory
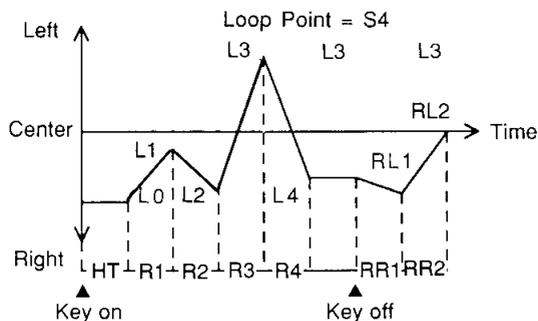Select: 02:Pan EG.
Press: F1 (Rate) to set pan EG rates.
Press: F2 (Lvl) to set pan EG levels.

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.

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 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.

COMMON DATA / ELEMENT DYNAMIC PAN

6.3 Pan name

Summary: Specify a ten-character name for the internal Pan data memory being edited.
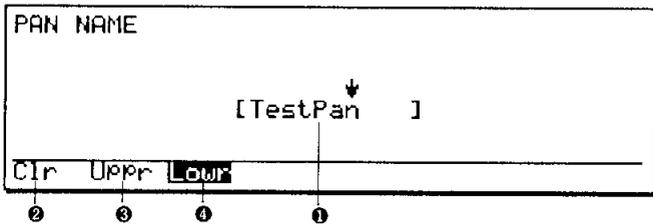
Procedure:
From: Dynamic Pan Edit job directory
Select: 03:Pan Name
Specify: a name for the pan memory

```
PAN NAME

          [TestPan    ]

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 *Introducing the TG77, How to use the numeric key pad,* on page 30.

COMMON DATA

7. Output group select

JUMP #208

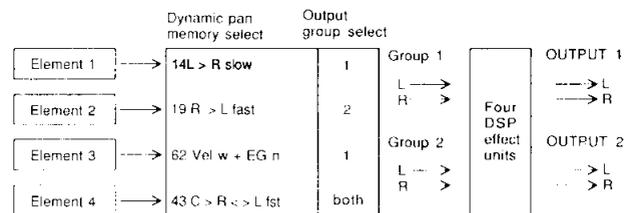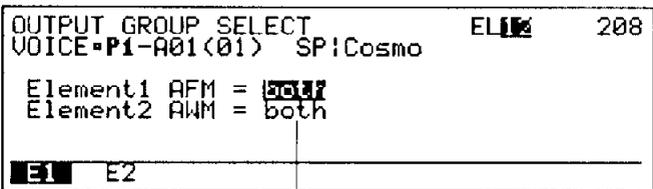**Summary:** Specify the output group for each element.

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

```
OUTPUT GROUP SELECT     ELIK    208
VOICE-P1-A01(01)  SP:Cosmo

Element1 AFM = both
Element2 AWM = both

E1   E2
       ❶
```

❶ Element 1–4 (off, grp1, grp2, both): Each of the elements in a voice is independently panned by a dynamic pan memory, and the stereo signal for

each element is sent to the DSP effect units via Output Group 1 and/or 2. The selected Output Group(s) will determine how each element is processed through the effects units. (Refer to Voice Common data job 10.1 Effect Mode for details.) If output group is turned off, that element will not be heard.

	Dynamic pan memory select	Output group select					
Element 1	14L > R slow	1	Group 1 L→ R >	Four DSP effect units	OUTPUT 1 →L →R		
Element 2	19 R > L fast	2					
Element 3	62 Vel w + EG n	1	Group 2 L > R >		OUTPUT 2 >L >R		
Element 4	43 C > R < > L fst	both					

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                  ELI☒   209
VOICE▪P1-A01(01)   SP!Cosmo

Random Pitch Depth = ☒
```
                              ❶

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 unsteady 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                    ELI☒   210
VOICE▪P1-A01(01)   SP!Cosmo

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 Full time.

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 #211

Summary: Specify how the effects units are connected, select an effect type for each unit, and make settings for each effect.

Procedure:

From: voice common job directory (JUMP #201)

Select: job 10:Effect (JUMP #211)

Select: the effect parameter you wish to edit
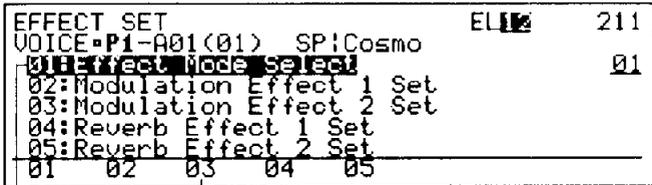
```
EFFECT SET              ELIK    211
VOICE•P1-A01(01)  SP!Cosmo
01:Effect Mode Select          01
02:Modulation Effect 1 Set
03:Modulation Effect 2 Set
04:Reverb Effect 1 Set
05:Reverb Effect 2 Set
 01    02    03    04    05
```
❶   ❷

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

01: Effect Mode Select: Specify how the four effect units will be connected. See 10.1 Effect Mode Select.

02: Modulation Effect 1 Set: Select an effect type and set parameters for modulation effect 1. See 10.2 Modulation Effect 1 Set.

03: Modulation Effect 2 Set: Select an effect type and set parameters for modulation effect 2. This is set in exactly the same way as explained for Modulation Effect 1. See 10.2 Modulation Effect 1 Set.

04: Reverb Effect 1 Set: Select an effect type and set parameters for reverb effect 1. See 10.4 (F1) Reverb effect 1 set.

05: Reverb Effect 2 Set: Select an effect type and set parameters for reverb effect 2. This is set in exactly the same way as Reverb Effect 1. See 10.4 (F1) Reverb effect 2 set.

❷ Pressing F1–F5 will select the corresponding job.
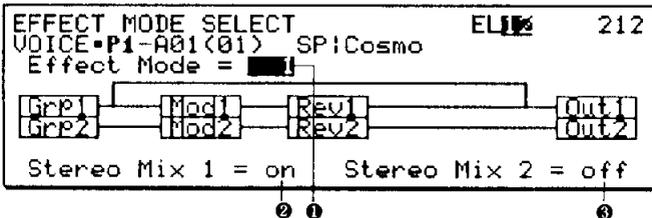

COMMON DATA / EFFECT SET

10.1 Effect mode select

JUMP #212

Summary: This determines how the four effects will be arranged to process the sound from the two stereo groups 1 and 2.

Procedure:

From: Effect Set job directory   (JUMP #201)
Select: 01:Effect Mode Select   (JUMP #212)
Specify: the effect mode

```
EFFECT MODE SELECT      ELIK    212
VOICE•P1-A01(01)  SP!Cosmo
 Effect Mode = 1
 Grp1────Mod1────Rev1────────Out1
 Grp2────Mod2────Rev2────────Out2
 Stereo Mix 1 = on   Stereo Mix 2 = off
```
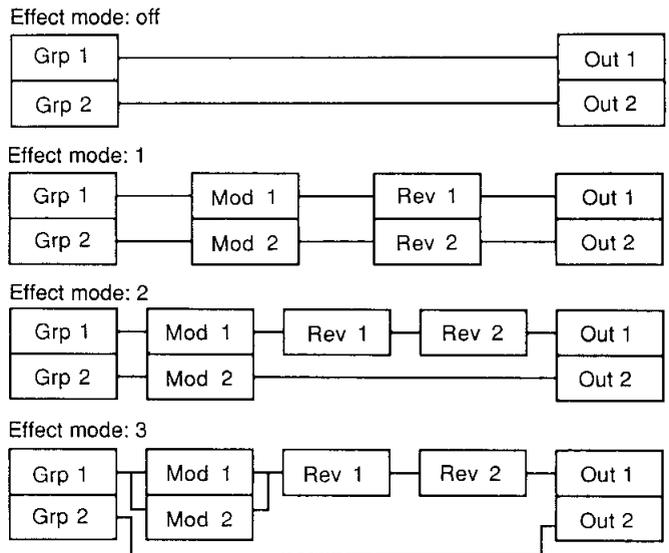   ❷ ❶   ❸

❶ Effect Mode (off, 1, 2, 3): This determines how the four effects will be arranged to process the sound from the two stereo groups 1 and 2. The effect mode will be graphically shown in the display.

When the Effect Mode is Off, the stereo groups 1 and 2 will be sent directly to output groups 1 and 2 without passing through the effect units.

When an Effect Mode of 1, 2, or 3 is selected, the stereo groups 1 and 2 will be processed through the effect units as shown in the following diagram.

❷ Stereo Mix 1 (off, on): When this is turned on, the unprocessed sound from group 1 will be added to the processed sound sent from output group 1.

❸ Stereo Mix 2 (off, on): When this is turned on, the unprocessed sound from group 2 will be added to the processed sound sent from output group 2. If effect mode 3 is selected, the Stereo Mix 2 cannot be set.

Effect mode: off
```
 Grp 1 ───────────────────── Out 1
 Grp 2 ───────────────────── Out 2
```

Effect mode: 1
```
 Grp 1 ── Mod 1 ── Rev 1 ── Out 1
 Grp 2 ── Mod 2 ── Rev 2 ── Out 2
```

Effect mode: 2
```
 Grp 1 ─ Mod 1 ─ Rev 1 ─ Rev 2 ─ Out 1
 Grp 2 ─ Mod 2 ────────────────── Out 2
```

Effect mode: 3
```
 Grp 1 ─ Mod 1 ─ Rev 1 ─ Rev 2 ─ Out 1
 Grp 2 ─ Mod 2 ────────────────── Out 2
```

Remarks:

• The settings in *Voice Common data 7. Output group select* (JUMP #208) will determine whether each element of the voice is sent to Group 1 or Group 2.

● All modulation effects are stereo-in stereo-out. Reverb effects 35–40 are also stereo-in stereo-out. Reverb effects 1–34 are mono-in stereo-out, and the incoming stereo signal to each effect unit is combined into a mono signal before it is processed.

Effect Mode 3 is an exception. Only the Lch output of modulation effect 1 and the Rch output of modulation effect 2 will be used for the Reverb effect 1 input.

● If you want the Dynamic Pan to be heard when using reverb effects 1–34, you must turn the Stereo Mix on to allow the direct stereo signal from the element pan to be combined with the output from the effect units.

The following sections 10.2 and 10.4 explain how to make settings for the four effect units.

COMMON DATA / EFFECT SET

10.1.1 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 10.1–10.5)
Press: COPY to get the following display.
Specify: the voice from which to copy the effect data
To copy: the data press F8
To quit: without copying press EXIT

```
COPY VOICE EFFECT
  Source Voice Select
P1-A10(10)  SP:Twilite              10
01:SP!Cosm  05:SP!Aria  09:SP.Padf 13:AP!CP77
02:SP!Metr  06:SP!Sawp  10:SP.xxxx 14:AP!Brig
03:SP!Diam  07:SP!Dark  11:SP!Anna 15:AP!Hamm
04:SP.Sqrp  08:SP!Must  12:AP.Ivor 16:AP!Gran
                                        Go
```

❶ ❷

❶ 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.

COMMON DATA / EFFECT SET

10.2 (F1) Modulation effect 1 set (Data)

JUMP #213

Summary: Select an effect type for modulation effect 1, and set the effect balance and output level. This explanation also applies to modulation effect 2.

Procedure:
From: Effect Set job directory   (JUMP #211)
Select: 02:Modulation Effect 1 Set
Press: F1 (Data)   (JUMP #213)
Specify: the effect type, effect balance, and output level

```
MODULATION EFFECT 1 SET      ELI%   213
VOICE=P1-A01(01)   SP!Cosmo
Effect Mode: 1     Mix1!on   Mix2!off
Effect Type    = 01!St.Chorus
Effect Balance = 100 %
Output Level   = 100 %

Data Parm
```

❹   ❸ ❷   ❶

❶ Effect Type: Four types of effect can be selected for the modulation effect unit. Refer to the list of modulation-type effects in the following section 10.2 (F2).

❷ Effect Balance (0...100%): This determines the balance of processed and unprocessed sound. At a setting of 0% the output of the effect unit will be only unprocessed sound, and at a setting of 100% the output of the effect unit will be only processed sound.

❸ Output Level (0...100%): This determines the volume level of the effect output. 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 To set the parameters of the selected Effect Type, press F2 (Parm). (See the following section 10.2 (F2).)

Modulation Effect
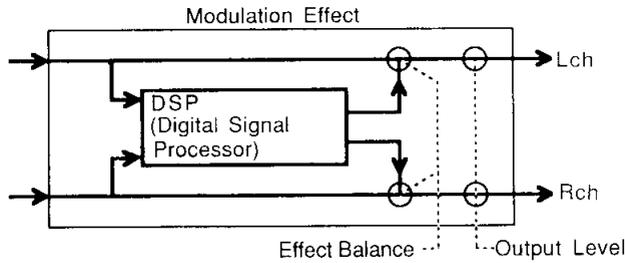
❹ **Remarks:** All modulation effects are stereo-in stereo-out.

Note: Changing the Effect Type will initialize the Parameter settings of F2 (Parm).

COMMON DATA / EFFECT SET
10.2 (F2) Modulation effect 1 set (Parameters)
JUMP #214

Summary: Set effect parameters of the effect type selected for modulation effect 1. This explanation also applies to modulation effect 2.

Procedure:

From: Effect Set job directory (JUMP #211)
Select: 02:Modulation Effect 1 Set
Press: F2 (Parm) (JUMP #214)
Specify: parameter settings for the selected effect

```
MODULATION EFFECT 1 SET    EL  214
VOICE-P1-A01(01)   SP:Cosmo
Effect Mode: 1     Mix1:on   Mix2:off
  Mod. Frequency      =  1.2 Hz
  Pitch Mod. Depth    = 100 %
  Amplitude Mod. Depth = [ 62 %]
Data Parm
```
❷   ❶

❶ The number and type of effect parameters will depend on the selected Effect Type. Refer to the following parameter lists for each effect type. Through has no parameters.

❷ To select an Effect Type and set Effect Balance and Output level, press F1 (Data). (See the previous section 10.2 (F1).)

Note: Changing the Effect type in F1 (Data) will initialize these Parameter settings.

Through: The input sound will be output without any processing.

