10 -1 MWMD, MWMV (Timbre data transmitted by SEND REQUEST 2, RECEIVE REQUEST 1 messages)

L	H

DCW 1 KEY FOLLOW	MWMD, MWMV (HEX)
0	00 00
1	01 1F
2	02 2C
3	03 39
4	04 46
5	05 53
6	06 60
7	07 6E
8	08 92
9	09 FF

10 -2 MWMD, MWHV (Timbre data transmitted by SEND REQUEST 2, RECEIVE REQUEST 2 messages)

L	H

DCW 1 KEY FOLLOW	MWMD, MWMV (HEX)
0	00 00
1	01 19
2	02 33
3	03 4E
4	04 6A
5	05 86
6	06 A3
7	07 C1
8	08 DF
9	09 FF

11 -1 PMAL (Timbre data transmitted by SEND REQUEST 1, RECEIVE REQUEST 1 messages)

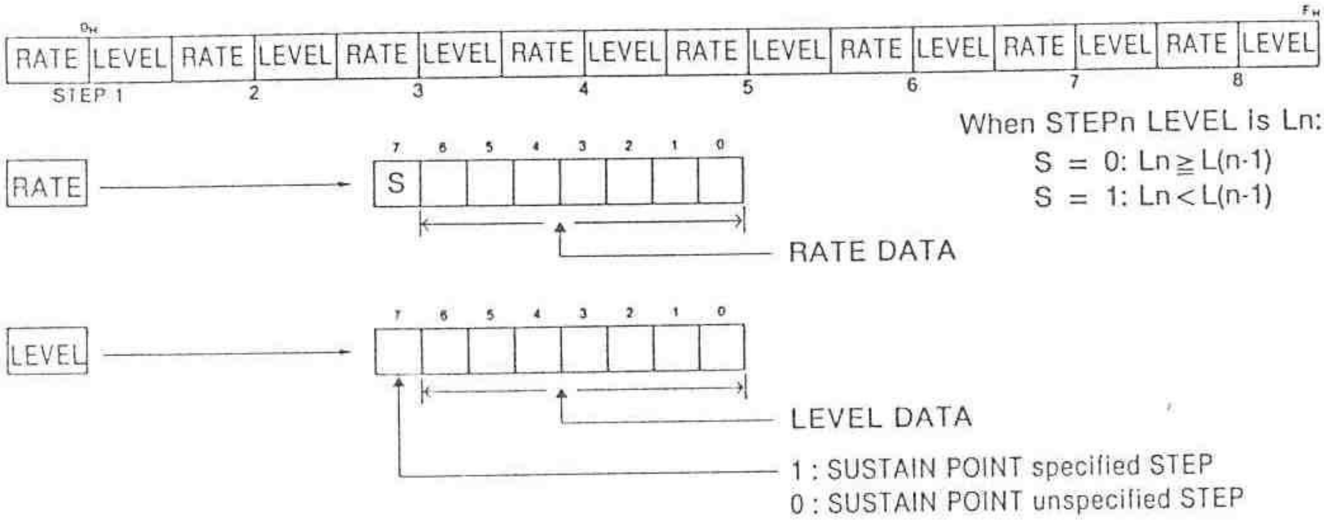
DCA 1 ENVELOPE END STEP	PMAL (HEX)
1	0 0
2	0 1
3	0 2
4	0 3
5	0 4
6	0 5
7	0 6
8	0 7

11 -2 PMAL (Timbre data transmitted by SEND REQUEST 2, RECEIVE REQUEST 2 messages)

DCA 1 ENVELOPE END STEP	PMAL (HEX)
1	d 0
2	d 1
3	d 2
4	d 3
5	d 4
6	d 5
7	d 6
8	d 7

d; LINE 1 VELOCITY (AMP)

2 PMA



See Table 4 for details on RATE and LEVEL.

13 -1 PMWL (Timbre data transmitted by SEND REQUEST 1, RECEIVE REQUEST 1 messages)

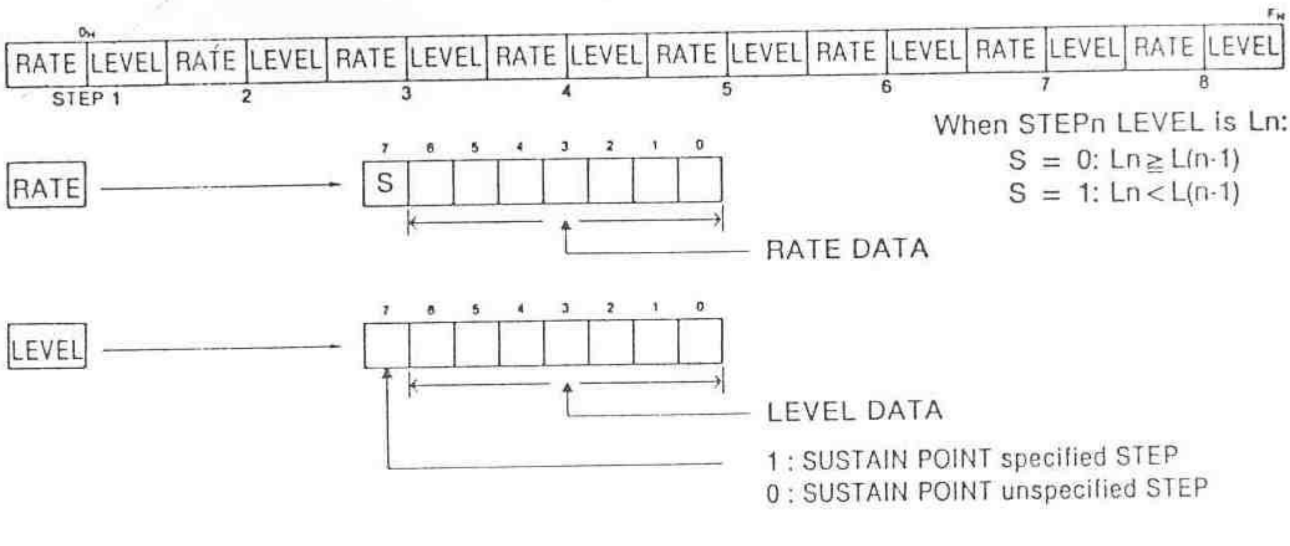
DCW 1 ENVELOPE END STEP	PMWL (HEX)
1	0 0
2	0 1
3	0 2
4	0 3
5	0 4
6	0 5
7	0 6
8	0 7

