YAMAHA

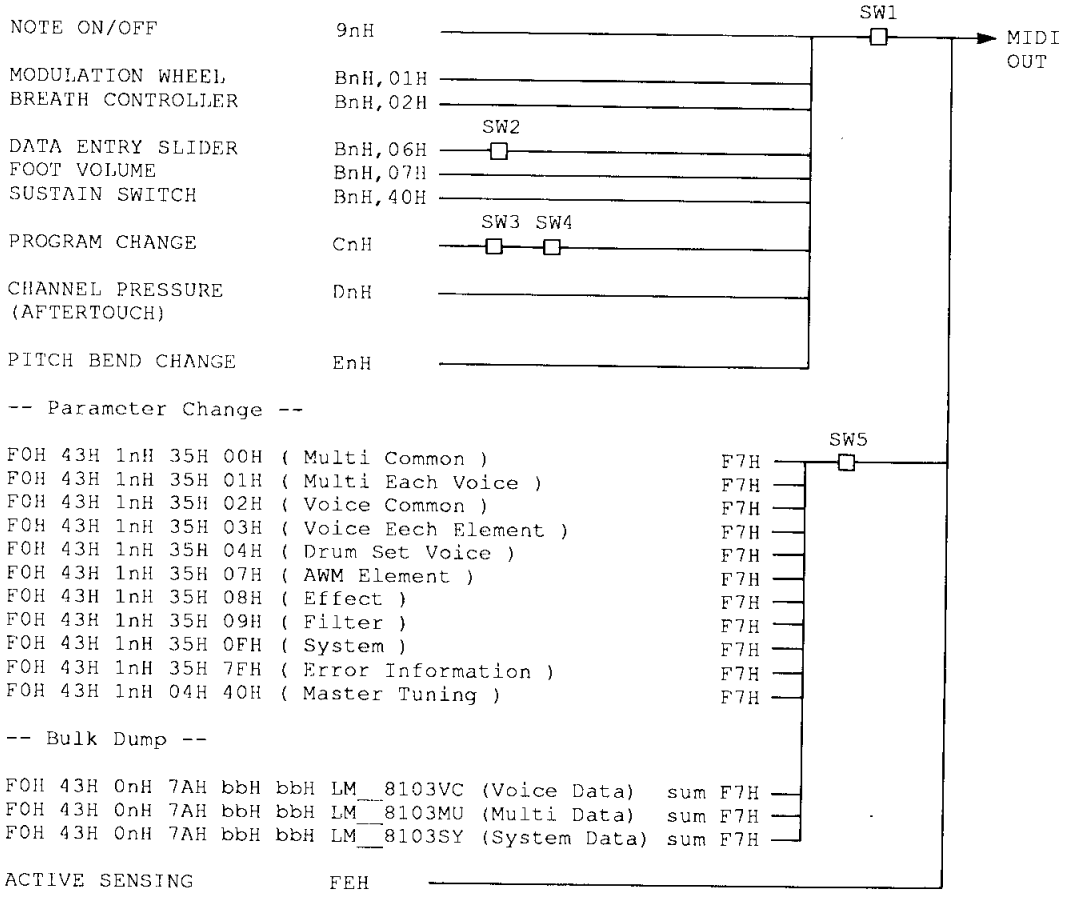
MUSIC SYNTHESIZER

SY55

MIDI DATA FORMAT

SYNTHESIZER PART

(1) TRANSMIT FLOW



SW1 ☐ MIDI Transmit Channel
MIDI transmit channel 1 ~ 16 or OMNI ON selection.

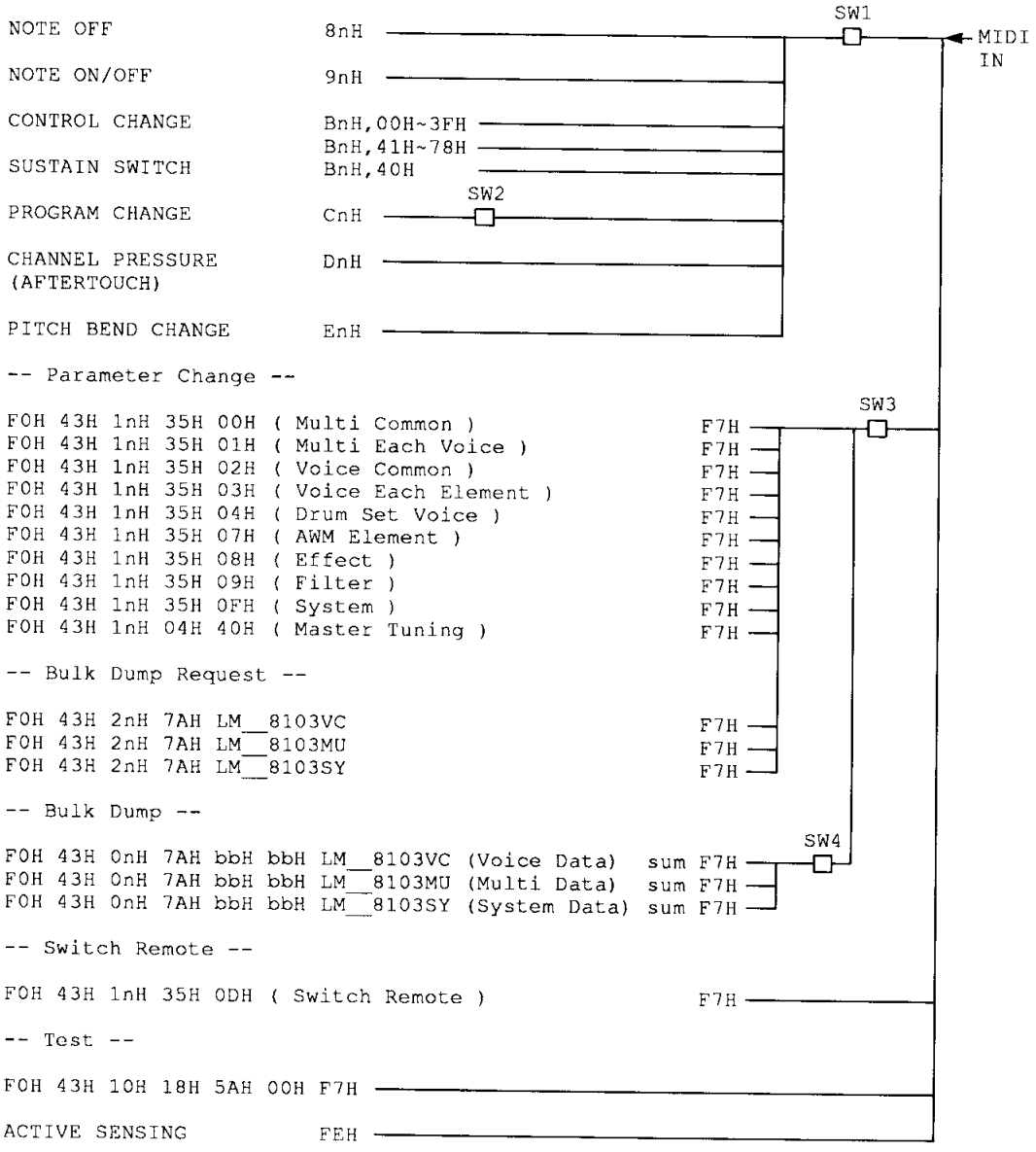
SW2 ☐ Transmitted in the play mode only.

SW3 ☐ Transmitted in the play mode only.

SW4 ☐ Program Change Mode Select
Program change transmit on/off, normal mode or direct mode selection.

SW5 ☐ System Exclusive Message Transmit Channel
System exclusive message on/off, and device number selection.

(2) RECEIVE FLOW



SW1 ☐ MIDI Receive Channel
MIDI receive channel 1 ~ 16 or OMNI ON selection.

SW2 ☐ Program Change Mode Select
Program change receive on/off, normal mode or direct mode selection.

SW3 ☐ System Exclusive Message Receive Channel
System exclusive message on/off, and device number selection.

SW4 ☐ Bulk Protect
Bulk data on/off, and switching (data received by edit buffer regardless of this setting).

(3) TRANSMIT/RECEIVE DATA

(3-1) CHANNEL VOICE MESSAGES

(3-1-1) NOTE OFF

STATUS	1000nnnnB	(8nH)	n = VOICE CHANNEL NUMBER
NOTE NUMBER	0kkkkkkkB		k = 0 (C-2) ~ 127 (G8)
VELOCITY	0vvvvvvvB		Ignored

Receive only.

(3-1-2) NOTE ON/OFF

STATUS	1001nnnnB	(9nH)	n = VOICE CHANNEL NUMBER
NOTE NUMBER	0kkkkkkkB		k = 36 (C1) ~ 96 (C6) (transmit)
			k = 0 (C-2) ~ 127 (G8) (receive)
VELOCITY	0vvvvvvvB	(v0)	NOTE ON
	00000000B	(v0)	NOTE OFF

* The following system data options are available for NOTE OFF and/or NOTE ON/OFF reception:
  all = all note numbers received.
  odd = only odd note numbers received.
  even = only even note numbers received.

