

YAMAHA

TONE GENERATOR

TG77

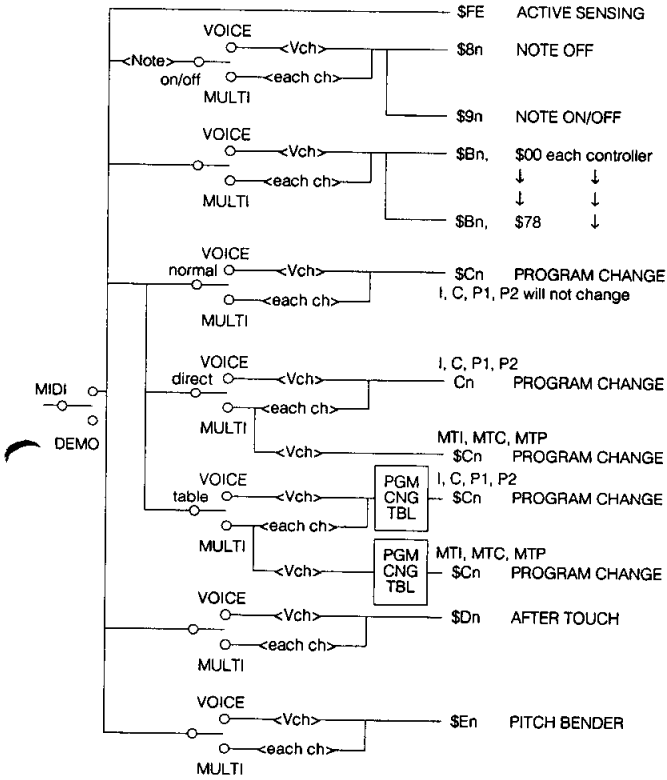
MIDI DATA FORMAT

1. Synthesizer mode

1.1 MIDI reception/transmission block diagram

< MIDI reception conditions > 1/2

Vch Voice Receive ch.



(continue)

- \$F0, \$43, \$1n, \$34, \$09 Parameter change (Filter data)
- \$F0, \$43, \$1n, \$34, \$0A Parameter change (PAN data)
- \$F0, \$43, \$1n, \$34, \$0B Parameter change (Micro Tuning data)
- \$F0, \$43, \$1n, \$34, \$0C Parameter change (Additional MULTI)
- \$F0, \$43, \$1n, \$34, \$0F Parameter change (System Setup data & Program Change Table)
- \$F0, \$43, \$1n, \$04, \$40 Parameter change (Master Tuning) Same format as DX1
1 VOICE bulk D.req.
- \$F0, \$43, \$2n, \$7A (LM_8101VC) 1 MULTI bulk D.req.
- \$F0, \$43, \$2n, \$7A (LM_8101MU) 1 Additional MULTI bulk D.req. (MMEM + AMMEM)
- \$F0, \$43, \$2n, \$7A (LM_8104MU) 1 PAN bulk D.req.
- \$F0, \$43, \$2n, \$7A (LM_8101PN) 1 Micro Tuning bulk D.req.
- \$F0, \$43, \$2n, \$7A (LM_8101MT) System Setup bulk D.req.
- \$F0, \$43, \$2n, \$7A (LM_8101SY) Program change table bulk D.req. (System setup + Program change table)
- \$F0, \$43, \$2n, \$7A (LM_8104PC)

Dev No = Device Number

VCED = Voice edit buffer

MCED = Multi edit buffer

VMEM = Voice memory

MMEM = Multi memory

AMMEM = Additional Multi memory

ACTIVE SENSING

Voice bulk

Multi bulk

Additional Multi bulk *1

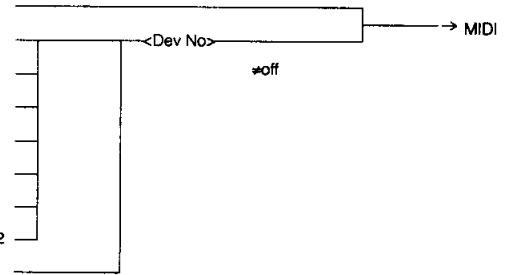
PAN bulk

Micro Tuning bulk

Synth setup bulk

Program change table bulk *2

Parameter change

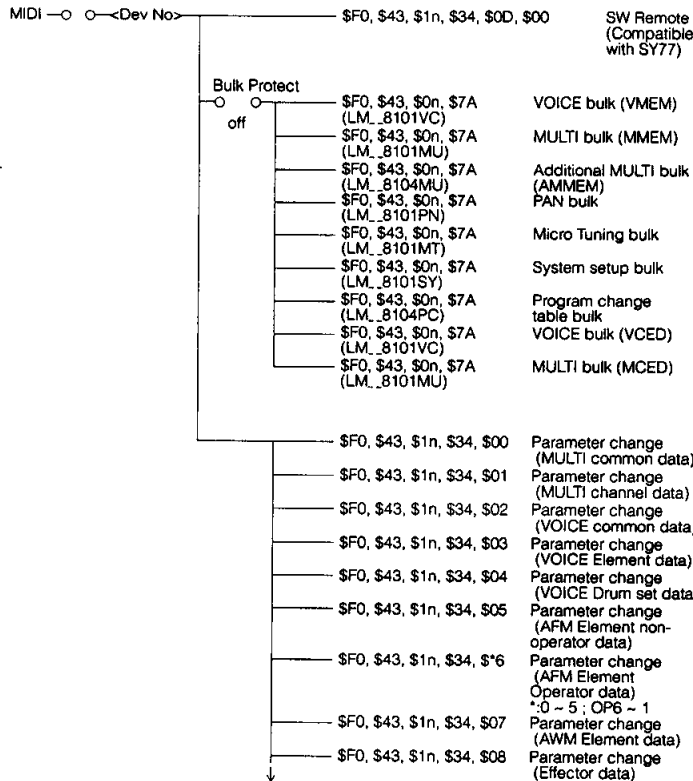


*1 Additional Multi bulk data is transmitted together with Multi bulk data.

*2 Program Change Table bulk data is transmitted together with System setup bulk data.

< MIDI reception conditions > 2/2

≠off



(continue)

2. Channel messages

2.1 Reception

2.1.1 Note on/off

Received note range = C-2 . . . G8
 Velocity range = 1 . . . 127 (note on only)

* A system setup parameter allows selection of
 normal = receive all note numbers
 odd = receive odd note numbers
 even = receive even note numbers

2.1.2 Control change

The following parameters can be controlled via MIDI.

cntrl#	parameter	data rng
0~120	Pitch Modulation	0...127
0~120	Amplitude Modulation	0...127
0~120	Filter Modulation	0...127
0~120	Pan LFO Modulation	0...127
0~120	Cutoff Bias	0...127
0~120	Pan Bias	0...127
0~120	EG Bias	0...127
0~120	Volume (assignable)	0...127
7	Volume	0...127
64	Sustain Switch	0...127
65	Portamento Switch	0...127

2.1.3 Program change

When a program change is received, the TG77 will operate as follows.
 A system setup parameter allows the following four modes of reception.

- 1) off : program changes will not be received.
- 2) normal
 : When in voice mode, program change data 00...63 correspond to voices 01...64. INTERNAL, CARD, or PRESET will not change. Program change data 64...127 will not be received.
 When in multi mode, program change data 00-63 correspond to voices 01-64, and program change data 64...79 correspond to multis 01...16. INTERNAL, CARD, or PRESET will not change. Program change data 80...127 will not be received.
- 3) direct
 : Program change data 00...116 will function the same as in normal mode. Program change data 117 and above are used to switch modes as follows, and when the following program change 00...116 is received, the mode and voice will be selected.

pgm change data value	
# 117	Voice Mode PRESET2
# 118	Multi Mode Voice PRESET2
# 119	Multi Mode Voice INTERNAL or CARD (whichever is currently selected by the MULTI)
# 120	Multi Mode Voice CARD or INTERNAL (whichever is currently selected by the MULTI)
# 121	Multi Mode Voice PRESET1
# 122	Voice Mode INTERNAL
# 123	Voice Mode CARD
# 124	Voice Mode PRESET1
# 125	Multi Mode Multi INTERNAL
# 126	Multi Mode Multi CARD
# 127	Multi Mode Multi PRESET

However, when the receiving device is in Voice mode, #118...#121 will be interpreted as

#118 → #117
 #119 → #122
 #120 → #123
 #121 → #124

and will be received while remaining in Voice mode.

4) table

: Programs will be selected as specified by the contents of the table, including the selection of Voice/Multi or Internal/Card/Preset (1,2).

2.1.4 Pitch bend

Only the MSB of the pitch bend is received.

2.1.5 Aftertouch

Channel aftertouch is received. Individual aftertouch is not received.

2.1.6 Channel mode messages

Not received

3. System exclusive messages

3.1 Parameter changes

The TG77 transmits and receives the following 15 types of parameter changes. (16: Remote Switch is only received.) Also, when 16: Remote Switch is received, the corresponding display will appear just as if the switch had actually been pressed.

- 1) Multi Common Data parameter change
- 2) Multi Channel Data parameter change
- 3) Voice Common Data parameter change
- 4) Voice Element Data parameter change
- 5) Voice Drum Set Data parameter change
- 6) AFM Element Common Data parameter change
- 7) AFM Element Operator Data parameter change
- 8) AWM Element Data parameter change
- 9) Effect Data parameter change
- 10) Filter Data parameter change
- 11) PAN Data parameter change
- 12) Micro Tuning Data parameter change
- 13) System Setup Data parameter change
- 14) Additional Multi Data parameter change
- 15) Program Change Table parameter change
- 16) Switch Remote parameter change

Except for turning the Device Number off, it is not possible to turn off reception of parameter changes for the various MIDI switches.

3.1.1 Multi Common Data parameter change

```

11110000 F0
01000011 43
0001nnnn nnnn = Device Number
00110100 34
00000000 00
00000000 00
00000000 00
00000000 00
000ppppp ppppp = Table 1-1, N2
00000000 00
0vvvvvvv vvvvvvv = ascii
11110111 F7
    
```

This message modifies Multi Common data (multi name) one parameter at a time. When this message is received, the following will occur.

Voice Play mode : ignore
 Voice Edit mode : ignore
 Multi Play mode : move to Multi Edit mode and receive
 Multi Edit mode : receive
 Voice Edit mode in Multi : receive
 Utility mode (Voice mode) : ignore
 Utility mode (Multi mode) : move to Voice Edit mode and receive

3.1.2 Multi Channel Data parameter change

```

11110000 F0
01000011 43
0001nnnn nnnn = Device Number
00110100 34
00000001 01
0000cccc cccc = Voice Channel Number
00000000 00
000ppppp ppppp = Table 1-2, N2
00000000 00
0vvvvvvv vvvvvvv = Data Value
11110111 F7

```

This message modifies the channel data of a multi one parameter at a time. When this message is received, the following will occur.

```

Voice Play mode      : ignore
Voice Edit mode      : ignore
Multi Play mode      : move to Multi Edit mode and receive
Multi Edit mode      : receive
Voice Edit mode in Multi : receive
Utility mode (Voice mode) : ignore
Utility mode (Multi mode) : move to Voice Edit mode and receive

```

3.1.3 Voice Common Data parameter change

```

11110000 F0
01000011 43
0001nnnn nnnn = Device Number
00110100 34
00000010 02
00000000 00
00000000 00
0pppppppp ppppppp = Table 1-3, N2
00000000 00
0vvvvvvvv vvvvvvv = Data Value
11110111 F7

```

This message modifies voice common data one parameter at a time. When this message is received, the following will occur.

```

Voice Play mode      : move to Voice Edit mode and receive
Voice Edit mode      : receive
Multi Play mode      : ignore
Multi Edit mode      : ignore
Voice Edit mode in Multi : receive
Utility mode (Voice mode) : move to Voice Edit mode and receive
Utility mode (Multi mode) : ignore

```

3.1.4 Voice Element Data parameter change

```

11110000 F0
01000011 43
0001nnnn nnnn = Device Number
00110100 34
00000011 03
0ee00000 ee = Element Number
00000000 00
000ppppp pppp = Table 1-4, N2
00000000 00
0vvvvvvvv vvvvvvv = Data Value
11110111 F7