13 -2 PMWL (Timbre data transmitted by SEND REQUEST 2, RECEIVE REQUEST 2 messages)

DCW 1 ENVELOPE END STEP	PMWL (HEX)
1	d 0
2	d 1
3	d 2
4	d 3
5	d 4
6	d 5
7	d 6
8	d 7

d; LINE 1 VELOCITY (WAVE)
WAVE = $00_{10} \sim 15_{10}$ -> d = $F_H \sim 0_H$

14 PMW



See Table 5 for details on RATE and LEVEL.

15 -1 PMPL (Timbre data transmitted by SEND REQUEST 1, RECEIVE REQUEST 1 messages)

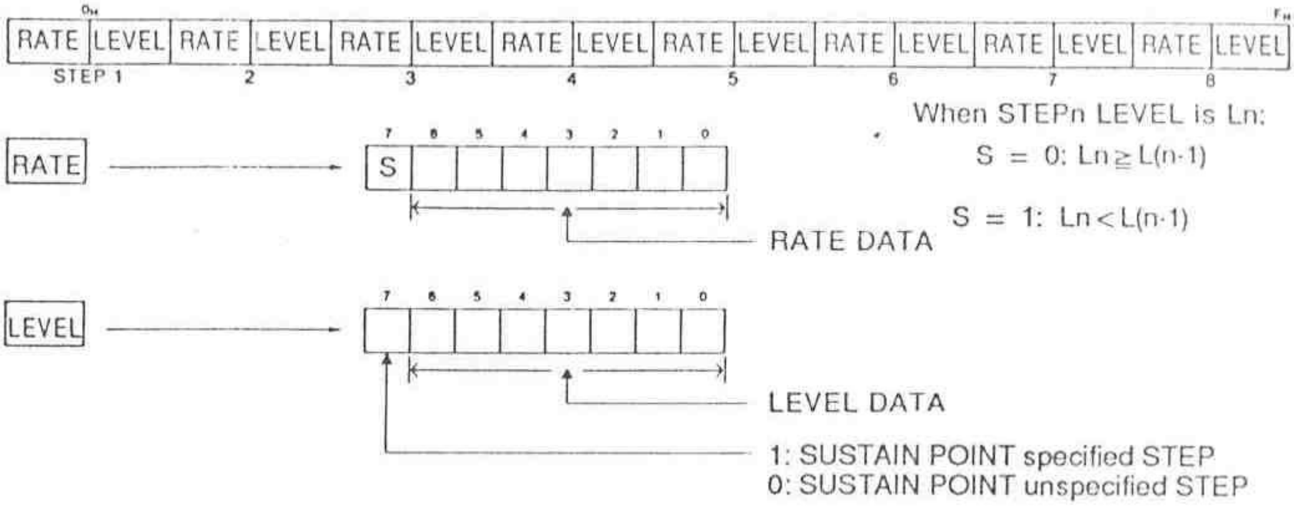
DCO 1 ENVELOPE END STEP	PMPL (HEX)
1	0 0
2	0 1
3	0 2
4	0 3
5	0 4
6	0 5
7	0 6
8	0 7

15 -2 PMPL (Timbre data transmitted by SEND REQUEST 2, RECEIVE REQUEST 2 messages)

DCO 1 ENVELOPE END STEP	PMPL (HEX)
1	d 0
2	d 1
3	d 2
4	d 3
5	d 4
6	d 5
7	d 6
8	d 7

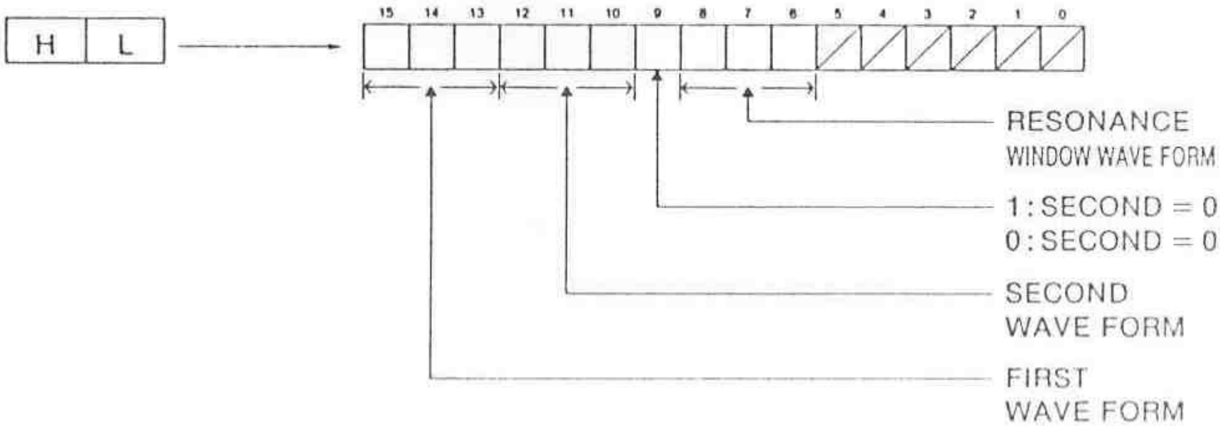
d; LINE 1 VELOCITY (WAVE)
PITCH = $00_{10} \sim 15_{10}$ -> d = $F_H \sim 0_H$

16 PMP



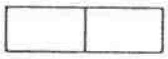
See Table 6 for details on RATE and LEVEL.

17 SFW



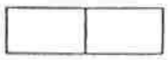
Waveform data format is the same as MFW.