(3-1-3) CONTROL CHANGE

STATUS	1011nnnnB	(BnH)	n = VOICE CHANNEL NUMBER
CONTROL NUMBER	0ccccccB		
CONTROL VALUE	0vvvvvvvB		

* The transmitted control number.

c = 1	MODULATION WHEEL	v = 0 ~ 127
c = 2	BREATH CONTROLLER	v = 0 ~ 127
c = 6	DATA ENTRY SLIDER (AT PLAY MODE)	v = 0 ~ 127
c = 7	FOOT VOLUME	v = 0 ~ 127
c = 64	SUSTAIN SWITCH	v = 0 : OFF, 127 : ON

* The received control number.

c = 0 ~ 120 These control numbers can be assigned to the following.
  Pitch Modulation
  Amplitude Modulation
  Filter Modulation
  Filter Cutoff
  EG Bias
  Voice Volume
  v = 0 ~ 127

c = 64 SUSTAIN SWITCH
  v = 0 ~ 63 : OFF , 64 ~ 127:ON

(3-1-4) PROGRAM CHANGE

[NORMAL MODE]

STATUS	1100nnnnB	(CnH)	n = VOICE CHANNEL NUMBER
PROGRAM NUMBER	0ppppppB		p = 0 ~ 63 (VOICE)
			64 ~ 79 (MULTI)

[DIRECT MODE]

* Voice or multi number select.
* Select multi-play setup voices.

```
STATUS          1100nnnnB       (CnH)   n = VOICE CHANNEL NUMBER
PROGRAM NUMBER  0ppppppB                p =  0 ~ 63 ( VOICE )
                                            64 ~ 79 ( MULTI )
```

* Select multi-play setup voices.
* Mode or memory select.

```
STATUS          1100nnnnB       (CnH)   n = VOICE CHANNEL NUMBER
MODE/MEMORY     0ddddddd                d = 119 ~ 127
 NUMBER
PROGRAM NUMBER  0ppppppB                p =   0 ~ 63 ( VOICE )
                                            64 ~ 79 ( MULTI )
```

* MODE/MEMORY NUMBER

```
d = 119         INDIVIDUAL      INTERNAL
d = 120         INDIVIDUAL      CARD
                ( INTERNAL and CARD cannot be combined in one MULTI. )
d = 121         INDIVIDUAL      PRESET
d = 122         COMMON          VOICE PLAY MODE   INTERNAL
d = 123         COMMON          VOICE PLAY MODE   CARD
d = 124         COMMON          VOICE PLAY MODE   PRESET
d = 125         COMMON          MULTI PLAY MODE   INTERNAL
d = 126         COMMON          MULTI PLAY MODE   CARD
d = 127         COMMON          MULTI PLAY MODE   PRESET
```

Transmitted in the play mode only.
Reception/transmission ON/OFF, normal mode or direct mode can be selected.

Sequencer receives and transmits in direct mode at all times.

NORMAL MODE

Select voice or multi number only.
Mode or memory cannot be selected.

[Transmit]

VOICE PLAY MODE :

Voice number transmitted if voice number changed.
p = 0 ~ 63

MULTI PLAY MODE :

Multi number + 64 transmitted if multi number changed.
p = 64 ~ 79
Voice number transmitted if voice number in multi-play setup changed.
p = 0 ~ 63

[Receive]

VOICE PLAY MODE :

p = 0 ~ 63 Voice select.
p = 64 ~ 127 Ignored

MULTI PLAY MODE :

p = 0 ~ 63 Change multi-play setup voice.
p = 64 ~ 79 Select multi-play setup.
p = 80 ~ 127 Ignored

DIRECT MODE

Mode and memory number select in addition to voice and multi number select.

[Transmit]

d = 119 ~ 127
Changes transmitted as:
p = 0 ~ 63 (VOICE)
64 ~ 79 (MULTI)

[Receive]

Voice or multi number select.
Change multi-play setup voice.

VOICE PLAY MODE

p = 0 ~ 63 Voice select.
p = 64 ~ 118 Ignored

MULTI PLAY MODE

p = 0 ~ 63 Change multi-play setup voice.
p = 64 ~ 79 Select multi-play setup.
p = 80 ~ 118 Ignored

Change multi-play setup.
Select mode or memory.

d = 119 ~ 127 Program change occurs when next program change message received.

d = 119 ~ 121
p = 0 ~ 63 Change multi-play setup.
d = 119, 120
Internal voice selected if preset multi currently active.
Voice with same memory number as multi selected if internal or card multi currently active.

d = 122 ~ 124
p = 0 ~ 63 (VOICE)
or
d = 125 ~ 127
p = 64 ~ 79 (MULIT)
changes mode, memory, voice or multi number.

(3-1-5) CHANNEL PRESSURE / AFTERTOUCH

STATUS	1101nnnnB	(DnH)	n = VOICE CHANNEL NUMBER
PRESSURE VALUE	0vvvvvvvB		v = 0 ~ 127

Aftertouch can be assigned to the following functions:
Pitch Modulation
Amplitude Modulation
Filter Modulation
Filter Cutoff
EG Bias
Voice Volume

(3-1-6) PITCH BEND CHANGE

STATUS	1110nnnnB	(EnH)	n = VOICE CHANNEL NUMBER
LSB	0vvvvvvvB		PITCH BEND CHANGE LSB
MSB	0vvvvvvvB		PITCH BEND CHANGE MSB

7-bit resolution.

The data transmitted is as shown below.

MSB	LSB	
00000000B (00H)	00000000B (00H)	Min.
01000000B (40H)	00000000B (00H)	Center
01111111B (7FH)	01111110B (7EH)	Max.

For reception, only the MSB data is operational.

MSB	
00000000B (00H)	Min.
01000000B (40H)	Center
01111111B (7FH)	Max.

(3-2) SYSTEM REAL TIME MESSAGES

(3-2-1) ACTIVE SENSING

STATUS 11111110B (FEH)

Transmitted approximately every 270 milliseconds.

Sensing begins when this code is received. If no status or data received for more than approximately 330 milliseconds, the MIDI received buffer is cleared and all notes/sustain switch are forced off. All control values are initialized.

(3-3) SYSTEM EXCLUSIVE MESSAGES

No exclusive messages received in demo mode - except remote switch.

(3-3-1) PARAMETER CHANGE

STATUS	11110000B	(F0H)	
IDENTIFICATION	01000011B	(43H)	
SUB STATUS	0001nnnnB	(1nH)	n = DEVICE NUMBER
GROUP NUMBER	00110101B	(35H)	
STRUCTURE NUMBER MSB	0000ttttB		
STRUCTURE NUMBER LSB	0feennnnB		
PARAMETER NUMBER MSB	0ppppppppB		
PARAMETER NUMBER LSB	0ppppppppB		
PARAMETER VALUE MSB	0vvvvvvvB		
PARAMETER VALUE LSB	0vvvvvvvB		
EOX	11110111B	(F7H)	

The 10 parameter change messages from MULTI COMMON to SYSTEM shown in the chart below are received; ERROR INFORMATION is transmitted.
Device number and receive/transmit on/off can be set in the utility mode.

Switch remote reception occurs regardless of reception on/off or device number settings.
These parameter change messages allow remote control of all panel switches, producing the same effect as if the corresponding panel switch was actually pressed.

Of all the system parameters, only the format of MASTER TUNING is different. Refer to chart 8.

Type	t	f	e	n	Refer to
MULTI COMMON	00H	-	-	-	chart 1
MULTI EACH VOICE	01H	-	-	channel#	chart 1
VOICE COMMON	02H	-	-	-	chart 2
VOICE EACH ELEMENT	03H	-	element#	-	chart 2
DRUM SET VOICE	04H	key note number			chart 3
AWM ELEMENT	07H	-	element#	-	chart 4
EFFECT	08H	-	-	-	chart 5
FILTER	09H	filter#	element#	-	chart 6
SWITCH REMOTE	0DH	-	-	-	chart 7
SYSTEM	0FH	-	-	-	chart 8
ERROR INFORMATION	7FH	-	-	-	chart 9

note) * element number 0 (EL1) ~ 3 (EL4)
* channel number 0 (CH1) ~ 15 (CH16)
* filter number 0 : filter #1
1 : filter #2
don't care : filter common
* key note number 36 (C1) ~ 96 (C6)

* Unused bits of the structure number LSB are transmitted as 0's and ignored when received.

* The unused bit of the parameter number MSB are transmitted as 0's and ignored when received.

* Error information is transmitted when an error occurs.

(3-3-2) BULK DUMP

STATUS	11110000B	(F0H)		
IDENTIFICATION	01000011B	(43H)		
SUB STATUS	0000nnnnB	(0nH)	n = DEVICE NUMBER	
FORMAT NUMBER	01111010B	(7AH)		
BYTE COUNT(MSB)	0bbbbbbbB			
BYTE COUNT(LSB)	0bbbbbbbB			
CLASSIFICATION	01001100B	(4CH)	ASCII'L	┐
NAME	01001101B	(4DH)	ASCII'M	│
	00100000B	(20H)	ASCII'_	│
	00100000B	(20H)	ASCII'_	│
DATA FORMAT	00111000B	(38H)	ASCII'8	│
NAME	00110001B	(31H)	ASCII'1	│
	00110000B	(30H)	ASCII'0	│ data bytes
	00110011B	(33H)	ASCII'3	│
	0mmmmmmmB		ASCII	│
	0mmmmmmmB		ASCII	│
ADDITIONAL	00000000B	(00H)		│
HEADER	00000000B	(00H)		│
	00000000B	(00H)		│
	00000000B	(00H)		│
	00000000B	(00H)		│
	00000000B	(00H)		│
	00000000B	(00H)		│
	00000000B	(00H)		│
	00000000B	(00H)		│
	00000000B	(00H)		│
	00000000B	(00H)		│
	00000000B	(00H)		│
	00000000B	(00H)		│
	00000000B	(00H)		│
	00000000B	(00H)		│
MEMORY TYPE	0xxxxxxxB			│
MEMORY NUMBER	0yyyyyyyB			│
DATA	0ddddddd B			│
	⋮			│
	0ddddddd B			┘
CHECK SUM	0eeeeeeeB	2's complement of 7 bits sum of all data bytes		
EOX	11110111B	(F7H)		

The 3 types of bulk data shown in the chart below are transmitted and received.
Device number, receive/transmit on/off and receive protect can be set in the utility mode.
Received to edit buffer regardless of protect setting.