1:St.Chorus (stereo chorus)
  Modulation Frequency (0.2...20.0 Hz)
  Pitch Mod. Depth (0...100%)
  Amplitude Modulation Depth (0...100%)

2:St.Flange (stereo flanger)
  Modulation Frequency (0.2...20 Hz)
  Modulation Depth (0...100%)
  Modulation Delay Time (0.2...15 ms)
  Feed Back Gain (0...99%)

3:Symphonic
  Modulation Frequency (0.2...20 Hz)
  Modulation Depth (0...100%)

4:Tremolo
  Modulation Frequency (0.2...20 Hz)
  Modulation Depth (0...100%)
  Phase (−8...+8)

Modulation effect parameters: The parameters of the modulation effects are explained below in alphabetical order.

Amplitude Modulation Depth: The amount of tremolo; i.e., cyclical change in volume.

Feedback Gain: For effects with very short delays such as 2.St.Flange, this will adjust the character of the effect.

Modulation Depth: The depth of the cyclical change.

Modulation Delay Time: For effects with very short delays such as 2.St.Flange, this will adjust the character of the effect.

Modulation Frequency: The speed of the cyclical change; i.e., the speed of chorusing, flanging, etc.

Pitch Modulation Depth: The amount of vibrato; i.e., cyclical change in pitch.

Phase: The phase of the pitch shifted signal.

10.4 (F1) Reverb effect 1 set (Data)

JUMP #217

Summary: Select an effect type for Reverb effect 1, and set the effect balance and output level. This explanation also applies to reverb effect 2.

Procedure:
From: Effect Set job directory (JUMP #211)
Select: 04:Reverb Effect 1 Set
Press: F1 (Data) (JUMP #217)
Specify: the effect type, effect balance, and output level

```
REVERB EFFECT 1 SET        ELIK   217
VOICE*P1-A01(01)   SPICosmo
Effect Mode: 1     Mix1:on   Mix2:off
 Effect Type    = 01:Rev. Hall
 Effect Balance = 52%
 Output Level   = 100 %

Data Parm
```

❹ **Effect Type:** Forty types of effects can be selected for the reverb effect unit. Refer to the list of reverb-type effects in the following section 10.4 (F2).

❷ **Effect Balance (0...100%):** This determines the balance of processed and unprocessed sound. At a setting of 0% the output of the effect unit will be only unprocessed sound, and at a setting of 100% the output of the effect unit will be only processed sound.

❸ **Output Level (0...100%):** This determines the volume level of the effect output. 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 To set the parameters of the selected Effect Type, press F2 (Parm). (See the following section 10.4 (F2).)
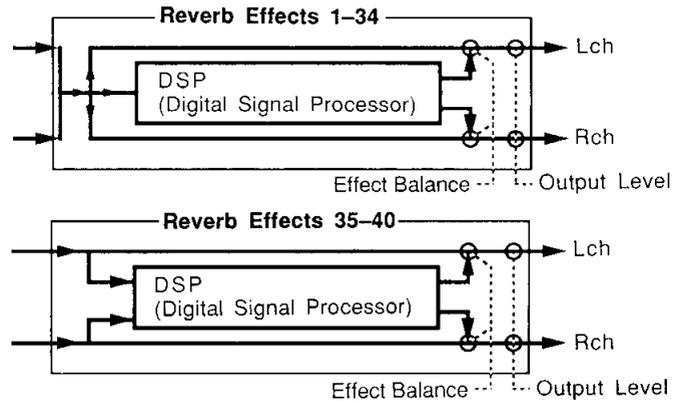
Remarks: Reverb effects 1:Rev.Hall to 34:Distortion are mono-in stereo-out. In other words, the incoming stereo signal from the element Dynamic Pan is combined into a mono signal and processed to create a stereo effect. Reverb effects 35:Ind.Delay to 40:Ind.Rev&Delay are stereo-in stereo-out, with independently settable parameters for left and right.

Note: Changing the Effect Type will initialize the Parameter settings of F2 (Parm).

10.4 (F2) Reverb effect 1 set (Parameters)

JUMP #218

Summary: Set effect parameters of the effect type selected for reverb effect 1. This explanation also applies to reverb effect 2.

Procedure:
From: Effect Set job directory (JUMP #211)
Select: 04:Reverb Effect 1 Set
Press: F2 (Parm) (JUMP #218)
Specify: parameter settings for the selected effect

```
REVERB EFFECT 1 SET        ELIK   218
VOICE*P1-A01(01)   SPICosmo
Effect Mode: 1     Mix1:on   Mix2:off
 Reverb Time    = 3.4 sec
 L.P.F.         = 9.0 KHz
 Initial Delay  = 41 ms

Data Parm
```

❶ The type of effect parameters will depend on the selected Effect Type. Refer to the following parameter lists for each effect type. 00:Off(Through) has no parameters.

❷ To select an Effect Type and set Effect Balance and Output level, press F1 (Data). (See the previous section 10.4 (F1).)

Note: Changing the Effect Type in F1 (Data) will initialize these Parameter settings.

1:Reverb Hall, 2:Reverb Room, 3:Reverb Plate, 4:Reverb Church, 5:Reverb Club, 6:Reverb Stage, 7:Reverb Bath Room, 8:Reverb Metal
Reverb Time (0.3...10.0 sec)
L.P.F. (1.25...12 KHz, Through)
Initial Delay (0.1...50 ms)

9:Single Delay
Delay Time (0.1...300 ms)
FB Delay Time (0.1...300 ms)
Feedback Gain (0...99%)

10:Delay L,R,
Lch Delay Time (0.1...300 ms)
Rch Delay Time (0.1...300 ms)
Feedback Gain (0...99%)

11:Stereo Echo
Lch Delay Time (0.1...152 ms)
Rch Delay Time (0.1...152 ms)
Feedback Gain (0...99%)

12:Doubler 1
Delay Time (0.1...50 ms)
H.P.F. (Thru, 160...1000 Hz)
L.P.F. (1.25...12 KHz, Thru)

13:Doubler 2
Lch Delay Time (0.1...50 ms)
Rch Delay Time (0.1...50 ms)
L.P.F. (1.25...12 KHz, Thru)

14:Ping-Pong Echo
Delay Time (0.1...152 ms)
Pre-Delay Time (0.1...80 ms)
Feedback Gain (0...99%)

15:Pan Reflection
Room Size (0.5...3.2)
Feedback Gain (0...99%)
Direction (L→R, L←R)

16:Early Reflection, 17:Gate Reverb, 18:Reverse Gate
Room Size (0.5...3.2)
L.P.F. (1.25...12 KHz, Thru)
Initial Delay (0.1...50 ms)

19:Feedback Early Reflection, 20:Feedback Gate, 21:Feedback Reverse
Room Size (0.5...3.2)
L.P.F. (1.25...12 KHz, Thru)
Feedback Gain (0...99%)

22:Single Delay & Reverb
Reverb Time (0.3...10.0 sec)
Delay Time (0.1...152 ms)
Feedback Gain (0...99%)

23: Delay L/R & Reverb
Reverb Time (0.3...10.0 sec)
Lch Delay Time (0.1...152 ms)
Rch Delay Time (0.1...152 ms)

24:Tunnel Reverb
Reverb Time (0.3...10.0 sec)
Delay Time (0.1...152 ms)
Feedback Gain (0..99%)

25:Tone Control 1
Low Gain (−12...+12 dB at 800 Hz)
Mid Gain (−12...+12 dB at 1260 Hz)
High Gain (−12...+12 dB at 4 KHz)

26:Single Delay + Tone Control 1,
27:Delay L/R + Tone Control 1
Brilliance (0...12)
Delay Time (0.1...300 ms)
Feedback Gain (0...99%)

28:Tone Control 2
H.P.F (Thru, 160...1000 Hz)
Mid Gain (−12...+12 dB at 1260 Hz)
L.P.F. (1.25...12 KHz, Thru)

29:Single Delay + Tone Control 2,
30:Delay L/R + Tone Control 2
Brilliance (0...12)
Delay Time (0.1...300 ms)
Feedback Gain (0...99%)

31:Distortion + Reverb
Reverb Time (0.3...10.0 sec)
Distortion Level (0...100%)
Dist & Rev Balance (0...100%)

32:Distortion + Single Delay,
33:Distortion + Delay L/R
  Delay Time (0.1...300 ms)
  Feedback Gain (0...99%)
  Distortion Level (0...100%)

34:Distortion
  Distortion Level (0...100%)
  H.P.F. (Thru, 160...1000 Hz)
  L.P.F. (1.25...12 KHz, Thru)

35:Ind. Delay
  Lch Delay Time (0.1...152 ms)
  Rch Delay Time (0.1...152 ms)
  Feedback Gain (0...99%)

36:Ind. Tone Control
  Lch Brilliance (0...12)
  Rch Brilliance (0...12)
  Mid Gain (−12...+12 dB at 1260 Hz)

37:Ind. Distortion
  Lch Dist. Level (0...100%)
  Rch Dist. Level (0...100%)
  L.P.F. (1.25...12 KHz, Thru)

38:Ind. Reverb
  Lch Reverb Time (0.3...10.0 sec)
  Rch Reverb Time (0.3...10.0 sec)
  High Control (0.1...1.0)

39:Ind. Delay & Reverb
  Lch Delay Time (0.1...152 ms)
  Lch Feedback Gain (0...99%)
  Rch Reverb Time (0.3...10.0 sec)

40:Ind. Reverb & Delay
  Lch Reverb Time (0.3...10.0 sec)
  Rch Delay Time (0.1...152 ms)
  Rch Feedback Gain (0...99%)

Reverb effect parameters: The parameters of the reverb effects are explained below in alphabetical order.

  Brilliance: the overall brightness of the sound
  Delay Time: the delay before the echoed sound
  Direction: the direction in which the echoes will be panned

Dist & Rev Balance: the balance between distortion and reverb
Distortion Level: the amount of the distorted sound
FB Delay Time: the delay between repeated echoes of the sound
Feedback Gain: the volume ratio of each echo to the previous one
H.P.F.: frequencies higher than this will be allowed to pass
High Control: the proportion at which high frequency reverb will decay
High Gain: the amount of boost or cut at 4 KHz
Initial Delay: the delay before the effect processed sound will be heard
L.P.F.: frequencies lower than this will be allowed to pass
Lch Brilliance: the overall brightness of the left channel
Lch Delay Time: the delay between repeated echoes in the left channel
Lch Dist. Level: the amount of distortion for the left channel
Lch Feedback Gain: the volume ratio of each successive left channel echo
Lch Reverb Time: the time for the left channel reverb to decrease 60 dB
Low Gain: the amount of boost or cut at 800 Hz
Mid Gain: the amount of boost or cut at 1260 Hz
Pre-Delay Time: the time delay before delay will begin
Rch Brilliance: the overall brightness of the right channel
Rch Delay Time: the delay between repeated echoes in the right channel
Rch Dist. Level: the amount of distortion for the right channel
Rch Feedback Gain: the volume ratio of each successive right channel echo
Rch Reverb Time: the time for the right channel reverb to decrease 60 dB
Reverb Time: the time for the reverb to decrease 60 dB
Room Size: the size (in arbitrary units) of the reverberant room

COMMON DATA

11. Micro tuning

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          ELI     221
VOICE•P1-A01(01)  SP:Cosmo
 Micro Tuning Select = 1 Equal
 Element1 AFM        = off
 Element2 AWM        = off

 Sel   E1    E2
  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 TG77 (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 TG77 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 Kirnberger 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 EP AWM2: This is a special tuning used in preset voice P1-B15 EP:Dynomod.

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.

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.

```
MICRO TUNING EDIT            222
I- 1 Far East
                             01

01:Micro Tuning Data
02:Micro Tuning Name


 01   02
```
❸   ❷   ❶
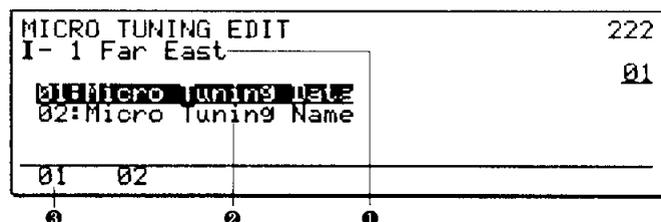
11.0.1 Copy micro tuning

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

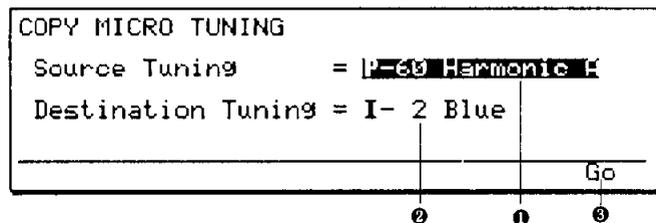**Procedure:**

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-60 Harmonic K

 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 inserted.