18 SMAD, SAMV



DCA 2 KEY FOLLOW and LEVEL data format is the same as that for MAMD and MAMV (see 9 -1, 9 -2).

19 SWMD, SWMV



DCA 2 KEY FOLLOW format is the same as that for MWMD and MWMV (see 10 -1, 10 -2).

20 PSAL

DCA 2 ENVELOPE END STEP and LINE 2 VELOCITY (AMP) data format is the same as that for PMAL (see 11 -1, 11 -2

21 PSA

DCA 2 ENVELOPE RATE AND LEVEL data format is the same as that for PMA (see 12)

22 PSWL

DCW @ENVELOPE END STEP and LINE 2 VELOCITY (WAVE) data format is the same as that for PMWL (see 13 -1, 13 -2).

23 PSW

DCW 2 ENVELOPE RATE and LEVEL data format is the same as that for PMW (see 14).

24 PSPL

DCO 2 ENVELOPE END STEP and LINE 2 VELOCITY (PITCH) data format is the same as that for PMPL (see15 -1, 15-2).

25 PSP

DCO 2 ENVELOPE RATE and LEVEL data format is the same as that for PMP (see 16).

26 NAME

0	1	.	E_H	F_H

16 byts

Timbre name and data are composed of a total of 16 bytes, with each byte corresponding to the 16 columns on the lower line of the LCD.

LCD

0 1 2	E_H F_H

The following lists the characters that can be used, and data contents are all ASCII characters.

1) 26 alphabetic characters
2) Numbers 0 ~ 9
3) • — / BLANK

VIBRATO DELAY TIME

DELAY TIME	PVDLD, PVDLV (HEX)	DELAY TIME	PVDLD, PVDLV (HEX)	DELAY TIME	PVDLD, PVDLV (HEX)	DELAY TIME	PVDLD, PVDLV (HEX)
0	00 00 00	25	19 00 19	50	32 00 4B	75	4B 00 DF
1	01 00 01	26	1A 00 1A	51	33 00 4F	76	4C 00 E7
2	02 00 02	27	1B 00 1B	52	34 00 53	77	4D 00 EF
3	03 00 03	28	1C 00 1C	53	35 00 57	78	4E 00 F7
4	04 00 04	29	1D 00 1D	54	36 00 5B	79	4F 00 FF
5	05 00 05	30	1E 00 1E	55	37 00 5F	80	50 01 0F
6	06 00 06	31	1F 00 1F	56	38 00 63	81	51 01 1F
7	07 00 07	32	20 00 21	57	39 00 67	82	52 01 2F
8	08 00 08	33	21 00 23	58	3A 00 6B	83	53 01 3F
9	09 00 09	34	22 00 25	59	3B 00 6F	84	54 01 4F
10	0A 00 0A	35	23 00 27	60	3C 00 73	85	55 01 5F
11	0B 00 0B	36	24 00 29	61	3D 00 77	86	56 01 6F
12	0C 00 0C	37	25 00 2B	62	3E 00 7B	87	57 01 7F
13	0D 00 0D	38	26 00 2D	63	3F 00 7F	88	58 01 8F
14	0E 00 0E	39	27 00 2F	64	40 00 87	89	59 01 9F
15	0F 00 0F	40	28 00 31	65	41 00 8F	90	5A 01 AF
16	10 00 10	41	29 00 33	66	42 00 97	91	5B 01 BF
17	11 00 11	42	2A 00 35	67	43 00 9F	92	5C 01 CF
18	12 00 12	43	2B 00 37	68	44 00 A7	93	5D 01 DF
19	13 00 13	44	2C 00 39	69	45 00 AF	94	5E 01 EF
20	14 00 14	45	2D 00 3B	70	46 00 B7	95	5F 01 FF
21	15 00 15	46	2E 00 3D	71	47 00 BF	96	60 02 1F
22	16 00 16	47	2F 00 3F	72	48 00 C7	97	61 02 3F
23	17 00 17	48	30 00 43	73	49 00 CF	98	62 02 5F
24	18 00 18	49	31 00 47	74	4A 00 D7	99	63 02 7F

VIBRATO RATE

RATE	PVSD, PVSV (HEX)	RATE	PVSD, PVSV (HEX)	RATE	PVSD, PVSV (HEX)	RATE	PVSD, PVSV (HEX)
0	00 00 20	25	19 03 40	50	32 09 E0	75	4B 1C E0
1	01 00 40	26	1A 03 60	51	33 0A 60	76	4C 1D E0
2	02 00 60	27	1B 03 80	52	34 0A E0	77	4D 1E E0
3	03 00 80	28	1C 03 A0	53	35 0B 60	78	4E 1F E0
4	04 00 A0	29	1D 03 C0	54	36 0B E0	79	4F 20 E0
5	05 00 C0	30	1E 03 E0	55	37 0C 60	80	50 23 E0
6	06 00 E0	31	1F 04 00	56	38 0C E0	81	51 25 E0
7	07 01 00	32	20 04 60	57	39 0D 60	82	52 27 E0
8	08 01 20	33	21 04 A0	58	3A 0D E0	83	53 29 E0
9	09 01 40	34	22 04 E0	59	3B 0E 60	84	54 2B E0
10	0A 01 60	35	23 05 20	60	3C 0E E0	85	55 2D E0
11	0B 01 80	36	24 05 60	61	3D 0F 60	86	56 2F E0
12	0C 01 A0	37	25 05 A0	62	3E 0F E0	87	57 31 E0
13	0D 01 C0	38	26 05 E0	63	3F 10 60	88	58 33 E0
14	0E 01 E0	39	27 06 20	64	40 11 E0	89	59 35 E0
15	0F 02 00	40	28 06 60	65	41 12 E0	90	5A 37 E0
16	10 02 20	41	29 06 A0	66	42 13 E0	91	5B 39 E0
17	11 02 40	42	2A 06 E0	67	43 14 E0	92	5C 3B E0
18	12 02 60	43	2B 07 20	68	44 15 E0	93	5D 3D E0
19	13 02 80	44	2C 07 60	69	45 16 E0	94	5E 3F E0
20	14 02 A0	45	2D 07 A0	70	46 17 E0	95	5F 41 E0
21	15 02 C0	46	2E 07 E0	71	47 18 E0	96	60 47 E0
22	16 02 E0	47	2F 08 20	72	48 19 E0	97	61 4B E0
23	17 03 00	48	30 08 E0	73	49 1A E0	98	62 4F E0
24	18 03 20	49	31 09 60	74	4A 1B E0	99	63 53 E0