Type	b	m	x	y	Refer to
VOICE	1AWM 01H 38H 2AWM 02H 31H 4AWM 04H 23H DRUM SET 04H 64H	VC	INTERNAL 00H PRESET 02H EDIT BUFFER 7FH	00H~3FH	chart 10
MULTI	01H 3AH	MU		00H~0FH	chart 11
SYSTEM	00H 2AH	SY	00H	00H	chart 12

NOTE)

For 1 voice or 1 multi bulk dump transmission, memory type = edit buffer, and memory number = ooH.
When a memory type = edit buffer bulk dump is received, the memory number is ignored.
Received to voice edit buffer only in voice mode.
Received to multi edit buffer only in multi mode.
All voice or all multi bulk dump transmission are carried out with the selected memory type and the appropriate voice multi memory number.

When a bulk dump other than a memory type = edit buffer type is received, memory type is processed as internal. Unused memory number bits are ignored.

If a system bulk dump is received, the memory type and memory number are ignored.

Unused bytes in the additional header (00H) are ignored when received.

When successive bulk dumps are transmitted, an interval of greater than approximately 100 milliseconds is inserted between each. This interval is also necessary between bulk dumps received.

(3-3-3) BULK DUMP REQUEST

STATUS	11110000B	(F0H)	
IDENTIFICATION	01000011B	(43H)	
SUB STATUS	0010nnnnB	(2nH)	n = DEVICE NUMBER
FORMAT NUMBER	01111010B	(7AH)	
CLASSIFICATION	01001100B	(4CH)	ASCII'L
NAME	01001101B	(4DH)	ASCII'M
	00100000B	(20H)	ASCII'_
	00100000B	(20H)	ASCII'_
DATA FORMAT	00111000B	(38H)	ASCII'8
NAME	00110001B	(31H)	ASCII'1
	00110000B	(30H)	ASCII'0
	00110011B	(33H)	ASCII'3
	0mmmmmmmB		ASCII
	0mmmmmmmB		ASCII
ADDITIONAL	00000000B	(00H)	
HEADER	00000000B	(00H)	
	00000000B	(00H)	
	00000000B	(00H)	
	00000000B	(00H)	
	00000000B	(00H)	
	00000000B	(00H)	
	00000000B	(00H)	
	00000000B	(00H)	
	00000000B	(00H)	
	00000000B	(00H)	
	00000000B	(00H)	
	00000000B	(00H)	
	00000000B	(00H)	
	00000000B	(00H)	
MEMORY TYPE	0xxxxxxxB		
MEMORY NUMBER	0yyyyyyyB		
EOX	11110111B	(F7H)	

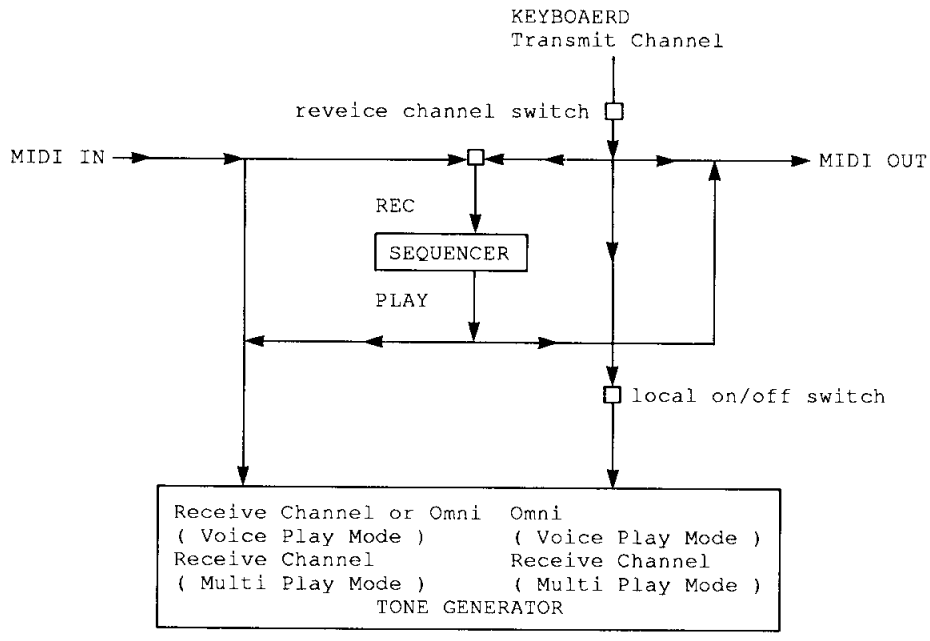
The 3 types of bulk dump request shown in the chart below are received.
Device nember and receive on/off can be set in the utility mode.

Type	m	x		y
VOICE	VC	INTERNAL	00H	00H~3FH
		PRESET	02H	
MULTI	MU	EDIT BUFFER	7FH	00H~0FH
SYSTEM	SY		00H	00H

NOTE)

Unused bytes in the additional header (00H) are ignored.
When memory type = edit buffer, the memory number is ignored.
When memory type ≠ edit buffer, the unused memory number bits are ignored.
For the system bulk dump request, the memory type and memory number are ignored.

(4) Keyboard, sequencer and tone generator section.



note) * Note on messages from the keyboard are transmitted in the voice play mode whether the receive and transmit channel are matched or not.

* Keyboard, sequencer and MIDI note on messages are separated. Keyboard, sequencer, and MIDI control data, with the exception of sustain, are not separated. Sustain is separated.

[CHART 1] Parameter Table (MULTI)

(1) Multi Header

MIDI Parameter Change Format

F0H 43H 1nH 35H 00H 00H 00H n2H 00H v2H F7H

note) n ; device number
n2 ; parameter number
v2 ; parameter value

No.	n2	function	value	note
		--- Multi Voice Set Name ---		
0	00	"* "	v2 : 20-127	
1	01	" * "	v2 : 20-127	
2	02	" * "	v2 : 20-127	
3	03	" * "	v2 : 20-127	
4	04	" * "	v2 : 20-127	
5	05	" * "	v2 : 20-127	
6	06	" * "	v2 : 20-127	
7	07	" * "	v2 : 20-127	
8	08	" * "	v2 : 20-127	
9	09	" *"	v2 : 20-127	
10	0A	Effect Source Select	v2 : 0-16	0:multi, 1-16:1-16ch

(2) Multi Each Voice

MIDI Parameter Change Format

F0H 43H 1nH 35H 01H t2H n1H n2H 00H v2H F7H

note) n ; device number
t2 ; voice channel number
n1 ; parameter number MSB
n2 ; parameter number LSB
v2 ; parameter value

No.	n2	function	value	note
0	00	Voice on/off Output Select (only TG55)	v2: b6 0-1 b0,1,2 0-5	0:off, 1:on 0:STR, 1:OFF, 2:1, 3:2, 4:12 5:VCE
1	01	Voice Memory Select	v2 : 0-1	0:int/crd, 1:pre
2	02	Voice Number	v2 : 0-63	
3	03	Volume	v2 : 0-127	
4	04	Tuning	v2 : 0-127	0-127:-64~+63
5	05	Note Shift	v2 : 0-127	0-127:-64~+63
6	06	Multi Static PAN	v2 : 0-63	0:voice, 1-63:-31~+31 If a mode other than VOICE is selected, voice pan will not operate.
7	07	Effect Level	v2 : 0-100	
8	08	Reserve Note	v2 : 0-16	

note) * The SY55 transmits parameter change when output select b0,1,2 = 7.
Whenthe TG55 receives this value, the current output select value does not change.

* The SY55 transmits bulk dump when output select b0,1,2 = 0.
Thus, when the TG55 receives a bulk dump from the SY55, output select becomes stereo L,R.

* When n2 = 00, n1 is used to display the edit screen shown during reception.
  n1=1 Output select
  n1=2 Voice on/off
  When n1 is a value other than 1, the voice on/off edit screen is displayed.
  The value changes with output select and voice on/off regardless of n1.
* When voice on/off is set to "off", the LCD changes to the edit screen when a volume - reserve note parameter change is received, but the value does not change.
  Voice on/off is forced on when a voice number is received.

[CHART 2] Parameter Table (VOICE)

(1) Voice Header

MIDI Parameter Change Format

F0H 43H 1nH 35H 02H 00H 00H n2H 00H v2H F7H

note) n ; device number
n2 ; parameter number
v2 ; parameter value

No.	n2	function	value	note
0	00	--- Element Select Mode --- Mode	v2 : 5-7,10	5:1AWM_poly 6:2AWM_poly 7:4AWM_poly 10:DRUM_SET
		--- Voice Name ---		
1	01	"* "	v2 : 20-127	
2	02	" * "	v2 : 20-127	
3	03	" * "	v2 : 20-127	
4	04	" * "	v2 : 20-127	
5	05	" * "	v2 : 20-127	
6	06	" * "	v2 : 20-127	
7	07	" * "	v2 : 20-127	
8	08	" * "	v2 : 20-127	
9	09	" * "	v2 : 20-127	
10	0A	" *"	v2 : 20-127	

note) * Element select mode 5 - 7 can be selected for voice number 1 - 62.
The element select mode is fixed at 10 for voice number 63 and 64.

