YAMAHA
MUSIC SYNTHESIZER
SY77
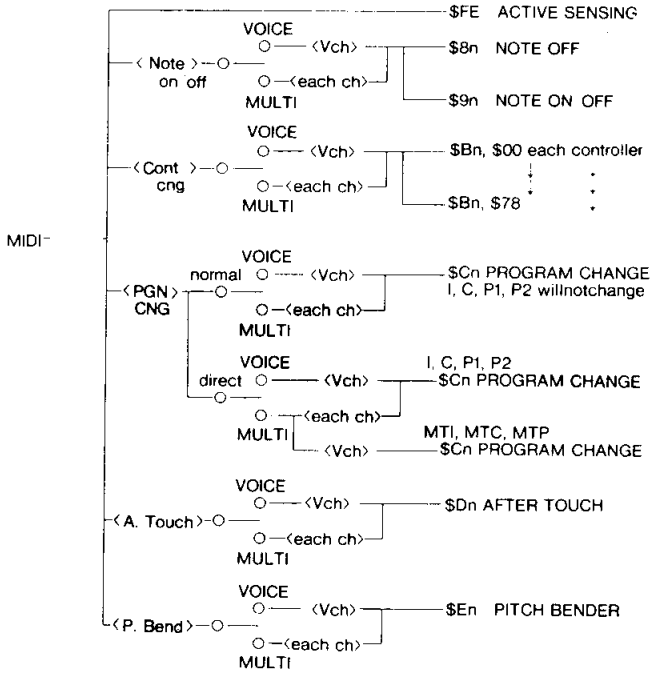
MIDI DATA FORMAT

2. Synthesizer mode

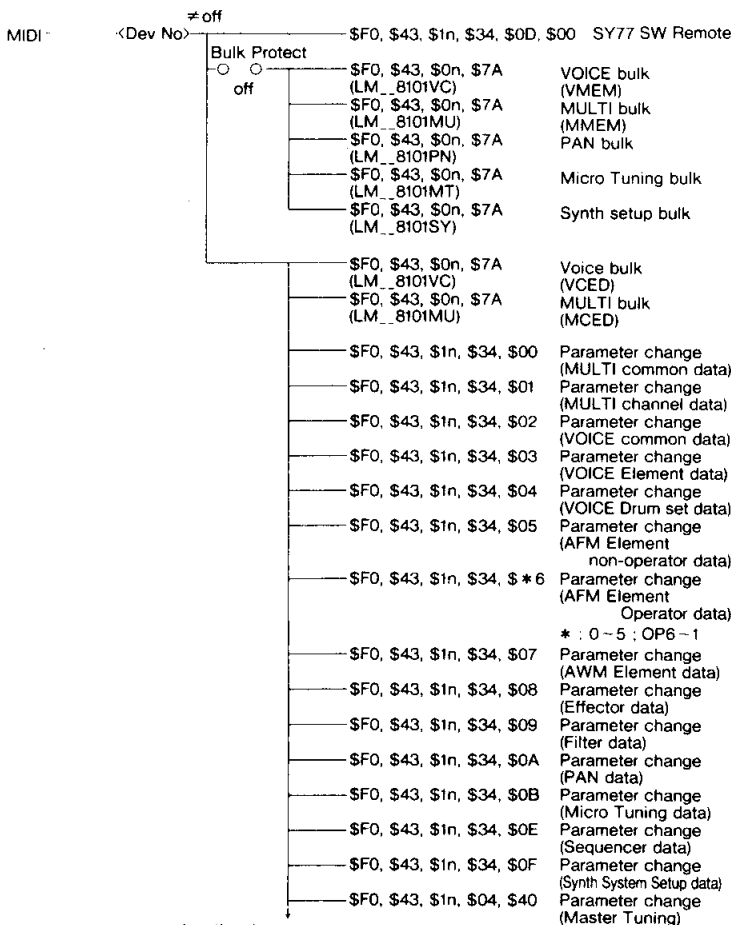## 2.1 MIDI reception/transmission block diagram

\<MIDI reception conditions\> 1/2

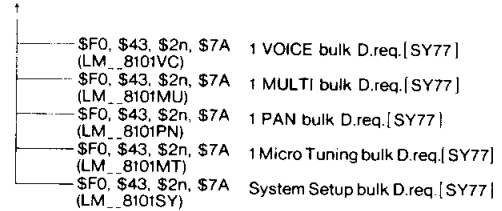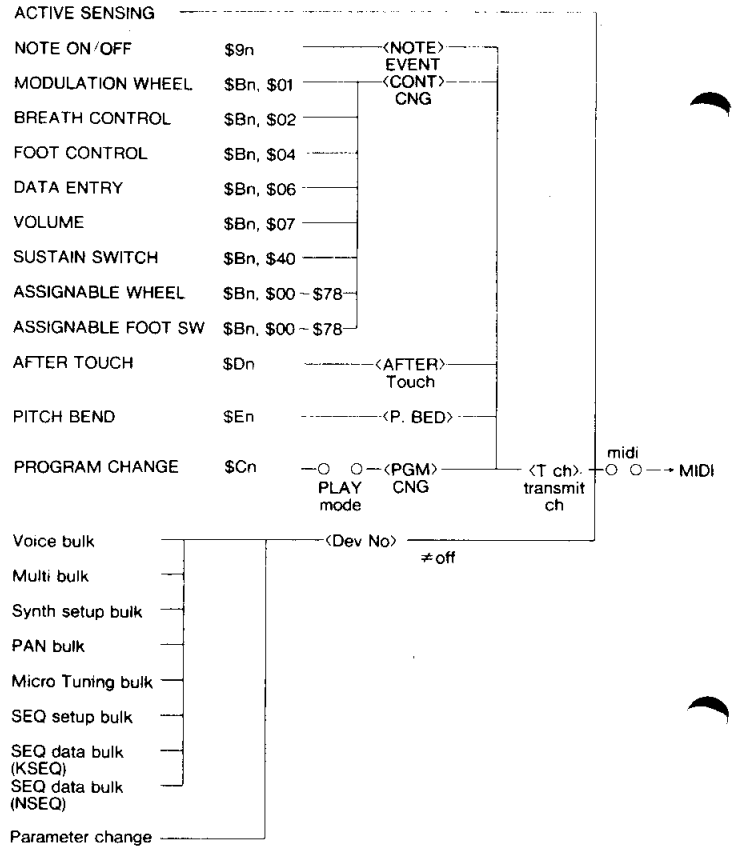Vch . . . . . Voice Receive ch.

```
                                    ──── $FE   ACTIVE SENSING
                        VOICE
                        O ──── <Vch> ──── $8n   NOTE OFF
   ─< Note >──O
     on off             O ─<each ch>──── $9n   NOTE ON OFF
                        MULTI

                        VOICE
                        O ──── <Vch> ──── $Bn, $00 each controller
   ─<Cont >──O
     cng                O ─<each ch>──── $Bn, $78
                        MULTI

                        VOICE
              normal  O ──── <Vch> ──── $Cn PROGRAM CHANGE
   ─<PGN>──O                              I, C, P1, P2 willnotchange
     CNG                O ─<each ch>──
                        MULTI

                        VOICE                 I, C, P1, P2
              direct  O ──── <Vch> ──── $Cn PROGRAM CHANGE
          ──O
                        O ─<each ch>──
                        MULTI                 MTI, MTC, MTP
                        ──── <Vch> ──── $Cn PROGRAM CHANGE

                        VOICE
                        O ──── <Vch> ──── $Dn AFTER TOUCH
   ─<A. Touch>──O
                        O ─<each ch>──
                        MULTI

                        VOICE
                        O ──── <Vch> ──── $En   PITCH BENDER
   ─<P. Bend>──O
                        O ─<each ch>──
                        MULTI
```