```

This message modifies voice element data one parameter at a time. When this message is received, the following will occur.

```

Voice Play mode      : if the specified element exists, move to
                        Voice. Edit mode and receive. If not, ignore.
Voice Edit mode      : if the specified element exists, receive. If
                        not, ignore.
Multi Play mode      : ignore
Multi Edit mode      : ignore
Voice Edit mode in Multi : same as for Voice Edit mode
Utility mode (Voice mode) : same as for Voice Play mode
Utility mode (Multi mode) : ignore

```

3.1.5 Voice Drum Set Data parameter change

```

11110000 F0
01000011 43
0001nnnn nnnn = Device Number
00110100 34
00000100 04
0mmmmmmm mmmmmm = MIDI Note Number
00000000 00
0000pppp pppp = Table 1-5, N2
0000000v v = Data Value ( MSB )
0vvvvvvv vvvvvvv = Data Value ( LS7bits )
11110111 F7

```

This message modifies voice drum set data one parameter at a time. When this message is received, the following will occur.

```

Voice Play mode      : if originally a drum set, move to Voice Edit
                        mode and receive. If not, ignore.
Voice Edit mode      : if originally a drum set, receive. If not,
                        ignore.
Multi Play mode      : ignore
Multi Edit mode      : ignore
Voice Edit mode in Multi : same as for Voice Edit mode
Utility mode (Voice mode) : same as for Voice Play mode
Utility mode (Multi mode) : ignore

```

3.1.6 AFM Element Common Data parameter change

```

11110000 F0
01000011 43
0001nnnn nnnn = Device Number
00110100 34
00000101 05
0ee00000 ee = Element Number
00000000 00
000ppppp ppppp = Table 1-6 N2
00000000 00
0vvvvvvvv vvvvvvv = Data Value
11110111 F7

```

This message modifies AFM element common data one parameter at a time. When this message is received, the following will occur.

```

Voice Play mode      : if the specified element exists and is AFM,
                        move to Voice Edit mode and receive. If not,
                        ignore.
Voice Edit mode      : if the specified element exists and is AFM,
                        receive. If not, ignore.
Multi Play mode      : ignore
Multi Edit mode      : ignore
Voice Edit mode in Multi : same as Voice Edit mode
Utility mode (Voice mode) : same as Voice Play mode
Utility mode (Multi mode) : ignore

```

3.1.7 AFM Element Operator Enable parameter change

```

11110000 F0
01000011 43
0001nnnn nnnn = Device Number
00110100 34
00000101 05
0ee00000 ee = Element Number
01111111 7F
01111111 7F
00000000 00
0vvvvvvvv vvvvvvv = Data Value
11110111 F7

```

This message modifies AFM operator enable data one parameter at a time. When this message is received, the following will occur.

```

Voice Play mode      : if the specified element exists and is AFM,
                        move to Voice Edit mode and receive. If not,
                        ignore.
Voice Edit mode      : if the specified element exists and is AFM,
                        receive. If not, ignore.
Multi Play mode      : ignore
Multi Edit mode      : ignore
Voice Edit mode in Multi : same as Voice Edit mode
Utility mode (Voice mode) : same as Voice Play mode
Utility mode (Multi mode) : ignore

```

3.1.8 AFM Element Operator Data parameter change

```

11110000 F0
01000011 43
0001nnnn nnnn = Device Number
00110100 34
00001110 ooo = 6 - (Operator Number)
0ee00000 ee = Element Number
00000000 00
00pppppp pppppp = Table 1-7, N2
0000000v v = Data Value (MSB)
0vvvvvvv vvvvvvv = Data Value (LS7bits)
11110111 F7
    
```

This message modifies AFM operator parameter data one parameter at a time. When this message is received, the following will occur.

Voice Play mode : if the specified element exists and is AFM, move to Voice Edit mode and receive. If not, ignore.

Voice Edit mode : if the specified element exists and is AFM, receive. If not, ignore.

Multi Play mode : ignore

Multi Edit mode : ignore

Voice Edit mode in Multi : same as in Voice Edit mode

Utility mode (Voice mode) : same as in Voice Play mode

Utility mode (Multi mode) : ignore

3.1.9 AWM Element Data parameter change

```

11110000 F0
01000011 43
0001nnnn nnnn = Device Number
00110100 34
00001111 07
0ee00000 ee = Element Number
00000000 00
0ppppppp ppppppp = Table 1-8, N2
0000000v v = Data Value (MSB)
0vvvvvvv vvvvvvv = Data Value (LS7bits)
11110111 F7
    
```

This message modifies AWM element data one parameter at a time. When this message is received, the following will occur.

Voice Play mode : if the specified element exists and is AWM, move to Voice Edit mode and receive. If not, ignore.

Voice Edit mode : if the specified element exists and is AWM, receive. If not, ignore.

Multi Play mode : ignore

Multi Edit mode : ignore

Voice Edit mode in Multi : same as in Voice Edit mode

Utility mode (Voice mode) : same as in Voice Play mode

Utility mode (Multi mode) : ignore

3.1.10 Effect Data parameter change

```

11110000 F0
01000011 43
0001nnnn nnnn = Device Number
00110100 34
00001000 08
00000000 00
00000000 00
000ppppp ppppp = Table 1-9, N2
00000000 00
0vvvvvvv vvvvvvv = Data Value
11110111 F7
    
```

This message modifies effect data one parameter at a time. When this message is received, the following will occur.

Voice Play mode : move to Voice Edit mode and receive

Voice Edit mode : receive

Multi Play mode : move to Multi Edit mode and receive

Multi Edit mode : receive

Voice Edit mode in Multi : receive. Modify the Multi effect.

Utility mode (Voice mode) : same as in Voice Play mode

Utility mode (Multi mode) : same as in Multi Play mode

3.1.11 Filter Data parameter change

```

11110000 F0
01000011 43
0001nnnn nnnn = Device Number
00110100 34
00001001 09
0ee00fff ee = Element Number, fff = filter Number
00000000 00
00pppppp pppppp = Table 1-10, N2
0000000v v = Data Value (MSB)
0vvvvvvv vvvvvvv = Data Value (LS7bits)
11110111 F7
    
```

This message modifies filter data one parameter at a time. When this message is received, the following will occur.

Voice Play mode : if the specified element exists, move to Voice Edit mode and receive. If not, ignore.

Voice Edit mode : if the specified element exists, receive. If not, ignore.

Multi Play mode : ignore

Multi Edit mode : ignore

Voice Edit mode in Multi : same as in Voice Edit mode

Utility mode (Voice mode) : same as in Voice Play mode

Utility mode (Multi mode) : ignore

3.1.12 PAN Data parameter change

```

11110000 F0
01000011 43
0001nnnn nnnn = Device Number
00110100 34
00001010 0A
000mmmmn mmmmn = Memory Number
00000000 00
000ppppp ppppp = Table 1-11, N2
00000000 00
00vvvvvv vvvvvv = Data Value
11110111 F7
    
```

This message modifies dynamic pan data one parameter at a time. When this message is received, the mode will not change, and the pan data of the specified memory will be modified.

3.1.13 Micro Tuning Data parameter change

```

11110000 F0
01000011 43
0001nnnn nnnn = Device Number
00110100 34
00001011 0B
000mmmmn mmmmn = Memory Number
0000000p p = Table 1-12, N1
0ppppppp ppppppp = Table 1-12, N2
0vvvvvvv vvvvvvv = Data Value (MS 7bits)
0vvvvvvv vvvvvvv = Data Value (LS 7bits)
11110111 F7
    
```

This message modifies micro tuning data one parameter at a time. When this message is received, the mode will not change, and the micro tuning data of the specified memory will be modified.

3.1.14 System Setup Data parameter change

```

11110000 F0
01000011 43
0001nnnn nnnn = Device Number
00110100 34
00001111 0F
00000000 00
00000000 00
0ppppppp ppppppp = Table 1-13, N2
00000000 00
0vvvvvvv vvvvvvv = Data Value
11110111 F7
    
```

This message modifies system setup data one parameter at a time. When this message is received, the mode will not change.

3.1.15 Additional Multi Data parameter change

```

11110000 F0
01000011 43
0001nnnn nnnn =Device Number
00110100 34
00001100 0C
0000cccc cccc =Voice Channel Number
00000000 00
000ppppp ppppp =Table 1-14, N2
00000000 00
0vvvvvvv vvvvvvv=Data Value
11110111 F7

```

This message modifies additional multi channel data one parameter at a time. When this message is received, the following will occur.

Voice Play mode : ignore
 Voice Edit mode : ignore
 Multi Play mode : move to Multi Edit mode
 Multi Edit mode : receive
 Voice Edit mode in Multi : receive
 Utility mode (Voice mode) : ignore
 Utility mode (Multi mode) : move to Multi Edit mode and receive

3.1.16 Program Change Table parameter change

```

1110000 F0
J1000011 43
0001nnnn nnnn =Device Number
00110100 34
00001111 0F
00000000 00
00000ppp pp =Table 1-15, N1
0ppppppp ppppppp=Table 1-15, N2
00000000 00
0vvvvvvv vvvvvvv=Data Value
11110111 F7

```

This message modifies Program Change Table data one parameter at a time. This message is received regardless of the mode.

3.1.17 Switch Remote parameter change

```

11110000 F0
01000011 43
0001nnnn nnnn =Device Number
00110100 34
00001101 0D
00000000 00
00000000 00
0ppppppp ppppppp=Table 1-16, N2
00000000 00
0vvvvvvv vvvvvvv =Data Value
11110111 F7

```

This message is only received, and allows remote control of all panel switches. The message will have the same effect as if that switch had been pressed. Reception of this data cannot be turned off by MIDI switch settings except for Device Number Off.

4. Bulk dump

Reception is possible at any time except while selecting the first song for demo playback, and during demo playback. Transmission will occur when the MIDI Utility "Bulk Dump" is executed, or when a dump request message is received.

4.1 Voice data bulk dump

There are nine types of voice data bulk dump as follows.

- 1). 1AFM Voice bulk dump
- 2). 2AFM Voice bulk dump
- 3). 4AFM Voice bulk dump
- 4). 1AWM Voice bulk dump
- 5). 2AWM Voice bulk dump
- 6). 4AWM Voice bulk dump
- 7). 1AFM_1AWM Voice bulk dump
- 8). 2AFM_2AWM Voice bulk dump
- 9). Drum_set Voice bulk dump

```

0 11110000 F0
1 01000011 43
2 0000nnnn nnnn = Device Number
3 01111010 7A
4 0bbbbbbb □ byte count
5 0bbbbbbb □
6 01001100 4C (ascii "L")
7 01001101 4D (ascii "M")
8 00100000 20 (ascii " ")
9 00100000 20 (ascii " ")
10 00111000 38 (ascii "8")
11 00110001 31 (ascii "1")
12 00110000 30 (ascii "0")
13 00110001 31 (ascii "1")
14 01010110 56 (ascii "V")
15 01000011 43 (ascii "C")
16 00000000 00
↓ ↓
29 00000000 00
30 0ttttttt ttttttt = Memory_type
31 0mmmmmmm mmmmmm = Memory Number
32 0ddddd dddddd = data
↓ ↓
0sssssss ssssss = check_sum
11110111 F7

```

MIDI Utility 1 Voice Bulk transmission

Memory__type = 7F
 Memory Number = 00

MIDI Utility Vc & Mlt Bulk or 64 Voices Bulk transmission

Memory__type = 00 (INT)
 Memory Number = start from 0 and transmit consecutively to 63. (In the case of Vc&Mlt, successively transmit Multis 0-15 immediately after this.)

1 Voice Bulk transmission by Dump Request

Memory__type = 00 (INT)
 02 (PRESET1)
 03 (PRESET2)
 7F (Edit__Buffer)
 Memory Number = 0-63 (the number specified by the Dump Request)

For reception, data will be processed as Edit__buffer when the Memory__type is 7F, and as INTERNAL for other cases.

* For details of the bulk dump data and dump request format, refer to table 2.