(2) Voice Common

MIDI Parameter Change Format

F0H 43H 1nH 35H 02H 00H 00H n2H 00H v2H F7H

note) n ; device number
n2 ; parameter number
v2 ; parameter value

No.	n2	function	value	note
0	10	--- Pitch Bend Wheel --- Range	v2 : 0-12	
1	11	--- After Touch Pitch Bend --- Pitch Bend Range	v2 : 0-12,16-28	0-12:0~+12 16-28:0~-12A (bit4 = sign bit)

No.	n2	function	value	note
		--- Pitch Modulation ---		
2	12	Device Assign (MIDI Control#)	v2 : 0-121	0-120:0-120, 121:AT
3	13	Modulation Range	v2 : 0-127	
		--- Amplitude Modulation ---		
4	14	Device Assign (MIDI Control#)	v2 : 0-121	0-120:0-120, 121:AT
5	15	Modulation Range	v2 : 0-127	
		--- Filter Modulation ---		
6	16	Device Assign (MIDI Control#)	v2 : 0-121	0-120:0-120, 121:AT
7	17	Modulation Range	v2 : 0-127	
		--- Filter Cut_off ---		
8	18	Device Assign (MIDI control#)	v2 : 0-121	0-120:0-120, 121:AT
9	19	Cut_off Range	v2 : 0-127	
10		Reserve	0	
11		Reserve	0	
		--- EG Bias ---		
12	1C	Device assign (MIDI control#)	v2 : 0-121	0-120:0-120, 121:AT
13	1D	Bias Range	v2 : 0-127	
		--- Voice Volume ---		
14*	1E	Device assign (MIDI control#)	v2 : 0-121	0-120:0-120, 121:AT
15*	1F	Volume Limit Low	v2 : 0-127	
16	20	Random Pitch Fluctuation	v2 : 0-7	
17	21	Output Select (only TG55)	v2 : 0-4	0:str, 1:off, 2:1, 3:2, 4:12
18*	22	Voice Volume	v2 : 0-127	
19*	23	AWM_card ID (MSB)	v2 : 0-127	(If 0:AWM_card not used,
20*	24	AWM_card ID (LSB)	v2 : 0-127	1 ~ max. 16383)

note) * Only numbers with an asterisk (*) apply to drum set voices.
* The SY55 transmits bulk dump when output select = 0.
Thus, when the TG55 receives a bulk dump from the SY55, output select becomes stereo L,R.

(3) Element Enable

MIDI Parameter Change Format

F0H 43H 1nH 35H 02H 00H 00H 7FH 00H v2H F7H

v2 ; 0,0,0,0,e3,e2,e1,e0 on:1 off:0

(4) Voice Each Element

MIDI Parameter Change Format

F0H 43H 1nH 35H 03H t2H 00H n2H 00H v2H F7H

note) n ; device number
t2 ; 00ee0000B
ee 00 - element 0
01 - element 1
10 - element 2
11 - element 3
n2 ; parameter number
v2 ; parameter value

No.	n2	function	value	note
0	00	Element Volume	v2 : 0-127	
1	01	Element Detune	v2 : 0-15	0-7:0~+7, 8-15:0~-7 (bit3 = sign bit)
2	02	Element Note Shift	v2 : 0-127	0-127:-64~+63
		--- Element Limit ---		
3	03	Note Limit Low	v2 : 0-127	(note #)
4	04	Note Limit High	v2 : 0-127	(note #)
5	05	Velocity Limit Low	v2 : 1-127	(velocity #)
6	06	Velocity Limit High	v2 : 1-127	(velocity #)
7	07	Static Pan	v2 : 1-63	1-63:-31~+31 No effect when Multi Static PAN selected.
8	08	Effect Balance	v2 : 0-100	

[CHART 3] PARAMTER TABLE (DRUM SET VOICE)

MIDI Parameter Change Format

F0H 43H 1nH 35H 04H t2H n1H n2H v1H v2H F7H

note) n ; device number
t2 ; MIDI note number
n1 ; parameter number MSB
n2 ; parameter number LSB
v1 ; MSB of parameter value
v2 ; LSB of parameter value

No.	n2	function	value	note
0	00	Alternate Group Wave on/off Output Select (only TG55)	v2 : b6 0-1 b5 0-1 b0,1,2 0-4	0:off, 1:on 0:off, 1:on 0:str, 1:off, 2:1, 3:2, 4:12
1	01	Wave Source	v2 : 0-1	0:pre, 1:card
2 3	02	Wave Number	v1 : 0-1 v2 : 0-127	(0~max.255)
4	03	Wave Volume	v2 : 0-127	
5	04	Wave Tuning	v2 : 0-127	0-127:-64~+63
6	05	Wave Note Shift	v2 : 16-100	16-100:-48~+36
7	06	Static Pan	v2 : 1-63	1-63:-31~+31 No effect when Multi Static PAN selected.
8	07	Effect Balance	v2 : 0~100	

note) * The SY55 transmits parameter change when output select b0,1,2 = 7.
Whenthe TG55 receives this value, the current output select value does not change.

* The SY55 transmits bulk dump when output select b0,1,2 = 0.
Thus, when the TG55 receives a bulk dump from the SY55, output select becomes stereo L,R.

* When n2 = 00, n1 is used to display the edit screen shown during reception.
n1=1 Output Select
n1=2 Wave on/off
n1=3 Alternate group

When n1 is a value other than 1 or 3, the wave on/off edit screen is displayed. The value changes with output select, wave on/off and alternate regardless of n1.

* When wave on/off is set to "off", the LCD changes to the edit screen when a volue does not change.
  Wave on/off is forced on when a wave number is received.

[CHART 4] PARAMETER TABLE (AWM ELEMENT)

MIDI Patameter Change Format

F0H 43H 1nH 35H 07H t2H 00H n2H v1H v2H F7H

note) n ; device number
t2 ; 00ee0000B
ee 00 - element 0
01 - element 1
10 - element 2
11 - element 3
n2 ; parameter number
v1 ; MSB of parameter value
v2 ; LSB of parameter value

(1) AWM Element Data 1

No.	n2	function	value	note
0	00	Wave Source	v2 : 0-1	0:pre, 1:card
1	01	Wave Number	v1 : 0-1	(0~255)
2			v2 : 0-127	
3	02	Frequency Mode	v2 : 0-1	0:normal, 1:fixed
4	03	Fixed Mode Note#	v2 : 0-127	
5	04	Frequency Fine	v2 : 0-127	0-127:-64~+63
6	05	Pitch Modulation Sensitivity	v2 : 0-7	
		--- Pitch EG ---		
7	06	Key_on Rate 1	v2 : 0-63	
8	07	Key_on Rate 2	v2 : 0-63	
9	08	Key_on Rate 3	v2 : 0-63	
10	09	Key_off Rate 1	v2 : 0-63	
11	0A	Key_on Level 0	v2 : 0-127	0-127:-64~+63
12	0B	Key_on Level 1	v2 : 0-127	0-127:-64~+63
13	0C	Key_on Level 2	v2 : 0-127	0-127:-64~+63
14	0D	Key_on Level 3	v2 : 0-127	0-127:-64~+63
15	0E	Key_off Level 1	v2 : 0-127	0-127:-64~+63
16	0F	Range	v2 : 1-3	1:2, 2:1, 3:1/2 oct
17	10	Rate Scaling	v2 : 0-15	0-7:0~+7, 8-15:0~-7 (bit3 = sign bit)
18	11	Velocity Switch	v2 : 0-1	0:off, 1:on
		--- Multi LFO ---		
19	12	Speed	v2 : 0-99	
20	13	Delay Time	v2 : 0-99	
21	14	Pitch Modulation Depth	v2 : 0-127	
22	15	Amplitude Modulation Depth	v2 : 0-127	
23	16	Filter Modulation Depth	v2 : 0-127	
24	17	Wave	v2 : 0-5	0:Tri, 1:Dwn, 2:Up, 3:Squ, 4:Sine, 5:S/H
25	18	Initial Phase	v2 : 0-99	
26		Reserve	0	

(2) AWM Element Data 2

No.	n2	function	value	note
		--- Amplitude EG ---		
0	4F	EG Mode	v2 : 0-1	0:normal, 1:hold
1	50	Key_on Rate 1 (attack/hold)	v2 : 0-63	
2	51	Key_on Rate 2 (decay)	v2 : 0-63	
3	52	Key_on Rate 3	v2 : 0-63	
4	53	Key_on Rate 4 (decay)	v2 : 0-63	
5	54	Key_off Rate 1 (release)	v2 : 0-63	
6	55	Key_on Level 2 (decay)	v2 : 0-63	
7	56	Key_on Level 3 (decay)	v2 : 0-63	
8	57	Rate Scaling	v2 : 0-15	0-7:0~+7, 8-15:0~-7 (bit3 = sign bit)
9	58	Out_level Scaling Break Point 1	v2 : 0-127	(note #)
10	59	Out_level Scaling Break Point 2	v2 : 0-127	(note #)
11	5A	Out_level Scaling Break Point 3	v2 : 0-127	(note #)
12	5B	Out_level Scaling Break Point 4	v2 : 0-127	(note #)
13 14	5C	Out_level Scaling Offset 1	v1 : 0-1 v2 : 0-127	(1-255:-127~+127)
15 16	5D	Out_level Scaling Offset 2	v1 : 0-1 v2 : 0-127	(1-255:-127~+127)
17 18	5E	Out_level Scaling Offset 3	v1 : 0-1 v2 : 0-127	(1-255:-127~+127)
19 20	5F	Out_level Scaling Offset 4	v1 : 0-1 v2 : 0-127	(1-255:-127~+127)
21	60	Velocity Sensitivity Key_on	v2 : 0-15	0-7:0~+7, 8-15:0~-7 (bit3 = sign bit)
22	61	Rate Velocity Switch Key_on	v2 : 0-1	0:off, 1:on
23	62	Amplitude Modulation Sens.	v2 : 0-15	0-7:0~+7, 8-15:0~-7 (bit3 = sign bit)