\<MIDI reception conditions\> 2/2

```
                    ≠ off
MIDI─  ─<Dev No>────────────── $F0, $43, $1n, $34, $0D, $00   SY77 SW Remote
          │ Bulk Protect
          │ ─O ─O ──── $F0, $43, $0n, $7A      VOICE bulk
          │   off       (LM__8101VC)            (VMEM)
          │          ── $F0, $43, $0n, $7A      MULTI bulk
          │             (LM__8101MU)            (MMEM)
          │          ── $F0, $43, $0n, $7A      PAN bulk
          │             (LM__8101PN)
          │          ── $F0, $43, $0n, $7A      Micro Tuning bulk
          │             (LM__8101MT)
          │          ── $F0, $43, $0n, $7A      Synth setup bulk
          │             (LM__8101SY)

                     ── $F0, $43, $0n, $7A      Voice bulk
                        (LM__8101VC)            (VCED)
                     ── $F0, $43, $0n, $7A      MULTI bulk
                        (LM__8101MU)            (MCED)
                     ── $F0, $43, $1n, $34, $00  Parameter change
                                                 (MULTI common data)
                     ── $F0, $43, $1n, $34, $01  Parameter change
                                                 (MULTI channel data)
                     ── $F0, $43, $1n, $34, $02  Parameter change
                                                 (VOICE common data)
                     ── $F0, $43, $1n, $34, $03  Parameter change
                                                 (VOICE Element data)
                     ── $F0, $43, $1n, $34, $04  Parameter change
                                                 (VOICE Drum set data)
                     ── $F0, $43, $1n, $34, $05  Parameter change
                                                 (AFM Element
                                                     non-operator data)
                     ── $F0, $43, $1n, $34, $*6  Parameter change
                                                 (AFM Element
                                                        Operator data)
                                                 * : 0~5 ; OP6~1
                     ── $F0, $43, $1n, $34, $07  Parameter change
                                                 (AWM Element data)
                     ── $F0, $43, $1n, $34, $08  Parameter change
                                                 (Effector data)
                     ── $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, $0E  Parameter change
                                                 (Sequencer data)
                     ── $F0, $43, $1n, $34, $0F  Parameter change
                                                 (Synth System Setup data)
                     ── $F0, $43, $1n, $04, $40  Parameter change
                                                 (Master Tuning)
          (continue)
```

(continue)

```
   ── $F0, $43, $2n, $7A     1 VOICE bulk D.req.[SY77]
      (LM__8101VC)
   ── $F0, $43, $2n, $7A     1 MULTI bulk D.req.[SY77]
      (LM__8101MU)
   ── $F0, $43, $2n, $7A     1 PAN bulk D.req.[SY77]
      (LM__8101PN)
   ── $F0, $43, $2n, $7A     1 Micro Tuning bulk D.req.[SY77]
      (LM__8101MT)
   ── $F0, $43, $2n, $7A     System Setup bulk D.req.[SY77]
      (LM__8101SY)
```

Dev No = Device Number

VCED = Voice edit buffer
MCED = Multi edit buffer
VMEM = Voice memory
MMEM = Multi memory

\<MIDI transmission conditions\>

```
ACTIVE SENSING    ──────────────────────────────────┐
NOTE ON/OFF       $9n ───────────────<NOTE>──────┐  │
                                      EVENT       │  │
MODULATION WHEEL  $Bn, $01 ──────────<CONT>───    │  │
                                      CNG         │  │
BREATH CONTROL    $Bn, $02 ──────                 │  │
FOOT CONTROL      $Bn, $04 ──────                 │  │
DATA ENTRY        $Bn, $06 ──────                 │  │
VOLUME            $Bn, $07 ──────                 │  │
SUSTAIN SWITCH    $Bn, $40 ──────                 │  │
ASSIGNABLE WHEEL  $Bn, $00~$78──                  │  │
ASSIGNABLE FOOT SW $Bn, $00~$78──                 │  │
AFTER TOUCH       $Dn ───────────────<AFTER>──    │  │
                                      Touch        │  │
PITCH BEND        $En ───────────────<P. BED>─    │  │
                                                         midi
PROGRAM CHANGE    $Cn ──O  O─<PGM>────<T ch>─┤O O─→ MIDI
                        PLAY  CNG      transmit
                        mode           ch
Voice bulk        ────────────────<Dev No>──────
Multi bulk        ──                    ≠ off
Synth setup bulk  ──
PAN bulk          ──
Micro Tuning bulk ──
SEQ setup bulk    ──
SEQ data bulk     ──
(KSEQ)
SEQ data bulk     ──
(NSEQ)
Parameter change ──
```

2.2 Channel messages

2.2.1 Transmission

2.2.1.1 Note on/off

Transmission note range   = C1(36) . . . C6(96)
Velocity range   = 0 . . . 127 (0: note off)

2.2.1.2 Control change

When the following controllers are moved MIDI data will be transmitted.

ctl #	parameter	data rng
1	Modulation wheel	0~127
2	Breath control	0~127
4	Foot control	0~127
6	Data entry slider	0~127
7	Volume pedal	0~127
64	Sustain switch	0 , 127
96	data increment Sw.	127
97	data decrement Sw.	127
0~120	Assignable wheel	0~127
0~120	Assignable foot sw	0 , 127

←┐ Transmitted in all modes
←┘ other than Voice
     Play mode or Multi Play
     mode.

2.2.1.3 Program change

When a voice is selected in voice mode, or when a multi is selected in multi mode, a program change is transmitted. The program change number is assigned according to the mode, as follows.

			Program Change Data	
			normal mode	direct mode
Voice	Internal	1~64	00~63	00~63
	Card	1~64	00~63	00~63
	Preset 1	1~64	00~63	00~63
	Preset 2	1~64	00~63	00~63
Multi	Internal	1~16	64~79	64~79
	Card	1~16	64~79	64~79
	Preset	1~16	64~79	64~79
From other to Voice Mode				
Internal Voice			not transmitted	122
Card Voice				123
Preset 1 Voice				124
Preset 2 Voice				117
From other to Multi Mode				
Internal Voice			not transmitted	119
Card Voice				120
Preset 1 Voice				121
Preset 2 Voice				118
From other to Multi Mode				
Internal Multi			not transmitted	125
Card Multi				126
Preset Multi				127

When the mode is set to "off", program changes will not be transmitted.

2.2.1.4 Pitch bend

Pitch bend is transmitted with 7 bit precision.

2.2.1.5 Aftertouch

Transmitted from MIDI when aftertouch is operated.

2.2.1.6 Channel mode messages

Channel mode messages are not transmitted.

2.2.2 Reception

2.2.2.1 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

2.2.2.2 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

2.2.2.3 Program change

When a program change is received, the SY77 will operate as follows. A system setup parameter allows the following three 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 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.
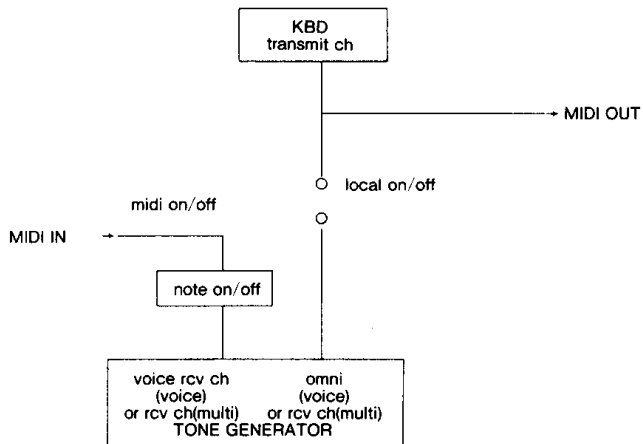
2.2.2.4 Pitch bend

Only the MSB of the pitch bend is received.

2.2.2.5 Aftertouch

2.2.2.6 Channel mode messages

Not received

2.2.3 Diagram of the keyboard section and tone generator section

Note 1) In voice mode, sound will be produced even if the Voice Receive Channel does not match the Keyboard Trans. Channel.

Note 2) Notes from the keyboard and notes from MIDI will be distinguished in polyphonic mode, and not distinguished in monophonic mode. Controller data from the keyboard and controller data from the keyboard (control change, aftertouch, pitch bend) will not be distinguished except for the sustain switch.

3. System exclusive messages

3.1 Parameter changes

The SY77 transmits and receives the following 13 types of parameter changes.
(However 13: Remote Switch is only received.) Also, when 13: Remote Switch is received, the corresponding display will appear just as if the switch had actually be 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). Switch Remote parameter change
14). System Setup Data parameter change

3.1.1 Multi Common Data parameter change

```
11110000    F0
01000011    43
0001nnnn    nnnn      =Device Number
00110100    34
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
0ppppppp    ppppppp =Table 1-3, N2
00000000    00
0vvvvvvv    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
0000pppp    pppp      =Table 1-4, N2
00000000    00
0vvvvvvv    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    FO
01000011    43
0001nnnn    nnnn = Device Number
00110100    34
00000100    04
0mmmmmmm    mmmmmmm = 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    FO
01000011    43
0001nnnn    nnnn    = Device Number
00110100    34
00000101    05
0ee00000    ee      = Element Number
00000000    00
000ppppp    ppppp   = Table 1-6 N2
00000000    00
0vvvvvvv    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    FO
01000011    43
0001nnnn    nnnn    = Device Number
00110100    34
00000101    05
0ee00000    ee      = Element Number
01111111    7F
01111111    7F
00000000    00
00vvvvvv    vvvvvv  = 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 Enable Parameter change

```
11110000    FO
01000011    43
0001nnnn    nnnn    = Device Number
00110100    34
00000110    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    FO
01000011    43
0001nnnn    nnnn    = Device Number
00110100    34
00000111    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 AWM Element Data parameter change

```
11110000    FO
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,  f f f = filter Number
00000000    00
00pppppp    pppppp  = Table 1-10, N2
0000000v    v       = Data Value (MSB)
0vvvvvvv    vvvvvv  = 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 exist, 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
000mmmmm    mmmmm   = 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
00001010    0B
000mmmmm    mmmmm   = 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 Switch Remote parameter change

```
11110000    F0
01000011    43
0001nnnn    nnnn    = Device Number
00110100    34
00001010    0D
00000000    00
00000000    00
0ppppppp    ppppppp = Table 1-13, 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.