VIBRATO DEPTH

DEPTH	PVDD, PVDV (HEX)	DEPTH	PVDD, PVDV (HEX)	DEPTH	PVDD, PVDV (HEX)	DEPTH	PVDD, PVDV (HEX)
0	00 00 01	25	19 00 1A	50	32 00 4F	75	4B 00 E7
1	01 00 02	26	1A 00 1B	51	33 00 53	76	4C 00 EF
2	02 00 03	27	1B 00 1C	52	34 00 57	77	4D 00 F7
3	03 00 04	28	1C 00 1D	53	35 00 5B	78	4E 00 FF
4	04 00 05	29	1D 00 1E	54	36 00 5F	79	4F 01 07
5	05 00 06	30	1E 00 1F	55	37 00 63	80	50 01 1F
6	06 00 07	31	1F 00 20	56	38 00 67	81	51 01 2F
7	07 00 08	32	20 00 23	57	39 00 6B	82	52 01 3F
8	08 00 09	33	21 00 25	58	3A 00 6F	83	53 01 4F
9	09 00 0A	34	22 00 27	59	3B 00 73	84	54 01 5F
10	0A 00 0B	35	23 00 29	60	3C 00 77	85	55 01 6F
11	0B 00 0C	36	24 00 2B	61	3D 00 7B	86	56 01 7F
12	0C 00 0E	37	25 00 2D	62	3E 00 7F	87	57 01 8F
13	0D 00 0E	38	26 00 2F	63	3F 00 83	88	58 01 9F
14	0E 00 0F	39	27 00 31	64	40 00 8F	89	59 01 AF
15	0F 00 10	40	28 00 33	65	41 00 97	90	5A 01 BF
16	10 00 11	41	29 00 35	66	42 00 9F	91	5B 01 CF
17	11 00 12	42	2A 00 37	67	43 00 A7	92	5C 01 DF
18	12 00 13	43	2B 00 39	68	44 00 AF	93	5D 01 EF
19	13 00 14	44	2C 00 3B	69	45 00 B7	94	5E 01 FF
20	14 00 15	45	2D 00 3D	70	46 00 BF	95	5F 02 0F
21	15 00 16	46	2E 00 3F	71	47 00 C7	96	60 02 3F
22	16 00 17	47	2F 00 41	72	48 00 CF	97	61 02 5F
23	17 00 18	48	30 00 47	73	49 00 D7	98	62 02 7F
24	18 00 19	49	31 00 4B	74	4A 00 DF	99	63 03 00

AMP ENVELOPE
PMA, PSA

RATE	MIDI DATA (HEX)	RATE	MIDI DATA (HEX)	RATE	MIDI DATA (HEX)	RATE	MIDI DATA (HEX)	LEVEL	MIDI DATA (HEX)	LEVEL	MIDI DATA (HEX)	LEVEL	MIDI DATA (HEX)	LEVEL	MIDI DATA (HEX)
0	00	25	1E	50	3C	75	5A	0	00	25	35	50	4E	75	67
1	01	26	1F	51	3D	76	5B	1	1D	26	36	51	4F	76	68
2	02	27	20	52	3E	77	5C	2	1E	27	37	52	50	77	67
3	03	28	21	53	3F	78	5D	3	1F	28	38	53	51	78	6A
4	04	29	22	54	40	79	5E	4	20	29	39	54	52	79	6B
5	06	30	24	55	42	80	60	5	21	30	3A	55	53	80	6C
6	07	31	25	56	43	81	61	6	22	31	3B	56	54	81	6D
7	08	32	26	57	44	82	62	7	23	32	3C	57	55	82	6E
8	09	33	27	58	45	83	63	8	24	33	3D	58	56	83	6F
9	0A	34	28	59	46	84	64	9	25	34	3E	59	57	84	70
10	0C	35	2A	60	48	85	66	10	26	35	3F	60	58	85	71
11	0D	36	2B	61	49	86	67	11	27	36	40	61	59	86	72
12	0E	37	2C	62	4A	87	68	12	28	37	41	62	5A	87	73
13	0F	38	2D	63	4B	88	69	13	29	38	42	63	5B	88	74
14	10	39	2E	64	4C	89	6A	14	2A	39	43	64	5C	89	75
15	12	40	30	65	4E	90	6C	15	2B	40	44	65	5D	90	76
16	13	41	31	66	4F	91	6D	16	2C	41	45	66	5E	91	77
17	14	42	32	67	50	92	6E	17	2D	42	46	67	5F	92	78
18	15	43	33	68	51	93	6F	18	2E	43	47	68	60	93	79
19	16	44	34	69	52	94	70	19	2F	44	48	69	61	94	7A
20	18	45	36	70	54	95	72	20	30	45	49	70	62	95	7B
21	19	46	37	71	55	96	73	21	31	46	4A	71	63	96	7C
22	1A	47	38	72	56	97	74	22	32	47	4B	72	64	97	7D
23	1B	48	39	73	57	98	75	23	39	48	4C	73	65	98	7E
24	1C	49	3A	74	58	99	77	24	34	49	4D	74	66	99	7F

AMP ENVELOPE RATE

1 RATE DATA (α) to MIDI DATA (β) conversion :
$\beta = 119_{10} * \alpha + 99_H$

$\beta = \frac{12 \cdot \alpha}{10}$

2 MIDI DATA (β) to RATE DATA (α) conversion:
When $\beta = 0$ $\alpha = 0$
When $\beta = 77_H$ $\alpha = 99_H$
In other cases :
$\alpha = 99_{10} * \beta + 119_{10} + 1$

AMP ENVELOPE RATE

LEVEL	MIDI DATA
0	0
1	29_{10} ($1D_H$)
⟩	⟩
99_{10}	127_{10} ($7F_H$)

Simple one-to-one conversion.