[CHART 5] PARAMETER TABLE (EFFECT)

MIDI Parameter Change Format

F0H 43H 1nH 35H 08H 00H 00H n2H 00H v2H F7H

note) n ; device number
n2 ; parameter number
v2 ; parameter value

No.	n2	function	value	note
0	00	Reverb Effect Type	v2 : 1-34	
1	01	Reverb Effect Output Level	v2 : 0-100	
2	02	Reverb Effect Parameter 1	v2 :	
3	03	Reverb Effect Parameter 2	v2 :	
4	04	Reverb Effect Parameter 3	v2 :	

[CHART 6] PARAMETER TABLE (FILTER)

MIDI Parameter Change Format

F0H 43H 1nH 35H 09H t2H 00H n2H 00H v2H F7H

note) n ; device number
t2 ; 0fee0000B

```
                    f   0 - filter 1
                        1 - filter 2
                        don't care - filter common
                   ee   00 - element 0
                        01 - element 1
                        10 - element 2
                        11 - element 3
          n2 ; parameter number
          v2 ; parameter value
```

(1) Filter 1 & 2

No.	n2	function	value	note
0	00	Filter Type	v2 : 0-2	0:THR, 1:LPF, 2:HPF (2:HPF in Filter 1 only)
1	01	Cut_off Frequency	v2 : 0-127	
2	02	Filter Mode	v2 : 0-2	0:EG, 1:LFO, 2:EGVA
3	03	Key_on Rate 1	v2 : 0-63	
4	04	Key_on Rate 2	v2 : 0-63	
5	05	Key_on Rate 3	v2 : 0-63	
6	06	Key_on Rate 4	v2 : 0-63	
7	07	Key_off Rate 1	v2 : 0-63	
8	08	Key_off Rate 2	v2 : 0-63	
9	09	Key_on Cut_off Level 0	v2 : 0-127	0-127:-64~+63
10	0A	Key_on Cut_off Level 1	v2 : 0-127	0-127:-64~+63
11	0B	Key_on Cut_off Level 2	v2 : 0-127	0-127:-64~+63
12	0C	Key_on Cut_off Level 3	v2 : 0-127	0-127:-64~+63
13	0D	Key_on Cut_off Level 4	v2 : 0-127	0-127:-64~+63
14	0E	Key_off Cut_off Level 1	v2 : 0-127	0-127:-64~+63
15	0F	Key_off Cut_off Level 2	v2 : 0-127	0-127:-64~+63
16	10	Rate Scaling	v2 : 0-15	0-7:0~+7, 8-15:0~-7 (bit3 = sign bit)
17	11	C_off_lvl Scaling Break Point 1	v2 : 0-127	(note #)
18	12	C_off_lvl Scaling Break Point 2	v2 : 0-127	(note #)
19	13	C_off_lvl Scaling Break Point 3	v2 : 0-127	(note #)
20	14	C_off_lvl Scaling Break Point 4	v2 : 0-127	(note #)
21 22	15	C_off_lvl Scaling Offset 1	v1 : 0-1 v2 : 0-127	(1-255:-127~+127)
23 24	16	C_off_lvl Scaling Offset 2	v1 : 0-1 v2 : 0-127	(1-255:-127~+127)
25 26	17	C_off_lvl Scaling Offset 3	v1 : 0-1 v2 : 0-127	(1-255:-127~+127)
27 28	18	C_off_lvl Scaling Offset 4	v1 : 0-1 v2 : 0-127	(1-255:-127~+127)

(2) Filter Common

No.	n2	function	value	note
0	32	Resonance	v2 : 0-99	
1	33	Velocity Sensitivity Key_on	v2 : 0-15	0-7:0~+7, 8-15:0~-7 (bit3 = sign bit)
2	34	Cut_off Modulation sensitivity	v2 : 0-15	0-7:0~+7, 8-15:0~-7 (bit3 = sign bit)

[CHART 7] PARAMTER CHANGE TABLE (SWITCH REMOTE)

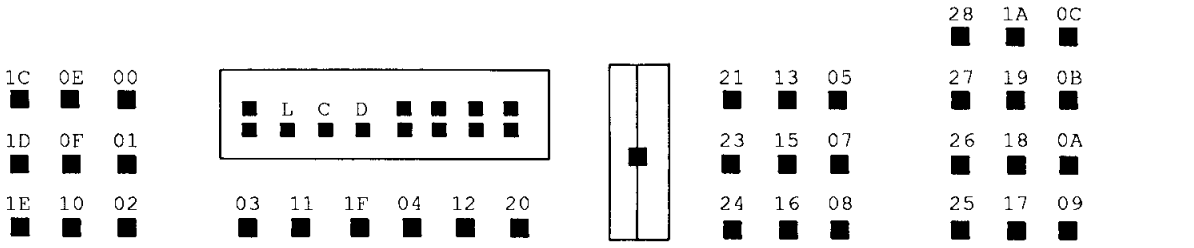
F0H 43H 1nH 35H 0DH 00H 00H n2H 00H v2H F7H

note) n ; device number
n2 ; parameter number
v2 ; parameter value
data range : off(00H~3FH),on(40H~7FH)

n2	switch	SY55
00	PRESET	o
01	>>	o
02	RUN	o
03	VOICE	o
04	EDIT/COMPARE	o
05	JOB	o
07	SELECT	o
08	EXIT	o
09	ENTER	o
0A	3	o
0B	6	o
0C	9	o
0E	CARD	o
0F	<<	o
10	STOP	o
11	MULTI	o
12	UTILITY	o
13	PAGE+	o
15	->	o
16	+1/YES	o
17	-	o
18	2	o
19	5	o
1A	8	o
1C	INTERNAL	o
1D	TOP	o
1E	REC	o
1F	SEQ	o
20	STORE/COPY	o
21	PAGE-	o
23	<-	o
24	-1/NO	o
25	0	o
26	1	o
27	4	o
28	7	o
7F	Initial Set	o

Switch numbers correspond to the following layout.

SY55



[CHART 8] PARAMETER TABLE (SYSTEM)

MIDI Parameter Change Format (Except Master Fine Tuning)

F0H 43H 1nH 35H 0FH 00H 00H n2H 00H v2H F7H

note) n ; device number
n2 ; parameter number
v2 ; parameter value

MIDI Parameter Change Format (Master Fine Tuning)

F0H 43H 1nH 04H 40H DTH F7H

note) n ; device number
DT ; paramter value

Same as DX1 Master Tuning

No.	n2	name	value	note
		--- Master Tuning ---		
0	00	Master Note Shift	v2 : 0-127	0-127:-64~+63
1		Master Fine Tuning	DT : 0-127	0-127:-64~+63
		--- Velocity ---		
2	02	Velocity Curve Select	v2 : 0-7	0-4:1~8
		--- MIDI ---		
3	03	Keyboard Transmit Channel	v2 : 0-15	0-15:1~16ch
4	04	Receive Channel	v2 : 0-16	0-15:1~16ch, 16:omni
5	05	Local Switch	v2 : 0-1	0:off, 1:on
6	06	Device Number	v2 : 0-17	0:off, 1-16:1~16, 17:all
7	07	Bulk Data Memory Protect Switch	v2 : 0-1	0:off, 1:on
8	08	Program Change Mode	v2 : 0-2	0:off, 1:normal, 2:direct
9	09	Effect on/off	v2 : 0-1	0:off, 1:on
10	0A	Card Bank Select 1 or 2	v2 : 0-1	syn 0:bank1, 1:bank2
11	0B	Note on/off	v2 : 0-2	0:all, 1:odd, 2:even
12		Reserve	0	
13		Reserve	0	
14		Reserve	0	
15		Reserve	0	

note) * When "Device # = all" is selected, transmission occurs on device number 1.

[CHART 9] PARAMETER TABLE (ERROR INFORMATION)

MIDI Parameter Change Format

F0H 43H 1nH 35H 7FH 00H 00H 00H 00H v2H F7H

note) v2 ; error number

number	name
01	MIDI Buffer Full
02	SEQ Buffer Full
03	MIDI Data
04	MIDI Check Sum
05	MIDI Device# off
06	MIDI Bulk Prot.
07	No Data Card
08	Data Card Prot.
09	Data Card Format
0A	Illegal Data
0B	Verify Failed
0C	Internal Bat.Lo
0D	Data Card Bat.Lo
0E	SEQ Memory Full
0F	SEQ Data Empty
10	Now SEQ Running
11	Song Data Exist
12	Internal Bat.NG
13	Data Card Bat.NG
14	ID Mismatch
15	No Wave Card
16	Wrong Wave Card
17	Now SEQ Running
18	(not defined)
19	Voice Type
1A	Song Cleared
----- not error -----	
1E	Bulk Received
1F	Bulk Receiving
20	Bulk Canceled

[CHART 10] BULK DUMP FORMAT (VOICE)

(1) 1AWM

STATUS	11110000B	(F0H)	
IDENTIFICATION	01000011B	(43H)	
SUB STATUS	0000nnnnB	(0nH)	n = DEVICE NUMBER
FORMAT NUMBER	01111010B	(7AH)	
BYTE COUNT(MSB)	00000001B	(01H)	
BYTE COUNT(LSB)	00111000B	(38H)	(Byte Count = 184)

HEADER	26 byte	see (3-3-2) BULK DUMP
VOICE HEADER	11 byte	see chart 2
EFFECT	5 byte	see chart 5
VOICE COMMON	21 byte	see chart 2
ELEMENT 0 DATA	9 byte	see chart 2
ELEMENT 0		
AWM ELEMENT DATA 1	27 byte	see chart 4
FILTER 1	29 byte	see chart 6
FILTER 2	29 byte	see chart 6
FILTER COMMON	3 byte	see chart 6
AWM ELEMENT DATA 2	24 byte	see chart 4