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.
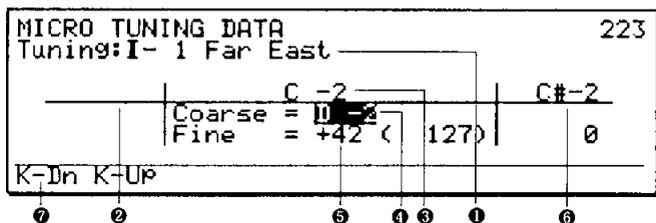
11.1 Micro tuning data

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 = D -2
         Fine   = +42 ( 127)     0
K-Dn K-Up
```
   ❼   ❷   ❺ ❹❸   ❶   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#-2...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 your MIDI keyboard to select a note at any time.

Remarks: First use F1 (K-Dn) and F2 (K-Up) to select the note whose tuning you want to edit. You can also use your MIDI 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 Fine 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

JUMP #224

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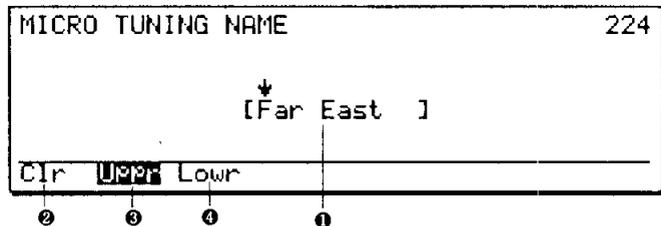
❶ Enter a ten-character name for the Micro Tuning data.

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

❸ To switch to upper-case characters press F2 (Uppr).
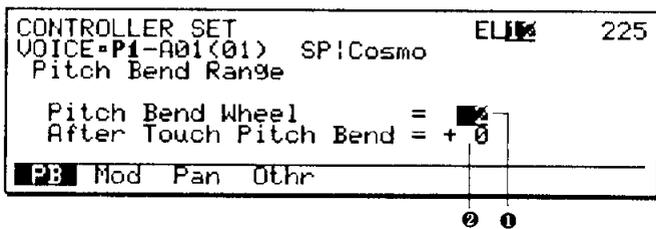
❹ To switch to lower-case characters press F3 (Lowr).

Remarks: Methods of entering character data are explained in *Introducing the TG77, How to use the numeric key pad,* on page 30.

COMMON DATA

12. (F1) Controller set (Pitch bend)

JUMP #225

Summary: Specify the range over which the pitch bend wheel and channel aftertouch of your MIDI keyboard will affect the pitch.

Procedure:

From: Common Data job directory (JUMP #201)
Select: job 12:Cntrllr
Press: F1 (PB) (JUMP #225)
Specify: the pitch bend effect of the pitch bend wheel and aftertouch

```
CONTROLLER SET              ELff  225
VOICE=P1-A01(01)  SP:Cosmo
 Pitch Bend Range

 Pitch Bend Wheel    = ▓
 After Touch Pitch Bend = + 0

 PB  Mod  Pan  Othr
            ❷    ❶
```

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

❷ After Touch Pitch Bend (–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 (with a maximum setting of –12) and up one octave (with a maximum setting of +12). Make sure that your keyboard is transmitting Channel Aftertouch. The TG77 does not respond to Polyphonic Aftertouch.

COMMON DATA

12. (F2) 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:Cntrllr
Press: F2 (Mod) (JUMP #226)
Specify: the controller and depth for each parameter

```
CONTROLLER SET          ELIX   226
VOICE=P1-A01(01)  SP:Cosmo
 Modulation Depth
            |Depth|MIDI Ctrl No. & Device
 Pitch     |  17 |    After Touch
 Amplitude |   0 |    012 Non-assigned no.
 Filter    |   0 |    013 Non-assigned no.
 PB  Mod  Pan  Othr
```
❺   ❸❷❶   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 (0...120, After Touch): These settings determine the controller devices that will add Pitch modulation, Amplitude modulation, and Filter modulation. The selected MIDI control number (0...120) is displayed at the left, and the function which is defined for that number is displayed at the right.

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

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.
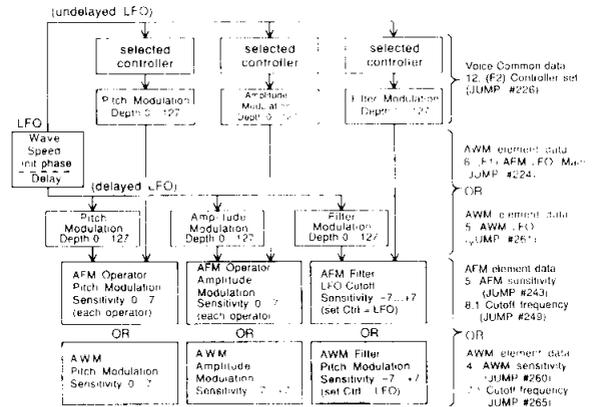
MIDI control number and device: MIDI implementation chart in the back of the owners manual for your MIDI keyboard will list the Control Change messages it is able to transmit. The official MIDI standard does not define the purpose of all of the MIDI Control Change messages 0–120. If the purpose of the selected control number is not defined by the standard, the LCD will show "Non-assigned no.". If your MIDI keyboard is able to transmit control change messages of these numbers, you can use them just like any other control number. "Non-assigned no." simply means that there is yet no official agreement as to the use of that control number.

Since the MIDI standard defines Aftertouch not as a control change but as a different type of message, it has no control number.

COMMON DATA

12. (F3) 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:Cntrllr

Press: F3 (Pan)   (JUMP #227)

Specify: the controller and depth for each parameter

```
CONTROLLER SET            EL    227
VOICE▪P1-A01(01)  SP!Cosmo
  Pan Control
            |Depth|MIDI Ctrl No. & Device
 Pan LFO   |  ▊ — | 013 Non-assigned no.
 Pan Bias  |  0 —|  010 PanPot

 PB   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, Modulation, or Other, press F1, F2, or F4. Refer to sections 12. (F1), 12. (F2), or 12. (F4).

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

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. (F4) 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:Cntrllr
Press: F4 (Othr) (JUMP #228)
Specify: the controller and depth for each parameter

```
CONTROLLER SET            EL    228
VOICE▪P1-A01(01)  SP!Cosmo
  Volume, EG bias, & Filter Cutoff Freq.
            |Value|MIDI Ctrl No. & Device
VolLowLimit|  ▊ — | 014 Non-assigned no.
EGbiasDepth|  0 —|  002 BreathController
CutoffDepth|  67 —| 001 Modulation
 PB   Mod  Pan  Othr
```
❺   ❸❷❶   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. The MIDI standard defines Control Change number 7 as MIDI volume. If you select control change 7 for VolLowLimit, the controller will regulate volume over the full range regardless of the "Value" setting. The LCD will display "Limit ignored!" to remind you of this.

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. 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. See the remarks below for details.

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

⑤ 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* or *Voice AWM Element 7.3 Cutoff EG.*

- 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 │
│VOICE▪P1-A01(01)                 │
│              ↓                  │
│         [SP!Cosmo  ]            │
│                                 │
│ 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 *Introducing the TG77, How to use the numeric key pad,* on page 30.
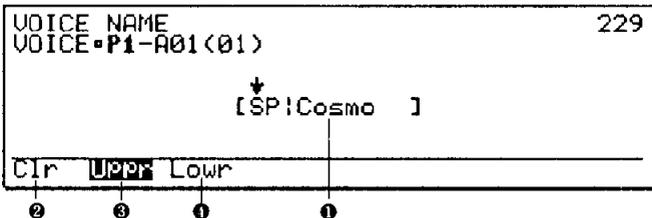
COMMON DATA

14. Individual output select

JUMP #276

Summary: Specify an individual output port 1–8 from which the un-panned un-processed sound of the voice will be output.

Procedure:

From: Voice Common job   (JUMP #201)
         directory

Select: job 14:IndOut   (JUMP #276)

Specify: the individual output port
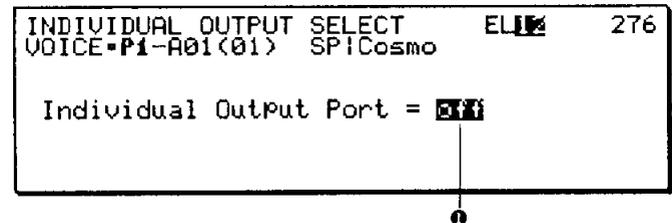
```
┌─────────────────────────────────────┐
│INDIVIDUAL OUTPUT SELECT   EL1▪  276 │
│VOICE▪P1-A01(01)   SP!Cosmo          │
│                                     │
│ Individual Output Port = 01▪        │
│                            │        │
└─────────────────────────────────────┘
                            ❶
```

● Individual Output Port (off, 1...8): Select the individual output port from which the voice will be output. The output is taken from before the element pan, and therefore is not affected by Pan nor Effect settings. When a voice is used in a multi, this voice parameter setting will be ignored, and the individual output port settings for each voice of the multi will be used instead. Refer to *Multi edit, 9. Voice individual output select* on page 165.

Note:

It is not possible for a voice to be output both from a stereo output group and from an individual output.

● *If the Individual Output Port is set to 1–8, (i.e., other than "off"), no sound will be output from the stereo output group selected in Common data, 7. Output group select (see page 97).*

● *If Common data, 7. Output group select is "off", no sound will be output from an Individual Output Port.*

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 setting. 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* or *Voice AWM Element 15. Initialize.*

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
    Stereo Mix   = 1 and 2 both on
    Effect Type   = 00:through (all effects)
    Effect Balance = 100% (all effects)
    Output Level   = 100% (all effects)

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

12 Controller Set
    Pitch Bend Wheel Depth   = 2
    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

14 Individual Output Select   = off

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 ▓▓▓▓ E3: -      230
•P1-A01(01)  SP¦Cosmo               01
▓▓▓▓▓▓ 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   ▓▓▓  E2
```

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 (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 levels 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, 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 cyclically repeating 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.

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AFM ELEMENT DATA

Operator select

Summary: Any time while editing an AFM parameter which is set independently for each operator, you can select the operator 1–6 to view and edit. However this is not possible if the LCD shows all six operators at once.

```
AFM OSCILLATOR      OP[   ] EL[ ]    235
VOICE=P1-A01(01)  SP:Cosmo  (E1/AFM)
OP 1
Freq Mode = fixed   Waveform   = 13
Coarse
Fine      = 0.000 Hz  Phase Sync = on
Detune    = - 4      Init Phase =   0
                                    A19
```

The selected operator is displayed in the LCD.

Procedure:

    From: AFM element jobs
                    (JUMP #235, 236, 237, 241)
    Press: the OPERATOR key while holding the BANK/SELECT key to cycle through operators 1–6.

Remarks: It is not possible to select an operator which has been turned off.

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 numeric keys 1–6 while holding the OPERATOR key to turn operators 1–6 off/on.

The on/off condition of each operator is shown in the upper right of the LCD when editing an AFM element. Operators that are on are displayed in inverse.

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

    This function is provided for convenience of 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.

```
AFM ALGORITHM                        234

Algorithm = 1       [2] [4] [6]
                    [1] [3] [5]
```

To return to the previous display, press EXIT.

Procedure:

    From: any job in the AFM   (JUMP #231–#255)
           job directory
    Press: F8 (Alg)   (JUMP #234)
    To exit: to the previous editing job 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)

```
COPY ELEMENT
  Source Voice Select
P1-A16(16) AP!Grand                16
01:SP!Cosm 05:SP!Aria 09:SP.Padf 13:AP!CP7?
02:SP:Metr 06:SP:Sawp 10:SP:Twil 14:AP!Brig
03:SP:Diam 07:SP:Dark 11:SP!Anna 15:AP!Hamm
04:SP.Sqrp 08:SP!Myst 12:AP.Ivor 16:AP!Grat
 Src  Elem
```

❷   **❶**
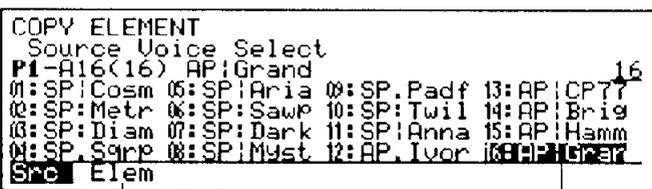
❶ Use the MEMORY button, BANK/SELECT button, DATA ENTRY slider, −1 +1 keys, or the numeric keypad to select a voice from which to copy an element. If you select a voice which contains no elements of the same type (AFM or AWM) as the voice you are editing, the bottom line of the LCD will show "Element type mismatch!".

❷ When you have selected a voice from which to copy an element, press F2 (Elem).

```
COPY ELEMENT
  Element No. Select

  Source Voice:P1-A16(16)  AP!Grand
      E1:AFM  E2:AWM  E3:|-  E4: -
  Element No. = 1
 Src  Elem                           Go
```

❹   **❸**   **❺**
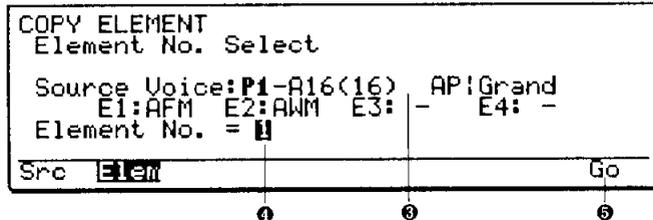
❸ Source Voice: The selected source voice and the number and type of elements are displayed.

❹ Element No.: Select the element from which to copy. You will only be able to select elements of the same type (AFM or AWM) as the element you were editing when you entered this Copy Element function.

❺ 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 2
  Destination = OP 1
                                     Go
```

❷ **❸** **❶**
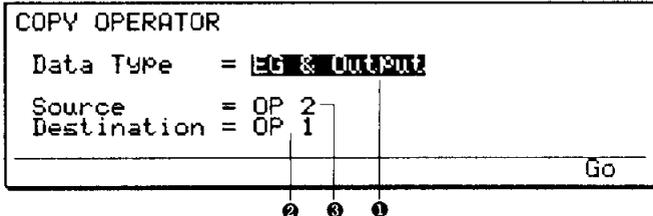
❶ Data Type: Select one of the following types of data to be copied.
EG&OUTPUT: Envelope generator, output level and scaling
EG: Envelope generator
OUTPUT: Output level and scaling

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       OP1▓▓▓▓▓ EL▓▓    231
VOICE▪P1-A01(01)   SP|Cosmo  (E1/AFM)
Algorithm Number = 42
┌──┬───┬───┬OP1 OP2│OP3 OP4 OP5 OP6
│FB │Src│Dst│
│FB1│OP6│   │in2 off│use off use in1
│FB2│█▓█│┌──│use off│use in1 in2 off
│FB3│OP2│└──│use in1│in2 off use off
│Form│Extn│InPt│           Alg
```
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 following chart of the 45 algorithms. 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 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. (F3) AFM algorithm (Input level).

If both inputs of an operator are already used by the algorithm connection, or 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.

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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
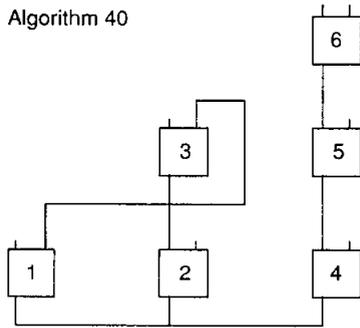
Note: If a carrier operator is used as a feedback source, the amount of feedback will vary depending on the number of carriers, since carrier output levels are automatically adjusted according to the number of carriers.

Remarks: In previous Yamaha 6-operator FM synthesizers, you had a choice of 32 algorithms each of which included one feedback loop. The TG77 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.

AFM ELEMENT DATA

1. (F2) AFM algorithm (External input)

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

Procedure:

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

❶ ❷

❶ Noise (off, in1, in2): The TG77 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. Since the AWM signal is taken from the point after *Common data 1. Element Level* (JUMP #202), the AWM element level must be above 0. If you wish to use the AWM waveform only to modulate an AFM operator, and do not wish to hear the straight AWM sound, turn off the AWM element in *Voice common 7. Output group select* (JUMP #208).

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, or 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)

```
··> FM ──> Filter ──> Amp ──> Pan >
```

Element 2 (AWM)