3.1.15 System Setup Data parameter change

```
11110000    F0
01000011    43
0001nnnn    nnnn    = Device Number
00110100    34
00001010    0F
00000000    00
00000000    00
0ppppppp    ppppppp = Table 1-14, 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.

4. Bulk dump

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    00mmmmmm    mmmmmm  = Memory Number
32    0ddddddd    ddddddd = data
·         ↓            ↓
      0sssssss    sssssss = 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

1 Voice Bulk transmission by Dump Request
>   Memory_type   = 00 (INT)
>   02 (PRESET1)
>   03 (PRESET2)
>   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	00mmmmmm	mmmmmm = Memory Number	
32	0ddddddd	ddddddd = data	
↓	↓	↓	
	0sssssss	sssssss = 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

1 Multi Bulk transmission by Dump Request
    Memory_type   = 00 (INT)
                         02 (PRESET)
    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 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	0ttttttt	ttttttt = Memory_type	
31	00mmmmmm	mmmmmm = Memory Number	
32	0ddddddd	ddddddd = data	
↓	↓	↓	
	0sssssss	sssssss = 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 4.

4.4 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	01010100	54 (ascii "T")	
16	00000000	00	
↓	↓	↓	
29	00000000	00	
30	00000000	00	= Memory_type
31	00mmmmmm	mmmmmm = Memory Number	
32	0ddddddd	ddddddd = data	
↓	↓	↓	
	0sssssss	sssssss = 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

MCT Bulk transmission by Dump Request
    Memory_type   = 00 (INT)
    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 5.

4.5 SYNTH 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	0ddddddd	ddddddd = data	
↓	↓	↓	
	0sssssss	sssssss = check_sum	
	11110111	F7	

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

4.6 SEQ setup data bulk dump

Reception is possible at any time when not playing back or recording.
This data is transmitted when the MIDI UTILITY "bulk dump" is executed,
or when a dump request is received.

0	11110000	F0	
1	01000011	43	
2	0000nnnn	nnnn	= Device Number
3	01111110	7E	
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	01010011	53 (ascii "S")	
16	0ddddddd	ddddddd = data	
↓	↓	↓	
	0sssssss	sssssss = check_sum	
	11110111	F7	

* For details of the bulk dump data and dump request format, refer to table 7-1.

Dump request

0	11110000	F0	
1	01000011	43	
2	0010nnnn	nnnn	= Device Number
3	01111110	7E	
4	01001100	4C (ascii "L")	
5	01001101	4D (ascii "M")	
6	00100000	20 (ascii " ")	
7	00100000	20 (ascii " ")	
8	00111000	38 (ascii "8")	
9	00110001	31 (ascii "1")	
10	00110000	30 (ascii "0")	
11	00110001	31 (ascii "1")	
12	01010011	53 (ascii "S")	
13	01010011	53 (ascii "S")	
14	11110111	F7	

4.7 SEQ song and pattern data bulk dump (KSEQ)

Reception is possible at any time when not playing back or recording.
This data is transmitted when the MIDI UTILITY "bulk dump" is executed,
or when a dump request is received.

0	11110000	F0	
1	01000011	43	
2	0000nnnn	nnnn	= Device Number
3	00001010	0A	
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	01001011	4B (ascii "K")	
11	01010011	53 (ascii "S")	
12	01000101	45 (ascii "E")	
13	01010010	51 (ascii "Q")	
14	00100000	20 (ascii " ")	
15	00100000	20 (ascii " ")	
16	0ddddddd	ddddddd = data	
•	↓	↓	
	0sssssss	sssssss = check_sum	
	11110111	F7	

Dump request

0	11110000	F0	
1	01000011	43	
2	0010nnnn	nnnn = Device Number	
3	00001010	0A	
4	01001100	4C (ascii "L")	
5	01001101	4D (ascii "M")	
6	00100000	20 (ascii " ")	
7	00100000	20 (ascii " ")	
8	01001011	4B (ascii "K")	
9	01010011	53 (ascii "S")	
10	01000101	45 (ascii "E")	
11	01010010	51 (ascii "Q")	
12	00100000	20 (ascii " ")	
13	00100000	20 (ascii " ")	
14	11110111	F7	

4.8 SEQ song and pattern data bulk dump (NSEQ)

Reception is possible at any time when not playing back or recording.
This data is transmitted when the MIDI UTILITY "bulk dump" is executed,
or when a dump request is received.

0	11110000	F0	
1	01000011	43	
2	0000nnnn	nnnn	= Device Number
3	00001010	0A	
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	01001110	4E (ascii "N")	
11	01010011	53 (ascii "S")	
12	01000101	45 (ascii "E")	
13	01010010	51 (ascii "Q")	
14	00100000	20 (ascii " ")	
15	00100000	20 (ascii " ")	
16	0ddddddd	ddddddd = data	
↓	↓	↓	
	0sssssss	sssssss = check_sum	
	11110111	F7	

Dump request

0	11110000	F0	
1	01000011	43	
2	0010nnnn	nnnn	= Device Number
3	00001010	0A	
4	01001100	4C (ascii "L")	
5	01001101	4D (ascii "M")	
6	00100000	20 (ascii " ")	
7	00100000	20 (ascii " ")	
8	01001110	4E (ascii "N")	
9	01010011	53 (ascii "S")	
10	01000101	45 (ascii "E")	
11	01010010	51 (ascii "Q")	
12	00100000	20 (ascii " ")	
13	00100000	20 (ascii " ")	
14	11110111	F7	

5. Sequencer mode

5.1 MIDI reception/transmission block diagram

(Receive flow chart)

(Note)

sw1 □ on when SEQ SETUP sync is set to MIDI
sw2 □ during RECORD, the SEQ SETUP reception channel
sw3 □ during RECORD, the SEQ SETUP velocity on/off
sw4 □ during RECORD, the SEQ SETUP control change on/off
sw5 □ during RECORD, the SEQ SETUP pitch bend on/off
sw6 □ during RECORD, the SEQ SETUP program change on/off
sw7 □ during RECORD, the SEQ SETUP channel pressure on/off
sw8 □ during RECORD, the SEQ SETUP system exclusive (of 32 bytes or less) on/off
sw9 □ on/off in SEQ SETUP for song position pointer, start, continue, stop
sw10 □ set by the utility Device Number
sw11 □ received only when utility Bulk Memory Protect = off
sw12 □ received only when utility Program Change Mode is not off

(Transmit flow chart)

```
MIDI OUT ──┬──────────────────┬────── $9n   note on·off
           │                  ├────── $Bn   control change
           │                  ├────── $En   pitch bend
           │          sw12    │
           │           □      │
           │    ┌──────┼──────┼────── $Cn   program change
           │    │              └───── $Dn   channel after touch
     sw9   sw1  │
      □─────□───┼──────────────┬────── $F8   MIDI clock
           │    │              ├────── $F2   song position pointer
           │    │              ├────── $FA   start
           │    │              ├────── $FB   continue
           │    │              └────── $FC   stop
     sw10  │
      □────┘──────────────────────── $F0   system exclusive 32 bytes or less