WAVE ENVELOPE
PMW, PSW

RATE	MIDI DATA (HEX)	RATE	MIDI DATA (HEX)	RATE	MIDI DATA (HEX)	RATE	MIDI DATA (HEX)	LEVEL	MIDI DATA (HEX)	LEVEL	MIDI DATA (HEX)	LEVEL	MIDI DATA (HEX)	LEVEL	MIDI DATA (HEX)
0	08	25	26	50	44	75	62	0	00	25	20	50	40	75	60
1	09	26	27	51	45	76	63	1	01	26	21	51	41	76	61
2	0A	27	28	52	46	77	64	2	02	27	22	52	42	77	62
3	0B	28	29	53	47	78	65	3	03	28	23	53	43	78	64
4	0C	29	2A	54	48	79	66	4	05	29	25	54	45	79	65
5	0E	30	2C	55	4A	80	68	5	06	30	26	55	46	80	66
6	0F	31	2D	56	4B	81	69	6	07	31	27	56	47	81	67
7	10	32	2E	57	4C	82	6A	7	08	32	29	57	49	82	69
8	11	33	2F	58	4D	83	6B	8	0A	33	2A	58	4A	83	6A
9	12	34	30	59	4E	84	6C	9	0B	34	2B	59	4B	84	6B
10	14	35	32	60	50	85	6E	10	0C	35	2C	60	4C	85	6D
11	15	36	33	61	51	86	6F	11	0E	36	2E	61	4E	86	6E
12	16	37	34	62	52	87	70	12	0F	37	2F	62	4F	87	6F
13	17	38	35	63	53	88	71	13	10	38	30	63	50	88	70
14	18	39	36	64	54	89	72	14	11	39	32	64	52	89	72
15	1A	40	38	65	56	90	74	15	13	40	33	65	53	90	73
16	1B	41	39	66	57	91	75	16	14	41	34	66	54	91	74
17	1C	42	3A	67	58	92	76	17	15	42	35	67	55	92	76
18	1D	43	3B	68	59	93	77	18	17	43	37	68	57	93	77
19	1E	44	3C	69	5A	94	78	19	18	44	38	69	58	94	78
20	20	45	3E	70	5C	95	7A	20	19	45	39	70	59	95	79
21	21	46	3F	71	5D	96	7B	21	1A	46	3B	71	5B	96	7B
22	22	47	40	72	5E	97	7C	22	1C	47	3C	72	5C	97	7C
23	23	48	41	73	5F	98	7D	23	1D	48	3D	73	5D	98	7D
24	24	49	42	74	60	99	7F	24	1E	49	3E	74	5E	99	7F

WAVE ENVELOPE RATE

1 RATE DATA (α) to MIDI DATA (β)
conversion : $\beta = 119_{10} * \alpha \div 99_H + 8$

$\beta = \frac{12 \cdot x}{10} + 8$

2 MIDI DATA (β) to RATE DATA (α)
conversion:
When $\beta' = \beta - 8$
When $\beta' = 0$ $\alpha = 0$
When $\beta' = 77_H$ $\alpha = 99_H$
In other cases :
$\alpha' = 99_{10} * \beta' \div 119_{10} + 1$

WAVE ENVELOPE RATE

1 LEVEL DATA (α) to MIDI DATA (β)
conversion :
$\beta = 127_{10} * \alpha \div 99_H$

$\beta = \frac{128}{100} \cdot x$

2 MIDI DATA (β) to LEVEL DATA (α)
conversion:
When $\beta = 0$ $\alpha = 0$
When $\beta = 7F_H$ $\alpha = 99_H$
In other cases :
$\alpha' = 99_{10} * \beta' \div 127_{10} + 1$

PITCH ENVELOPE
PMP, PSP

RATE	MIDI DATA (HEX)	RATE	MIDI DATA (HEX)	RATE	MIDI DATA (HEX)	RATE	MIDI DATA (HEX)	LEVEL	MIDI DATA (HEX)	LEVEL	MIDI DATA (HEX)	LEVEL	MIDI DATA (HEX)	LEVEL	MIDI DATA (HEX)
0	00	25	20	50	40	75	60	0	00	25	19	50	32	75	4F
1	01	26	21	51	41	76	61	1	01	26	1A	51	33	76	50
2	02	27	22	52	42	77	62	2	02	27	1B	52	34	77	51
3	03	28	23	53	43	78	64	3	03	28	1C	53	35	☆78	52
4	05	29	25	54	45	79	65	4	04	29	1D	54	36	79	53
5	06	30	26	55	46	80	66	5	05	30	1E	55	37	80	54
6	07	31	27	56	47	81	67	6	06	31	2F	56	38	81	55
7	08	32	29	57	49	82	69	7	07	32	20	57	39	82	56
8	0A	33	2A	58	4A	83	6A	8	08	33	21	58	3A	83	57
9	0B	34	2B	59	4B	84	6B	9	09	34	22	59	3B	☆84	58
10	0C	35	2C	60	4C	85	6D	10	0A	35	23	60	3C	85	59
11	0E	36	2E	61	4E	86	6E	11	0B	36	24	61	3D	86	5A
12	0F	37	2F	62	4F	87	6F	12	0C	37	25	62	3E	87	5B
13	10	38	30	63	50	88	70	13	0D	38	23	63	3F	88	5C
14	11	39	32	64	52	89	72	14	0E	39	27	64	44	89	5D
15	13	40	33	65	53	90	73	15	0F	40	28	65	45	☆90	5E
16	14	41	34	66	54	91	74	16	10	41	29	☆66	46	91	5F
17	15	42	35	67	55	72	76	17	11	42	2A	67	47	92	60
18	17	43	37	68	57	93	77	18	12	43	2B	68	48	93	61
19	18	44	38	69	58	94	78	19	13	44	2C	69	49	94	62
20	19	45	39	70	59	95	79	20	14	45	2D	70	4A	95	63
21	1A	46	3B	71	5B	96	7B	21	15	46	2E	71	4B	☆96	64
22	1C	47	3C	72	5C	97	7C	22	16	47	2F	☆72	4C	97	65
23	1D	48	3D	73	5D	98	7D	23	17	48	30	73	4D	98	66
24	1E	49	3E	74	5E	99	7F	24	18	49	31	74	4E	99	67