```
Wave ──> Filter ──> Amp ──> Pan >
```

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.
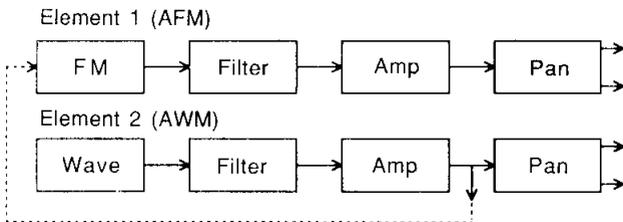
AFM ELEMENT DATA

1. (F3) AFM algorithm (Input level)

JUMP #233

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

Procedure:

From: AFM Element job   (JUMP #230)
       directory

Select: job 01:Algrthm. and press   (JUMP #233)
        F3 (Inpt)

Specify: the input level for each operator input

```
AFM ALGORITHM      OF1▮▮▮▮▮  EL▮▮      233
VOICE·P1-A01(01)  SP!Cosmo  (E1/AFM)
         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  off  FB\2  off  FB\4  off
│ Level┘   7    -    7    -    7    -
│Form Extr ▮Inpt▮              A19
```

❶   ❷

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 TG77, the input levels in1 and in 2 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.

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2. AFM oscillator

Summary: Set frequency-related parameters for each operator.

Procedure:

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

```
AFM OSCILLATOR    OF      EL     235
VOICE=P1-A01(01)  SP:Cosmo  (E1/AFM)
┌OP 1
│Freq Mode = fixed┐ Waveform    = 13──┐
│Coarse = 0.000 Hz │                   │
│Fine              │ Phase Sync = on   │
│Detune = - 4      │ Init Phase =  0   │
                                   A19
```

❶   ❹ ❸   ❷   ❼ ❻❺

❶ **Operator (1–6):** This displays the operator being edited. To move to another operator, hold the BANK/SELECT key and repeatedly press OPERATOR to cycle through operators 1–6.

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.

Phase Setting — 0° (0), 90° (32), 180° (64), 270° (96), 360° (127)
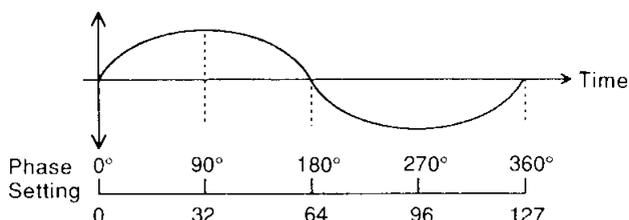
Waveform: The sixteen waveforms that can be produced by each operator are not modeled after any "real" instrument but are mathematical transformations of sinewaves. The following chart shows the harmonic content of each waveform. The amplitude of each harmonic partial is given as a percentage of the fundamental.

1

2
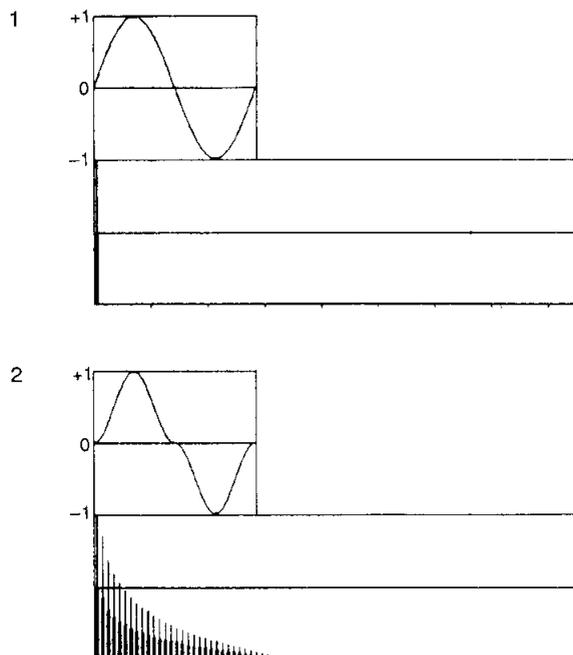
The –100dB level is exceeded by odd harmonics up to the 65th harmonic.

120

3
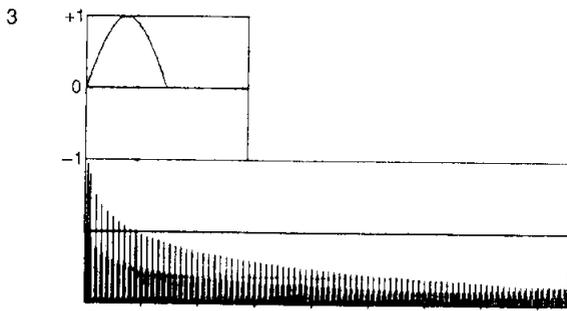
The −100dB level is exceeded by even harmonics up
to the 392nd harmonic.

4
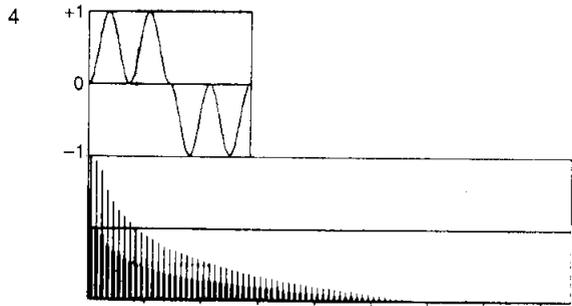
The −100dB level is exceeded by odd harmonics up
to the 113th harmonic.

5
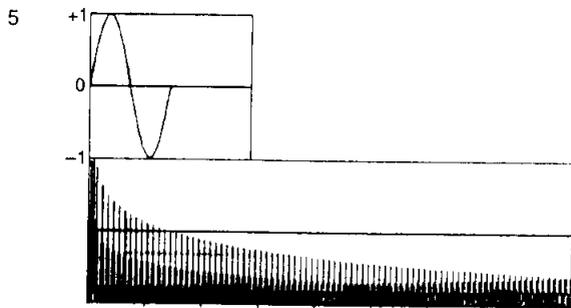
The −100dB level is exceeded by the 2nd harmonic,
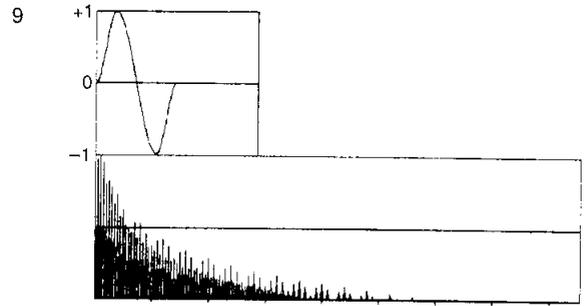and all odd harmonics.

6
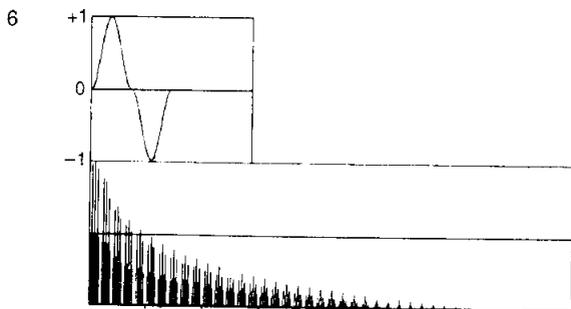
The −100dB level is exceeded by harmonics up
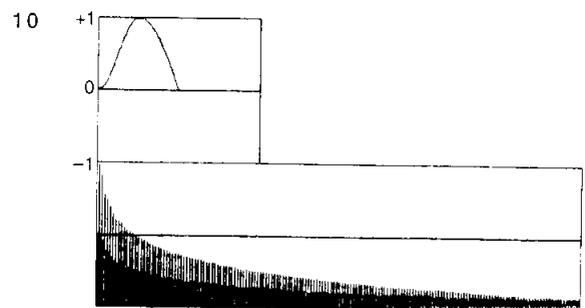to the 130th harmonic. [4th terms do not exist]

7
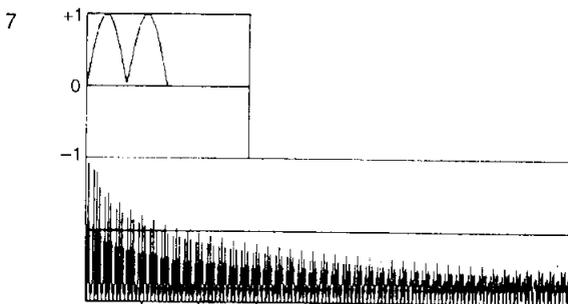
The −100dB level is exceeded by all harmonics except
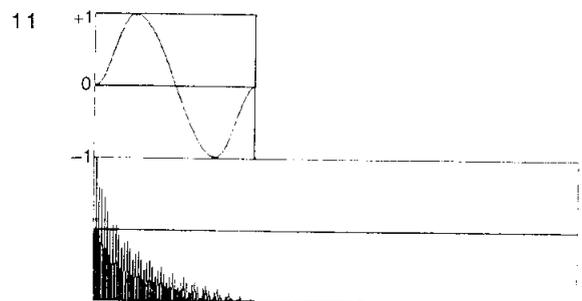(4n-2) terms which do not exist.

8
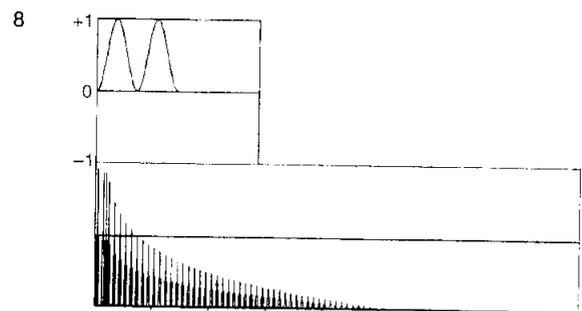
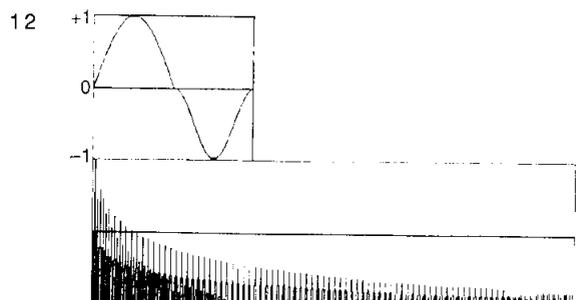The −100dB level is exceeded by the 4th harmonic,
and odd harmonics up to the 99th harmonic.

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 21st harmonic, and odd numbered harmonics up to the 63rd harmonic.

15

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

14

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

16

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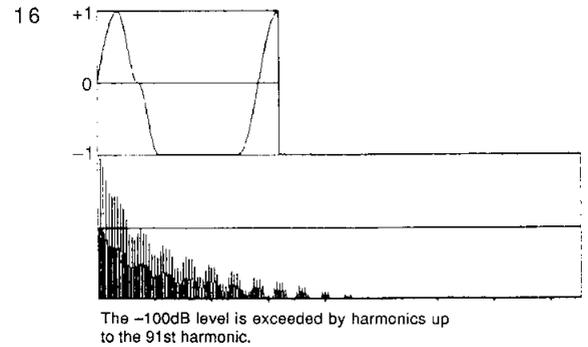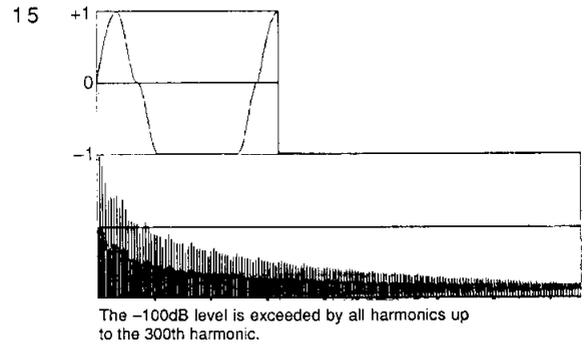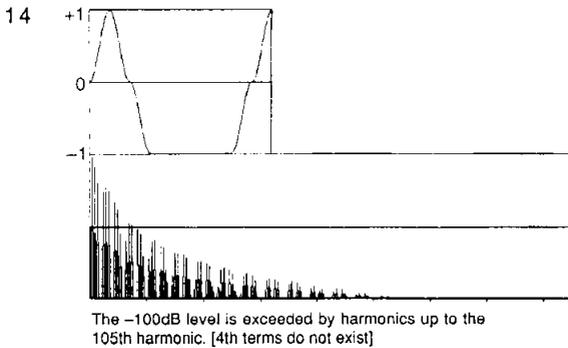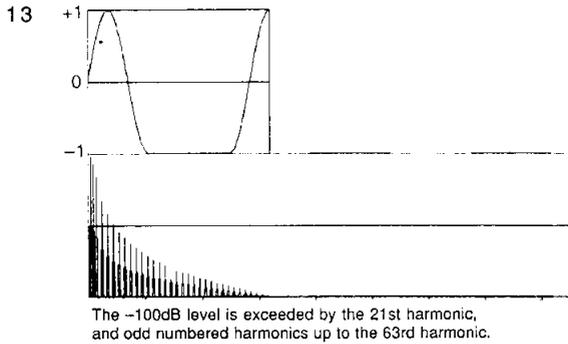
AFM ELEMENT DATA

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   (JUMP #230)
           directory

    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
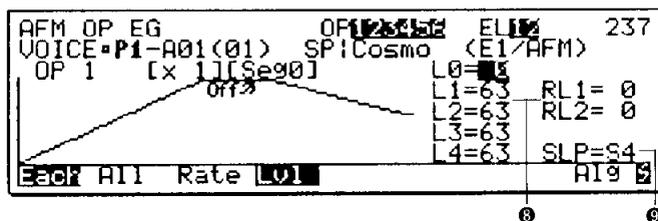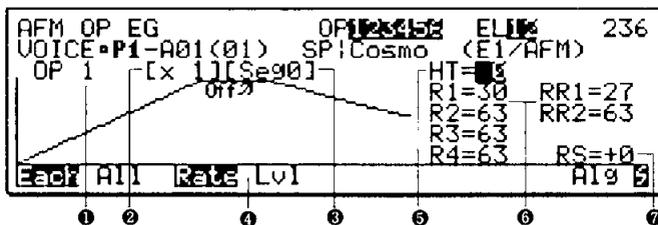
❶ The number of the currently selected operator is displayed. To move to another operator, hold the BANK/SELECT key and repeatedly press OPERATOR to cycle through operators 1–6.

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 L4, 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.
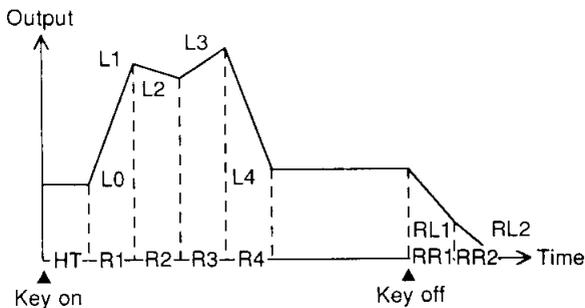
Segment Loop Point: The SLP setting determines the Level from which the EG will loop. If you continue holding a note after Level 4 is reached, when SLP is set to ...
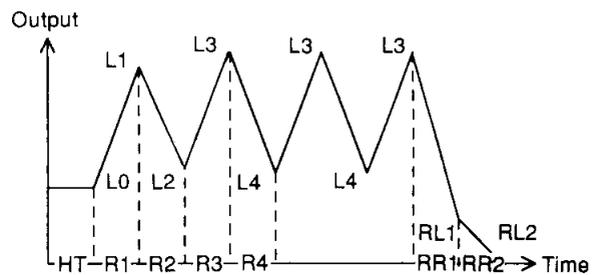
SLP=S1 the level will change L4 → L1 → L2 → L3 → L4 → L1 → ...

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.
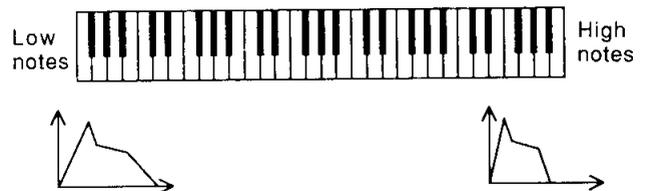
AFM ELEMENT DATA

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)