4.2 Multi data bulk dump

```

0 11110000 F0
1 01000011 43
2 0000nnnn nnnn = Device Number
3 01111010 7A
4 0bbbbbbb □ byte count
5 0bbbbbbb □
6 01001100 4C (ascii "L")
7 01001101 4D (ascii "M")
8 00100000 20 (ascii " ")
9 00100000 20 (ascii " ")
10 00111000 38 (ascii "8")
11 00110001 31 (ascii "1")
12 00110000 30 (ascii "0")
13 00110001 31 (ascii "1")
14 01001101 4D (ascii "M")
15 01010101 55 (ascii "U")
16 00000000 00
↓ ↓
29 00000000 00
30 0ttttttt ttttttt = Memory_type
31 0mmmmmmm mmmmmm = Memory Number
32 0ddddd dddddd = data
↓ ↓
0sssssss ssssss = check_sum
11110111 F7

```

MIDI Utility 1 Multi Bulk transmission

Memory__type = 7F
 Memory Number = 00

MIDI Utility Vc & Mlt Bulk or 16 Multi Bulk transmission

Memory__type = 00 (INT)
 Memory Number = start from 0 and transmit consecutively to 15. (In the case of Vc&Mlt, successively transmit Voices 0-63 immediately after this.)

I Multi Bulk transmission by Dump Request

Memory__type = 00 (INT)
 02 (PRESET)
 7F (Edit__Buffer)
 Memory Number = 0~15 (the number specified by the Dump Request)

For reception, data will be processed as Edit__buffer when the Memory__type is 7F, and as INTERNAL for other cases.

* For details of the bulk dump data and dump request format, refer to table 3.

4.3 Additional multi data bulk dump

```

0 11110000 F0
1 01000011 43
2 0000nnnn nnnn =Device Number
3 01111010 7A
4 0bbbbbbb □ byte count
5 0bbbbbbb □
6 01001100 4C (ascii "L")
7 01001101 4D (ascii "M")
8 00100000 20 (ascii " ")
9 00100000 20 (ascii " ")
10 00111000 38 (ascii "8")
11 00110001 31 (ascii "1")
12 00110000 30 (ascii "0")
13 00110100 34 (ascii "4")
14 01001101 4D (ascii "M")
15 01010101 55 (ascii "U")
16 00000000 00
↓
29 00000000 00
30 01111111 tttttt=Memory_type
31 00mmmmmm mmmmm =Memory Number
32 0ddddd dddddd=data
↓
0sssssss ssssss=check_sum
11110111 F7
    
```

MIDI Utility I Multi Bulk transmission

Memory_type = 7F
 Memory Number = 00

MIDI Utility Vc & Mlt Bulk or 16 Multi Bulk transmission

Memory_type = 00 (INT)
 Memory Number = start from 0 and transmit consecutively to 15. (In the case of Vc&Mlt, successively transmit Voices 0~63 immediately after this.)

I Multi Bulk transmission by Dump Request

Memory_type = 00 (INT)
 02 (PRESET)
 7F (Edit buffer)
 Memory number = 0~15 (the number specified by the Dump Request)

For reception, data will processed as Edit__buffer when the Memory_type is 7F, and as INTERNAL in other cases.

* For details of the bulk dump data and dump request format, refer to table 4.

4.4 Pan data bulk dump

```

0 11110000 F0
1 01000011 43
2 0000nnnn nnnn = Device Number
3 01111010 7A
4 0bbbbbbb □ byte count
5 0bbbbbbb □
6 01001100 4C (ascii "L")
7 01001101 4D (ascii "M")
8 00100000 20 (ascii " ")
9 00100000 20 (ascii " ")
10 00111000 38 (ascii "8")
11 00110001 31 (ascii "1")
12 00110000 30 (ascii "0")
13 00110001 31 (ascii "1")
14 01010000 50 (ascii "P")
15 01001110 4E (ascii "N")
16 00000000 00
↓
29 00000000 00
30 01111111 tttttt = Memory_type
31 00mmmmmm mmmmm = Memory Number
32 0ddddd dddddd = data
↓
0sssssss ssssss = check_sum
11110111 F7
    
```

MIDI Utility Vc & Mlt Bulk or PAN Bulk transmission

Memory__type = 00 (INT)
 Memory Number = start from 0 and transmit consecutively to 31

PAN Bulk transmission by Dump Request

Memory-type = 00 (INT)
 02 (PRESET)
 Memory Number = 0~63 (the number specified by the Dump Request)

For reception, bits 5 and 6 of Memory__type and Memory Number will be ignored, and the data will be processed as INTERNAL.

* For details of the bulk dump data and dump request format, refer to table 5.

4.5 Micro tuning data bulk dump

```

0 11110000 F0
1 01000011 43
2 0000nnnn nnnn = Device Number
3 01111010 7A
4 0bbbbbbb □ byte count
5 0bbbbbbb □
6 01001100 4C (ascii "L")
7 01001101 4D (ascii "M")
8 00100000 20 (ascii " ")
9 00100000 20 (ascii " ")
10 00111000 38 (ascii "8")
11 00110001 31 (ascii "1")
12 00110000 30 (ascii "0")
13 00110001 31 (ascii "1")
14 01001101 4D (ascii "M")
15 01010101 54 (ascii "T")
16 00000000 00
↓
29 00000000 00
30 00000000 00 = Memory_type
31 00mmmmmm mmmmm = Memory Number
32 0ddddd dddddd = data
↓
0sssssss ssssss = check_sum
11110111 F7
    
```

MIDI Utility Vc & Mlt Bulk or Micro Tuning Bulk transmission

Memory__type = 00 (INT)
 Memory Number = start from 0 and transmit consecutively to 1

PAN Bulk transmission by Dump Request

Memory__type = 00 (INT)
 02 (PRESET)
 Memory Number = 0~63 (the number specified by the Dump Request)

For reception, bits 1~6 of Memory__type and Memory Number will be ignored, and the data will be processed as INTERNAL.

* For details of the bulk dump data and dump request format, refer to table 6.

4.6 System setup data bulk dump

```

0 11110000 F0
1 01000011 43
2 0000nnnn nnnn = Device Number
3 01111010 7A
4 0bbbbbbb □ byte count
5 0bbbbbbb □
6 01001100 4C (ascii "L")
7 01001101 4D (ascii "M")
8 00100000 20 (ascii " ")
9 00100000 20 (ascii " ")
10 00111000 38 (ascii "8")
11 00110001 31 (ascii "1")
12 00110000 30 (ascii "0")
13 00110001 31 (ascii "1")
14 01010011 53 (ascii "S")
15 01011001 59 (ascii "Y")
16 00000000 00
↓
31 00000000 00
32 0ddddd dddddd = data
↓
0sssssss ssssss = check_sum
11110111 F7
    
```

* For details of the bulk dump data and dump request format, refer to table 7.

4.7 Program change table data bulk dump

```

0 11110000 F0
1 0100011 43
2 0000nnnn nnnn =Device Number
3 01111010 7A
4 0bbbbbbb ] byte count
5 0bbbbbbb
6 01001100 4C (ascii "L")
7 01001101 4D (ascii "M")
8 00100000 20 (ascii " ")
9 00100000 20 (ascii " ")
10 00111000 38 (ascii "8")
11 00110001 31 (ascii "1")
12 00110000 30 (ascii "0")
13 00110100 34 (ascii "4")
14 01010000 50 (ascii "P")
15 0100011 43 (ascii "C")
16 00000000 00
↓
31 00000000 00
32 0ddddddd ddddddd=data
↓
0sssssss ssssss=check_sum
11110111 F7
  
```

* For details of the bulk dump data and dump request format, refer to table 8.

5. Status FE (active sensing)

a) Transmission

Transmit FE at intervals of approximately 170 msec.

b) Reception

Once FE has been received, if no MIDI data arrives for an interval longer than approximately 300 msec, the MIDI receive buffer is cleared, and if any keys remain on, they will be turned off.

< Table 1-1 >

MIDI Parameter Change table (Multi mode Common Data)

\$F0, \$43, \$1n, \$34, \$00, \$00, \$00, N2, \$00, V2, \$F7

Note) n : Device Number
V2 : parameter value

[header section]

	N2	data name	data range	note
0	00	MNAM 0	ascii	---Multi Voice Set Name---
1	01	MNAM 1	ascii	" * " " "
2	02	MNAM 2	ascii	" * " " "
3	03	MNAM 3	ascii	" * " " "
4	04	MNAM 4	ascii	" * " " "
5	05	MNAM 5	ascii	" * " " "
6	06	MNAM 6	ascii	" * " " "
7	07	MNAM 7	ascii	" * " " "
8	08	MNAM 8	ascii	" * " " "
9	09	MNAM 9	ascii	" * " " "
10	0A	MNAM10	ascii	" * " " "
11	0B	MNAM11	ascii	" * " " "
12	0C	MNAM12	ascii	" * " " "
13	0D	MNAM13	ascii	" * " " "
14	0E	MNAM14	ascii	" * " " "
15	0F	MNAM15	ascii	" * " " "
16	10	MNAM16	ascii	" * " " "
17	11	MNAM17	ascii	" * " " "
18	12	MNAM18	ascii	" * " " "
19	13	MNAM19	ascii	" * " " "

< Table 1-2 >

MIDI Parameter Change table (Multi mode Channel Data)

\$F0, \$43, \$1n, \$34, \$01, T2, \$00, N2, \$00, V2, \$F7

Note) n : Device Number
T2 : voice channel number
V2 : parameter value

[channel data]

	V2	data name	data range	note
0	00	OFVCSW INDOUT OUT0CH OUT1CH	b6 ; off/on b5-b2 ; off, 1-8 b0 ; off/on b1 ; off/on	---Stereo Output 1 Select--- Off_voice_switch Individual Output select Output 1 select Output 2 select
1	01	VMEM	int, crd, p1, p2	Voice Memory select
2	02	VNUM	0-63	Voice number
3	03	VOL	0-127	Volume
4	04	MTUN	-64-+63 (o/b)	Tuning
5	05	MNSF	-64-+63 (o/b)	Note shift
6	06	STPAN	voice, -31-+31 (o/b)	Multi Static PAN

Note) (o/b) ; offset binary

< Table 1-3 >

MIDI Parameter Change table (Voice common data)

\$F0, \$43, \$1n, \$34, \$02, \$00, \$00, N2, \$00, V2, \$F7

Note) n : channel number
V2 : parameter value

[header data]

	N2	data name	data range	note
0	00	ELMODE	0; 1AFM_mono 1; 2AFM_mono 2; 4AFM_mono 3; 1AFM_poly 4; 2AFM_poly 5; 1AWM_poly 6; 2AWM_poly 7; 4AWM_poly 8; 1AFM_1AWM_poly 2AFM_2AWM_poly 9; 2FM_2PCM_poly 10; DRUM_SET	---Element Select Mode---
1	01	VNAM0	ascii	---Voice Name---
2	02	VNAM1	ascii	" * " " "
3	03	VNAM2	ascii	" * " " "
4	04	VNAM3	ascii	" * " " "
5	05	VNAM4	ascii	" * " " "
6	06	VNAM5	ascii	" * " " "
7	07	VNAM6	ascii	" * " " "
8	08	VNAM7	ascii	" * " " "
9	09	VNAM8	ascii	" * " " "
10	0A	VNAM9	ascii	" * " " "

[Controllers]

	N2	data name	data range	note
11	28	WPBR	0-12	---Pitch Bend---
12	29	ATPBR	-12- +12 (s m)	Wheel Pitch Bend Range After_Touch Pitch Bend Range
13	2A	PMASN	0-121	---Pitch Modulation---
14	2B	PMRNG	0-127	Device Assign (MIDI control ≠) Modulation range
15	2C	AMASN	0-121	---Amplitude Modulation---
16	2D	AMRNG	0-127	Device Assign (MIDI control ≠) Modulation range
17	2E	FMASN	0-121	---Filter Modulation---
18	2F	FMRNG	0-127	Device Assign (MIDI control ≠) Modulation range
19	30	PNLASN	0-121	---PAN Modulation---
20	31	PNLRNG	0-127	Note) Valid only when Multi is selected Device Assign (MIDI control ≠) Modulation range
21	32	COASN	0-121	---Filter Cut_off Bias---
22	33	CORNG	0-127	Device Assign (MIDI control ≠) Cut_off range
23	34	PNBASN	0-121	---PAN Bias---
24	35	PNBRNG	0-127	Note) Valid only when Multi is selected Device Assign (MIDI control ≠) Bias range
25	36	EGBASN	0-121	---EG Bias---
26	37	EGBRNG	0-127	Device Assign (MIDI control ≠) Bias range
27	38	VVLASN	0-121	---Voice Volume---
28	39	VVLLML	0-127	Device Assign (MIDI control ≠) Volume Limit Low

Note) For the above Device Assigns, 121 will select After Touch.