           ├── $F0 43 0n 0A bb bb LM__KSEQ__(KSEQ data) sum F7
           ├── $F0 43 0n 0A bb bb LM__NSEQ__(NSEQ data) sum F7
           └── $F0 43 0n 7E bb bb LM__8101SS (setup data) sum F7
```

(Note)

sw1 □ on when SEQ SETUP sync is set to MIDI

sw9 □ on/off in SEQ SETUP for song position pointer, start, continue, stop

sw10 □ set by the utility Device Number

sw12 □ received only when utility Program Change Mode is not off

5.2 Channel messages

Received only during RECORD. Transmitted only during PLAY and overdubbing.
For transmission and reception conditions, refer to the Receive flow chart and Transmit flow chart.

5.3 Mode messages

Neither received nor transmitted.

5.4 System common messages

Receive only $F2 and $F7. All others are neither received nor transmitted.

5.5 System realtime messages

5.5.1 Status F8, FA, FB, FC

Receive.

5.5.2 Status F9, FD, FF

After decoding, do nothing.

6. 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
				---Multi Voice Set Name---
0	00	MNAM 0	ascii	" * "
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 Common 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
				---Stereo Output 1 Select---
0	00	OFVCSW	b6 ; off/on	Off_voice_switch
		OUT0CH	b0 ; off/on	Output 1 select
		OUT1CH	b1 ; off/on	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 bynary

8

<Table 1-3>

MIDI Parameter Change table (Voice data 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 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--- Wheel Pitch Bend Range
12	29	ATPBR	−12 ~ +12 (s m)	After_Touch Pitch Bend Range
13	2A	PMASN	0 ~ 121	---Pitch Modulation--- Device Assign (MIDI control #)
14	2B	PMRNG	0 ~ 127	Modulation range
15	2C	AMASN	0 ~ 121	---Amplitude Modulation--- Device Assign (MIDI control #)
16	2D	AMRNG	0 ~ 127	Modulation range
17	2E	FMASN	0 ~ 121	---Filter Modulation--- Device Assign (MIDI control #)
18	2F	FMRNG	0 ~ 127	Modulation range
19	30	PNLASN	0 ~ 121	---PAN Modulation--- Note) Valid only when Multi is selected Device Assign (MIDI control #)
20	31	PNLRNG	0 ~ 127	Modulation range
21	32	COASN	0 ~ 121	---Filter Cut_off Bias--- Device Assign (MIDI control #)
22	33	CORNG	0 ~ 127	Cut_off range
23	34	PNBASN	0 ~ 121	---PAN Bias--- Note) Valid only when Multi is selected Device Assign (MIDI control #)
24	35	PNBRNG	0 ~ 127	Bias range
25	36	EGBASN	0 ~ 121	---EG Bias--- Device Assign (MIDI control #)
26	37	EGBRNG	0 ~ 127	Bias range
27	38	VVLASN	0 ~ 121	---Voice Volume--- Device Assign (MIDI control #)
28	39	VVLLML	0 ~ 127	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 element. Mode
32	3D	POS	0~127	Time
33	3E	reserve		
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, el, e0, 0, 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
1	01	ELDT	−7 ~ +7 (s m)	Element Detune
2	02	ELNS	−64 ~ +63 (o b)	Element Note Shift
3	03	ENLL	0 ~ 127 (note #)	---Element Note Limit--- Low Limit
4	04	ENLH	0 ~ 127 (note #)	High Limit
5	05	EVLL	0 ~ 127 (note #)	---Element Velocity Limit--- Low Limit
6	06	EVLH	0 ~ 127 (note #)	High Limit
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 WID*
and WAV*, V1 will be $00)
V2 : LSB of parameter value

	N2	data name	data range	note
0	00	ALTGRP OUT1 OUT0	b6 ; 0 ~ 1 b1 ; 0 ~ 1 b0 ; 0 ~ 1	Alternate groop Output 2 select Output 1 select
1	01	WSRC	0 ~ 2	Wave Source
2	02	WAV	0 ~ max.255	Wave Number (V1; MSB V2; LS7bits)
3	03	WVL	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
2	02	FPR2	0~63	key_on Rate 2
3	03	FPR3	0~63	key_on Rate 3
4	04	FPRR1	0~63	key_off Rate 1
5	05	FPL0	−64~+63 (o/b)	key_on Level 0
6	06	FPL1	−64~+63 (o/b)	key_on Level 1
7	07	FPL2	−64~+63 (o/b)	key_on Level 2
8	08	FPL3	−64~+63 (o/b)	key_on Level 3
9	09	FPRL1	−64~+63 (o/b)	key_off Level 1
10	0A	FPEGR	0~3	Range
11	0B	FPRS	0~7	Rate Scaling
12	0C	FVPSW	on/off	Velocity Switch
13	0D	FLFSPD	0~99	—Main LFO— Speed
14	0E	FLFDLY	0~99	Delay time
15	0F	FLFPMD	0~127	Pitch Modulation Depth
16	10	FLFAMD	0~127	Amplitude Modulation Depth
17	11	FLFFMD	0~127	Filter Modulation Depth
18	12	FLFWAV	0~5	Wave
19	13	FLINTP	0~99	Initial Phase
20	14	reserve		
21	15	SLFWD	0~3	—Sub LFO— Wave
22	16	SLFS	0~127	Speed
23	17	SLFDM	delay/delay	delay mode/decay mode
24	18	SLFDT	0~99	Delay time/decay time
25	19	SLPMD	0~127	Pitch Modulation Depth

< Table 1-7 >

MIDI Parameter Change table (AFM Element)

$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	
$06	OP6
$16	OP5
$26	OP4
$36	OP3
$46	OP2
$56	OP1

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

	N2	data name	data range		note
0	00	R1	0~63		EG key_on Rate 1
1	01	R2	0~63		EG key_on Rate 2
2	02	R3	0~63		EG key_on Rate 3
3	03	R4	0~63		EG key_on Rate 4
4	04	RR1	0~63		EG key_off Rate 1
5	05	RR2	0~63		EG key_off Rate 2
6	06	L1	0~63		EG key_on Level 1
7	07	L2	0~63		EG key_on Level 2
8	08	L3	0~63		EG key_on Level 3
9	09	L4	0~63		EG key_on Level 4
10	0A	RL1	0~63		EG key_off Level 1
11	0B	RL2	0~63		EG key_off Level 2
12	0C	SLP	0~3 (disp: 63-0)		EG Sustain Loop Point
13	0D	HT	0~63		EG key_on/Hold Time
14	0E	L0	0~63		EG key_on Level 0
15	0F	RS	−7~+7 (s/m)		EG Rate Scaling
16	10	FAMS	0~7		Amplitude Modulation Sens.
17	11	VSON	−7~+7 (s/m)		Velocity Sensitivity
18	12	reserve			
19	13	ALGSRC0	V2 b3~0	; 0~10	oscilator input0 Source
		ALGSRC1	V1 b0,V2 b6~4	; 0~10	oscilator input1 Source
20	14	ALGDST	V2 b1,0	; 0~3	oscilator output Destination
		OACSRC0	V2 b3,2	; 0~2	Out_Accumulator input 0 Source
		OACSRC1	V2 b4	; 0~1	Out_Accumulator input 1 Source
21	15	SHIFT0	V2 b5~3	; 0~7	oscilator input 0 Shift value
		SHIFT1	V2 b2~0	; 0~7	oscilator input 1 Shift value
22	16	COR	0~7		output level Correction
23	17	PWAVE	0~15		Waveform of oscilator
24	18	FMLPMS	V2 b4~2	; 0~7	M_LFO Pitch Modulation Sens.
		PES	V2 b1	; 0~1	Pitch EG Switch
		FPM	V2 b0	; 0~1	frequency Mode