PITCH ENVELOPE RATE

1 RATE DATA (α) to MIDI DATA (β) conversion :
$\beta = 127_{10} * \alpha + 99_H$

$\beta = \frac{12 \cdot \alpha}{10} + 8$

2 MIDI DATA (β) to RATE DATA (α) conversion:
When $\beta = 0$ $\alpha = 0$

When $\beta = 7F_H$ $\alpha = 99_H$

In other cases :

$\alpha = 99_{10} * \beta + 127_{10} + 1$

PITCH ENVELOPE RATE

LEVEL DATA	MIDI DATA
$0 \sim 63_{10}$	$0 \sim 63_{10}$ ($3F_H$)
$64_{10} \sim 99_{10}$	68_H (44_H) $\sim 103_{10}$ (67_H)

one-to-one

Indicates * octaves from basic pitch of LEVEL = 0

V OPERATION DATA

(1) Operation data

1 As with the timbre data in the previous section, operation data is also handled in 4-bit segments for MIDI OUT.

High order	Low order
d_1	d_2
4 bit	4 bit

$\longrightarrow$

1.	0	d_2
2.	0	d_1

2 Operation data takes on the form of NORMAL mode type, TONE MIX Mode type or KEY SPLIT mode type. Each of these three forms of data is illustrated in the following pages. The messages SEND REQUEST 3 and RECEIVE REQUEST 3 are used to send/receive operation data.

NORMAL MODE FORM

	DATA NAME	DATA FORMAT
1	MODE NO.	0
2	PORTAMENTO TIME	
3	PORTAMENTO SWEEP	
4	GLIDE TIME	
5	GLIDE NOTE	
6	MODULATION DEPTH	
7	BEND RANGE	
8	MOD. AFTER TOUCH DEPTH	
9	MOD. AFTER TOUCH RANGE	
10	NORMAL EFFECT ON/OFF	
11	MODE FLAG	
12	NORMAL PROGRAM NO.	
13	————	
14	————	
15	————	
16	————	
17	————	
18	————	
19	————	
20	————	

All data formats are 1byte.

TONE MIX MODE FORM

	DATA NAME	DATA FORMAT
1	MODE NO.	
2	PORTAMENTO TIME	
3	PORTAMENTO SWEEP	
4	GLIDE TIME	
5	GLIDE NOTE	
6	MODULATION DEPTH	
7	BEND RANGE	
8	MOD. AFTER TOUCH DEPTH	
9	MOD. AFTER TOUCH RANGE	
10	EFFECT ON/OFF	
11	MODE FLAG	
12	TONE 1 PROGRAM NO.	
13	TONE 2 PROGRAM NO.	
14	TONE 1 LEVEL	
15	TONE 2 LEVEL	
16	TONE 2 FINE	
17	TONE 2 OCT. NOTE	
18	————	
19	————	
20	————	

All data formats are 1byte.

KEY SPLIT MODE FORM

	DATA NAME	DATA FORMAT
1	MODE NO.	
2	PORTAMENTO TIME	
3	PORTAMENTO SWEEP	
4	GLIDE TIME	
5	GLIDE NOTE	
6	MODULATION DEPTH	
7	BEND RANGE	
8	MOD. AFTER TOUCH DEPTH	
9	MOD. AFTER TOUCH RANGE	
10	LOWER EFFECT ON/OFF	
11	MODE FLAG	
12	UPPER EFFECT ON/OFF	
13	MODE FLAG	
14	SPLIT POINT	
15	LOWER PROGRAM NO.	
16	UPPER PROGRAM NO.	
17	LOWER LEVEL	
18	UPPER LEVEL	
19	LOWER OCT. SHIFT	
20	UPPER OCT. SHIFT	

All data formats are 1byte.

2 DATA DETAILS

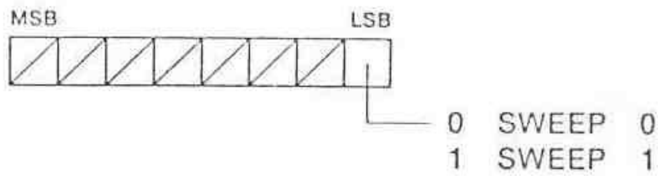
1 MODE NO.