<Only for Normal>

	N2	data name	data range	note
29	3A	MCTUN	0~65	Micro Tuning table select
30	3B	RNDP	0~7	Random Pitch fluctuation
31	3C	PORM	0, 1	---Portamento--- Note) Valid only when the mode is only FM element. Mode Time
32	3D	POS	0~127	
33	3E	INDOUT	b5~2; off, 1~8	Individual Output Select
34	3F	VVOL	0~127	Voice Volume

Note) (s/m); sign magnitude

<Table 1-4>

MIDI Parameter Change table (Normal Voice Element Data)

\$F0, \$43, \$1n, \$34, \$03, T2, \$00, N2, \$00, V2, \$F7

Note) n : Device Number
V2 : parameter value
T2 : 0, e1, e0, 0, 0, 0, 0

e1	e0	
0	0	Element 1
0	1	Element 2
1	0	Element 3
1	1	Element 4

	N2	data name	data range	note
0	00	ELVL	0 - 127	Element Level Element Detune Element Note Shift
1	01	ELDT	-7 ~ +7 (s m)	
2	02	ELNS	-64 ~ +63 (o b)	
3	03	ENLL	0 - 127 (note ≠)	---Element Note Limit--- Low Limit High Limit
4	04	ENLH	0 - 127 (note ≠)	
5	05	EVLL	0 - 127 (note ≠)	---Element Velocity Limit--- Low Limit High Limit
6	06	EVLH	0 - 127 (note ≠)	
7	07	PANNM	0 - 95	PAN data set table select Note) Valid only when Multi is selected
8	08	MCTEN OUTSEL0 OUTSEL1	b0; 0~1 b1; 0~1 b2; 0~1	Micro Tuning switch Output Select 1 Output Select 2

Note) (s/m); sign magnitude
(o/b); offset binary

<Table 1-5>

MIDI Parameter Change table (Drum_Set)

\$F0, \$43, \$1n, \$34, \$04, T2, \$00, N2, V1, V2, \$F7

Note) n : channel number
T2 : MIDI note number
N2 : parameter value
V1 : MSB of parameter value (for parameters other than VAV*, V1 will be \$00)
V2 : LSB of parameter value

	N2	data name	data range	note
0	00	ALTGRP INDOUT OUT1 OUT0	b6; 0~1 b5~2; off, 1~8 b1; 0~1 b0; 0~1	Alternate group Individual Output select Output 2 select Output 1 select
1	01	WSRC	0~2	Wave Source Wave Number (V1; MSB V2; LS7bits)
2	02	WAV	0~max. 255	
3	03	WWL	0~127	Wave Volume
4	04	WTN	-64~+63 (o/b)	Wave Tuning
5	05	WNS	-48~+36 (o/b)	Wave Note Shift
6	06	WPN	-31~+31 (o/b)	Static PAN

Note) (o/b); offset binary

<Table 1-6>

MIDI Parameter Change table (AFM Element Common)

\$F0, \$43, \$1n, \$34, \$05, T2, \$00, N2, \$00, V2, \$F7

Note) n : Device Number
N2 : parameter number
V2 : parameter value

T2	
\$00	Element 1
\$20	Element 2
\$40	Element 3
\$60	Element 4

	N2	data name	data range	note
0	00	ALGNUM	0 - 44	(127 is free algorithm number. Algorithm only via MIDI)
1	01	FPR1	0 - 63	---Pitch EG--- key_on Rate 1 key_on Rate 2 key_on Rate 3 key_off Rate 1 key_on Level 0 key_on Level 1 key_on Level 2 key_on Level 3 key_off Level 1 Range Rate Scaling Velocity Switch
2	02	FPR2	0 - 63	
3	03	FPR3	0 - 63	
4	04	FPRR1	0 - 63	
5	05	FPL0	-64 ~ +63 (o b)	
6	06	FPL1	-64 ~ +63 (o b)	
7	07	FPL2	-64 ~ +63 (o b)	
8	08	FPL3	-64 ~ +63 (o b)	
9	09	FPRL1	-64 ~ +63 (o b)	
10	0A	FPEGR	0:8oct, 1:2oct, 2:1oct, 3:1/2oct	
11	0B	FPRS	0 - 7	
12	0C	FVPSW	off on	
13	0D	FLFSPD	0 - 99	---multi LFO--- Speed Delay time Pitch Modulation Depth Amplitude Modulation Depth Filter Modulation Depth Wave Initial Phase
14	0E	FLFDLY	0 - 99	
15	0F	FLFPMD	0 - 127	
16	10	FLFAMD	0 - 127	
17	11	FLFFMD	0 - 127	
18	12	FLFWAV	0 - 5	
19	13	FLINTP	0 - 5	
20	14	reserve	0 - 99	
21	15	SLFWD	0 - 3	---Sub LFO--- Wave Speed delay mode decay mode Delay time decay time Pitch Modulation Depth
22	16	SLFS	0 - 127	
23	17	SLFDM	delay decay	
24	18	SLFDT	0 - 99	
25	19	SLPMD	0 - 127	

<Table 1-7>

MIDI Parameter Change table (AFM Element Common)

\$F0, \$43, \$1n, \$34, T1, T2, \$00, N2, V1, V2, \$F7

Note) n : Device Number
N2 : parameter number
V1 : MSB of parameter value
V2 : LSB of parameter value

T1		T2	
\$06	OP6	\$00	Element 1
\$16	OP5	\$20	Element 2
\$26	OP4	\$40	Element 3
\$36	OP3	\$60	Element 4
\$46	OP2		
\$56	OP1		

	N2	data name	data range	note
0	00	R1	0 - 63	EG key_on Rate 1 EG key_on Rate 2 EG key_on Rate 3 EG key_on Rate 4 EG key_off Rate 1 EG key_off Rate 2 EG key_on Level 1 EG key_on Level 2 EG key_on Level 3 EG key_on Level 4 EG key_off Level 1 EG key_off Level 2 EG Sustain Loop Point EG key_on Hold Time EG key_on Level 0 EG Rate Scaling Amplitude Modulation Sens Velocity Sensitivity
1	01	R2	0 - 63	
2	02	R3	0 - 63	
3	03	R4	0 - 63	
4	04	RR1	0 - 63	
5	05	RR2	0 - 63	
6	06	L1	0 - 63	
7	07	L2	0 - 63	
8	08	L3	0 - 63	
9	09	L4	0 - 63	
10	0A	RL1	0 - 63	
11	0B	RL2	0 - 63	
12	0C	SLP	0 - 3	
13	0D	HT	0 - 63	
14	0E	LO	0 - 63	
15	0F	RS	-7 ~ +7 (s m)	
16	10	FAMS	0 - 7	
17	11	VSON	-7 ~ +7 (s m)	
18	12	reserve		
19	13	ALGSRC0 ALGSRC1	V2 b3 - 0 ; 0 - 10 V1 b0, V2 b6 - 4 ; 0 - 10	oscillator input0 Source oscillator input1 Source oscillator output Destination Out_Accumulator input 0 Source Out_Accumulator input 1 Source
20	14	ALGDST OACSRC0 OACSRC1	V2 b1,0 ; 0 - 3 V2 b3,2 ; 0 - 2 V2 b4 ; 0 - 1	
21	15	SHIFT0 SHIFT1	V2 b5 - 3 ; 0 - 7 V2 b2 - 0 ; 0 - 7	oscillator input 0 Shift value oscillator input 1 Shift value output level Correction Waveform of oscillator
22	16	COR	0 - 7	
23	17	PWAVE	0 - 15	M_LFO Pitch Modulation Sens. Pitch EG Switch frequency Mode
24	18	FMLPMS PES FPM	V2 b4 - 2 ; 0 - 7 V2 b1 ; 0 - 1 V2 b0 ; 0 - 1	
25	19	KOE PHASE	V1 b0 ; 0 - 1 V2 b6 - 0 ; 0 - 127	initial phase set Enable initial Phase of oscillator Pitch Detune
26	1A	FPD	-15 ~ +15 (s m)	

	N2	data name	data range	note
27	1B	TL	0 - 127	out_level
28	1C	BP1	0 - 127 (note #)	out_level scaling Break Point
29	1D	BP2	0 - 127 (note #)	out_level scaling Break Point
30	1E	BP3	0 - 127 (note #)	out_level scaling Break Point
31	1F	BP4	0 - 127 (note #)	out_level scaling Break Point
32	20	EGOS1	-128 ~ +127 (2bytes)	out_level offset (BP1)
33	21	EGOS2	-128 ~ +127 (2bytes)	out_level offset (BP2)
34	22	EGOS3	-128 ~ +127 (2bytes)	out_level offset (BP3)
35	23	EGOS4	-128 ~ +127 (2bytes)	out_level offset (BP4)
36	24	RVSW	off on	Rate Velocity Switch
37	25	FPC		frequency Course
38	26	FPF		frequency Fine

< Table 1-8 >

MIDI Parameter Change table (AWM Element)

\$F0, \$43, \$1n, \$34, \$07, T2, \$00, N2, V1, V2, \$F7

Note) n : Device Number
 N2 : parameter number
 V1 : MSB of parameter value
 V2 : LSB of parameter value
 T2 : table at right

T2	
\$00	Element 1
\$20	Element 2
\$40	Element 3
\$60	Element 4

[AWM generator unit]

	N2	data name	data range	note
0	00	WSOURCE	0 - 2	AWM Wave Source
1	01	AWMWAVE	V1: MSB 1bit V2: LS7bits	AWM Wave number
2	02	PPM	normal fixed	frequency Mode
3	03	PNOTE	0 - 127	fixed mode note #
4	04	PPF	-64 ~ +63	frequency Fine
5	05	PMLPMS	0 - 7	pitch modulation sensitivity
6	06	PPR1	0 - 63	---Pitch EG---
7	07	PPR2	0 - 63	key_on Rate 1
8	08	PPR3	0 - 63	key_on Rate 2
9	09	PPRR1	0 - 63	key_off Rate 1
10	0A	PPL0	-64 ~ +63 (o b)	key_on Level 0
11	0B	PPL1	-64 ~ +63 (o b)	key_on Level 1
12	0C	PPL2	-64 ~ +63 (o b)	key_on Level 2
13	0D	PPL3	-64 ~ +63 (o b)	key_on Level 3
14	0E	PPRL1	-64 ~ +63 (o b)	key_off Level 1
15	0F	PPEGR	1:2oct, 2:1oct, 3:1/2oct	Range
16	10	PPRS	-7 ~ +7	Rate Scaling
17	11	PVPSW	off on	Velocity Switch
18	12	PLFSPD	0 - 99	---multi LFO---
19	13	PLFDLY	0 - 99	Speed
20	14	PLFPMD	0 - 127	Delay time
21	15	PLFAMD	0 - 127	Pitch Modulation Depth
22	16	PLFFMD	0 - 127	Amplitude Modulation Depth
23	17	PLFWAV	0 - 5	Filter Modulation Depth
24	18	PLINTP	0 - 99	Wave
25	19	reserve		Initial Phase

[Amplitude EG data]

	N2	data name	data range	note
26	4F	PAEGMD	normal hold	EG mode
27	50	PAR1	0 - 63	key_on Rate 1 (attack hold)
28	51	PAR2	0 - 63	key_on Rate 2 (decay)
29	52	PAR3	0 - 63	key_on Rate 3
30	53	PAR4	0 - 63	key_on Rate 4 (decay)
31	54	PARR1	0 - 63	key_off Rate 1 (release)
32	55	PAL2	0 - 63	key_on Level 2 (decay)
33	56	PAL3	0 - 63	key_on Level 3 (decay)
34	57	PARS	-7 ~ +7	rate scaling
35	58	PABP1	0 - 127 (note #)	out_level scaling Break Point
36	59	PABP2	0 - 127 (note #)	out_level scaling Break Point
37	5A	PABP3	0 - 127 (note #)	out_level scaling Break Point
38	5B	PABP4	0 - 127 (note #)	out_level scaling Break Point
39	5C	PAOS21	-128 ~ +127 (2bytes)	out_level scaling offset
40	5D	PAOS22	-128 ~ +127 (2bytes)	out_level scaling offset
41	5E	PAOS23	-128 ~ +127 (2bytes)	out_level scaling offset
42	5F	PAOS24	-128 ~ +127 (2bytes)	out_level scaling offset
43	60	PAVSON	-7 ~ +7 (s m)	Velocity Sensitivity
44	61	PARVSW	off on	Attack Rate Velocity Switch
45	62	PAMS	-7 ~ +7 (s m)	amplitude modulation sens.