25	19	KOE	V1 b0	; 0~1	initial phase set Enable
		PHASE	V2 b6~0	; 0~127	initial Phase of oscilator
26	1A	FPD	−15~+15 (s/m)		Pitch Detune

< 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; MSB1bit 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— key_on Rate 1
7	07	PPR2	0~63	key_on Rate 2
8	08	PPR3	0~63	key_on Rate 3
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	1~3	Range
16	10	PPRS	−7~+7	Rate Scaling
17	11	PVPSW	off/on	Velocity Switch
18	12	PLFSPD	0~99	—multi LFO— Speed
19	13	PLFDLY	0~99	Delay time
20	14	PLFPMD	0~127	Pitch Modulation Depth
21	15	PLFAMD	0~127	Amplitude Modulation Depth
22	16	PLFFMD	0~127	Filter Modulation Depth
23	17	PLFWAV	0~5	Wave
24	18	PLINTP	0~99	Initial Phase
25	19			

Right column top table (continuation of AFM Element, Table 1-7):

	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

[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	CHR1TYPE	0~4	Chorus Effect 1 Type
2	02	CHR1BLNC	0~100	Chorus Effect 1 Balance
3	03	CHR1OLVL	0~100	Chorus Effect 1 Output Level
4	04	CHR1PRM1		Chorus Effect 1 Parameter 1
5	05	CHR1PRM2		Chorus Effect 1 Parameter 2
6	06	CHR1PRM3		Chorus Effect 1 Parameter 3
7	07	CHR1PRM4		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	CHR2OLVL	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	REV1TYPE	0~4	Reverb Effect 1 Type
16	10	REV1BLNC	0~100	Reverb Effect 1 Balance
17	11	REV1OLVL	0~100	Reverb Effect 1 Output Level
18	12	REV1PRM1		Reverb Effect 1 Parameter 1
19	13	REV1PRM2		Reverb Effect 1 Parameter 2
20	14	REV1PRM3		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	REV2OLVL	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	lpf/ (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_lvl scaling Break Point
18	12	FBP2	0~127 (note #)	c_off_lvl scaling Break Point
19	13	FBP3	0~127 (note #)	c_off_lvl scaling Break Point
20	14	FBP4	0~127 (note #)	c_off_lvl scaling Break Point
21	15	FOS1	−128~+127 (2bytes)	c_off_lvl scaling offset
22	16	FOS2	−128~+127 (2bytes)	c_off_lvl scaling offset
23	17	FOS3	−128~+127 (2bytes)	c_off_lvl scaling offset
24	18	FOS4	−128~+127 (2bytes)	c_off_lvl 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
	N1	N2	data name	data range	note
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
	N1	N2	data name	data range	note
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
					---Micro Tuning Name---
128	02	00	MTNAM0	ascii	" * "
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 1-13>

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	35	23	PSW36	±
1	01	PSW 2	MULTI	36	24	PSW37	ENTER
2	02	PSW 3	SONG	37	25	PSW38	1
3	03	PSW 4	PATTERN	38	26	PSW39	2
4	04	PSW 5	UTILITY	39	27	PSW40	3
5	05	PSW 6	EDIT	40	28	PSW41	4
6	06	PSW 7	STORE	41	29	PSW42	5
7	07	PSW 8	EFFECT	42	2A	PSW43	6
8	08	PSW 9	I<	43	2B	PSW44	7
9	09	PSW10	<<	44	2C	PSW45	8
10	0A	PSW11	LOCATE	45	2D	PSW46	9
11	0B	PSW12	>>	46	2E	PSW47	INTERNAL
12	0C	PSW13	RECORD	47	2F	PSW48	CARD
13	0D	PSW14	STOP	48	30	PSW49	PRESET 1
14	0E	PSW15	RUN	49	31	PSW50	PRESET 2
15	0F	PSW16	SHIFT	50	32	PSW51	A
16	10	PSW17	F1	51	33	PSW52	B
17	11	PSW18	F2	52	34	PSW53	C
18	12	PSW19	F3	53	35	PSW54	D
19	13	PSW20	F4	54	36	PSW55	1
20	14	PSW21	F5	55	37	PSW56	2
21	15	PSW22	F6	56	38	PSW57	3
22	16	PSW23	F7	57	39	PSW58	4
23	17	PSW24	F8	58	3A	PSW59	5
24	18	PSW25	EXIT	59	3B	PSW60	6
25	19	PSW26	PAGE<	60	3C	PSW61	7
26	1A	PSW27	PAGE>	61	3D	PSW62	8
27	1B	PSW28	JUMP	62	3E	PSW63	9
28	1C	PSW29	-1	63	3F	PSW64	10
29	1D	PSW30	↑	64	40	PSW65	11
30	1E	PSW31	+1	65	41	PSW66	12
31	1F	PSW32	←	66	42	PSW67	13
32	20	PSW33	↓	67	43	PSW68	14
33	21	PSW34	→	68	44	PSW69	15
34	22	PSW35	0	69	45	PSW70	16

<Table 1-14>

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
				---Greeting Message---
0	00	GRTMSU 0	ascii	Upper " * "
1	01	GRTMSU 1	ascii	Upper " * "
2	02	GRTMSU 2	ascii	Upper " * "
3	03	GRTMSU 3	ascii	Upper " * "
4	04	GRTMSU 4	ascii	Upper " * "
5	05	GRTMSU 5	ascii	Upper " * "
6	06	GRTMSU 6	ascii	Upper " * "
7	07	GRTMSU 7	ascii	Upper " * "
8	08	GRTMSU 8	ascii	Upper " * "
9	09	GRTMSU 9	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	GRTMSL 0	ascii	Lower " * "
21	15	GRTMSL 1	ascii	Lower " * "
22	16	GRTMSL 2	ascii	Lower " * "
23	17	GRTMSL 3	ascii	Lower " * "
24	18	GRTMSL 4	ascii	Lower " * "
25	19	GRTMSL 5	ascii	Lower " * "
26	1A	GRTMSL 6	ascii	Lower " * "
27	1B	GRTMSL 7	ascii	Lower " * "
28	1C	GRTMSL 8	ascii	Lower " * "
29	1B	GRTMSL 9	ascii	Lower " * "
30	1E	GRTMSL10	ascii	Lower " * "
31	1F	GRTMSL11	ascii	Lower " * "
32	20	GRTMSL12	ascii	Lower " * "

	N2	data name	data range	note
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	MTUNE	−64~63 (o/b)	Master Fine Tuning (receive only)
42	2A	FIXVEL	off, 1~127	—Velocity— Fixed Velocity
43	2B	VELCRV	0~7	Velocity Curve select
44	2C	MW2MCN	0~120	—MIDI Control Number Assign— Modulation Wheel 2
45	2D	FSASN	0~120	Foot Switch assign
46	2E	EDCONFSW	off/on	Edit Confirm switch
47	2F	TXCH	0~15	—MIDI— keyboard transmit channel
48	30	VRCH	0~15, omni	Voice Receive channel
49	31	LOCAL	off/on	Local switch
50	32	DVCNUM	off, 0~15, all	Device number
51	33	NTSW	all/odd/even	Note_Even_Odd switch
52	34	BLKMPRT	off/on	Bulk data Memory protect switch
53	35	PGCMOD	0~5	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 Switch

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

< Table 2 >

Voice Bulk Dump

Note) Memory__type   internal   ; $00
                  preset 1   ; $02
                  preset 2   ; $03
                  Edit Buffer ; $7F (Used only when transmitting from SY77. 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	OP6_R1	377	ALGNUM
1	$43	↓	↓	403	FFTYPE1
2	$0N	125	reserve	↓	↓
3	$7A	126	OP6_ALGSRC (MSB)	423	FFBP14
4	⌐byte count	127	OP6_ALGSRC (low 7bits)	424	FFOS11 (MSB)
5		128	OP6_ALGDST	425	FFOS11 (low 7bits)
6	L	↓	↓	426	FFOS12 (MSB)
7	M	132	OP6_FMPMS	427	FFOS12 (low 7bits)