→ 0 NORMAL MODE FORM
1 TONE MIX MODE FORM
2 KEY SPLIT MODE FORM

2 PORTAMENTO TIME

→ $0 \sim 99_{10}$

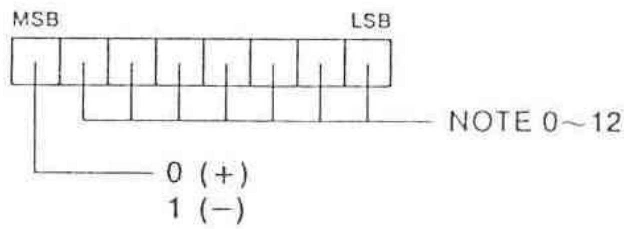
3 PORTAMENTO SWEEP

→


4 GLIDE TIME

→ $0 \sim 99_{10}$

5 GLIDE NOTE

→


6 MODULATION DEPTH

→ $0 \sim 99_{10}$: DEPTH 0 ~ 99

7 BEND RANGE

→ $0 \sim 12_{10}$: RANGE 0 ~ 12

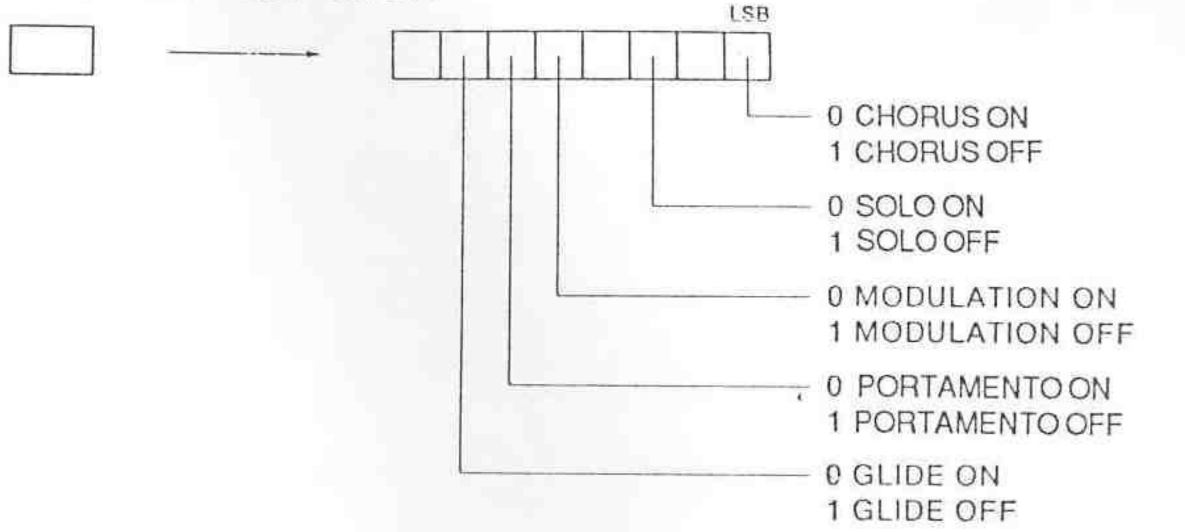
8 MOD. AFTER TOUCH DEPTH

→ $0 \sim 99_{10}$: DEPTH 0 ~ 99

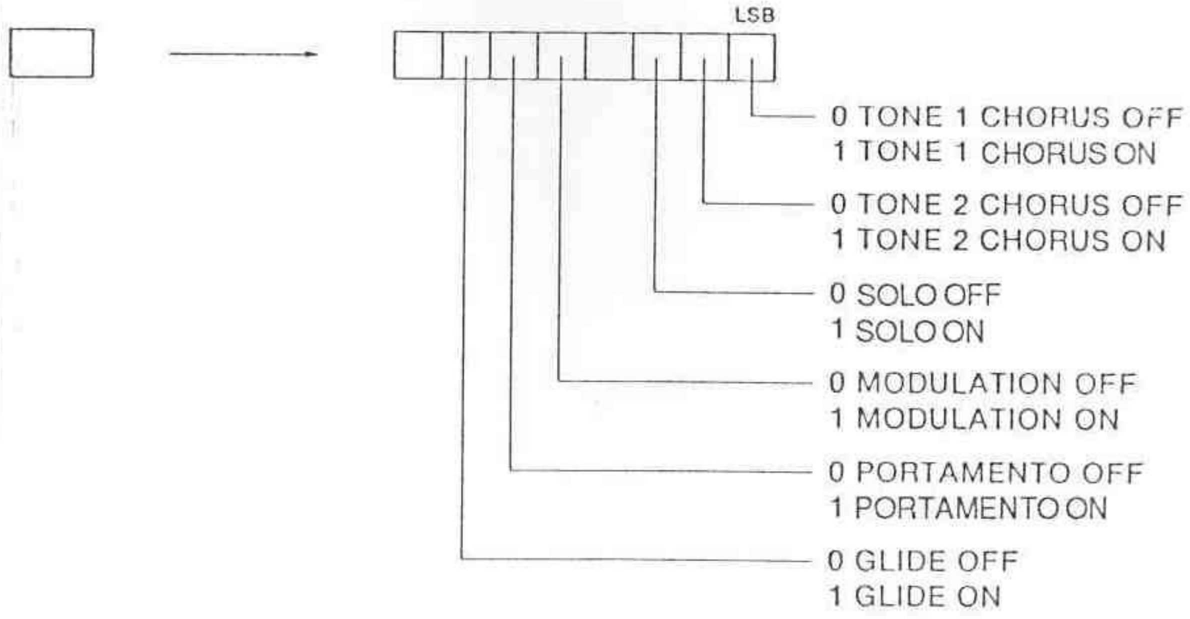
9 MOD. AFTER TOUCH RANGE

→ $0 \sim 15_{10}$: RANGE 0 ~ 15

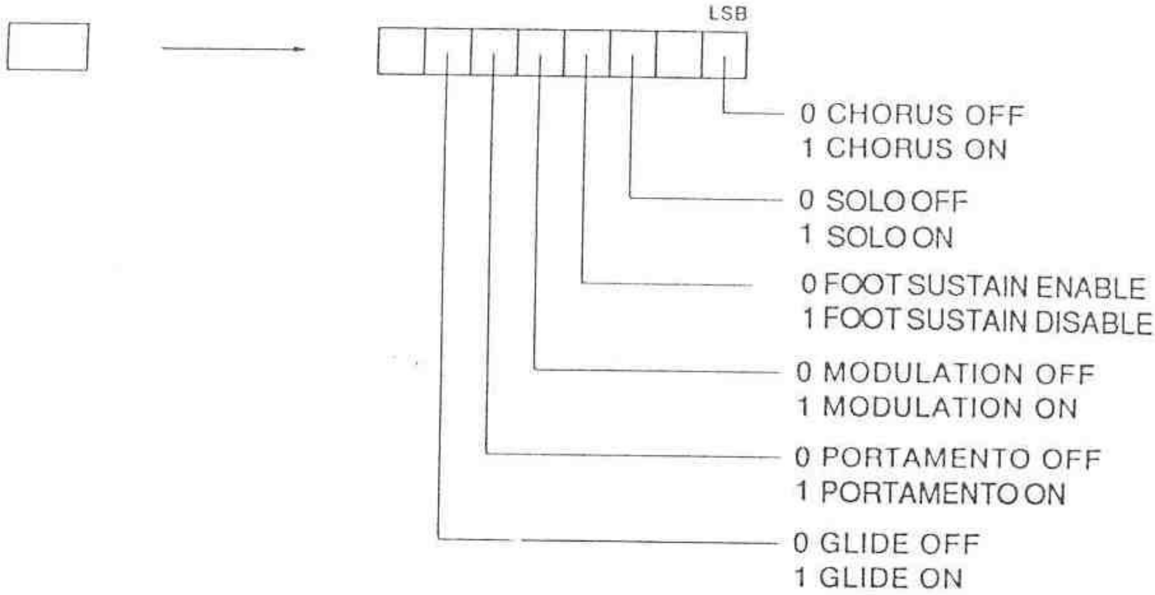
10 NORMAL EFFECT ON/OFF



11 TONE MIX EFFECT ON/OFF

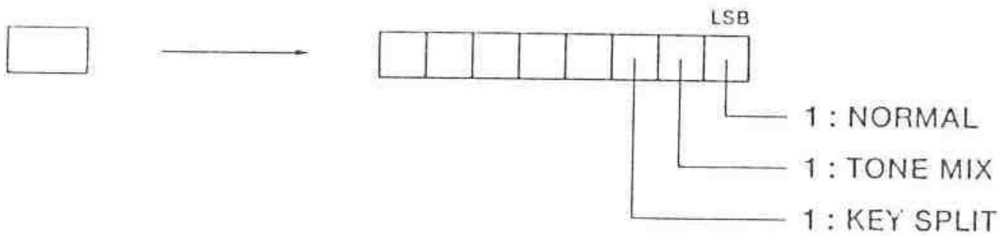


12 LOWER EFFECT ON/OFF (KEY SPLIT LOWER KEY SIDE)
UPPER EFFECT ON/OFF (KEY SPLIT UPPER KEY SIDE)



MODULATION ON/OFF is either ON or OFF for both the UPPER and LOWER keyboards.

13 MODE FLAG



Any one of the three low order bits must be i. The NORMAL mode is assumed when all three low order bits are 0.

14 NORMAL PROGRAM NO.

TONE 1 PROGRAM NO.
TONE 2 PROGRAM NO.
LOWER PROGRAM NO.
UPPER PROGRAM NO.

$0 \sim 7_{10}$	CARTRIDGE BANK	A-1~A-8
$8 \sim 15_{10}$	CARTRIDGE BANK	B-1~B-8
$16 \sim 23_{10}$	CARTRIDGE BANK	C-1~C-8
$24 \sim 31_{10}$	CARTRIDGE BANK	D-1~D-8
$32 \sim 39_{10}$	CARTRIDGE BANK	E-1~E-8
$40 \sim 47_{10}$	CARTRIDGE BANK	F-1~F-8
$48 \sim 55_{10}$	CARTRIDGE BANK	G-1~G-8