< Table 1-9 >

MIDI Parameter Change table (Effect Data)

\$F0, \$43, \$1n, \$34, \$08, \$00, \$00, N2, \$00, V2, \$F7

Note) n : Device Number
 V2 : parameter value

	N2	data name	data range	note
0	00	EFMODE	0 - 3	mode select
1	01	CHRITYPE	0 - 4	Chorus Effect 1 Type
2	02	CHRIBLNC	0 - 100	Chorus Effect 1 Balance
3	03	CHRIOVLV	0 - 100	Chorus Effect 1 Output Level
4	04	CHRIPRM1		Chorus Effect 1 Parameter 1
5	05	CHRIPRM2		Chorus Effect 1 Parameter 2
6	06	CHRIPRM3		Chorus Effect 1 Parameter 3
7	07	CHRIPRM4		Chorus Effect 1 Parameter 4
8	08	CHR2TYPE	0 - 4	Chorus Effect 2 Type
9	09	CHR2BLNC	0 - 100	Chorus Effect 2 Balance
10	0A	CHR2OLV	0 - 100	Chorus Effect 2 Output Level
11	0B	CHR2PRM1		Chorus Effect 2 Parameter 1
12	0C	CHR2PRM2		Chorus Effect 2 Parameter 2
13	0D	CHR2PRM3		Chorus Effect 2 Parameter 3
14	0E	CHR2PRM4		Chorus Effect 2 Parameter 4
15	0F	REVIYPE	0 - 4	Reverb Effect 1 Type
16	10	REVIBLNC	0 - 100	Reverb Effect 1 Balance
17	11	REVIOVLV	0 - 100	Reverb Effect 1 Output Level
18	12	REVIPRM1		Reverb Effect 1 Parameter 1
19	13	REVIPRM2		Reverb Effect 1 Parameter 2
20	14	REVIPRM3		Reverb Effect 1 Parameter 3
21	15	REV2TYPE	0 - 4	Reverb Effect 2 Type
22	16	REV2BLNC	0 - 100	Reverb Effect 2 Balance
23	17	REV2OLV	0 - 100	Reverb Effect 2 Output Level
24	18	REV2PRM1		Reverb Effect 2 Parameter 1
25	19	REV2PRM2		Reverb Effect 2 Parameter 2
26	1A	REV2PRM3		Reverb Effect 2 Parameter 3
27	1B	ST_MIX1		Stereo Mix 1
28	1C	ST_MIX2		Stereo Mix 2

< Table 1-10 >

MIDI Parameter Change table (Filter Data)

\$F0, \$43, \$1n, \$34, \$09, T2, \$00, N2, V1, V2, \$F7

Note) n : Device Number
 N2 : parameter number
 V1 : MSB of parameter value
 V2 : LSB of parameter value
 T2 : O, E, E, O, O, N, N, N
 table at right

E		N	
00	Element 1	000	AFM filt. 1
01	Element 2	001	AFM filt. 2
10	Element 3	010	AFM common
11	Element 4	011	AWM filt. 1
		100	AWM filt. 2
		101	AWM common

[filter 1 & 2]

	N2	data name	data range	note
0	00	FTYPE	lp/ (hpf)/ thr	filter type
1	01	FCTOF	0 - 127	cut_off frequency
2	02	FMODE	EG, LFO, EG-VA	filter mode
3	03	FR1	0 - 63	key_on Rate 1
4	04	FR2	0 - 63	key_on Rate 2
5	05	FR3	0 - 63	key_on Rate 3
6	06	FR4	0 - 63	key_on Rate 4
7	07	FRR1	0 - 63	key_off Rate 1
8	08	FRR2	0 - 63	key_off Rate 2
9	09	FL0	-64 ~ +63 (o b)	key_on cut_off Level 0
10	0A	FL1	-64 ~ +63 (o b)	key_on cut_off Level 1
11	0B	FL2	-64 ~ +63 (o b)	key_on cut_off Level 2
12	0C	FL3	-64 ~ +63 (o b)	key_on cut_off Level 3
13	0D	FL4	-64 ~ +63 (o b)	key_on cut_off Level 4
14	0E	FRL1	-64 ~ +63 (o b)	key_off cut_off Level 1
15	0F	FRL2	-64 ~ +63 (o b)	key_off cut_off Level 2
16	10	FRS	-7 ~ +7	rate scaling
17	11	FBP1	0 - 127 (note #)	c_off_lv1 scaling Break Point
18	12	FBP2	0 - 127 (note #)	c_off_lv1 scaling Break Point
19	13	FBP3	0 - 127 (note #)	c_off_lv1 scaling Break Point
20	14	FBP4	0 - 127 (note #)	c_off_lv1 scaling Break Point
21	15	FOS1	-128 ~ +127 (2bytes)	c_off_lv1 scaling offset
22	16	FOS2	-128 ~ +127 (2bytes)	c_off_lv1 scaling offset
23	17	FOS3	-128 ~ +127 (2bytes)	c_off_lv1 scaling offset
24	18	FOS4	-128 ~ +127 (2bytes)	c_off_lv1 scaling offset

[filter common]

	N2	data name	data range	note
25	32	FRES	0 - 99	resonance
26	33	FVSON	-7 ~ +7 (s m)	Velocity Sensitivity
27	34	FCMS	-7 ~ +7 (s m)	Cut_off modulation sensitivity

< Table 1-11 >

MIDI Parameter Change table (Pan Data)

\$F0, \$43, \$1n, \$34, \$0A, T2, \$00, N2, \$00, V2, \$F7

Note) n : Device Number
T2 : Memory number
N2 : parameter number
V2 : parameter value

N2	data name	data range	note
0 00	PNSCSEL	velocity, note #, LFO	PAN source select
1 01	PNSCDPT	0~99	PAN source depth
---EG---			
2 02	PNDT	0~63	key_on Hold Time
3 03	PNR1	0~63	key_on Rate 1
4 04	PNR2	0~63	key_on Rate 2
5 05	PNR3	0~63	key_on Rate 3
6 06	PNR4	0~63	key_on Rate 4
7 07	PNRR1	0~63	key_off Rate 1
8 08	PNRR2	0~63	key_off Rate 2
9 09	PNL0	-32~+31 (o/b)	key_on Level 0
10 0A	PNL1	-32~+31 (o/b)	key_on Level 1
11 0B	PNL2	-32~+31 (o/b)	key_on Level 2
12 0C	PNL3	-32~+31 (o/b)	key_on Level 3
13 0D	PNL4	-32~+31 (o/b)	key_on Level 4
14 0E	PNRL1	-32~+31 (o/b)	key_off Level 1
15 0F	PNRL2	-32~+31 (o/b)	key_off Level 2
16 10	PNSLP	0~3	repeat segment
---Dynamic PAN Name---			
17 11	PNNAM0	ascii	" * " "
18 12	PNNAM1	ascii	" * " "
19 13	PNNAM2	ascii	" * " "
20 14	PNNAM3	ascii	" * " "
21 15	PNNAM4	ascii	" * " "
22 16	PNNAM5	ascii	" * " "
23 17	PNNAM6	ascii	" * " "
24 18	PNNAM7	ascii	" * " "
25 19	PNNAM8	ascii	" * " "
26 1A	PNNAM9	ascii	" * " "

Note) (o/b) : offset binary (invert the sign bit of the 2's complement)

< Table 1-12 >

MIDI Parameter Change table (Micro Tuning Data)

\$F0, \$43, \$1n, \$34, \$0B, T2, N1, N2, V1, V2, \$F7

Note) n : Device Number
V1 : MS7bits of parameter value
T2 : memory number
V1 : LS7bits of parameter value

N1	N2	data name	data range	note
0 00	00	MCTC_-2	0~10794	C_-2
1 00	02	MCTC # -2	0~10794	C # -2
2 00	04	MCTD_-2	0~10794	D_-2
3 00	06	MCTD # -2	0~10794	D # -2
4 00	08	MCTE_-2	0~10794	E_-2
5 00	0A	MCTF_-2	0~10794	F_-2
6 00	0C	MCTF # -2	0~10794	F # -2
7 00	0E	MCTG_-2	0~10794	G_-2
8 00	10	MCTG # -2	0~10794	G # -2
9 00	12	MCTA_-2	0~10794	A_-2
10 00	14	MCTA # -2	0~10794	A # -2
11 00	16	MCTB_-2	0~10794	B_-2
12 00	18	MCTC_-1	0~10794	C_-1
13 00	1A	MCTC # -1	0~10794	C # -1
14 00	1C	MCTD_-1	0~10794	D_-1
15 00	1E	MCTD # -1	0~10794	D # -1
16 00	20	MCTE_-1	0~10794	E_-1
17 00	22	MCTF_-1	0~10794	F_-1
18 00	24	MCTF # -1	0~10794	F # -1
19 00	26	MCTG_-1	0~10794	G_-1
20 00	28	MCTG # -1	0~10794	G # -1
21 00	2A	MCTA_-1	0~10794	A_-1
22 00	2C	MCTA # -1	0~10794	A # -1
23 00	2E	MCTB_-1	0~10794	B_-1
24 00	30	MCTC_0	0~10794	C_0
25 00	32	MCTC # 0	0~10794	C # 0
26 00	34	MCTD_0	0~10794	D_0
27 00	36	MCTD # 0	0~10794	D # 0
28 00	38	MCTE_0	0~10794	E_0
29 00	3A	MCTF_0	0~10794	F_0
30 00	3C	MCTF # 0	0~10794	F # 0
31 00	3E	MCTG_0	0~10794	G_0
32 00	40	MCTG # 0	0~10794	G # 0
33 00	42	MCTA_0	0~10794	A_0
34 00	44	MCTA # 0	0~10794	A # 0
35 00	46	MCTB_0	0~10794	B_0