```
AFM OPERATOR EG      OF       EL      238
VOICE•P1-A01(01)   SP!Cosmo  (E1/AFM)
Keyon Rates & Rate Scaling
  HT R1 R2 R3 R4 RS   HT R1 R2 R3 R4 RS
1| 0 30 63 63 63 +0 |4| 0 63 63 63 63 +0
2| 0 63 63 63 63 +0 |5| 0 30 63 63 63 +0
3| 0 30 63 63 63 +0 |6| 0 63 63 63 63 +0
Each All  OnR  OnL   K-of            Alg
```

❶   ❷   ❸

```
AFM OPERATOR EG      OF       EL      239
VOICE•P1-A01(01)   SP!Cosmo  (E1/AFM)
Keyon Levels & Loop Point
  L0 L1 L2 L3 L4 LP   L0 L1 L2 L3 L4 LP
1| 0 63 63 63 63 S4 |4| 0 63 63 63 63 S4
2| 0 63 63 63 63 S4 |5| 0 63 63 63 63 S4
3| 0 63 63 63 63 S4 |6| 0 63 63 63 63 S4
Each All  OnR  OnL   K-of            Alg
```

❹   ❺

```
AFM OPERATOR EG      OF       EL      240
VOICE•P1-A01(01)   SP!Cosmo  (E1/AFM)
Keyoff Rates & Levels
  RR1 RR2 RL1 RL2     RR1 RR2 RL1 RL2
1| 20  63   0   0  |4| 10  63   0   0
2| 10  63   0   0  |5| 27  63   0   0
3| 27  63   0   0  |6| 10  63   0   0
Each All  OnR  OnL   K-of            Alg
```

❻   ❼

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 RR1, RR2 (KeyOff Rates 0...63): These determine the speed with which the operator EG will change levels after a key is released.

❼ RL1, RL2 (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. (F1) AFM operator EG (Each operator)*.

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

```
AFM OP OUTPUT        OF       EL      241
VOICE•P1-A01(01)   SP!Cosmo  (E1/AFM)
  OP 6  Output Level = 103    Note Offset
                          BP1 | C 1 | + 0
                          BP2 | G 2 | + 0
                          BP3 | E 4 | - 8
                          BP4 | C 6 | - 24
Each All                                Alg
```
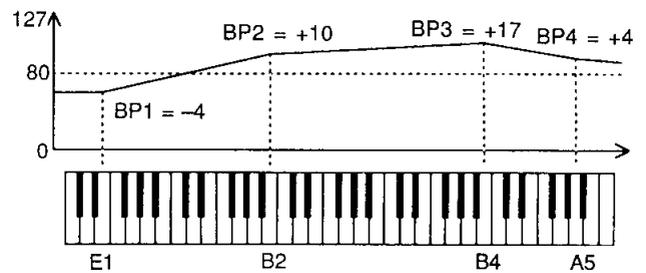
❶❷

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 (MIDI) and press a key on your MIDI keyboard 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) AFM 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 following break point settings.

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

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 (Each)*. 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 (Each)* for details.

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

125

5. AFM sensitivity

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▨▨▨▨  EL▨▨   243
VOICE=P1-A01(01)   SP:Cosmo  (E1/AFM)
          OP1  OP2  OP3  OP4  OP5  OP6
  Velocity  +▨  +0   +2   +0   +2   +0
  Rate Vel  off  off  off  off  off  off
  AModSens  0    0    0    0    0    0
  PModSens  1    0    0    0    3    1
  KVS  Rate  AMS  PMS              A19
```
⑤   ①   ②   ③   ④

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 determine the *sensitivity* of each operator to the Amplitude Modulation Depth (AMD) and/or Pitch Modulation 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).
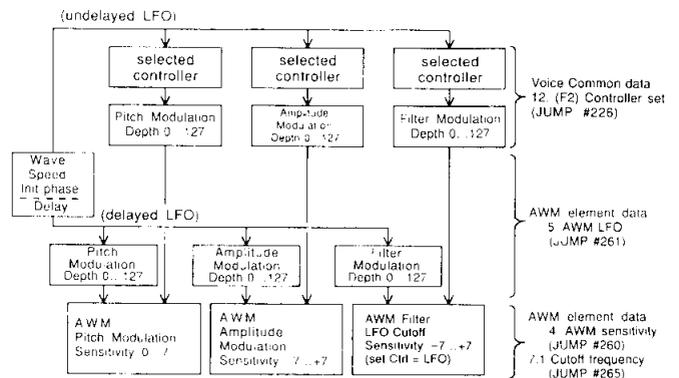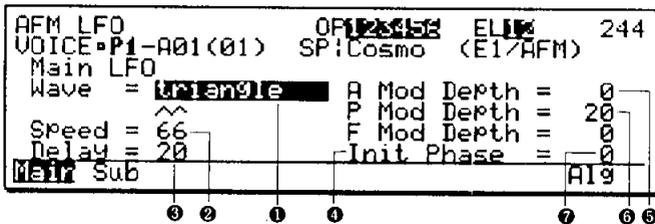
AFM ELEMENT DATA

6. (F1) AFM LFO (Main)

Summary: The Main 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: AFM Element job directory (JUMP #230)

Select: job 06:LFO and press (JUMP #244)
   F1 (Main)

Specify: parameters for the main LFO

```
AFM LFO            OP        ELI    244
VOICE=P1-A01(01)  SP:Cosmo  (E1/AFM)
Main LFO
Wave  = triangle   A Mod Depth =   0
                   P Mod Depth =  20
Speed = 66         F Mod Depth =   0
Delay = 20        [Init Phase  =   0
Main Sub                             A19
```

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 determined by the Speed setting.
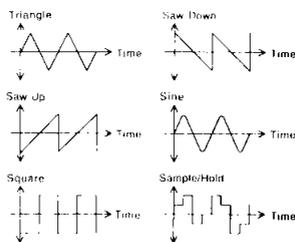
❷ **Speed** (0...99): The speed of the LFO modulation. Higher settings result in faster modulation.

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 waveform 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.*

❻ **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.*

❼ **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 AFM filter (Cutoff frequency).*
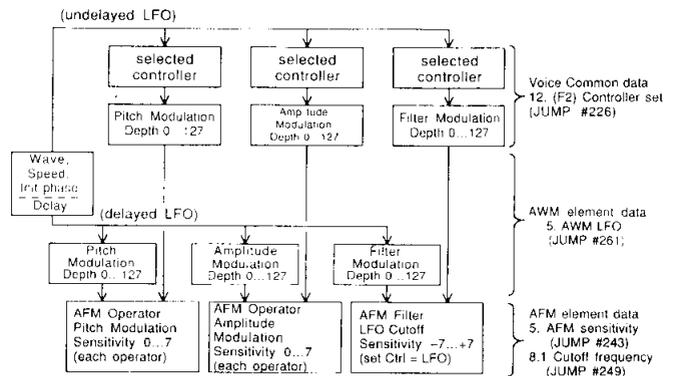
AFM ELEMENT DATA

6. (F2) AFM LFO (Sub)

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         EL      245
VOICE•P1-A01(01)  SP:Cosmo  (E1/AFM)
 Sub LFO for Pitch
 Mode = delay          Speed =   80
 Wave = triangle       Time  =    0
        ∿             P Mod Depth =    0
Main Sub                             A19
```

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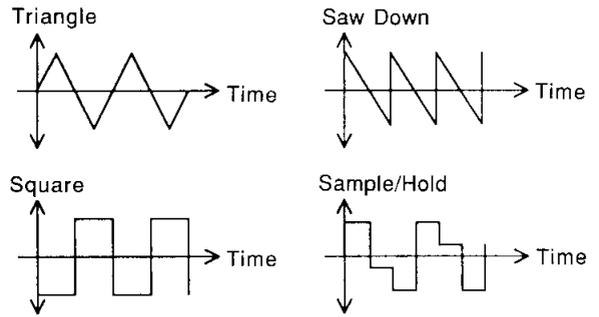
Mode and Time: The mode and time settings work together to determine how the Sub LFO will begin or end. When Mode=delay the Sub LFO will begin after the time delay specified by **❹** Time. When Mode=decay the Sub LFO will affect the sound beginning immediately from when the key is pressed, but will gradually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

Mode = Delay

Mode = Decay

---
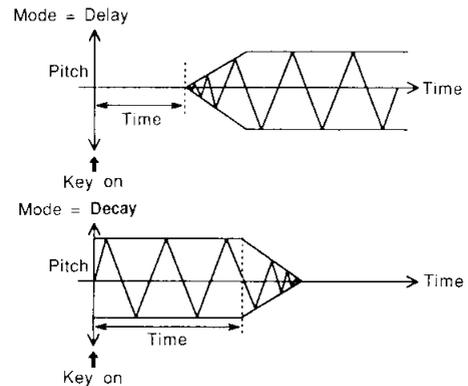
7. (F1) AFM pitch EG (Switch)

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         EL      246
VOICE•P1-A01(01)  SP:Cosmo  (E1/AFM)
        OP1  OP2  OP3  OP4  OP5  OP6
PEG Sw   on   on   on   on   on   on
Rate Scaling  = + 0
Velocity Sw   = off
PEG Range     = 8 oct
Sw  EG                              A19
```

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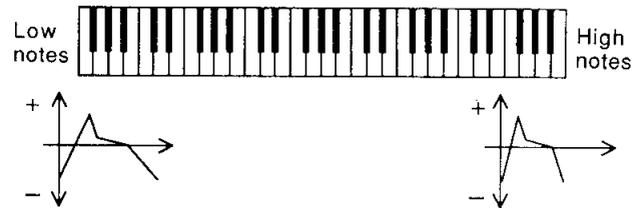
Velocity Sw (velocity switch): When this is "on", strongly played notes will cause the pitch EG to change over a greater range.
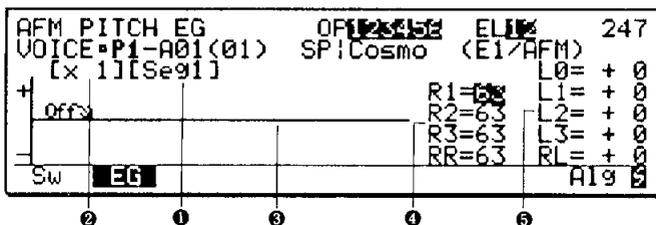

AFM ELEMENT DATA

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

❶ 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.

❷ 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 25 seconds at "x50".

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.

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High (+) 63

Normal pitch

Low (−) 64

L1

L3

L0

L2

RL

Time

R1 ─ R2 ─ R3 ─ RR

Key on

Key off
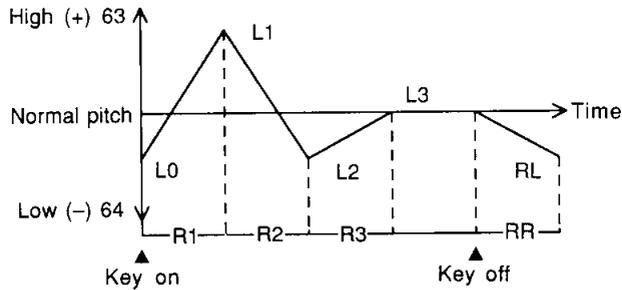
Note: Even if the AFM pitch EG and the AWM pitch EG have identical Rate settings, there will be slight differences in the timing of the pitch change.

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

```
AFM FILTER          OF        EL       248
VOICE▪P1-A01<01>  SPiCosmo  <E1/AFM>
                                        01
  01:Cutoff Frequency
  02:Cutoff Scaling
  03:Cutoff EG

  01    02    03                    A19
```

❷   ❶

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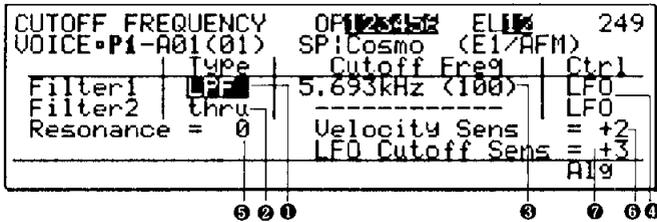
The filter type (HPF/LPF/THRU) will not be copied.