8		133	OP6_KOE	428	FFOS13 (MSB)
9		134	OP6_PHASE	429	FFOS13 (low 7bits)
10	8	135	OP6_FPD	430	FFOS14 (MSB)
11	1	↓	↓	431	FFOS14 (low 7bits)
12	0	140	OP6_BP4	432	FFTYPE2
13	1	141	OP6_EGOS1 (MSB)	↓	↓
14	V	142	OP6_EGOS1 (low 7bits)	452	FFBP24
15	C	143	OP6_EGOS2 (MSB)	453	FFOS21(MSB)
16		144	OP6_EGOS2 (low 7bits)	454	FFOS21 (low 7bits)
.	⌐$00	145	OP6_EGOS3 (MSB)	455	FFOS22 (MSB)
29		146	OP6_EGOS3 (low 7bits)	456	FFOS22 (low 7bits)
30	Memory__type	147	OP6_EGOS4 (MSB)	457	FFOS23 (MSB)
31	Memory#	148	OP6_EGOS4 (low 7bits)	458	FFOS23 (low 7bits)
32	$00 or $03 (ELMODE)	149	OP6_RVSW	459	FFOS24 (MSB)
33	VNAMO	150	OP6_FPC	460	FFOS24 (low 7bits)
.		151	OP6_FPF	461	FFRES
95	VVOL	152	OP5_R1	462	FFVSON
96	AWMID high 7bit	↓	↓	463	FFCMS
97	AWMID low 7bit	197	OP4_R1	464	check__sum
98	ELVLO	↓	↓	465	$F7
.		242	OP3_R1		
106	ELSWO MCTENO	↓	↓		
		287	OP2_R1		
		↓	↓		
		332	OP1_R1		
		↓	↓		

(2) 2AFM

	data		Element1 data		Element1 data
0	$F0	116	OP6_R1	386	ALGNUM
1	$43	↓	↓	432	FFBP14
2	$0N	134	reserve	433	FFOS11 (MSB)
3	$7A	135	OP6_ALGSRC (MSB)	434	FFOS11 (low 7bits)
4	⌐byte count	136	OP6_ALGSRC (low 7bits)	435	FFOS12 (MSB)
5		137	OP6_ALGDST	436	FFOS12 (low 7bits)
6	L	↓	↓	437	FFOS13 (MSB)
7	M	141	OP6_FMPMS	438	FFOS13 (low 7bits)
8		142	OP6_KOE	439	FFOS14 (MSB)
9		143	OP6_PHASE	440	FFOS14 (low 7bits)
10	8	144	OP6_FPD	441	FFTYPE2
11	1	↓	↓	↓	↓
12	0	149	OP6_BP4	461	FFBP24
13	1	150	OP6_EGOS1 (MSB)	462	FFOS21(MSB)
14	V	151	OP6_EGOS1 (low 7bits)	463	FFOS21 (low 7bits)
15	C	152	OP6_EGOS2 (MSB)	464	FFOS22 (MSB)
16		153	OP6_EGOS2 (low 7bits)	465	FFOS22 (low 7bits)
.	⌐$00	154	OP6_EGOS3 (MSB)	466	FFOS23 (MSB)
29		155	OP6_EGOS3 (low 7bits)	467	FFOS23 (low 7bits)
30	Memory_type	156	OP6_EGOS4 (MSB)	468	FFOS24 (MSB)
31	Memory#	157	OP6_EGOS4 (low 7bits)	469	FFOS24 (low 7bits)
32	$01 or $04 (ELMODE)	158	OP6_RVSW	470	FFRES
33	VNAMO	159	OP6_FPC	471	FFVSON
.		160	OP6_FPF	472	FFCMS
95	VVOL	161	OP5_R1		
96	AWMID high 7bit	↓	↓		Element1 data
97	AWMID low 7bit	206	OP4_R1	473	OP6_R1
98	ELVLO	↓	↓	↓	↓
.		251	OP3_R1	829	FFCMS
106	ELSWO MCTENO	↓	↓		
107	ELVL1	296	OP2_R1	830	check__sum
.		↓	↓	831	$F7
115	ELSW1 MCTEN1	341	OP1_R1		
		↓	↓		

(3) 4AFM

Note) Memory# ; $30 ~ $3F

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

	data		Element1 data		Element1 data
0	$F0	134	OP6_R1	404	ALGNUM
1	$43	↓	↓	450	FFBP14
2	$0N	152	reserve	451	FFOS11 (MSB)
3	$7A	153	OP6_ALGSRC (MSB)	452	FFOS11 (low 7bits)
4	⌐byte count	154	OP6_ALGSRC (low 7bits)	453	FFOS12 (MSB)
5		155	OP6_ALGDST	454	FFOS12 (low 7bits)
6	L	↓	↓	455	FFOS13 (MSB)
7	M	159	OP6_FMPMS	456	FFOS13 (low 7bits)
8	−	160	OP6_KOE	457	FFOS14 (MSB)
9		161	OP6_PHASE	458	FFOS14 (low 7bits)
10	8	162	OP6_FPD	459	FFTYPE2
11	1	↓	↓	↓	↓
12	0	167	OP6_BP4	479	FFBP24
13	1	168	OP6_EGOS1 (MSB)	480	FFOS21(MSB)
14	V	169	OP6_EGOS1 (low 7bits)	481	FFOS21 (low 7bits)
15	C	170	OP6_EGOS2 (MSB)	482	FFOS22 (MSB)
16		171	OP6_EGOS2 (low 7bits)	483	FFOS22 (low 7bits)
.	⌐$00	172	OP6_EGOS3 (MSB)	484	FFOS23 (MSB)
29		173	OP6_EGOS3 (low 7bits)	485	FFOS23 (low 7bits)
30	Memory_type	174	OP6_EGOS4 (MSB)	486	FFOS24 (MSB)
31	Memory#	175	OP6_EGOS4 (low 7bits)	487	FFOS24 (low 7bits)
32	$02 (ELMODE)	176	OP6_RVSW	488	FFRES
33	VNAMO	177	OP6_FPC	489	FFVSON
↓	↓	178	OP6_FPF	490	FFCMS
95	VVOL	179	OP5_R1		
96	AWMID high 7bit	↓	↓		Element2 data
97	AWMID low 7bit	224	OP4_R1	491	OP6_R1
98	ELVLO	↓	↓	↓	↓
↓	↓	269	OP3_R1	847	FFCMS
106	ELSWO MCTENO	↓	↓		
107	ELVLO	314	OP2_R1		Element3 data
↓	↓	↓	↓	848	OP6_R1
115	ELSW1 MCTEN1	359	OP1_R1	↓	↓
116	ELSW2	↓	↓	1204	FFCMS
↓	↓	↓	↓		
124	ELSW2 MCTEN2				Element4 data
125	ELSW3			1205	OP6_R1
↓	↓			↓	↓
133	ELSW3 MCTEN3			1561	FFCMS
				1562	check__sum
				1563	$F7

13

(4) 1AWM

#	data		#	Element1 data
0	$F0		107	WSOURCE
1	$43		108	PCMWAVE (MSB)
2	$0N		109	PCMWAVE (low 7bits)
3	$7A		110	PPM
4	⌐ byte count		↓	↓
5	⌐		132	PINITP
6	L		133	reserve
7	M		134	PFTYPE1
8	–		↓	↓
9	–		154	PFBP14
10	8		155	PFOS11 (MSB)
11	1		156	PFOS11 (low 7bits)
12	0		157	PFOS12 (MSB)
13	1		158	PFOS12 (low 7bits)
14	V		159	PFOS13 (MSB)
15	C		160	PFOS13 (low 7bits)
16			161	PFOS14 (MSB)
·	⌐ $00		162	PFOS14 (low 7bits)
29			163	PFTYPE2
30	Memory_type		↓	↓
31	Memory ≠		183	PFBP24
32	$05 (ELMODE)		184	PFOS21 (MSB)
33	VNAM0		185	PFOS21 (low 7bits)
·	·		186	PFOS22 (MSB)
95	VVOL		187	PFOS22 (low 7bits)
96	AWMID (high 7bits)		188	PFOS23 (MSB)
97	AWMID (low 7bits)		189	PFOS23 (low 7bits)
98	ELVL0		190	PFOS24 (MSB)
·			191	PFOS24 (low 7bits)
106	ELSW0 MCTEN0		192	PFRES
			207	PABP4
			208	PAOS21 (MSB)
			209	PAOS21 (low 7bits)
			210	PAOS22 (MSB)
			211	PAOS22 (low 7bits)
			212	PAOS23 (MSB)
			213	PAOS23 (low 7bits)
			214	PAOS24 (MSB)
			215	PAOS24 (low 7bits)
			216	PAVSON
			217	PARVSW
			218	PAMS
			219	check_sum
			220	$F7

(5) 2AWM

#	data		#	Element1 data
0	$F0		116	WSOURCE
1	$43		117	PCMWAVE (MSB)
2	$0N		118	PCMWAVE (low 7bits)
3	$7A		119	PPM
4	⌐ byte count		↓	↓
5	⌐		163	PFBP14
6	L		164	PFOS11 (MSB)
7	M		165	PFOS11 (low 7bits)
8	–		166	PFOS12 (MSB)
9	–		167	PFOS12 (low 7bits)
10	8		168	PFOS13 (MSB)
11	1		169	PFOS13 (low 7bits)
12	0		170	PFOS14 (MSB)
13	1		171	PFOS14 (low 7bits)
14	V		172	PFTYPE2
15	C		↓	↓
16			192	PFBP24
·	⌐ $00		193	PFOS21 (MSB)
29			194	PFOS21 (low 7bits)
30	Memory_type		195	PFOS22 (MSB)
31	Memory ≠		196	PFOS22 (low 7bits)
32	$06 (ELMODE)		197	PFOS23 (MSB)
33	VNAM0		198	PFOS23 (low 7bits)
·	·		199	PFOS24 (MSB)
95	VVOL		200	PFOS24 (low 7bits)
96	AWMID (high 7bits)		201	PFRES
97	AWMID (low 7bits)		↓	↓
98	ELVL0		216	PFBP4
·			217	PAOS21 (MSB)
106	ELSW0 MCTEN0		218	PAOS21 (low 7bits)
107	ELVL1		219	PAOS22 (MSB)
·			220	PAOS22 (low 7bits)
115	ELSW1 MCTEN1		221	PAOS23 (MSB)
			222	PAOS23 (low 7bits)
			223	PAOS24 (MSB)
			224	PAOS24 (low 7bits)
			225	PAVSON
			226	PARVSW
			227	PAMS

#	Element2 data
228	WSOURCE
↓	↓
339	PAMS
340	check_sum
341	$F7