N1	N2	data name	data range	note
36 00	48	MCTC_1	0~10794	C_1
37 00	4A	MCTC # 1	0~10794	C # 1
38 00	4C	MCTD_1	0~10794	D_1
39 00	4E	MCTD # 1	0~10794	D # 1
40 00	50	MCTE_1	0~10794	E_1
41 00	52	MCTF_1	0~10794	F_1
42 00	54	MCTF # 1	0~10794	F # 1
43 00	56	MCTG_1	0~10794	G_1
44 00	58	MCTG # 1	0~10794	G # 1
45 00	5A	MCTA_1	0~10794	A_1
46 00	5C	MCTA # 1	0~10794	A # 1
47 00	5E	MCTB_1	0~10794	B_1
48 00	60	MCTC_2	0~10794	C_2
49 00	62	MCTC # 2	0~10794	C # 2
50 00	64	MCTD_2	0~10794	D_2
51 00	66	MCTD # 2	0~10794	D # 2
52 00	68	MCTE_2	0~10794	E_2
53 00	6A	MCTF_2	0~10794	F_2
54 00	6C	MCTF # 2	0~10794	F # 2
55 00	6E	MCTG_2	0~10794	G_2
56 00	70	MCTG # 2	0~10794	G # 2
57 00	72	MCTA_2	0~10794	A_2
58 00	74	MCTA # 2	0~10794	A # 2
59 00	76	MCTB_2	0~10794	B_2
60 00	78	MCTC_3	0~10794	C_3
61 00	7A	MCTC # 3	0~10794	C # 3
62 00	7C	MCTD_3	0~10794	D_3
63 00	7E	MCTD # 3	0~10794	D # 3
64 01	00	MCTE_3	0~10794	E_3
65 01	02	MCTF_3	0~10794	F_3
66 01	04	MCTF # 3	0~10794	F # 3
67 01	06	MCTG_3	0~10794	G_3
68 01	08	MCTG # 3	0~10794	G # 3
69 01	0A	MCTA_3	0~10794	A_3
70 01	0C	MCTA # 3	0~10794	A # 3
71 01	0E	MCTB_3	0~10794	B_3
72 01	10	MCTC_4	0~10794	C_4
73 01	12	MCTC # 4	0~10794	C # 4
74 01	14	MCTD_4	0~10794	D_4
75 01	16	MCTD # 4	0~10794	D # 4
76 01	18	MCTE_4	0~10794	E_4
77 01	1A	MCTF_4	0~10794	F_4
78 01	1C	MCTF # 4	0~10794	F # 4
79 01	1E	MCTG_4	0~10794	G_4
80 01	20	MCTG # 4	0~10794	G # 4
81 01	22	MCTA_4	0~10794	A_4
82 01	24	MCTA # 4	0~10794	A # 4
83 01	26	MCTB_4	0~10794	B_4
84 01	28	MCTC_5	0~10794	C_5
85 01	2A	MCTC # 5	0~10794	C # 5
86 01	2C	MCTD_5	0~10794	D_5
87 01	2E	MCTD # 5	0~10794	D # 5
88 01	30	MCTE_5	0~10794	E_5
89 01	32	MCTF_5	0~10794	F_5
90 01	34	MCTF # 5	0~10794	F # 5
91 01	36	MCTG_5	0~10794	G_5
92 01	38	MCTG # 5	0~10794	G # 5
93 01	3A	MCTA_5	0~10794	A_5
94 01	3C	MCTA # 5	0~10794	A # 5
95 01	3E	MCTB_5	0~10794	B_5
96 01	40	MCTC_6	0~10794	C_6
97 01	42	MCTC # 6	0~10794	C # 6
98 01	44	MCTD_6	0~10794	D_6
99 01	46	MCTD # 6	0~10794	D # 6
100 01	48	MCTE_6	0~10794	E_6
101 01	4A	MCTF_6	0~10794	F_6
102 01	4C	MCTF # 6	0~10794	F # 6
103 01	4E	MCTG_6	0~10794	G_6
104 01	50	MCTG # 6	0~10794	G # 6
105 01	52	MCTA_6	0~10794	A_6
106 01	54	MCTA # 6	0~10794	A # 6
107 01	56	MCTB_6	0~10794	B_6
108 01	58	MCTC_7	0~10794	C_7
109 01	5A	MCTC # 7	0~10794	C # 7
110 01	5C	MCTD_7	0~10794	D_7
111 01	5E	MCTD # 7	0~10794	D # 7
112 01	60	MCTE_7	0~10794	E_7
113 01	62	MCTF_7	0~10794	F_7
114 01	64	MCTF # 7	0~10794	F # 7
115 01	66	MCTG_7	0~10794	G_7
116 01	68	MCTG # 7	0~10794	G # 7
117 01	6A	MCTA_7	0~10794	A_7
118 01	6C	MCTA # 7	0~10794	A # 7
119 01	6E	MCTB_7	0~10794	B_7
120 01	70	MCTC_8	0~10794	C_8
121 01	72	MCTC # 8	0~10794	C # 8
122 01	74	MCTD_8	0~10794	D_8
123 01	76	MCTD # 8	0~10794	D # 8
124 01	78	MCTE_8	0~10794	E_8
125 01	7A	MCTF_8	0~10794	F_8
126 01	7C	MCTF # 8	0~10794	F # 8
127 01	7E	MCTG_8	0~10794	G_8
128 02	00	MTNAM0	ascii	---Micro Tuning Name---
129 02	01	MTNAM1	ascii	" * " "
130 02	02	MTNAM2	ascii	" * " "
131 02	03	MTNAM3	ascii	" * " "
132 02	04	MTNAM4	ascii	" * " "
133 02	05	MTNAM5	ascii	" * " "
134 02	06	MTNAM6	ascii	" * " "
135 02	07	MTNAM7	ascii	" * " "
136 02	08	MTNAM8	ascii	" * " "
137 02	09	MTNAM9	ascii	" * " "

<Table I-13>

MIDI Parameter Change table (System Setup)

\$F0, \$43, \$1n, \$34, \$0F, \$00, \$00, N2, \$00, V2, \$F7

Note) n ; channel number
 N2 ; parameter number
 V2 ; parameter value

Note) Exception ; Master fine tuning (at transmit) \$F0, \$43, \$1N, \$04, \$40, DT, \$F7 (DX1_Master_Tuning is used)

	N2	data name	data range	note
0	00	GRTMSU0	ascii	---Greeting Message---
1	01	GRTMSU1	ascii	Upper "
2	02	GRTMSU2	ascii	Upper "
3	03	GRTMSU3	ascii	Upper "
4	04	GRTMSU4	ascii	Upper "
5	05	GRTMSU5	ascii	Upper "
6	06	GRTMSU6	ascii	Upper "
7	07	GRTMSU7	ascii	Upper "
8	08	GRTMSU8	ascii	Upper "
9	09	GRTMSU9	ascii	Upper "
10	0A	GRTMSU10	ascii	Upper "
11	0B	GRTMSU11	ascii	Upper "
12	0C	GRTMSU12	ascii	Upper "
13	0D	GRTMSU13	ascii	Upper "
14	0E	GRTMSU14	ascii	Upper "
15	0F	GRTMSU15	ascii	Upper "
16	10	GRTMSU16	ascii	Upper "
17	11	GRTMSU17	ascii	Upper "
18	12	GRTMSU18	ascii	Upper "
19	13	GRTMSU19	ascii	Upper "
20	14	GRTMSL0	ascii	Lower "
21	15	GRTMSL1	ascii	Lower "
22	16	GRTMSL2	ascii	Lower "
23	17	GRTMSL3	ascii	Lower "
24	18	GRTMSL4	ascii	Lower "
25	19	GRTMSL5	ascii	Lower "
26	1A	GRTMSL6	ascii	Lower "
27	1B	GRTMSL7	ascii	Lower "
28	1C	GRTMSL8	ascii	Lower "
29	1D	GRTMSL9	ascii	Lower "
30	1E	GRTMSL10	ascii	Lower "
31	1F	GRTMSL11	ascii	Lower "
32	20	GRTMSL12	ascii	Lower "
33	21	GRTMSL13	ascii	Lower "
34	22	GRTMSL14	ascii	Lower "
35	23	GRTMSL15	ascii	Lower "
36	24	GRTMSL16	ascii	Lower "
37	25	GRTMSL17	ascii	Lower "
38	26	GRTMSL18	ascii	Lower "
39	27	GRTMSL19	ascii	Lower "
40	28	MNSFT	64-63 (o/b)	Master Note Shift
41	29	MITUNE	64-63 (o/b)	Master Fine Tuning (receive only)
42	2A	FIXVEL	off, 1-127	---Velocity---
43	2B	VELCRV	0-7	Fixed Velocity Velocity Curve select
44	2C	MW2MCN	0-120	---MIDI Control Number Assign---
45	2D	FSASN	0-120	Modulation Wheel 2 Foot Switch assign
46	2E	EDCONFSW	off/on	Edit Confirm switch
47	2F	TXCH	0-15	---MIDI---
48	30	VRCH	0-15, omni	keyboard transmit channel
49	31	LOCAL	off/on	Voice Receive channel
50	32	DVCNUM	off, 0-15, all	Local switch
51	33	NTSW	all/odd/even	Device number
52	34	BLKMPRT	off/on	Note_Even_Odd switch
53	35	PGCMOD	0-5	Bulk data Memory protect switch Program Change mode
54	36	reserve		
55	37	reserve		
56	38	reserve		
57	39	reserve		
58	3A	reserve		
59	3B	reserve		
60	3C	reserve		
61	3D	reserve		
62	3E	reserve		
63	3F	reserve		
40	EBYP	off/on		Effect Bypass Sw (param cng only)

Note) (o/b) ; offset binary (invert the sign_bit of the 2's_complement)

FIXVEL, MW2MCN, FSASN, TXCH and LOCAL, are for SY77.

<Table I-14>

MIDI Parameter Change table (Additional Multi Data)

\$F0, \$43, \$1n, \$34, \$0C, T2, \$00, N2, \$00, V2, \$F7

Note) n ; Device Number
 T2 ; voice channel number
 N2 ; parameter number
 V2 ; parameter value

[common data]

	N2	data name	data range	note
0	00	ASNMODE	0-1	Assign mode switch
1	01	reserved		
2	02	AFMELMO	0-16	number of AFM element of inst 1
3	03	AFMELM1	0-16	number of AFM element of inst 2
4	04	AFMELM2	0-16	number of AFM element of inst 3
5	05	AFMELM3	0-16	number of AFM element of inst 4
6	06	AFMELM4	0-16	number of AFM element of inst 5
7	07	AFMELM5	0-16	number of AFM element of inst 6
8	08	AFMELM6	0-16	number of AFM element of inst 7
9	09	AFMELM7	0-16	number of AFM element of inst 8
10	0A	AFMELM8	0-16	number of AFM element of inst 9
11	0B	AFMELM9	0-16	number of AFM element of inst 10
12	0C	AFMELM10	0-16	number of AFM element of inst 11
13	0D	AFMELM11	0-16	number of AFM element of inst 12
14	0E	AFMELM12	0-16	number of AFM element of inst 13
15	0F	AFMELM13	0-16	number of AFM element of inst 14
16	10	AFMELM14	0-16	number of AFM element of inst 15
17	11	AFMELM15	0-16	number of AFM element of inst 16
18	12	AWMELM0	0-16	number of AWM element of inst 1
19	13	AWMELM1	0-16	number of AWM element of inst 2
20	14	AWMELM2	0-16	number of AWM element of inst 3
21	15	AWMELM3	0-16	number of AWM element of inst 4
22	16	AWMELM4	0-16	number of AWM element of inst 5
23	17	AWMELM5	0-16	number of AWM element of inst 6
24	18	AWMELM6	0-16	number of AWM element of inst 7
25	19	AWMELM7	0-16	number of AWM element of inst 8
26	1A	AWMELM8	0-16	number of AWM element of inst 9
27	1B	AWMELM9	0-16	number of AWM element of inst 10
28	1C	AWMELM10	0-16	number of AWM element of inst 11
29	1D	AWMELM11	0-16	number of AWM element of inst 12
30	1E	AWMELM12	0-16	number of AWM element of inst 13
31	1F	AWMELM13	0-16	number of AWM element of inst 14
32	20	AWMELM14	0-16	number of AWM element of inst 15
33	21	AWMELM15	0-16	number of AWM element of inst 16

<Table I-15>

MIDI Parameter Change table (Program change table)

\$F0, \$43, \$1n, \$34, \$0F, \$00, \$N1, N2, \$00, V2, \$F7

Note) n ; channel number
 N1, N2 ; parameter number
 V2 ; parameter value

[common data]

	N1	N2	data name	data range	note
0	00	41	PGMTYP0	0-10	voice type 0
1	00	42	PGMNUM0	0-63	program number 0
2	00	43	PGMTYP1	0-10	voice type 1
3	00	44	PGMNUM1	0-63	program number 1
4	00	45	PGMTYP2	0-10	voice type 2
5	00	46	PRMNUM2	0-63	program number 2
6	00	47	PGMTYP3	0-10	voice type 3
7	00	48	PGMNUM3	0-63	program number 3
8	00	49	PGMTYP4	0-10	voice type 4
9	00	4A	PGMNUM4	0-63	program number 4
62	00	7F	PGMTYP31	0-10	voice type 31
63	01	00	PGMNUM31	0-63	program number 31
252	02	3D	PGMTYP126	0-10	voice type 126
253	02	3E	PGMNUM126	0-63	program number 126
254	02	3F	PGMTYP127	0-10	voice type 127
255	02	40	PGMNUM127	0-63	program number 127

(extended to 2byte per 1 number)

(note)

- type 0 : Internal voice (common)
- 1 : Card voice (common)
- 2 : Preset1 voice (common)
- 3 : Preset2 voice (common)
- 4 : Internal multi
- 5 : Card multi
- 6 : Preset multi
- 7 : Internal voice (ind)
- 8 : Card voice (ind)
- 9 : Preset1 voice (ind)
- 10 : Preset2 voice (ind)

<Table 1-16>

MIDI Parameter Change table (Switch Remote)

\$F0, \$43, \$1n, \$34, \$0D, \$00, \$00, N2, \$00, V2, \$F7

Note) n ; Device Number
 N2 ; parameter number
 V2 ; parameter value

data range : off (\$00~\$3F), on (\$40~\$7F)

N2	sw. #	note	N2	sw. #	note
0	00	PSW 1	VOICE		
1	01	PSW 2	MULTI		
2	02	-	*1		
3	03	-	-		
4	04	PSW 5	UTILITY		
5	05	PSW 6	EDIT		
6	06	PSW 7	STORE		
7	07	PSW 8	EFFECT		
8	08	-	-		
9	09	-	-		
10	0A	-	-		
11	0B	-	-		
12	0C	-	-		
13	0D	-	-		
14	0E	-	-		
15	0F	PSW16	SHIFT		
16	10	PSW17	F1		
17	11	PSW18	F2		
18	12	PSW19	F3		
19	13	PSW20	F4		
20	14	PSW21	F5		
21	15	PSW22	F6		
22	16	PSW23	F7		
23	17	PSW24	F8		
24	18	PSW25	EXIT		
25	19	PSW26	PAGE<		
26	1A	PSW27	PAGE>		
27	1B	PSW28	JUMP		
28	1C	PSW29	-1		
29	1D	PSW30	↑		
30	1E	PSW31	+1		
31	1F	PSW32	←		
32	20	PSW33	↓		
33	21	PSW34	→		
34	22	PSW35	0		
35	23	PSW36	±		
36	24	PSW37	ENTER		
37	25	PSW38	1		
38	26	PSW39	2		
39	27	PSW40	3		
40	28	PSW41	4		
41	29	PSW42	5		
42	2A	PSW43	6		
43	2B	PSW44	7		
44	2C	PSW45	8		
45	2D	PSW46	9		
46	2E	-	-		
47	2F	-	-		
48	30	-	-		
49	31	-	-		
50	32	-	-		
51	33	-	-		
52	34	-	-		
53	35	-	-		
54	36	-	-		
55	37	-	-		
56	38	-	-		
57	39	-	-		
58	3A	-	-		
59	3B	-	-		
60	3C	-	-		
61	3D	-	-		
62	3E	-	-		
63	3F	-	-		
64	40	-	-		
65	41	-	-		
66	42	-	-		
67	43	-	-		
68	44	-	-		
69	45	-	-		
70	46	PSW71	MEMORY		
71	47	PSW72	BANK/SELECT		
72	48	PSW73	OP		
73	49	PSW74	EL		

*1 Switches 2, 3, 8-14 and 46-69 have no function.