CHECK SUM	0eeeeeeeB	2's complement of 7 bits sum of all data bytes	
EOX	11110111B	(F7H)	

(2) 2AWM

STATUS	11110000B	(F0H)	
IDENTIFICATION	01000011B	(43H)	
SUB STATUS	0000nnnnB	(0nH)	n = DEVICE NUMBER
FORMAT NUMBER	01111010B	(7AH)	
BYTE COUNT(MSB)	00000010B	(02H)	
BYTE COUNT(LSB)	00110001B	(31H)	(Byte Count = 305)

HEADER	26 byte	see (3-3-2) BULK DUMP
VOICE HEADER	11 byte	see chart 2
EFFECT	5 byte	see chart 5
VOICE COMMON	21 byte	see chart 2
ELEMENT 0 DATA	9 byte	see chart 2
ELEMENT 1 DATA	9 byte	see chart 2
ELEMENT 0		
AWM ELEMENT DATA 1	27 byte	see chart 4
FILTER 1	29 byte	see chart 6
FILTER 2	29 byte	see chart 6
FILTER COMMON	3 byte	see chart 6
AWM ELEMENT DATA 2	24 byte	see chart 4
ELEMENT 1		
AWM ELEMENT DATA 1	27 byte	see chart 4
FILTER 1	29 byte	see chart 6
FILTER 2	29 byte	see chart 6
FILTER COMMON	3 byte	see chart 6
AWM ELEMENT DATA 2	24 byte	see chart 4

CHECK SUM	0eeeeeeeB	2's complement of 7 bits sum of all data bytes	
EOX	11110111B	(F7H)	

(3) **4AWM**

STATUS	11110000B	(F0H)	
IDENTIFICATION	01000011B	(43H)	
SUB STATUS	0000nnnnB	(0nH)	n = DEVICE NUMBER
FORMAT NUMBER	01111010B	(7AH)	
BYTE COUNT(MSB)	00000100B	(04H)	
BYTE COUNT(LSB)	00100011B	(23H)	(Byte Count = 547)

HEADER	26 byte	see (3-3-2) BULK DUMP
VOICE HEADER	11 byte	see chart 2
EFFECT	5 byte	see chart 5
VOICE COMMON	21 byte	see chart 2
ELEMENT 0 DATA	9 byte	see chart 2
ELEMENT 1 DATA	9 byte	see chart 2
ELEMENT 2 DATA	9 byte	see chart 2
ELEMENT 3 DATA	9 byte	see chart 2
ELEMENT 0		
AWM ELEMENT DATA 1	27 byte	see chart 4
FILTER 1	29 byte	see chart 6
FILTER 2	29 byte	see chart 6
FILTER COMMON	3 byte	see chart 6
AWM ELEMENT DATA 2	24 byte	see chart 4
ELEMENT 1		
AWM ELEMENT DATA 1	27 byte	see chart 4
FILTER 1	29 byte	see chart 6
FILTER 2	29 byte	see chart 6
FILTER COMMON	3 byte	see chart 6
AWM ELEMENT DATA 2	24 byte	see chart 4
ELEMENT 2		
AWM ELEMENT DATA 1	27 byte	see chart 4
FILTER 1	29 byte	see chart 6
FILTER 2	29 byte	see chart 6
FILTER COMMON	3 byte	see chart 6
AWM ELEMENT DATA 2	24 byte	see chart 4
ELEMENT 3		
AWM ELEMENT DATA 1	27 byte	see chart 4
FILTER 1	29 byte	see chart 6
FILTER 2	29 byte	see chart 6
FILTER COMMON	3 byte	see chart 6
AWM ELEMENT DATA 2	24 byte	see chart 4

CHECK SUM	0eeeeeeeB		2's complement of 7 bits sum of all data bytes
EOX	11110111B	(F7H)	

(4) DRUM SET

STATUS	11110000B	(F0H)	
IDENTIFICATION	01000011B	(43H)	
SUB STATUS	0000nnnnB	(0nH)	n = DEVICE NUMBER
FORMAT NUMBER	01111010B	(7AH)	
BYTE COUNT(MSB)	00000100B	(04H)	
BYTE COUNT(LSB)	01100100B	(64H)	(Byte Count = 612)
	HEADER		26 byte see (3-3-2) BULK DUMP
	VOICE HEADER		11 byte see chart 2
	EFFECT		5 byte see chart 5
	VOICE COMMON		21 byte see chart 2
	C1 DRUM SET VOICE		9 byte see chart 3
	C6 DRUM SET VOICE		9 byte see chart 3
CHECK SUM	0eeeeeeeB	2's complement of 7 bits sum of all data bytes	
EOX	11110111B	(F7H)	

[CHART 11] BULK DUMP FORMAT (MULTI)

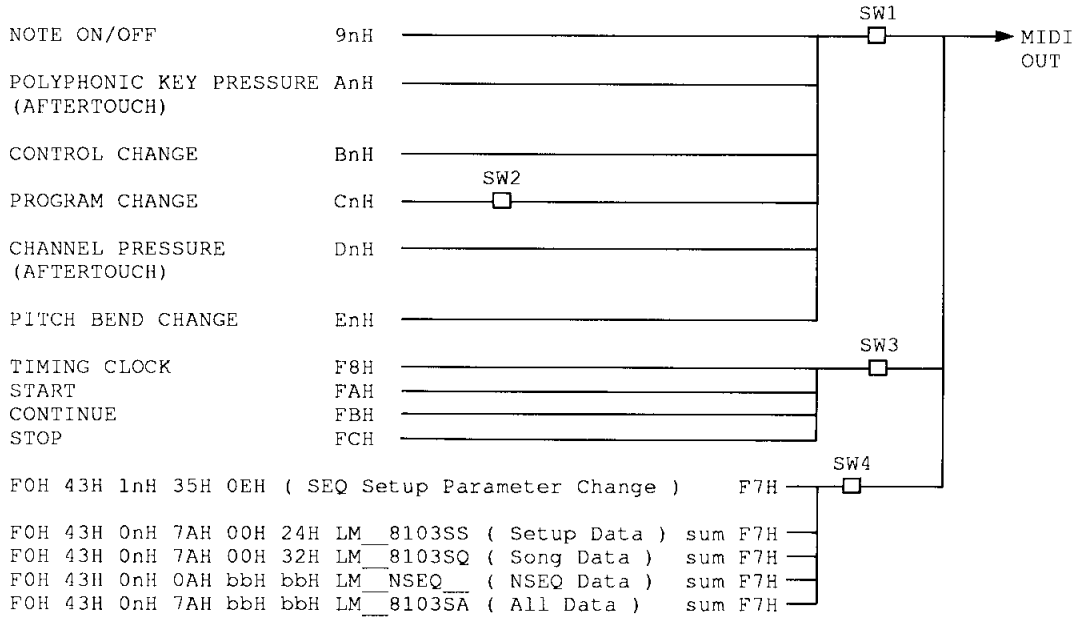
STATUS	11110000B	(F0H)	
IDENTIFICATION	01000011B	(43H)	
SUB STATUS	0000nnnnB	(0nH)	n = DEVICE NUMBER
FORMAT NUMBER	01111010B	(7AH)	
BYTE COUNT(MSB)	00000001B	(01H)	
BYTE COUNT(LSB)	00111010B	(3AH)	(Byte Count = 186)
	HEADER		26 byte see (3-3-2) BULK DUMP
	MULTI HEADER		11 byte see chart 1
	EFFECT		5 byte see chart 5
	CH_0 VOICE		9 byte see chart 1
	CH15 VOICE		9 byte see chart 1
CHECK SUM	0eeeeeeeB	2's complement of 7 bits sum of all data bytes	
EOX	11110111B	(F7H)	

[CHART 12] BULK DUMP FORMAT (SYSTEM)

STATUS	11110000B	(F0H)	
IDENTIFICATION	01000011B	(43H)	
SUB STATUS	0000nnnnB	(0nH)	n = DEVICE NUMBER
FORMAT NUMBER	01111010B	(7AH)	
BYTE COUNT(MSB)	00000000B	(00H)	
BYTE COUNT(LSB)	00101010B	(2AH)	(Byte Count = 42)
	HEADER		26 byte see (3-3-2) BULK DUMP
	SYSTEM		16 byte see chart 8
CHECK SUM	0eeeeeeeB	2's complement of 7 bits sum of all data bytes	
EOX	11110111B	(F7H)	