8.1 Cutoff frequency

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  OF       ELI       249
VOICE.P1-A01(01)  SP:Cosmo  (E1/AFM)
                |  Type  |  Cutoff Freq  |  Ctrl
Filter1 |  LPF  |  5.693kHz (100)  |  LFO
Filter2 |  thru |  ------------    |  LFO
Resonance = 0    |  Velocity Sens   = +2
                 |  LFO Cutoff Sens  = +3
                 |                   A19
```
   ⑤②①   ③   ⑦ ⑥④

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. (F4) Controller set* (JUMP #228). Negative settings will reverse the effect of the assigned controller.

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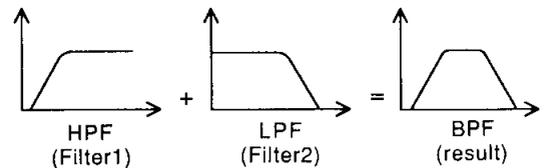
Low Pass Filter (LPF)   High Pass Filter (HPF)

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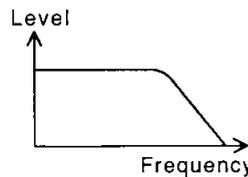
Frequency   Frequency
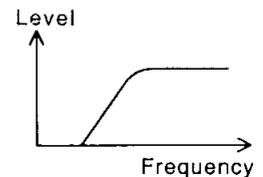
By setting filter 1 to HPF and filter 2 to LPF, you can create a Band Pass Filter that passes only a central band of frequencies.

HPF   LPF   BPF
(Filter1)   (Filter2)   (result)

Each of the TG77's filters has a slope of 12 dB/octave. This means that if the cutoff frequency of a 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

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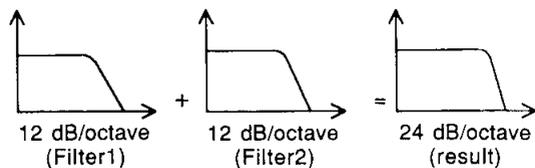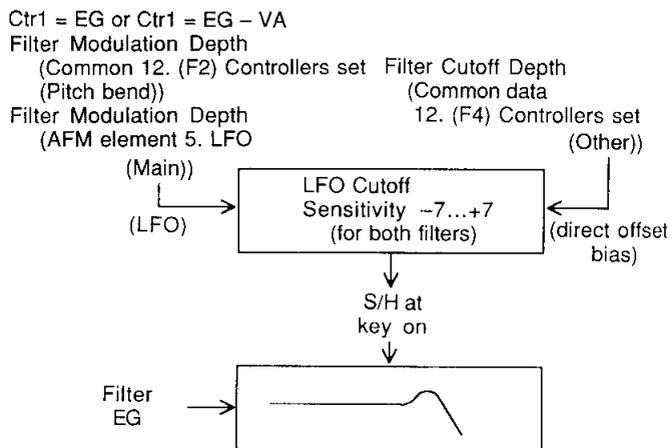
24 dB/octave filtering creates a sharp cutoff which is quite obvious, while 12 dB/octave filtering is a more subtle effect. Analog synthesizers of the past have used both types. 12 dB/octave filtering was considered especially suitable for strings, and 24 dB/octave filtering was for brass or synth bass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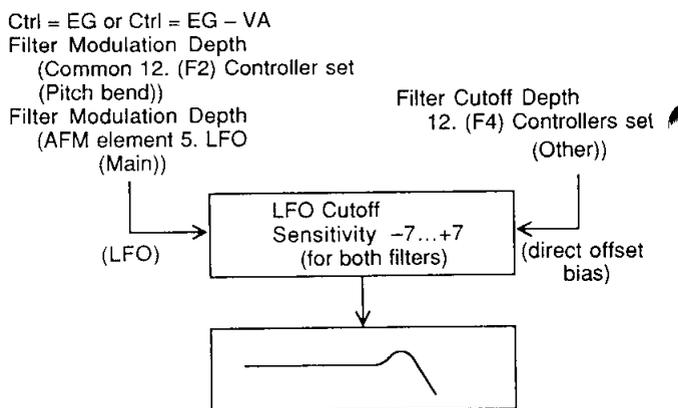

Resonance = 0   Resonance = 20
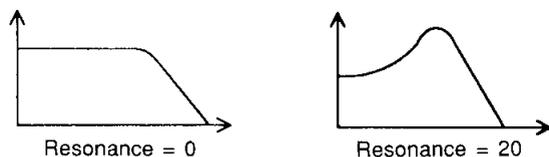
Extremely high settings of filter resonance will make the filter oscillate so that it produces a pitch of its own. This is a technique often used on analog synthesizers of the past.

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.*) Key velocity will shift the cutoff frequency.

Ctrl = EG or Ctrl = EG – VA
Filter Modulation Depth
    (Common 12. (F2) Controllers set   Filter Cutoff Depth
    (Pitch bend))   (Common data
Filter Modulation Depth   12. (F4) Controllers set
    (AFM element 5. LFO   (Other))
        (Main))

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 Cutoff 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 Cutoff 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.
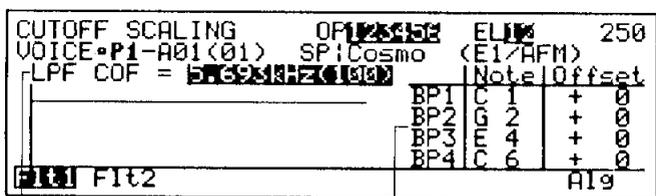
Ctrl = EG or Ctrl = EG – VA
Filter Modulation Depth
    (Common 12. (F2) Controller set
    (Pitch bend))   Filter Cutoff Depth
Filter Modulation Depth   12. (F4) Controllers set
    (AFM element 5. LFO   (Other))
        (Main))

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.

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 (Flt2)   (JUMP #251)
Specify: filter scaling parameters

```
CUTOFF SCALING    OP[      ]  EL[ ]    250
VOICE•P1-A01(01)  SP:Cosmo   (E1/AFM)
┌LPF COF = [           ]    |Note|Offset
                       BP1│C 1 │ + 0
                       BP2│G 2 │ + 0
                       BP3│E 4 │ + 0
                       BP4│C 6 │ + 0
[Flt1] Flt2                         A1g
```

❶   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 Cutoff frequency.*

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 (MIDI) and play a note on your MIDI instrument to enter the new note setting.

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.
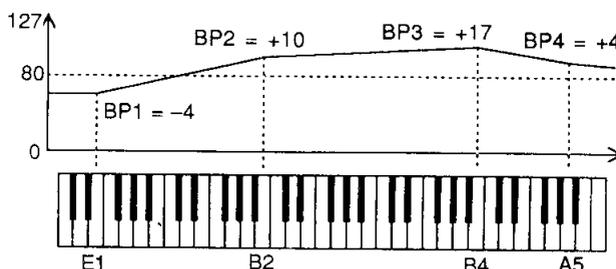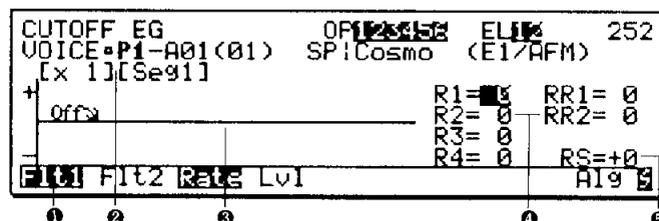

The offset at each break point is added to the cutoff frequency of 80. For example the offset at break point 1 (E1) is –4, so the resulting cutoff frequency at E1 is 76. The resulting cutoff frequency is limited to the range of 0...127.
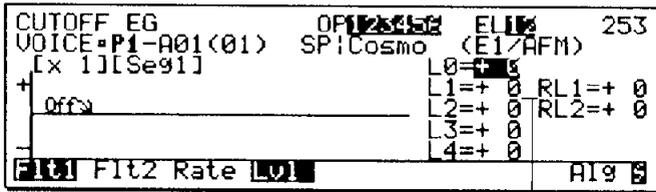
8.3 Cutoff EG

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

```
CUTOFF EG         OP[      ]  EL[ ]    252
VOICE•P1-A01(01)  SP:Cosmo   (E1/AFM)
 [x 1][Seg1]
+                          R1=[ ]  RR1= 0
 Off                       R2= 0 ─RR2= 0
                           R3= 0
                           R4= 0  RS=+0
[Flt1] Flt2 Rate Lvl                A1g
```

❶ ❷   ❸   ❹   ❺

```
CUTOFF EG          OP........ EL..      253
VOICE=P1-A01(01)  SP:Cosmo  (E1/AFM)
 [x 1][Seg1]                L0=+ 5
+                           L1=+ 0  RL1=+ 0
  Off                       L2=+ 0  RL2=+ 0
                            L3=+ 0
                            L4=+ 0
 Flt1 Flt2 Rate Lvl                 RIS 5
```

● This indicates whether you are editing the EG of filter 1 or 2.

● 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).

● The filter EG is graphically displayed.

● 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.

● 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.

● 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.

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 Cutoff frequency.*

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.

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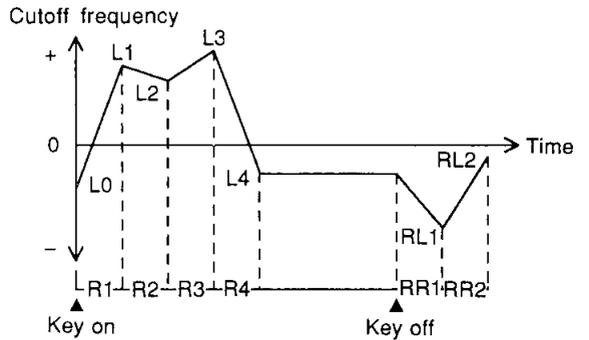
Rate Scaling: On most acoustic instruments, high notes have a naturally shorter attack and decay. This can be simulated by setting rate scaling to a positive value (+1...+7). The following diagram shows how higher notes will have faster rates (shorter EGs). Negative settings will have the opposite effect.
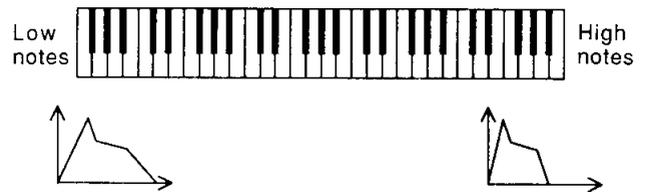
AFM ELEMENT DATA

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 setting. 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. Initialize voice* or *AWM element 15. Initialize AWM element.*

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.

AWM element data

AWM element job directory

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 ████  E3: -      256
·P1-A01(01)  SP:Cosmo             01
01:WaveSet 05:LFO    09: -----  13: -----
02:EG      06:PitchEG 10: -----  14: -----
03:Output  07:Filter  11: -----  15:Initlz
04:Sensitv 08: -----  12: -----  16:Recall
Mode Com │ E1  █E2█
```

❶ This area shows the number (E1–E4) and type (AFM or AWM) of elements in the selected voice mode. Elements which are turned on are displayed in inverse video. Elements can be turned on/off as explained on page 88.

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

01:WaveSet (AWM waveform set): Select an AWM sampled waveform from preset memory or a WAVEFORM card, and specify the pitch at which it will sound.

02:EG (AWM EG): The AWM Amplitude EG determines how the volume of each note will change over time.

03:Output (AWM output): The output level of an AWM element can be adjusted across the keyboard.

04: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.

05:LFO (AWM LFO): The AWM element LFO creates a cyclically changing control signal that can be used for tremolo, vibrato, or wah-wah.

06:PitchEG (AWM pitch EG): The pitch of each note can be made to change in a fixed way over time.

07: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 7. 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 1, 2, 3, 4, 5, or 6

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 116). 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 7. *AWM filter* will access the Copy Filter operation. For details, refer to *AFM element data, 8.0 Copy filter*, page 130.
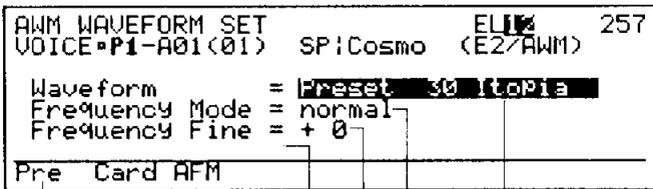

AWM ELEMENT DATA

1. 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 01:WaveSet   (JUMP #257)

Specify: the waveform and frequency

```
AWM WAVEFORM SET        ELI▓   257
VOICE■P1-A01(01)  SP:Cosmo  (E2/AWM)

Waveform      = Preset  30  Utopia
Frequency Mode = normal┐
Frequency Fine = + 0┐

Pre  Card  AFM
```
 ❺   ❹ ❸ ❷   ❶

❶ Waveform (Preset 1...112, Card 1...99, AFM): Select an AWM waveform from internal presets 1...112. Refer to *Preset waveforms* below. If a waveform card is inserted into the WAVEFORM slot, you will also be able to select Card waveforms. The number of card waveforms will depend on each card. If the voice mode includes both AWM and AFM elements, you will be able to select AFM as well. For details see *Waveform = AFM* below.

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): For both normal and fixed modes, this adjusts the fine pitch of the waveform.

❹ Note Number (C-2...G8): The note number setting will appear only if frequency mode is set to "fixed". This 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 Pressing F1 (Pre) will select preset waveforms, F2 (Card) will select card waveforms, and pressing F3 (AFM) will select the sound from the AFM element if the voice includes an AFM element.

Note when using card waveforms: Remember that it is not possible to use two waveform cards at once. If the same Multi uses two or more AWM voices which use AWM waveforms from different cards, at least one AWM voice will be using the wrong waveform. In the same way, it is not possible for two AWM elements in a single voice to use AWM waveforms from different cards.

Waveform = AFM: For voice modes 09:1AFM&1AWM and 10:2AFM&2AWM, you have the option of setting "Waveform = AFM". When this is selected, the output from the AFM element will be used instead of a AWM waveform. This means that the AFM sound will be processed through the two filters of the AFM element and also through the two filters of the AWM element, allowing you to create complex filtering effects.

Element 1 (AFM)

Element 2 (AWM)
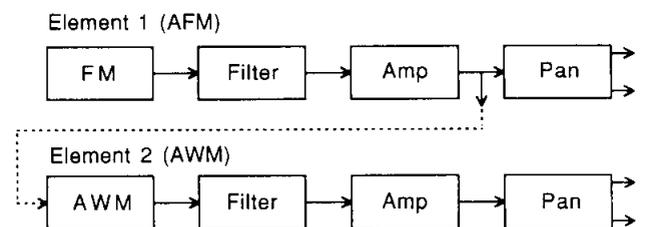
When "Waveform = AFM" is selected, the AWM element common data (note shift, etc.) and AWM pitch-related data such as pitch EG and LFO pitch modulation will be ignored. The result is essentially a single AFM element processed through two pairs of filters.

Preset waveforms: The preset waveforms in ROM can be broadly divided into the following six categories.

Multi-sampled Acoustic instruments sampled at two or more points across the keyboard to preserve the realism of the original sound.