<Table 2>

Voice Bulk Dump

Note) Memory_type internal : \$00
 preset 1 : \$02
 preset 2 : \$03
 Edit_Buffer : \$7F (Memory# is transmitted as \$00, ignored when receiving.)

When receiving Bulk_dump, if Memory_type is other than \$7F, this is processed as Internal.

Note) Memory # \$00-\$0F ; Bank_A1 ~ 16
 \$10-\$1F ; Bank_B1 ~ 16
 \$20-\$2F ; Bank_C1 ~ 16
 \$30-\$3F ; Bank_D1 ~ 16

Note) When receiving Bulk_dump, bit 6 of Memory# is ignored.

(1) 1AFM

data	Element1 data	Element1 data
0 \$F0	107 Table 1-7, 00-26	377 Table 1-6, 00-19
1 \$43	↓ OP6_R1	↓ ALGNUM
2 \$0N	↓	↓
3 \$7A	125 reserve	403 Table 1-10, 00-18
4 [] byte count	126 OP6_ALGSRG (MSB)	↓ FL1_FTYPE
5 []	127 OP6_ALGSRG (low 7bits)	423 ↓
6 L	128 OP6_ALGDST	424 FL1_FBP4
7 M	↓	425 FL1_FOS1 (MSB)
8 -	132 OP6_FMPMS	426 FL1_FOS2 (MSB)
9 -	133 OP6_KOE	427 FL1_FOS3 (low 7bits)
10 8	134 OP6_PHASE	428 FL1_FOS3 (MSB)
11 1	135 OP6_FPD	429 FL1_FOS3 (low 7bits)
12 0	↓	430 FL1_FOS4 (MSB)
13 1	140 OP6_BP4	431 FL1_FOS4 (low 7bits)
14 V	141 OP6_EGOS1 (MSB)	
15 C	142 OP6_EGOS1 (low 7bits)	
16 ↓	143 OP6_EGOS2 (MSB)	
17 [] \$00	144 OP6_EGOS2 (low 7bits)	
29 ↓	145 OP6_EGOS3 (MSB)	
30 Memory_type	146 OP6_EGOS3 (low 7bits)	
31 Memory#	147 OP6_EGOS4 (MSB)	
	148 OP6_EGOS4 (low 7bits)	
32 Table 1-3, 00-0A	149 OP6_RVSW	
↓ \$00 or \$03	150 OP6_FPC	
(ELMODE)	151 OP6_FPF	
33 VNAME	↓	
↓	152 Table 1-7, 00-26	
43 Table 1-9, 00-1C	↓ OP5_R1	
↓	↓	
72 Table 1-3, 28-3F	197 Table 1-7, 00-26	
↓ WPBR	↓ OP4_R1	
95 ↓ VVOL	↓	
96 AWMID high 7bit	242 Table 1-7, 00-26	
97 AWMID low 7bit	↓ OP3_R1	
	↓	
98 Table 1-4, 00-08	287 Table 1-7, 00-26	
↓ ELVLO	↓ OP2_R1	
106 ↓ MCTENO	↓	
	332 Table 1-7, 00-26	
	↓ OP1_R1	
	↓	

(2) 2AFM

data	Element1 data	Element2 data
0 \$F0	116	
1 \$43	↓	Same as (1) 1AFM 107-463
2 \$0N	472	
3 \$7A	↓	
4 [] byte count		
5 []		
6 L		
7 M	473	
8 -	↓	Same as (1) 1AFM 107-463
9 -	829	
10 8		
11 1		
12 0	830	check_sum
13 1	831	\$F7
14 V		
15 C		
16 ↓		
29 ↓		
30 Memory_type		
31 Memory#		
32 \$01 or \$04		
↓ (ELMODE)		
33 ↓		
↓ Same as (1) 1AFM 33-97		
98 Table 1-4, 00-08		
↓ ELVLO		
106 ↓ MCTENO		
107 Table 1-4, 00-08		
↓ ELVL1		
115 ↓ MCTEN1		

(3) 4AFM

Note) Memory# : \$30~\$3F

When receiving, cancel if Memory# is other than the above.

data		Element1 data	
0	\$F0	134	Same as (1) 1AFM 107-463
1	\$43	↓	
2	\$0N	490	Element2 data
3	\$7A	↓	
4	byte count	491	Same as (1) 1AFM 107-463
5	L	↓	
6	M	847	Element3 data
7	-	↓	
8	-	848	Same as (1) 1AFM 107-463
9	-	↓	
10	8	1204	Element4 data
11	1	↓	
12	0	1205	Same as (1) 1AFM 107-463
13	1	↓	
14	V	1561	check_sum \$F7
15	C	↓	
16	\$00	1562	Table 1-4, 00-08 ELVLO
17	Memory_type	↓	
18	Memory#	1563	MCTEN0
19	\$02 (ELMODE)	↓	
20	Same as (1) 1AFM 33-97	1561	Table 1-4, 00-08 ELVL1
21	↓	↓	
22	↓	1562	MCTEN1
23	↓	↓	
24	97	1563	Table 1-4, 00-08 ELVL2
25	Table 1-4, 00-08 ELVLO	↓	
26	↓	106	MCTEN2
27	106	↓	
28	Table 1-4, 00-08 ELVL1	107	MCTEN1
29	↓	↓	
30	115	115	Table 1-4, 00-08 ELVL2
31	Table 1-4, 00-08 ELVLO	↓	
32	↓	116	MCTEN2
33	116	↓	
34	Table 1-4, 00-08 ELVL3	125	MCTEN3
35	↓	↓	
36	133	133	

(5) 2AWM

data		Element1 data	
0	\$F0	116	Same as (4) 1AWM 107-218
1	\$43	↓	
2	\$0N	227	Element2 data
3	\$7A	↓	
4	byte count	228	Same as (4) 1AWM 107-218
5	L	↓	
6	M	339	check_sum \$F7
7	-	↓	
8	-	340	Table 1-4, 00-08 ELVLO
9	-	↓	
10	8	341	MCTEN0
11	1	↓	
12	0	340	Table 1-4, 00-08 ELVL1
13	1	↓	
14	V	341	MCTEN1
15	C	↓	
16	\$00	340	Table 1-4, 00-08 ELVLO
17	Memory_type	↓	
18	Memory#	341	MCTEN0
19	\$06 (ELMODE)	↓	
20	Same as (1) 1AFM 33-97	97	Table 1-4, 00-08 ELVL1
21	↓	↓	
22	↓	97	MCTEN1
23	97	↓	
24	Table 1-4, 00-08 ELVLO	98	MCTEN0
25	↓	↓	
26	106	106	
27	Table 1-4, 00-08 ELVL1	107	MCTEN1
28	↓	↓	
29	115	115	

(6) 4AWM

data		Element1 data	
0	\$F0	134	Same as (4) 1AWM 107-218
1	\$43	↓	
2	\$0N	245	Element2 data
3	\$7A	↓	
4	byte count	246	Same as (4) 1AWM 107-218
5	L	↓	
6	M	357	Element3 data
7	-	↓	
8	-	358	Same as (4) 1AWM 107-218
9	-	↓	
10	8	469	Element4 data
11	1	↓	
12	0	470	Same as (4) 1AWM 107-218
13	1	↓	
14	V	581	check_sum \$F7
15	C	↓	
16	\$00	582	Table 1-4, 00-08 ELVLO
17	Memory_type	↓	
18	Memory#	583	MCTEN0
19	\$07 (ELMODE)	↓	
20	Same as (1) 1AFM 33-97	97	Table 1-4, 00-08 ELVL1
21	↓	↓	
22	↓	97	MCTEN1
23	97	↓	
24	Table 1-4, 00-08 ELVLO	98	MCTEN0
25	↓	↓	
26	106	106	
27	Table 1-4, 00-08 ELVL1	107	MCTEN1
28	↓	↓	
29	115	115	
30	Table 1-4, 00-08 ELVL2	116	MCTEN2
31	↓	↓	
32	124	124	
33	Table 1-4, 00-08 ELVL3	125	MCTEN3
34	↓	↓	
35	133	133	

(4) 1AWM

data		Element1 data	
0	\$F0	107	Table 1-8, 00-19 WSOURCE
1	\$43	↓	
2	\$0N	108	PCMWAVE (MSB)
3	\$7A	↓	
4	byte count	109	PCMWAVE (low 7bits)
5	L	↓	
6	M	110	PPM
7	-	↓	
8	-	134	Same as (1) 1AFM 403-463
9	-	↓	
10	8	194	Table 1-8, 4F-62 PAEGMD
11	1	↓	
12	0	195	PABP4
13	1	↓	
14	V	207	PAOS21 (MSB)
15	C	↓	
16	\$00	208	PAOS21 (low 7bits)
17	Memory_type	↓	
18	Memory#	209	PAOS22 (MSB)
19	\$05 (ELMODE)	↓	
20	Same as (1) 1AFM 33-97	210	PAOS22 (low 7bits)
21	↓	↓	
22	↓	211	PAOS23 (MSB)
23	97	↓	
24	Table 1-4, 00-08 ELVLO	212	PAOS23 (low 7bits)
25	↓	↓	
26	106	213	PAOS24 (MSB)
27	Table 1-4, 00-08 ELVL1	↓	
28	↓	214	PAOS24 (low 7bits)
29	115	↓	
30	Table 1-4, 00-08 ELVL2	215	PAOS24 (low 7bits)
31	↓	↓	
32	124	216	PAVSON
33	Table 1-4, 00-08 ELVL3	↓	
34	↓	217	PARVSW
35	133	↓	
36	Table 1-4, 00-08 ELVLO	218	PAMS
37	↓	↓	
38	106	219	check_sum \$F7
39	MCTEN0	↓	
40	↓	220	

(7) 1AFM_1AWM

data	Element1 data
0 \$F0	116 ↓ 472 Same as (1) 1AFM 107-463
1 \$43	
2 \$0N	
3 \$7A	
4] byte count	Element2 data
5	
6 L	473 ↓ 584 Same as (4) 1AWM 107-218
7 M	
8 -	
9 -	
10 8	585 check_sum
11 1	
12 0	586 \$F7
13 1	
14 V	
15 C	
16] \$00	
29 Memory_type	
30 Memory#	
32 \$08 (ELMODE)	
33] Same as	
↓ (1) 1AFM 33-97	
97	
98 Table 1-4.00-08	
↓ ELVLO	
106 ↓ MCTENO	
107 Table 1-4.00-08	
↓ ELVL1	
115 ↓ MCTEN1	

(9) Drum_set

Note) Memory# : \$30-\$3F

When receiving, cancel if Memory# is other than the above.