SEQUENCER PART

(1) TRANSMIT FLOW



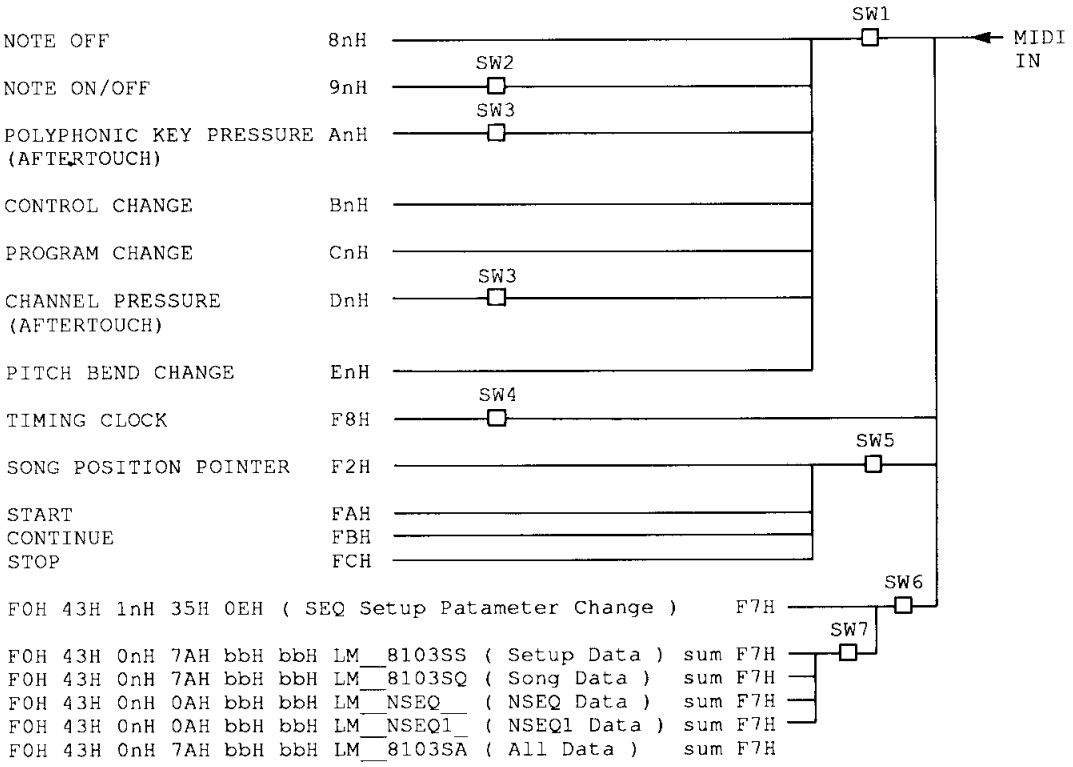
SW1☐ MIDI Transmit Channel
Transmit channel selection for each track.

SW2☐ Program Change Mode Select
Program change transmission ON/OFF, normal mode, or direct mode can be selected.

SW3☐ MIDI Control
Transmit ON/OFF can be selected.

SW4☐ System Exclusive Message Transmit Channel
System exclusive message transmission ON/OFF or device number can be selected.

(2) RECEIVE FLOW



SW1 ☐ MIDI Receive Channel
Record receive channel can be selected.

SW2 ☐ Velocity Filter

SW3 ☐ Aftertouch Filter
Velocity recording ON/OFF can be selected.

SW4 ☐ Clock Condition Select
Aftertouch recording ON/OFF can be selected.

SW5 ☐ MIDI Control
Receive ON/OFF can be selected.

SW6 ☐ System Exclusive Message Receive Channel
System exclusive message receive ON/OFF or device number can be selected.

SW7 ☐ Bulk Protect
Bulk data receive ON/OFF can be selected.

(3) TRANSMIT/RECEIVE DATA

(3-1) CHANNEL VOICE MESSAGE

Transmitted during play or overdub.

Received during recording.

(3-1-1) NOTE OFF

STATUS	1000nnnnB	(8nH)	n = VOICE CHANNEL NUMBER
NOTE NUMBER	0kkkkkkkB		k = 0 (C-2) ~ 111 (D#7)
VELOCITY	0vvvvvvvB		Ignored

Receive only.
Changed to 9nH 00H for transmission.

(3-1-2) NOTE ON/OFF

STATUS	1001nnnnB	(9nH)	n = VOICE CHANNEL NUMBER
NOTE NUMBER	0kkkkkkkB		k = 0 (C-2) ~ 111 (D#7)
VELOCITY	0vvvvvvvB	(v0)	NOTE ON
	00000000B	(v0)	NOTE OFF

Velocity recording ON/OFF during reception can be selected.

(3-1-3) POLYPHONIC KEY PRESSURE (AFTERTOUCH)

STATUS	1010nnnnB	(AnH)	n = VOICE CHANNEL NUMBER
NOTE NUMBER	0kkkkkkkB		k = 0 (C-2) ~ 111 (D#7)
PRESSURE VALUE	0vvvvvvvB		v = 0 ~ 127

Touch recording ON/OFF during reception can be selected.

(3-1-4) CONTROL CHANGE

STATUS	1011nnnnB	(BnH)	n = VOICE CHANNEL NUMBER
CONTROL NUMBER	0ccccccB		c = 0 ~ 120
CONTROL VALUE	0vvvvvvvB		

(3-1-5) PROGRAM CHANGE

[NORMAL MODE]

STATUS	1100nnnnB	(CnH)	n = VOICE CHANNEL NUMBER
PROGRAM NUMBER	0ppppppB		p = 0 ~ 118

[DIRECT MODE]

STATUS	1100nnnnB	(CnH)	n = VOICE CHANNEL NUMBER
MODE/MEMORY NUMBER	0ddddddB		d = 119 ~ 127
PROGRAM NUMBER	0ppppppB		p = 0 ~ 79

* MODE/MEMORY NUMBER

d = 119	INDIVIDUAL	INTERNAL
d = 120	INDIVIDUAL	CARD
	(INTERNAL and CARD cannot be combined in one MULTI.)	
d = 121	INDIVIDUAL	PRESET
d = 122	COMMON	VOICE PLAY MODE INTERNAL
d = 123	COMMON	VOICE PLAY MODE CARD
d = 124	COMMON	VOICE PLAY MODE PRESET
d = 125	COMMON	MULTI PLAY MODE INTERNAL
d = 126	COMMON	MULTI PLAY MODE CARD
d = 127	COMMON	MULTI PLAY MODE PRESET

During transmission, program change transmission ON/OFF, normal mode, or direct mode can be selected (in UTILITY mode).

(3-1-6) CHANNEL PRESSURE / AFTERTOUCH

STATUS	1101nnnnB	(DnH)	n = VOICE CHANNEL NUMBER
PRESSURE VALUE	0vvvvvvvB		v = 0 ~ 127

After touch recording ON/OFF during reception can be selected.

(3-1-7) PITCH BEND CHANGE

STATUS	1110nnnnB	(EnH)	n = VOICE CHANNEL NUMBER
LSB	0vvvvvvvB		PITCH BEND CHANGE LSB
MSB	0vvvvvvvB		PITCH BEND CHANGE MSB

(3-2) CHANNEL MODE MESSAGE

Not transmitted or received.

(3-3) SYSTEM COMMON MESSAGE

F2H (song position pointer) only received (except during record or play).
No others transmitted or received.

(3-3-1) SONG POSITION POINTER

STATUS	11110010B	(F2H)	
	01111111B		l = LEAST SIGNIFICANT
	0hhhhhhhB		h = MOST SIGNIFICANT

Receive only.
Receive ON/OFF selection.

(3-4) SYSTEM REAL TIME MESSAGE

(3-4-1) TIMING CLOCK

STATUS 11111000B (F8H)

Internal timing clock, or external timing clock received via MIDI IN can be selected.

Transmit ON/OFF can be selected.

(3-4-2) START

STATUS 11111010B (FAH)

Transmit/receive ON/OFF can be selected.

(3-4-3) CONTINUE

STATUS 11111011B (FBH)

Transmit/receive ON/OFF can be selected.

(3-4-4) STOP

STATUS 11111100B (FCH)

Transmit/receive ON/OFF can be selected.

(3-5) SYSTEM EXCLUSIVE MESSAGE

Exclusive messages not received in demo mode.

(3-5-1) PARAMETER CHANGE

STATUS	11110000B	(F0H)	
IDENTIFICATION	01000011B	(43H)	
SUB STATUS	0001nnnnB	(1nH)	n = DEVICE NUMBER
GROUP NUMBER	00010000B	(35H)	
STRUCTURE NUMBER MSB	00001110B	(0EH)	
STRUCTURE NUMBER LSB	00000000B	(00H)	
PARAMETER NUMBER MSB	00000000B	(00H)	
PARAMETER NUMBER LSB	0ppppppB		
PARAMETER VALUE MSB	00000000B	(00H)	
PARAMETER VALUE LSB	0vvvvvvvB		
EOX	11110111B	(F7H)	

Setup data only, parameter change transmitted and received.
Not received during play.

Device number and transmit/receive ON/OFF can be selected in UTILITY mode.

See chart 1 for PARAMETER NUMBER and VALUE.
Data Format same as sequencer section.

(3-5-2) BULK DUMP

(i) SETUP DATA, SONG DATA or ALL DATA

STATUS	11110000B	(F0H)		
IDENTIFICATION	01000011B	(43H)		
SUB STATUS	0000nnnnB	(0nH)	n = DEVICE NUMBER	
FORMAT NUMBER	01111010B	(7AH)		
BYTE COUNT(MSB)	0bbbbbbbB			
BYTE COUNT(LSB)	0bbbbbbbB			
CLASSIFICATION	01001100B	(4CH)	ASCII'L	┐
NAME	01001101B	(4DH)	ASCII'M	│
	00100000B	(20H)	ASCII'_	│
	00100000B	(20H)	ASCII'_	│
DATA FORMAT	00111000B	(38H)	ASCII'8	│
NAME	00110001B	(31H)	ASCII'1	│
	00110000B	(30H)	ASCII'0	│ data bytes
	00110011B	(33H)	ASCII'3	│
	0mmmmmmmB		ASCII	│
	0mmmmmmmB		ASCII	│
ADDITIONAL	00000000B	(00H)		│
HEADER	00000000B	(00H)		│
	00000000B	(00H)		│
	00000000B	(00H)		│
	00000000B	(00H)		│
	00000000B	(00H)		│
	00000000B	(00H)		│
	00000000B	(00H)		│
	00000000B	(00H)		│
	00000000B	(00H)		│
	00000000B	(00H)		│
	00000000B	(00H)		│
	00000000B	(00H)		│
	00000000B	(00H)		│
	00000000B	(00H)		│
MEMORY TYPE	0xxxxxxxB			│
MEMORY NUMBER	0yyyyyyyB			│
DATA	0ddddddddB			│
	⋮			│
	0ddddddddB			┘
CHECK SUM	0eeeeeeeB	2's complement of 7 bits sum of all data bytes		
EOX	11110111B	(F7H)		

Type	b	m	x	y	Refer to
SETUP DATA	00H 24H	SS	00H	00H	chart 2
SONG DATA	00H 32H	SQ	7FH	00H	chart 2
ALL DATA	bbH bbH	SA	00H	00H	

note) Additional header ignored when received.