(6) 4AWM

#	data		#	Element1 data		#	Element1 data
0	$F0		134	WSOURCE		246	WSOURCE
1	$43		135	PCMWAVE (MSB)		↓	↓
2	$0N		136	PCMWAVE (low 7bits)		357	PAMS
3	$7A		137	PPM			
4	⌐ byte count		↓	↓			Element3 data
5	⌐		181	PFBP14		358	WSOURCE
6	L		182	PFOS11 (MSB)		↓	↓
7	M		183	PFOS11 (low 7bits)		469	PAMS
8	–		184	PFOS12 (MSB)			
9	–		185	PFOS12 (low 7bits)			Element4 data
10	8		186	PFOS13 (MSB)		470	WSOURCE
11	1		187	PFOS13 (low 7bits)		↓	↓
12	0		188	PFOS14 (MSB)		581	PAMS
13	1		189	PFOS14 (low 7bits)		582	check_sum
14	V		190	PFTYPE2		583	$F7
15	C		↓	↓			
16			210	PFBP24			
↓	⌐ $00		211	PFOS21 (MSB)			
29			212	PFOS21 (low 7bits)			
30	Memory_type		213	PFOS22 (MSB)			
31	Memory#		214	PFOS22 (low 7bits)			
32	$07 (ELMODE)		215	PFOS23 (MSB)			
33	VNAM0		216	PFOS23 (low 7bits)			
↓	↓		217	PFOS24 (MSB)			
95	VVOL		218	PFOS24 (low 7bits)			
96	AWMID high 7bit		219	PFRES			
97	AWMID low 7bit		↓	↓			
98	ELVL0		234	PFBP4			
↓	↓		235	PAOS21 (MSB)			
106	ELSW0 MCTEN0		236	PAOS21 (MSB)			
107	ELVL1		237	PAOS22 (MSB)			
↓	↓		238	PAOS23 (MSB)			
115	ELSW2 MCTEN2		239	PAOS23 (MSB)			
116	ELVL2		240	PAOS23 (low 7bits)			
↓	↓		241	PAOS24 (MSB)			
124	ELSW2 MCTEN2		242	PAOS24 (low 7bits)			
125	ELVL3		243	PAVSON			
↓	↓		244	PARVSW			
133	ELSW3 MCTEN3		245	PAMS			

(7) 1AFM_1AWM

#	data		#	Element1 data		#	Element1 data
0	$F0		116	OP6_R1		386	ALGNUM
1	$43		↓	↓		↓	↓
2	$0N		134	reserve		432	FFBP14
3	$7A		135	OP6_ALGSRC (MSB)		433	FFOS11 (MSB)
4	⌐ byte count		136	OP6_ALGSRC (low 7bits)		434	FFOS11 (low 7bits)
5	⌐		137	OP6_ALGDST		435	FFOS12 (MSB)
6	L		↓	↓		436	FFOS12 (low 7bits)
7	M		141	OP6_FMPMS		437	FFOS13 (MSB)
8	–		142	OP6_K0E		438	FFOS13 (low 7bits)
9	–		143	OP6_PHASE		439	FFOS14 (MSB)
10	8		144	OP6_FPD		440	FFOS14 (low 7bits)
11	1		↓	↓		441	FFTYPE2
12	0		149	OP6_BP4		↓	↓
13	1		150	OP6_EGOS1 (MSB)		461	FFBP24
14	V		151	OP6_EGOS1 (low 7bits)		462	FFOS21(MSB)
15	C		152	OP6_EGOS2 (MSB)		463	FFOS21 (low 7bits)
16			153	OP6_EGOS2 (low 7bits)		464	FFOS22 (MSB)
↓	⌐ $00		154	OP6_EGOS3 (MSB)		465	FFOS22 (low 7bits)
29			155	OP6_EGOS3 (low 7bits)		466	FFOS23 (MSB)
30	Memory_type		156	OP6_EGOS4 (MSB)		467	FFOS23 (low 7bits)
31	Memory#		157	OP6_EGOS4 (low 7bits)		468	FFOS24 (MSB)
32	$08 (ELMODE)		158	OP6_RVSW		469	FFOS24 (low 7bits)
33	VNAM0		159	OP6_FPC		470	FFRES
↓	↓		160	OP6_FPF		471	FFVSON
95	VVOL		161	OP5_R1		472	FFCMS
96	AWMID high 7bit		↓	↓			
97	AWMID low 7bit		206	OP4_R1			
98	ELVL0		↓	↓			
↓	↓		251	OP3_R1			
106	ELSW0 MCTEN0		↓	↓			
107	ELVL1		296	OP2_R1			
↓	↓		↓	↓			
115	ELSW1 MCTEN1		341	OP1_R1			
			↓	↓			
			↓	↓			

14

	Element2 data
473	WSOURCE
474	PCMWAVE (MSB)
475	PCMWAVE (low 7bits)
476	PPM
↓	↓
521	PFBP14
522	PFOS11 (MSB)
523	PFOS11 (low 7bits)
524	PFOS12 (MSB)
525	PFOS12 (low 7bits)
526	PFOS13 (MSB)
527	PFOS13 (low 7bits)
528	PFOS14 (MSB)
529	PFOS14 (low 7bits)
530	PFTYPE2
↓	↓
549	PFBP24
550	PFOS21 (MSB)
551	PFOS21 (low 7bits)
552	PFOS22 (MSB)
553	PFOS22 (low 7bits)
554	PFOS23 (MSB)
555	PFOS23 (low 7bits)
556	PFOS24 (MSB)
557	PFOS24 (low 7bits)
558	PFRES
↓	↓
573	PABP4
574	PAOS21 (MSB)
575	PAOS21 (low 7bits)
576	PAOS22 (MSB)
577	PAOS22 (low 7bits)
578	PAOS23 (MSB)
579	PAOS23 (low 7bits)
580	PAOS24 (MSB)
581	PAOS24 (low 7bits)
582	PAVSON
583	PARVSW
584	PAMS
585	check_sum
586	$F7

(8) 2AFM__2AWM

Note) Memory# ; $30 ~ $3F

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

	data
0	$F0
1	$43
2	$0N
3	$7A
4	⌐byte count
5	⌐
6	L
7	M
8	—
9	...
10	8
11	1
12	0
13	1
14	V
15	C
16	⌐
.	⌐$00
29	⌐
30	Memory_type
31	Memory #
32	$09 (ELMODE)
33	VNAM0
.	.
95	VVOL
96	AWMID high 7bit
97	AWMID low 7bit
98	ELVL0
.	.
106	ELSW0 MCTEN0
107	ELVL1
.	.
115	ELSW1 MCTEN1
116	ELVL2
.	.
124	ELSW2 MCTEN2
125	ELVL3
.	.
133	ELSW3 MCTEN3

	Element1 data
134	OP6_R1
↓	↓
152	OP6_VSOF
153	OP6_ALGSRC (MSB)
154	OP6_ALGSRC (low 7bits)
155	OP6_ALGDST
↓	↓
159	OP6_FMPMS
160	OP6_KOE
161	OP6_PHASE
162	OP6_FPD
↓	↓
167	OP6_BP4
168	OP6_EGOS1 (MSB)
169	OP6_EGOS1 (low 7bits)
170	OP6_EGOS2 (MSB)
171	OP6_EGOS2 (low 7bits)
172	OP6_EGOS3 (MSB)
173	OP6_EGOS3 (low 7bits)
174	OP6_EGOS4 (MSB)
175	OP6_EGOS4 (low 7bits)
176	OP6_RVSW
177	OP6_FPC
178	OP6_FPF
179	OP5_R1
↓	↓
224	OP4_R1
.	.
269	OP3_R1
↓	↓
314	OP2_R1
.	.
359	OP1_R1
↓	↓

	Element1 data
404	ALGNUM
↓	↓
450	FFBP14
451	FFOS11 (MSB)
452	FFOS11 (low 7bits)
453	FFOS12 (MSB)
454	FFOS12 (low 7bits)
455	FFOS13 (MSB)
456	FFOS13 (low 7bits)
457	FFOS14 (MSB)
458	FFOS14 (low 7bits)
459	FFTYPE2
↓	↓
479	FFBP24
480	FFOS21 (MSB)
481	FFOS21 (low 7bits)
482	FFOS22 (MSB)
483	FFOS22 (low 7bits)
484	FFOS23 (MSB)
485	FFOS23 (low 7bits)
486	FFOS24 (MSB)
487	FFOS24 (low 7bits)
488	FFRES
489	FFVSON
490	FFCMS

	Element2 data
491	OP6_R1
.	.
847	FFCMS

	Element3 data
848	WSOURCE
849	PCMWAVE (MSB)
850	PCMWAVE (low 7bits)
851	PPM
↓	↓
897	PFBP14
898	PFOS11 (MSB)
899	PFOS11 (low 7bits)
900	PFOS12 (MSB)
901	PFOS12 (low 7bits)
902	PFOS13 (MSB)
903	PFOS13 (low 7bits)
904	PFOS14 (MSB)
905	PFOS14 (low 7bits)
906	PFTYPE2
↓	↓
924	PFBP24
925	PFOS21 (MSB)
926	PFOS21 (low 7bits)
927	PFOS22 (MSB)
928	PFOS22 (low 7bits)
929	PFOS23 (MSB)
930	PFOS23 (low 7bits)
931	PFOS24 (MSB)
932	PFOS24 (low 7bits)
933	PFRES
↓	↓
948	PABP4
949	PAOS21 (MSB)
950	PAOS21 (low 7bits)
951	PAOS22 (MSB)
952	PAOS22 (low 7bits)
953	PAOS23 (MSB)
954	PAOS23 (low 7bits)
955	PAOS24 (MSB)
956	PAOS24 (low 7bits)
957	PAVSON
958	PARVSW
959	PAMS

	Element4 data
960	WSOURCE
↓	↓
↓	↓
1071	PAMS
1072	check_sum
1073	$F7

(9) Drum__set

	data
0	$F0
1	$43
2	$0N
3	$7A
4	⌐byte count
5	⌐
6	L
7	M
8	...
9	
10	8
11	1
12	0
13	1
14	V
15	C
16	⌐
.	⌐$00
29	⌐
30	Memory_type
31	Memory #
32	$0A (ELMODE)
33	VNAM0
.	.
71	ST_MIX2
72	⌐
.	⌐$00
87	⌐
88	VVLASN
89	VVLLML
90	⌐
.	⌐$00
95	⌐
96	AWMID high 7
97	AWMID low 7

	Drum_set data
98	ALTC_1, OUT*C_1
99	WSRCC_1
100	WAVC_1 (MSB)
101	WAVC_1 (low 7bits)
102	WVLC_1
103	WTNC_1
104	WNSC_1
105	WPNC_1