1	Piano	18	Thumping
2	Trumpet	19	Popping
3	Mute Tp	20	Fretless
4	Horn	21	Wood Bass
5	Flugel	22	Shamisen
6	Trombone	23	Koto
7	Brass	24	Violin
8	Flute	25	Pizz
9	Clarinet	26	Strings
10	Tenor Sax	27	AnlgBass
11	Alto Sax	28	Anlg Brs
12	GtrSteel	29	Chorus
13	EG Sngl	30	Itopia
14	EG Humbk	31	Vib
15	EG Harmo	32	Marimba
16	EG mute	33	Tubular
17	E.Bass		

Waves Fairly short samples, especially useful when used with an AFM element. Most are sampled at one point.

34	Cele Wv	46	12Str Wv
35	HarpsiWv	47	Bass Wv
36	E.P. Wv	48	Cello Wv
37	Pipe Wv	49	ContraWv
38	Organ Wv	50	Xylo Wv
39	Tuba Wv	51	Glock Wv
40	Picco Wv	52	Harp Wv
41	S.Sax Wv	53	Sitar Wv
42	BassonWv	54	StlDrmWv
43	Reco Wv	55	MtReedWv
44	MuteTpWv	56	OhAttack
45	Gut Wv		

Oscillator Basic waveforms such as the sawtooth or square waves used in analog synthesizers.

57	AnlgSaw1	62	Pulse 10
58	AnlgSaw2	63	Pulse 25
59	Digital1	64	Pulse 50
60	Digital2	65	Tri
61	Digital3		

Transients Short samples that are especially useful when used as the attack of a sound.

66	Piano Np	72	Bottle 3
67	E.P. Np	73	Tube
68	Vibe Np	74	Vocal Ga
69	DmpPiano	75	Vocal Ba
70	Bottle 1	76	Sax trans
71	Bottle 2	77	Bow trans

Other Various waveforms usable as sound effects or as part of other sounds.

78	Bulb	86	Steam
79	Tear	87	Narrow
80	Bamboo	88	Airy
81	Cup Echo	89	Styroll
82	Digi Atk	90	Noise
83	Temp Ra	91	Bell mix
84	Giri	92	Haaa
85	Water		

Drumset Drums and other rhythm instruments. These can be used not only in a Drum Set voice, but also as the waveform for an AWM element of a normal voice.

|			
93	BD1	103	Tom 2
94	BD2	104	HHclosed
95	BD3	105	HH open
96	BD4	106	Crash
97	SD1	107	Ride
98	SD2	108	Claps
99	SD3	109	Cowbell
100	SD roll	110	Tambrn
101	Rim	111	Shaker
102	Tom 1	112	Analg Perc

AWM ELEMENT DATA

2. AWM EG

Summary: This determines how the volume of an AWM element will change over time.
Procedure:
From: AWM Element job (JUMP #256)
directory
Select: job 02:EG. (JUMP #258)
Specify: volume EG parameters
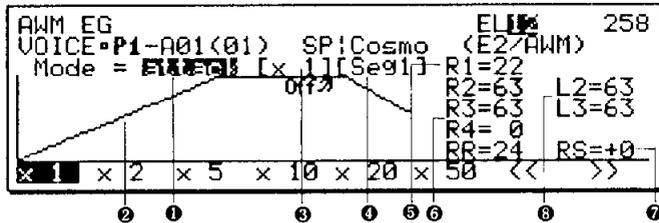
❶ EG Mode (Mode = hold, attack): This setting determines whether the first segment of the AWM EG will begin from level 0 (attack mode) or from maximum level (hold mode).

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 determine 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 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
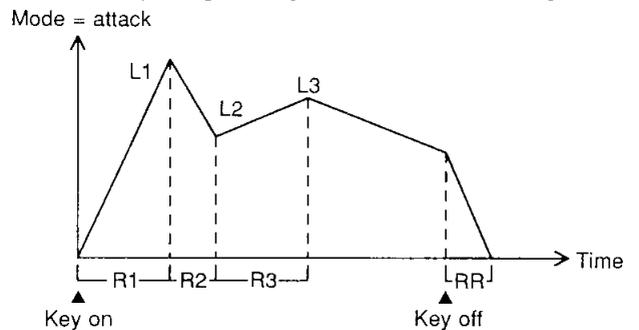
In normal mode the AWM EG level will begin from 0 and rise at the rate of R1 to maximum level. When maximum level is reached it will move at the rate of R2 to level L2. When level L2 is reached it will move at the rate of R3 to level L3. When level L3 is reached it will begin moving at the rate of R4 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.
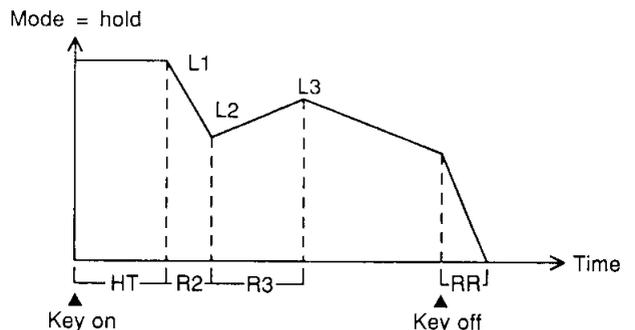
Mode = hold

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.
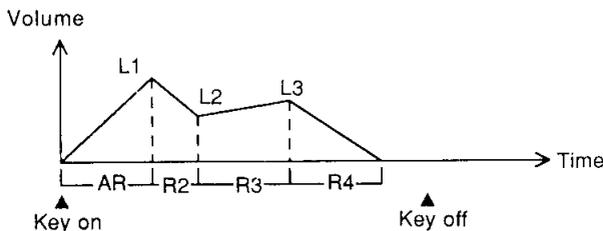

- If R4=0 and you continue holding a note, after the level reaches L3 it will stay at L3 as long as you hold the note. When you release the note, the level will decrease at the rate of RR to a level of 0.
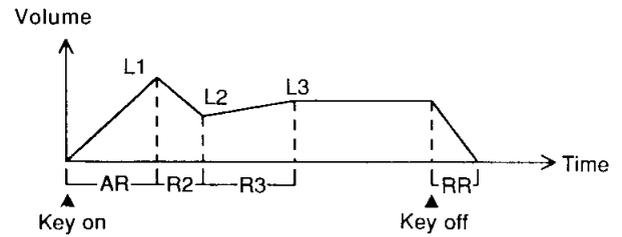
- After reaching L3 the level will decrease at the rate R4, but when you release the note the level will begin decreasing at the rate RR.
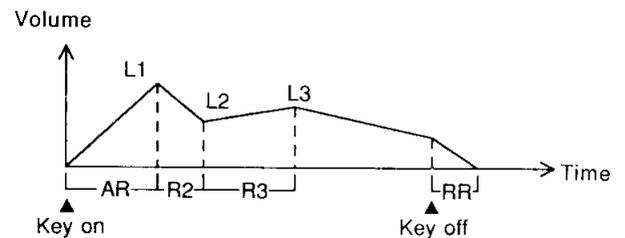
Rate Scaling: On most acoustic instruments, high notes have a naturally shorter attack and decay. This can be simulated by setting rate scaling to a positive value (+1...+7). The following diagram shows how higher notes will have faster rates (shorter EGs). Negative settings will have the opposite effect.
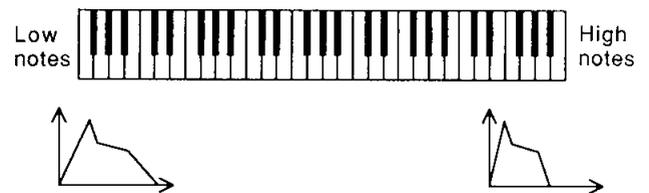
AWM ELEMENT DATA

3. AWM output

JUMP #259

Summary: The Element Level of an AWM element can be adjusted across the keyboard.

Procedure:

From: AWM Element job directory (JUMP #256)

Select: job 03: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) will be adjusted across the keyboard. When the cursor is located at note, you can press F7 (MIDI) and press a key on your MIDI keyboard to enter it as the new note setting.

❷ The keyboard level scaling is graphically displayed.

Break Point: The AWM Element 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 element level will be adjusted across the keyboard. Offset (–127...+127) determines the output level adjustment for each of the four points specified by 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 element level would be adjusted across the keyboard for the following break point settings.
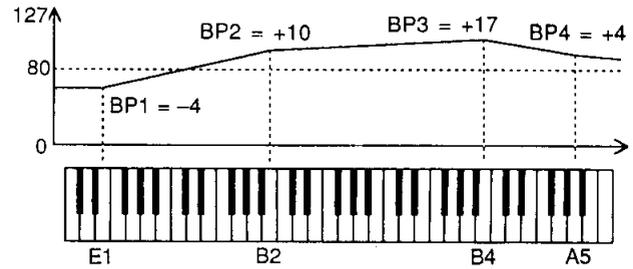
Each offset is added to the element level (80 in this example). For example the offset at break point 1 (E1) is –4, so the resulting element level at E1 is 76. The resulting element level is limited to the range of 0...127.
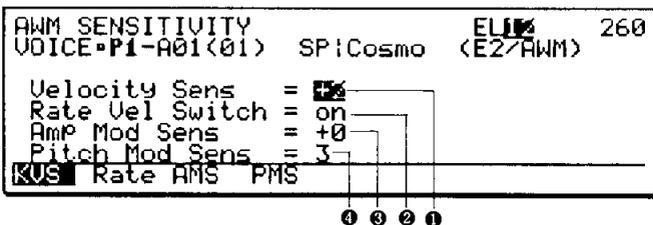

AWM ELEMENT DATA

4. AWM sensitivity

JUMP #260

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 04:Sensitv	(JUMP #260)

Specify: sensitivity to velocity and modulation

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) 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.
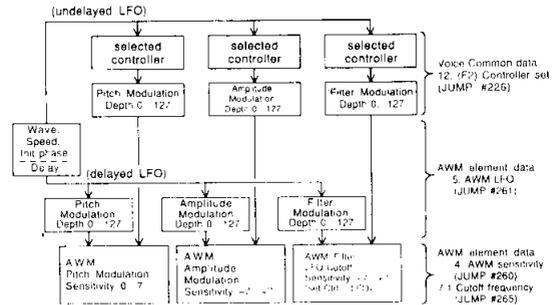
AWM ELEMENT DATA

5. AWM LFO

JUMP #261

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 05:LFO   (JUMP #261)

Specify: the LFO parameters

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.

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 AWM element.

❺ Pitch Modulation Depth (0...127): This determines how greatly the LFO will affect the pitch of the AWM element.

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. (F1) AFM LFO (Main)*.

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 4. 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, 7.1 Cutoff frequency* (JUMP #265).
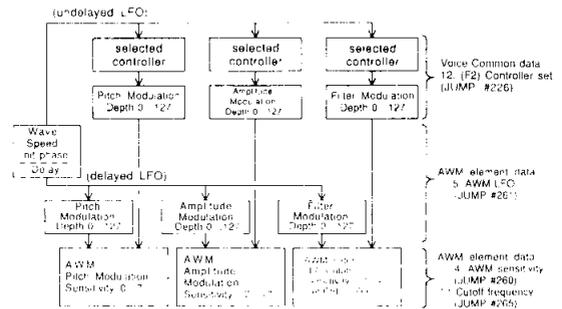
AWM ELEMENT DATA

6. (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 *6. (F2) AWM pitch EG (EG settings)*.
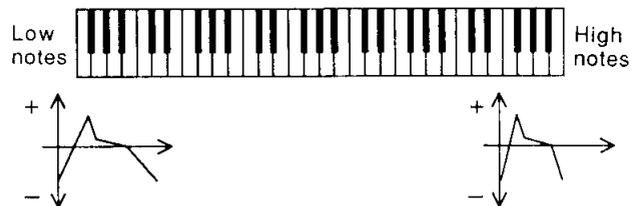
Procedure:

From: AWM Element job directory   (JUMP #256)

Select: job 06:PitchEG and press   (JUMP #262)
F1 (Data)

Specify: pitch EG scaling, velocity, and range

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
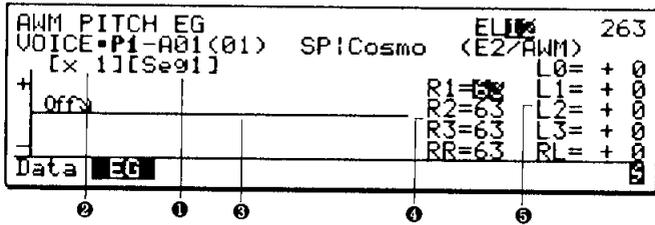
6. (F2) AWM pitch EG (EG settings)

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 *6. (F1) AWM pitch EG (Data)*.

Procedure:

From: AWM Element job directory   (JUMP #256)

Select: job 06:PitchEG and press   (JUMP #263)
F2 (EG)

Specify: pitch EG parameters

```
AWM PITCH EG                ELIK   263
VOICE•P1-A01(01)  SP!Cosmo  (E2/AWM)
 [x 1][Seg1]                     L0= + 0
+  ___                       R1=58  L1= + 0
  _Off_                      R2=63  L2= + 0
 |                           R3=63  L3= + 0
 |                           RR=63  RL= + 0
 Data  EG                                0
```
            ❷   ❶ ❸   ❹   ❺

❶ 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.

❷ 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 25 seconds at "x50".

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 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.
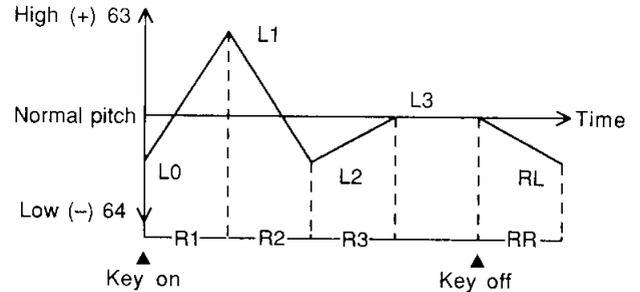
Note: Even if the AWM pitch EG and the AFM pitch EG have identical Rate settings, there will be slight differences in the timing of the pitch change.