(ii) NSEQ DATA

STATUS	11110000B	(F0H)		
IDENTIFICATION	01000011B	(43H)		
SUB STATUS	0000nnnnB	(0nH)	n = DEVICE NUMBER	
FORMAT NUMBER	00001010B	(0AH)		
BYTE COUNT(MSB)	0bbbbbbbB			
BYTE COUNT(LSB)	0bbbbbbbB			
CLASSIFICATION	01001100B	(4CH)	ASCII'L	┐
NAME	01001101B	(4DH)	ASCII'M	│
	00100000B	(20H)	ASCII'_	│
	00100000B	(20H)	ASCII'_	│
DATA FORMAT	0mmmmmmmB	(4EH)	ASCII'N	│
NAME	0mmmmmmmB	(53H)	ASCII'S	│
	0mmmmmmmB	(45H)	ASCII'E	│ data bytes
	0mmmmmmmB	(51H)	ASCII'Q	│
	0mmmmmmmB		ASCII	│
	0mmmmmmmB	(20H)	ASCII'_	│
DATA	0ddddddddB			│
	⋮			│
	0ddddddddB			┘
CHECK SUM	0eeeeeeeB	2's complement of 7 bits sum of all data bytes		
EOX	11110111B	(F7H)		

Type	m	Refer to
NSEQ DATA NSEQ1 DATA (receive only)	NSEQ__ NSEQ1_	chart 3

The five types of data shown in (i) and (ii) are transmitted.
Device number, transmit/receive ON/OFF and protect can be selected in UTILITY mode.

Reception possible only in modes other than play and record.
"LM__NSEQ1_" bulk header can also be received (however, macro, odd time signatures, and exclusive data will be ignored).

When song data or NSEQ data is received, the data is loaded into that song only when that song is empty.
When all data is received, the received data is loaded and all previous data is erased.

Transmitted when UTILITY mode Bulk Transmit executed.

The following data is transmitted when "SETUP" is selected and a bulk dump is executed.

1. SETUP DATA

The following data is transmitted when "SONG" is selected, a song number is selected, and a bulk dump is executed.

1. SONG DATA
2. NSEQ DATA

No transmission occurs if the specified song is empty.

The "ALL DATA" data format is as shown below when "SEQ ALL" is selected and a bulk dump is executed.

1. SONG 1 SONG DATA
   ⋮
8. SONG 8 SONG DATA
9. SETUP DATA
10. SONG 1 NSEQ DATA
    ⋮
17. SONG 8 NSEQ DATA

The song data is transmitted even if the song is empty.
NSEQ track data begins with F0H mnH (m = song number; n = track number)

If bulk dumps are executed in succession, a break of greater than 100 milliseconds is inserted between each transmission.
If an ALL DATA or NSEQ DATA transmission exceeds 512 bytes, it will be broken down into 512-byte blocks and a byte count and header will be attached to the beginning of each. A checksum will be attached to the end of each block. A break of greater than 100 milliseconds will be inserted between each block.
In accordance with the above, a break of greater than 100 milliseconds is required between each bulk dump when multiple bulk dumps are received.

(3-5-3) DUMP REQUEST

Not receive.

[CHART 1] SEQUENCER SETUP DATA

MIDI Parameter Change Format

F0H 43H 1nH 35H 0EH 00H 00H n2H 00H v2H F7H

note) n ; device number
n2 ; parameter number
v2 ; parameter value

No.	function	value	note
0	Click Condition	0-3	0:off, 1:rec, 2:play/rec, 3:always
1	Clock Condition	0-1	0:internal, 1:MIDI
2	Rec Channel	0-17	0-15:1-16ch, 16:omni, 17:kbd
3	After Touch Record SW	0-1	0:off, 1:on
4	Velocity Record SW	0-1	0:off, 1:on
5	Song Number	0-7	0-7:1-8
6	Rec Type	0-3	0:overdub, 1:replace, 2:step, 3:punch
7	MIDI Control	0-1	0:off, 1:on
8	Reserve	0	
9	Reserve	0	

[CHART 2] SEQUENCER SONG DATA

No.	function	value	note
0	Time Signature 1	0-15	TSIG1/TSIG2 TSIG1=0:1..15:16
1	Time Signature 2	2-4	TSIG2=2:1/4, 3:1/8, 4:1/16
2	Tempo 1	0-1	tempo 30-240
3	Tempo 2	0-127	
4	Song Name 1	20-127	
5	Song Name 2	20-127	
6	Song Name 3	20-127	
7	Song Name 4	20-127	
8	Song Name 5	20-127	
9	Song Name 6	20-127	
10	Song Name 7	20-127	
11	Song Name 8	20-127	
12	Track 1 Tch	0-15	
13	Track 2 Tch	0-15	
14	Track 3 Tch	0-15	

No.	function	value	note
15 16 17 18 19	Track 4 Tch Track 5 Tch Track 6 Tch Track 7 Tch Track 8 Tch	0-15 0-15 0-15 0-15 0-15	
20 21	Mode/Memory Number Program Number	122-127 0-79	Direct Mode Program Change
22	Reserved	0	
23	Song Data Store Flag	0-1	

[CHART 3] NSEQ DATA FORMAT

The NSEQ data for 1 song is composed of the data for several tracks beginning with F0H 0nH (n = track number) and ending with F2H. Track data not transmitted if the track is empty.

The time/event/control data described elsewhere is included between F0H and 0nH.

hex	description
F0 00 -- -- F2	top of track #1 time/event/control data end of record
-- -- --	track #2 ~ #7 data
F0 07 -- -- -- F2	top of track #8 time/event/control data end of record

(Add) NSEQ time/event/control data DATA FORMAT (binary)

```
short time      0ttttttt                                ( 384th note/bit )
long time       0ttttttt 0ttttttt                       ( MS byte = head of LS byte )

short note      10dddddd 0kkkkkkk 0vvvvvvv
long note       11dddddd 0ddddddd 0kkkkkkk 0vvvvvvv
short note      10dddddd 1kkkkkkk                       ( When velocity = 40H )
long note       110ddddd 0ddddddd 1kkkkkkk              ( When velocity = 40H )

                ddd = duration                          ( 96th note/bit )
                kkk = MIDI note number
                vvv = MIDI velocity

measure mark    11110101                                ( Measure line )
no operation    11111000

Others are the same as MIDI format except MS byte

poly a.touch    11111010 0kkkkkkk 0vvvvvvv
control change  11111011 0ccccccc 0vvvvvvv
program change  11111100 0ppppppp
channel a.touch 11111101 0vvvvvvv
pitch bend      11111110 0vvvvvvv 0vvvvvvv
```

YAMAHA [Music Synthesizer --- synthesizer part] Date : 12/08,1989
Model SY55 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, 3	memorized
Mode Messages	x	x	
Mode Altered	**********	x	
Note Number : True voice	36 - 96 **********	0 - 127 0 - 127	
Velocity Note ON	o 9nH,v=1-127	o v=1-127	
Velocity Note OFF	x 9nH,v=0	x	
After Touch Key's	x	x	
After Touch Ch's	o	o	
Pitch Bender	o	o 0-12 semi	7 bit resolution
Control Change 0	x	o	
Control Change 1	o	o	Modulation Wheel
Control Change 2	o	o	Breath Control
Control Change 3-5	x	o	
Control Change 6	o (play mode)	o	Data Entry Knob
Control Change 7	o	o	Volume
Control Change 8-63	x	o	
Control Change 64	o	o	Sustain Switch
Control Change 65-120	x	o	
Prog Change : True #	o 0-79,119-127 **********	o 0-79,119-127 0 - 63	if program on
System Exclusive	o	o	voic,mult,system
System : Song Pos	x	x	
System : Song Sel	x	x	
Common : Tune	x	x	
System Real Time :Clock	x	x	
System 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:			

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 : 12/08,1989
Model SY55 MIDI Implementation Chart Version : 1.0

Function ...	Transmitted	Recognized	Remarks
Basic Default	1 - 16	1 - 16	memorized
Basic Changed	1 - 16	1 - 16	
Mode Default	x	x	
Mode Messages	x	x	
Mode Altered	**********	x	
Note Number : True voice	0 - 111 **********	0 - 111	
Velocity Note ON	o 9nH,v=1-127	o v=1-127	*1
Velocity Note OFF	x 9nH,v=0	x	
After Touch Key's	o	o (after on)	
After Touch Ch's	o	o (after on)	
Pitch Bender	o	o	
Control Change 0 - 120	o	o	
Prog Change : True #	o 0 - 127 **********	o 0 - 127	if program on
System Exclusive	o	o	setup,song,seq
System Common : Song Pos	x	o(MIDI cont on)	
System Common : Song Sel	x	x	
System Common : Tune	x	x	
System Real Time :Clock	o(MIDI cont on)	o(MIDI sync)	
System Real Time :Commands	o(MIDI cont on)	o(MIDI cont on)	
Aux :Local ON/OFF	x	x	
Aux :All Notes OFF	x	x	
Mes- :Active Sense	x	x	
sages:Reset	x	x	

Notes: *1 = receive if velocity record switch is on.
if switch is off,velocity is fixed to 64.

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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