106	ALTC#1, OUT*C#1
↓	↓
114	ALTD_1, OUT*D_1
↓	↓
122	ALTD#1, OUT*D#1
↓	↓
130	ALTE_1, OUT*E_1
↓	↓
138	ALTF_1, OUT*F_1
↓	↓
146	ALTF#1, OUT*F#1
↓	↓
154	ALTG_1, OUT*G_1
↓	↓
162	ALTG#1, OUT*G#1
↓	↓
170	ALTA_1, OUT*A_1
↓	↓
178	ALTA#1, OUT*A#1
↓	↓
186	ALTB_1, OUT*B_1
↓	↓

	Drum_set data
194	ALTC_2, OUT*C_2
↓	↓
290	ALTC_3, OUT*C_3
↓	↓
386	ALTC_4, OUT*C_4
↓	↓
482	ALTC_5, OUT*C_5
↓	↓
578	ALTC_6, OUT*C_6
↓	↓
585	WPNC_6
586	check_sum
587	$F7

15

(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 ↓ 27	$00
28	Memory type
29	Memory #
30	$F7

except $7F (Edit Buf)

< Table 3 >

Multi Bulk Dump

Note) Memory__type Internal ; $00
preset ; $02
Edit Buffer ; $7F (Used only when transmitting from the SY77. 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
0	$F0
1	$43
2	$0N
3	$7A
4 ↓ 5	byte count
6	L
7	M
8	..
9	
10	8
11	1
12	0
13	1
14	M
15	U
16 ↓ 29	$00
30	Memory__type
31	Memory #
32 ↓ 52 ↓ 80	MNAM 0 ... EFMODE ... ST__MIX2

	data
90	OFVCSW__0, OUT * CH__0
97	OFVCSW__1, OUT * CH__1
104	OFVCSW__2, OUT * CH__2
111	OFVCSW__3, OUT * CH__3
118	OFVCSW__4, OUT * CH__4
125	OFVCSW__5, OUT * CH__5
132	OFVCSW__6, OUT * CH__6
139	OFVCSW__7, OUT * CH__7
146	OFVCSW__8, OUT * CH__8
153	OFVCSW__9, OUT * CH__9
160	OFVCSW10, OUT * CH10
167	OFVCSW11, OUT * CH11
174	OFVCSW12, OUT * CH12
181	OFVCSW13, OUT * CH13
188	OFVCSW14, OUT * CH14
195	OFVCSW15, OUT * CH15
201	STPAN15
202	check__sum
203	$F7

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

memory type is not $7F (Edit Buf)

< Table 4 >

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
0	$F0
1	$43
2	$0N
3	$7A
4 ↓ 5	byte count
6	L
7	M
8	
9	
10	8
11	1
12	0
13	1
14	P
15	N
16 ↓ 29	$00
30	Memory__type
31	Memory #
32 ↓ 48	PNSCSEL ... FPNSLP
49 ↓ 58	PNNAM__1 ... PNNAM10
59	check__sum
60	$F7

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

< Table 5 >

Micro Tuning Bulk Dump

Note) Memory$ $00 — $01 : INT 1—2
Note) When receiving Bulk dump, bits 6—1 of Memory# are ignored.

dump request

	data
0	$F0
1	$43
2	$0N
3	$7A
4 ↓ 5	byte count
6	L
7	M
8	..
9	
10	8
11	1
12	0
13	1
14	M
15	T
16 ↓ 29 ↓ 30	$00
31	Memory #
32	MCTC__-2 (high 7bits)
33	MCTC__-2 (low 7bits)
286	MCTG__8 (high 7bits)
287	MCTG__8 (low 7bits)
288 ↓ 297	MTNAM__1 ... MTNAM10
298	check__sum
299	$F7

	data
0	$F0
1	$43
2	$2N
3	$7A
4	L
5	M
6	—
7	—
8	8
9	1
10	0
11	1
12	M
13	T
14 ↓ 27	$00
28	$00
29	Memory #
30	$F7

<Table 6>

System Setup Bulk Dump

dump request

	data			data
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 ↓ 29	⎤ $00
15	Y		30	$F7
16 ↓ 31	⎤ $00			
32 ↓ 85	GRTMSU_0 ↓ PGCMOD			
86 ↓ 95	reserve ↓ reserve			
96	check_sum			
97	$F7			

<Table 7-1>

Squencer Setup Bulk Dump

dump request

	data			data
0	$F0		0	$F0
1	$43		1	$43
2	$0N		2	$2N
3	$7E		3	$7E
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	S
14	S		14	$F7
15	S			
16	QUANTIZE			
17	CLICK SWITCH			
18	CLICK BEAT			
19	reserve			
20	SYNC MODE			
21	REC MIDI CHANNEL			
22	VELOCITY SW.			
23	CONTROL CHANGE SW.			
24	PITCH BEND SW.			
25	PROGRAM CHANGE SW.			
26	AFTER TOUCH SW.			
27	SY.EXCLUSIVE SW.			
28	MIDI CONTROL SW.			
29	EDIT BEAT/CLOCK			
30	ACCENT1			
31	ACCENT2			
32	ACCENT3			
33	ACCENT4			
34	GATE TYPE			
35	check_sum			
36	$F7			

<Table 7-2>

Squencer Song & Pattern (KSEQ, NSEQ) Bulk Dump

KSEQ and NSEQ data is converted from 1 byte into 2 byte ascii data and transmitted. The data for one song consists of one or more tracks of data, where each track begins with F0 0n (n = track number) and ends with F2. Empty tracks will not be included.

hex	description
F0 00	top of record track #1
…	time event control data
F2	end of record track #1
…	track #2 ~ #15 data
F0 0F	top of record track #16
…	time event control data
F2	end of record track #16

YAMAHA [Music Synthesizer---synthesizer part] Date :25-NOV-1989
        Model SY77   MIDI Implementation Chart   Version : 1.0

Function ...	Transmitted	Recognized	Remarks
Basic Default	1 - 16	1 - 16	memorized
Channel Changed	1 - 16	1 - 16	
Mode Default	3	1,2,3,4	memorized
Messages	x	x	
Altered	**************	x	
Note	36 - 96	0 - 127	
Number : True voice	**************	1 - 127	
Velocity Note ON	o 9nH,v=1-127	o v=1-127	
Note OFF	x 9nH,v=0	x	
After Key's	x	x	
Touch Ch's	o	o	
Pitch Bender	o	o 0-12 semi	7 bit resolution
Control 1	o M.Wheel	o	
2	o Breath cont.	o	
4	o Foot cont.	o	
Control 6	o Data entry	o	
7	o Foot volume	o	Volume
Change 64	o Sustain sw.	o	Sustain
65	o Portamento sw	o	Portamento
96	o inc.	o	
97	o dec.	o	
0 - 6	o Assignable	o	
8 - 120	o Assignable	o	
Prog	o 0-79,117-127	o 0-79,117-127	
Change : True #	*********** *2	*1	
System Exclusive	o	o	voice etc.
System : Song Pos			
: Song Sel	See the sequencer part.		
Common : Tune			
System :Clock			
Real Time :Commands			
Aux :Local ON/OFF	x	x	
:All Notes OFF	x	x	
Mes- :Active Sense	o	o	
sages :Reset	x	x	

Note *1 ; voice : 0 - 63 ,   multi : 0 - 15
     *2 ; Send PC : 0 - 127

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

YAMAHA [Music synthesizer---sequencer part]   Date :25-NOV-1989
          Model   SY77   MIDI Implementation Chart Version : 1.0

Function ...	Transmitted	Recognized	Remarks
Basic Default	1 - 16	1 - 16	memorized
Channel Changed	1 - 16	1 - 16	
Mode Default	×	×	
Messages	×	×	
Altered	**************	×	
Note	0 - 127	0 - 127	
Number : True voice	**************		
Velocity Note ON	o 9nH,v=1-127	o v=1-127	
Note OFF	× 9nH,v=0	×	
After Key's	×	×	
Touch Ch's	o	o	
Pitch Bender	o	o	
0 - 120 Control Change	o	o	
Prog	o 0 - 127	o 0 - 127	
Change : True #	**************		
System Exclusive	o	o	Song data etc.
System : Song Pos	o	o	
: Song Sel	×	×	
Common : Tune	×	×	
System :Clock	o	o	
Real Time :Commands	o	o	
Aux :Local ON/OFF	×	×	
:All Notes OFF	×	×	
Mes- :Active Sense	o	×	
sages:Reset	×	×	

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