data	Drum_set data	Drum_sot data
0 \$F0	98 ALTC_1, OUT *C_1	194 ALTC_2, OUT *C_2
1 \$43	99 WSRCC_1	↓
2 \$0N	100 WAVC_1 (MSB)	↓
3 \$7A	101 WAVC_1 (low 7bits)	↓
4] byte count	102 WVLC_1	290 ALTC_3, OUT *C_3
5	103 WTNC_1	↓
6 L	104 WNSC_1	↓
7 M	105 WPNC_1	↓
8 -	106 ALTC#1, OUT *C#1	386 ALTC_4, OUT *C_4
9 -	↓	↓
10 8	114 ALTD_1, OUT *D_1	482 ALTC_5, OUT *C_5
11 1	↓	↓
12 0	122 ALTD#1, OUT *D#1	↓
13 1	↓	↓
14 V	130 ALTE_1, OUT *E_1	578 ALTC_6, OUT *C_6
15 C	↓	↓
16] \$00	138 ALTF_1, OUT *F_1	585 WPNC_6
29 Memory_type	↓	↓
30 Memory#	146 ALTF#1, OUT *F#1	586 check_sum
32 \$0A (ELMODE)	↓	587 \$F7
33] Same as	154 ALTG_1, OUT *G_1	
↓ (1) 1AFM 33-71	↓	
71	162 ALTG#1, OUT *G#1	
72] \$00	↓	
88 VVLASN	170 ALTA_1, OUT *A_1	
89 VVLLML	↓	
90	178 ALTA#1, OUT *A#1	
91] \$00	↓	
95 AWMID high 7	186 ALTB_1, OUT *B_1	
96 AWMID low 7	↓	
97	↓	

(8) 2AFM_2AWM

Note) Memory# : \$30-\$3F

When receiving, cancel if Memory# is other than the above.

data	Element1 data
0 \$F0	134 ↓ 490 Same as (1) 1AFM 107-463
1 \$43	
2 \$0N	
3 \$7A	
4] byte count	Element2 data
5	
6 L	491 ↓ 847 Same as (1) 1AFM 107-463
7 M	
8 -	
9 -	
10 8	848 ↓ 959 Same as (4) 1AWM 107-218
11 1	
12 0	960 ↓ 1071 Same as (4) 1AWM 107-218
13 1	
14 V	1072 check_sum
15 C	
16] \$00	1073 \$F7
29 Memory_type	
30 Memory#	
32 \$09 (ELMODE)	
33] Same as	
↓ (1) 1AFM 33-97	
97	
98 Table 1-4.00-08	
↓ ELVLO	
106 ↓ MCTENO	
107 Table 1-4.00-08	
↓ ELVL1	
115 ↓ MCTEN1	
116 Table 1-4.00-08	
↓ ELVL2	
124 ↓ MCTEN2	
125 Table 1-4.00-08	
↓ ELVL3	
133 ↓ MCTEN3	

(10) dump_request

data
0 \$F0
1 \$43
2 \$2N
3 \$7A
4 L
5 M
6 -
7 -
8 8
9 1
10 0
11 1
12 V
13 C
14] \$00
27
28 Memory type
29 Memory #
30 \$F7

< Table 3 >

Multi Bulk Dump

Note) Memory_type internal : \$00
 preset : \$02
 Edit_Buffer : \$7F (Memory\$ is transmitted as \$00, ignored when receiving.)

When receiving Bulk_dump, processed as Internal if Memory_type is other than \$7F.

Note) Memory# \$00-\$0F : INT 1-16

Note) When receiving Bulk_dump, bits 6-4 of Memory# are ignored.

		dump_request	
data		data	
0	\$F0	90	Table 1-2, 00-06
1	\$43	↓	OFVCSW_0, OUT*CH_0
2	\$0N	↓	
3	\$7A	97	OFVCSW_1, OUT*CH_1
4	↓	↓	
5	byte count	104	OFVCSW_2, OUT*CH_2
6	L	↓	
7	M	111	OFVCSW_+3, OUT*CH_3
8	-	↓	
9	-	118	OFVCSW_4, OUT*CH_4
10	8	↓	
11	1	125	OFVCSW_5, OUT*CH_5
12	0	↓	
13	1	132	OFVCSW_6, OUT*CH_6
14	M	↓	
15	U	139	OFVCSW_7, OUT*CH_7
16	↓	↓	
17		146	OFVCSW_8, OUT*CH_8
18		↓	
19		153	OFVCSW_9, OUT*CH_9
20		↓	
21	\$00	160	OFVCSW10, OUT*CH10
22	↓	↓	
23		167	OFVCSW11, OUT*CH11
24		↓	
25		174	OFVCSW12, OUT*CH12
26		↓	
27		181	OFVCSW13, OUT*CH13
28		↓	
29		188	OFVCSW14, OUT*CH14
30	Memory__type	↓	
31	Memory#	195	OFVCSW15, OUT*CH15
		↓	
		201	STPAN15
32	Table 1-9, 00-13		
	MNAMO		
	↓		
51	MNAM19		
52	Table 1-9, 00-1C		
	EFMODE		
	↓		
80	ST_MIX2		

<Table 4>

Additional Multi Bulk Dump

Note) Memory_type internal ; \$00
 preset ; \$02

Edit_buffer; \$7F (memory # is transmitted as \$00,
 ignored when receiving)

When receiving Bulk_dump, processed as Internal if Memory_type
 is other than \$7F.

Note) Memory # \$00-\$0F ; INT1-16

Note) When receiving Bulk_dump, bits 6-4 of Memory # are ignored.

		dump_request	
data		data	
0	\$F0	0	\$F0
1	\$43	1	\$43
2	\$0N	2	\$2N
3	\$7A	3	\$7A
4	↓	4	L
5	byte count	5	L
6	L	6	M
7	M	7	-
8	-	8	8
9	-	9	1
10	8	10	0
11	1	11	4
12	0	12	M
13	4	13	U
14	M	14	↓
15	U	15	\$00
16	↓	16	
17	\$00	17	
18		18	
19		19	
20		20	
21		21	
22		22	
23		23	
24		24	
25		25	
26		26	
27		27	
28		28	Memory__type
29		29	Memory#
30	Memory__type	30	\$7F
31	Memory#		
32	Table 1-14, 00-21		
	ASNMODE		
	↓		
65	AWMELM15		
66	check_sum		
67	\$F7		

<Table 5>

Pan Bulk Dump

Note) Memory__type internal ; \$00
 preset ; \$02

When receiving Bulk_dump, processed as Internal regardless of
 the Memory__type.

Note) Memory# \$00-\$1F : INT 1-32

Note) When receiving Bulk_dump, bits 6, 5 of Memory# are ignored.

		dump_request	
data		data	
0	\$F0	0	\$F0
1	\$43	1	\$43
2	\$0N	2	\$2N
3	\$7A	3	\$7A
4	↓	4	L
5	byte count	5	M
6	L	6	-
7	M	7	8
8	-	8	8
9	-	9	1
10	8	10	0
11	1	11	1
12	0	12	P
13	1	13	N
14	P	14	↓
15	N	15	\$00
16	↓	16	
17		17	
18		18	
19		19	
20		20	
21		21	
22		22	
23		23	
24		24	
25		25	
26		26	
27		27	
28		28	Memory__type
29		29	Memory#
30	Memory__type	30	\$F7
31	Memory#		
32	Table 1-11, 00-1A		
	PNSCSEL		
	↓		
58	PNNAM9		
59	check_sum		
60	\$F7		

<Table 6>

Micro Tuning Bulk Dump

Note) Memory_type internal ; \$00
 preset ; \$02

When receiving Bulk_dump, processed as Internal regardless of
 Memory_type.

Note) Memory# \$00-\$01 : INT 1-2

Note) When receiving Bulk_dump, bits 6-1 of Memory# are ignored.

		dump_request	
data		data	
0	\$F0	0	\$F0
1	\$43	1	\$43
2	\$0N	2	\$2N
3	\$7A	3	\$7A
4	↓	4	L
5	byte count	5	M
6	L	6	-
7	M	7	8
8	-	8	8
9	-	9	1
10	8	10	0
11	1	11	1
12	0	12	M
13	1	13	T
14	M	14	↓
15	T	15	\$00
16	↓	16	
17		17	
18		18	
19		19	
20		20	
21		21	
22		22	
23		23	
24		24	
25		25	
26		26	
27		27	
28		28	\$00
29		29	Memory #
30	Memory#	30	\$F7
32	table 1-12, 0000-017E		
	MCTC_-2 (high 7bits)		
	↓		
	MCTC_-2 (low 7bits)		
	↓		
286	MCTG_8 (high 7bits)		
287	MCTG_8 (low 7bits)		
288	table 1-12, 0200-0209		
	MTNAM_1		
	↓		
297	MTNAM10		
298	check_sum		
299	\$F7		

<Table 7>

System Setup Bulk Dump

data		dump_request	
0	\$F0	0	\$F0
1	\$43	1	\$43
2	\$0N	2	\$2N
3	\$7A	3	\$7A
4	] byte count	4	L
5	] ]	5	M
6	L	6	-
7	M	7	-
8	-	8	8
9	-	9	1
10	8	10	0
11	1	11	1
12	0	12	S
13	1	13	Y
14	S	14]]
15	Y	15	] \$00
16	] ]	29]]
17	] \$00	30	\$F7
32	Table 1-13, 00-35		
33	GRTMSU_0		
85	PGCMOD		
86	reserve		
95	reserve		
96	check_sum		
97	\$F7		

<Table 8>

Program Change Table Bulk Dump

data		dump_request	
0	\$F0	0	\$F0
1	\$43	1	\$43
2	\$0N	2	\$2N
3	\$7A	3	\$7A
4	] byte count	4	L
5	] ]	5	M
6	L	6	-
7	M	7	-
8	-	8	8
9	-	9	1
10	8	10	0
11	1	11	4
12	0	12	P
13	4	13	C
14	P	14]]
15	C	15	] \$00
16	] ]	29]]
17	] \$00	30	\$F7
32	Table 1-15, 0041-0240		
33	PGMTYP0		
287	PGMNUM127		
288	check_sum		
289	\$F7		

Function ...	Transmitted	Recognized	Remarks
:Basic Default	: x	: 1 - 16	: memorized
:Channel Changed	: x	: 1 - 16	:
:Mode Default	: x	: 1,2,3,4	: memorized
:Mode Messages	: x	: x	:
:Mode Altered	: *****	: x	:
:Note Number : True voice	: x	: 0 - 127	:
	: *****	: 1 - 127	:
:Velocity Note ON	: x	: o v=1-127	:
:Velocity Note OFF	: x	: x	:
:After Key's	: x	: x	:
:Touch Ch's	: x	: o	:
:Pitch Bender	: x	: o 0-12 semi	: 7 bit resolution:
:Control 1	: x	: o	: Modulation wheel:
:Control 2	: x	: o	: Breath control
:Control 4	: x	: o	: Foot control
:Control 6	: x	: o	: Data entry knob
:Control 7	: x	: o	: Volume
:Change 64	: x	: o	: Sustain
:Change 65	: x	: o	: Portamento
:Change 96	: x	: o	: Data entry +1
:Change 97	: x	: o	: Data entry -1
:Change 0 - 6	: x	: o	: Assignable
:Change 8 - 120	: x	: o	: Assignable
:Prog Change : True #	: x	: o 0-127 *1	: assignable
	: *****	: *2	:
:System Exclusive	: o	: *3	: *3 voice etc.
:System : Song Pos	: x	: x	:
:System : Song Sel	: x	: x	:
:Common : Tune	: x	: x	:
:System :Clock	: x	: x	:
:Real Time :Commands	: x	: x	:
:Aux :Local ON/OFF	: x	: x	:
:Aux :All Notes OFF	: x	: x	:
:Mes- :Active Sense	: o	: o	:
:sages:Reset	: x	: x	:
Notes: *1 ; receive if program change sw is not off.			
*2 ; voice : 0 - 63 , multi : 0 - 15			
(if program change sw is not "table")			
*3 ; transmit/receive if device No. is not off.			

Mode 1 : OMNI ON, POLY Mode 2 : OMNI ON, MONO o : Yes
 Mode 3 : OMNI OFF, POLY Mode 4 : OMNI OFF, MONO x : No

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VJ96820 9072.5 R2 ITP Printed in Japan