AWM ELEMENT DATA

7. 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 07:Filter (JUMP #264)
Specify: the desired filter edit job and press ENTER
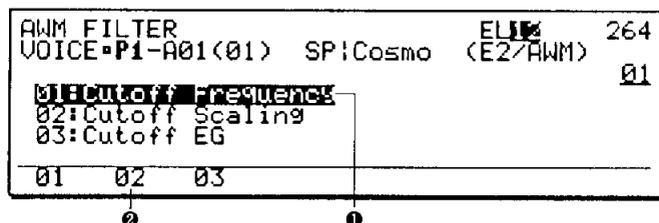
```
AWM FILTER                  ELIK   264
VOICE•P1-A01(01)  SP!Cosmo  (E2/AWM)
                                 01
 01:Cutoff Frequency
 02:Cutoff Scaling
 03:Cutoff EG
 01   02   03
```
       ❷   ❶

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.

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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)
        directory

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 setting. 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 reset 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 voice* or *AFM Element 15. Initialize AFM element.*

Initialized settings for AWM Element data

01 AWM Waveform Select

Waveform	= Preset 65 (triangle wave)
Frequency Mode	= normal
Fixed Mode Note #	= C3
Frequency Fine	= ±0

02 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

03 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

04 AWM Sensitivity

Velocity Sens	= ±0
Rate Velocity Switch	= off
AMS	= 0
PMS	= 3

05 AWM LFO

Wave	= Triangle
Speed	= 65
Delay Time	= 0
AMD, PMD, FMD	= 0
Init Phase	= 0

06 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

07 AWM Filter

Resonance	= 0	Break Point 2 Note	= G2
Cutoff Mod Sens	= ±0	Break Point 3 Note	= E4
Keyon Velocity Sens	= ±0	Break Point 4 Note	= C6
*** following data is same for both filters ***		Break Point Offset	= 0 (BP 1–4)
Filter Type	= thru	Keyon Rates 1–4	= 63
Filter Control	= LFO	Keyoff Rates 1–2	= 63
Cutoff Frequency	= 127	Rate Scaling	= ±0
Break Point 1 Note	= C1	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.
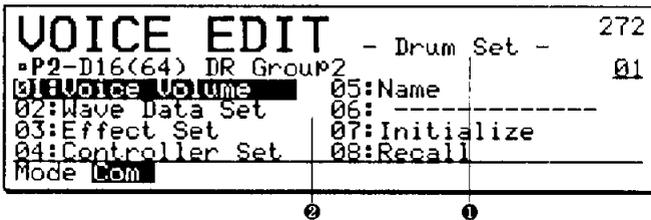
Drum set data

Drum set job directory

JUMP #272

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
■P2-D16(64) DR Group2           01
01:Voice Volume    05:Name
02:Wave Data Set   06: ----------
03:Effect Set      07:Initialize
04:Controller Set  08:Recall
Mode Com
```
       ❷   ❶

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 note of the TG77's 61-note drum set, and specify tuning and pan for each.

03: Effect Set: Specify how the four DSP effect units will be connected, select an effect type for each unit, and make settings for each effect.

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

JUMP #273

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■P2-D16(64)  DR Group2 (Drum Set)

Voice Volume=  127
```
              ❶
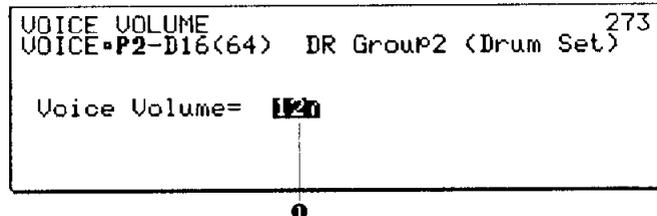
❶ Voice Volume (0...127): This determines the overall volume of the entire drum voice.

2. Wave data set

JUMP #274

Summary: Select a waveform for each key of the TG77's 61-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

148

```
WAVE DATA SET                              274
VOICE=P2-D16(64)   DR Group2 (Drum Set)
┌C 1 : Wave┐= Preset  94 30 2
│Level     │= 127 ┌Note Shift = - 2
│Alternate │= off │Fine Tune  = + 0
│Output Group= grp2│Static Pan = + 0
└Ind.Out Port= off
K-Dn K-Up Pre  Card
```

❶ ❸❹❺ ❻❷   ❼   ❽   ❾

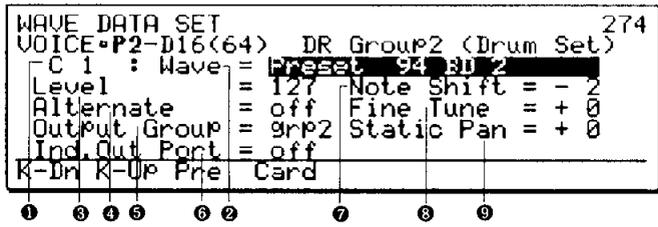❶ Key Note Number (C1...C6): Press a key on your MIDI keyboard to select a key note number, and it will be displayed here. (It is not possible to move the cursor here.)

❷ Waveform (Preset 1...112, Card 1...99): Select the AWM sample that will be played by the corresponding Key Note Number. A list of the 112 preset waveforms is given in *AWM element edit, 1. AWM Waveform Set* (page 138).

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 Individual Output Port (off, 1...8): Select the individual output port from which the waveform selected for this key note number will be output.

❼ Note Shift (–48...+36 in half steps): Adjust the tuning of the waveform in half steps.

❽ Fine Tuning (–64...+63 in units of 1.171875 cents): Adjust the tuning of the waveform in fine steps.

❾ Static Pan (–31...+31 = Left...Right): Specify the stereo position for each key note number.

Use the following two steps to make settings ❷–❾ for each note of the keyboard. Repeat the two steps as necessary.

1. Press a key on your MIDI keyboard to select a key note number. The selected key note number will be displayed in ❶.
2. Make settings ❷–❾ 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-
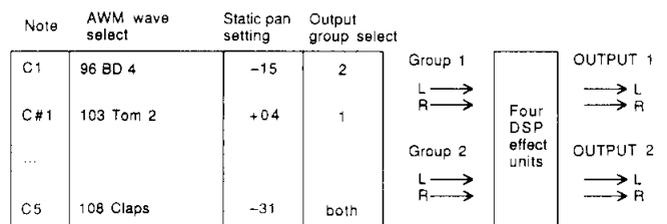
hat at the same time. By selecting alternate "on" for the two key note numbers that play the closed hi-hat and open hi-hat waveforms, playing the closed hi-hat will make the open hi-hat stop, and vice versa.

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 the 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 an 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.*

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 selected output group will determine how each waveform of the drum voice will be processed through the effect units.

Note	AWM wave select	Static pan setting	Output group select
C1	96 BD 4	–15	2
C#1	103 Tom 2	+04	1
...			
C5	108 Claps	–31	both

Group 1 L⟶ R⟶   Four DSP effect units   OUTPUT 1 ⟶L ⟶R
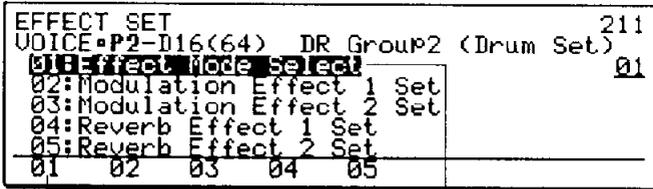
Group 2 L⟶ R⟶   OUTPUT 2 ⟶L ⟶R

Individual Output Port: If this is set to 1–8 (i.e.,other than "off"), no sound will be output from the stereo output groups. If the Output Group (see above) is set "off", there will be no sound either from the stereo output groups *or* from the individual output selected here.

DRUM SET DATA

3. Effect set

JUMP #211

Summary: Specify how the four DSP effect units will be connected, select an effect type for each unit, and make settings for each effect.

Procedure:

From: drum set job directory   (JUMP #272)

Select: 03:Effect Set   (JUMP #211)

Specify: the effect job you wish to edit and press ENTER

```
EFFECT SET                         211
VOICE•P2-D16(64)  DR Group2 (Drum Set)
01:Effect Mode Select            01
02:Modulation Effect 1 Set
03:Modulation Effect 2 Set
04:Reverb Effect 1 Set
05:Reverb Effect 2 Set
01   02   03   04   05
```

❷   ❶

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

01: Effect Mode Select: Specify how the four effect units will be connected. (JUMP #212)

02: Modulation Effect 1 Set: Select an effect type and set parameters for modulation effect 1. (JUMP #213, #214)

03: Modulation Effect 2 Set: Select an effect type and set parameters for modulation effect 2. These are set in exactly the same way as explained for Modulation Effect 1. (JUMP #215, #216)

04: Reverb Effect 1 Set: Select an effect type and set parameters for reverb effect 1. (JUMP #217, #218)

05: Reverb Effect 2 Set: Select an effect type and set parameters for reverb effect 2. These are set in exactly the same way as Reverb Effect 1. (JUMP #219, #220)
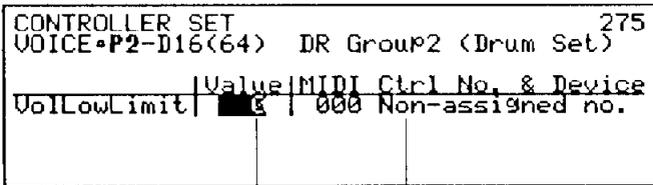
❷ Pressing F1–F5 will select the corresponding job.

Note: Effect settings for a drum set voice are made in exactly the same way as for a normal voice. For details on effect settings, refer to Common Data job 10. Effect set.

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•P2-D16(64)  DR Group2 (Drum Set)

          |Value|MIDI Ctrl No. & Device
VolLowLimit|  0  | 000 Non-assigned no.
```

     ❷   ❶

❶ Device (MIDI Control #): Select a controller number 0–120 or aftertouch. For example when "001 Modulation" is selected, the modulation wheel on your MIDI keyboard will regulate the volume of the drum voice. For a detailed explanation of controller numbers, refer to *Voice Common job 12. (F2) Controller set.*

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.

The MIDI standard defines Control Change number 7 as MIDI volume. If you select control change 7 for VolLowLimit, the controller will regulate volume over the full range regardless of the "Value" setting. The LCD will display "Limit ignored!" to remind you of this.

150

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·P2-D16<64>
                  ↓
             [DR Group2 ]


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 data* of the *Introductory section*.
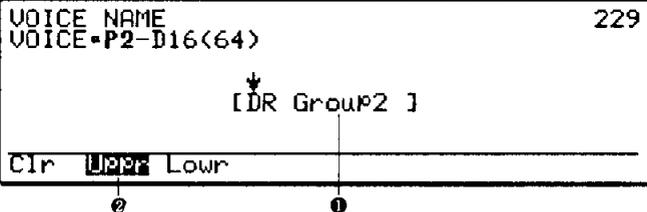
DRUM SET DATA

7. Initialize voice

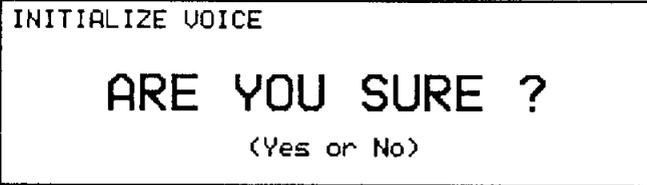**Summary:** Initialize the drum set data being edited to the basic or minimum settings.

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
                 (all key note numbers)
Output Group   = both
                 (all key note numbers)
Individual Output = off
Port   (all key note numbers)
Fine tuning   = ±0
                 (all key note numbers)
Alternate   = off (all key note numbers except A2 HI-HAT CLOSED and B2 HI-HAT OPEN)

Key note number	Waveform (preset)	Note shift	Static pan
C1	96 BASS DRUM 4	−5	±0
C#1	96 BASS DRUM 4	+5	±0
D1	95 BASS DRUM 3	−5	±0
D#1	95 BASS DRUM 3	+5	±0
E1	103 TOM 2	−9	+24
F1	103 TOM 2	−3	−8
F#1	103 TOM 2	+3	+8
G1	103 TOM 2	+9	+24
G#1	94 BASS DRUM 2	±0	±0
A1	93 BASS DRUM 1	±0	±0
A#1	99 SNARE DRUM 3	±0	±0
B1	102 TOM 1	−9	−24
C2	102 TOM 1	−3	−8
C#2	98 SNARE DRUM 2	±0	±0
D2	102 TOM 1	+3	−8
D#2	101 RIM SHOT	±0	+12
E2	97 SNARE DRUM 1	±0	±0
F2	102 TOM 1	+9	+24
F#2	108 CLAPS	±0	−12
G2	109 COWBELL	±0	−20
G#2	111 SHAKER	±0	+20
A2	104 HI-HAT CLOSED		±0
A#2	110 TAMBOURINE	±0	−10
B2	105 HI-HAT OPEN	±0	+24
C3	106 CRASH	±0	+10
C#3	100 SNARE DRUM ROLL	±0	±0
D3	107 RIDE	−4	−24
D#3	107 RIDE	+4	−24
E3	73 TUBE	−10	−26
F3	73 TUBE	−5	−20
F#3	73 TUBE	+5	−14
G3	82 DIGITAL ATTACK	−7	±0
G#3	82 DIGITAL ATTACK	+7	±0
A3	112 ANALOG PERCUSSION	−5	±0
A#3	112 ANALOG PERCUSSION	+5	±0
B3	77 BOW TRAN	−5	±0
C4	77 BOW TRAN	+5	±0
C#4	80 BAMBOO	±0	+20

Key note number	Waveform (preset)	Note shift	Static pan
D4	75 VOCAL "Ba"	−5	+24
D#4	75 VOCAL "Ba"	+5	+24
E4	83 TEMP RA	±0	±0
F4	71 BOTTLE 2	±0	±0
F#4	70 BOTTLE 1	±0	±0
G4	72 BOTTLE 3	±0	±0
G#4	81 CUP ECHO	±0	±0
A4	74 VOCAL "Ga"	−5	−24
A#4	74 VOCAL "Ga"	+5	−24
B4	79 TEAR	±0	±0
C5	59 OH ATTACK C	−12	±0
C#5	59 OH ATTACK C#	−11	±0
D5	59 OH ATTACK D	−10	±0
D#5	59 OH ATTACK D#	−9	±0
E5	59 OH ATTACK E	−8	±0
F5	59 OH ATTACK F	−7	±0
F#5	59 OH ATTACK F#	−6	±0
G5	59 OH ATTACK G	−5	±0
G#5	59 OH ATTACK G#	−4	±0
A5	59 OH ATTACK	−3	±0
A#5	59 OH ATTACK A#	−2	±0
B5	59 OH ATTACK B	−1	±0
C6	59 OH ATTACK C high	±0	±0

03 Effect set
*** same as normal voice initial data ***

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.