$56 \sim 63_{10}$	CARTRIDGE BANK	H-1~H-8
$64 \sim 71_{10}$	INTERNAL BANK	A-1~A-8
$72 \sim 79_{10}$	INTERNAL BANK	B-1~B-8
$80 \sim 87_{10}$	INTERNAL BANK	C-1~C-8
$88 \sim 95_{10}$	INTERNAL BANK	D-1~D-8
$96 \sim 103_{10}$	INTERNAL BANK	E-1~E-8
$104 \sim 111_{10}$	INTERNAL BANK	F-1~F-8
$112 \sim 119_{10}$	INTERNAL BANK	G-1~G-8
$120 \sim 127_{10}$	INTERNAL BANK	H-1~H-8

15 TONE 1 LEVEL

TONE 2 LEVEL
LOWER LEVEL
UPPER LEVEL

→ $1 \sim 15_{10}$: LEVEL 1~15

16 TONE 2 FINE (TONE MIX)

→ $0 \sim 63_{10}$: FINE 0~60

FINE 0 ~ 60

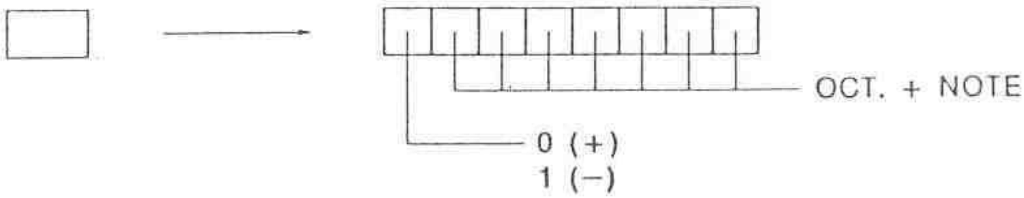
							LSB
						0	0

LSB
0 0

The table below shows the relationship between the FINE $0 \sim 60_{10}$ and MIDI send data $0 \sim 63_{10}$

FINE DATA $0 \sim 60_{10}$	$0_{10} \sim 15_{10}$	$16_{10} \sim 30_{10}$	$31_{10} \sim 45_{10}$	$46_{10} \sim 60_{10}$
MIDI SENT DATA $0 \sim 63_{10}$	$0_{10} \sim 15_{10}$	$17_{10} \sim 31_{10}$	$33_{10} \sim 47_{10}$	$49_{10} \sim 63_{10}$

17 TONE OCT. + NOTE (TONE MIX)



7 bits	OCT.	NOTE
0~11	0	$0 \sim 11_{10}$
12~23	1	$0 \sim 11_{10}$
24~35	2	$0 \sim 11_{10}$
36~47	3	$0 \sim 11_{10}$

18 LOWER OCT. SHIFT (KEY SPLIT)

0 ~ 2 : OCT. SHIT + 0 ~ + 2

19 UPPER OCT. SHIFT (KEY SPLIT)

0, 81, 82 : OCT. SHIT + 0, -1, - 2

20 SPLIT POINT

$1 \sim 60_{10}$: SPLIT POINT $1 \sim 60_{10}$

END

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