
Classic 50/20 MIDI Implementation

Roland Exclusive Messages

1. Data Format for Exclusive Messages

Roland's MIDI implementation uses the following data format for all exclusive messages (type IV):

Byte	Description
F0H	Exclusive status
41H	Manufactures ID (Roland)
DEV	Device ID
MDL	Model ID
CMD	Command ID
[BODY]	Maindata
F7H	End of exclusive

MIDI status : F0H, F7H

An exclusive message must be flanked by a pair of status codes, starting with a Manufactures-ID immediately after F0H (MIDI version 1.0).

Manufactures-ID : 41H

The Manufactures-ID identifies the manufacturer of a MIDI instrument that triggers an exclusive message. Value 41H represents Roland's Manufactures-ID.

Device-ID : DEV

The Device-ID contains a unique value that identifies the individual device in the multiple implementation of MIDI instruments. It is usually set to 00H - 0FH, a value smaller by one than that of a basic channel, but value 00H - 1FH may be used for a device with multiple basic channels.

Model-ID : MDL

The Model-ID contains a value that uniquely identifies one model from another. Different models, however, may share an identical Model-ID if they handle similar data.

The Model-ID format may contain 00H in one or more places to provide an extended data field. The following are examples of valid Model-IDs, each representing a unique model:

0111
0211
0311
0011, 0111
0011, 0211
00H, 00H, 0111

Command-ID : CMD

The Command-ID indicates the function of an exclusive message. The Command-ID format may contain 00H in one or more places to provide an extended data field. The following are examples of valid Command-IDs, each representing a unique function:

0111
0211
0311
0011, 0111
00H, 02H
00H, 00H, 0111

Main data : BODY

This field contains a message to be exchanged across an interface. The exact data size and contents will vary with the Model-ID and Command-ID.

2. Address-mapped Data Transfer

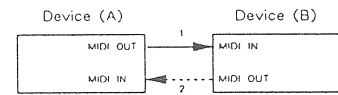
Address mapping is a technique for transferring messages conforming to the data format given in Section 1. It assigns a series of memory-resident records -- waveform and tone data, switch status, and parameters, for example -- to specific locations in a machine-dependent address space, thereby allowing access to data residing at the address a message specifies.

Address-mapped data transfer is therefore independent of models and data categories. This technique allows use of two different transfer procedures: one-way transfer and handshake transfer.

One-way transfer procedure (See Section 3 for details.)

This procedure is suited for the transfer of a small amount of data. It sends out an exclusive message completely independent of a receiving device status.

Connection Diagram

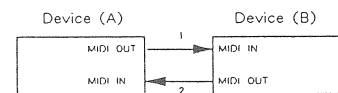


Connection point 2 is essential for "Request data" procedures. (See Section 3.)

Handshake-transfer procedure (See Section 4 for details.)

This procedure initiates a predetermined transfer sequence (handshaking) across the interface before data transfer takes place. Handshaking ensures that reliability and transfer speed are high enough to handle a large amount of data.

Connection Diagram



Connection points 1 and 2 is essential.

*There are separate Command-IDs for different transfer procedures.

*Devices A and B cannot exchange data unless they use the same transfer procedure, share identical Device-ID and Model ID, and are ready for communication.

3. One-way Transfer Procedure

This procedure sends out data all the way until it stops when the messages are so short that answerbacks need not be checked.

For long messages, however, the receiving device must acquire each message in time with the transfer sequence, which inserts intervals of at least 20 milliseconds in between.

Types of Messages

Message	Command ID
Request data 1	RQ1 (11H)
Data set 1	DT1 (12H)

Request data # 1 : RQ1 (11H)

This message is sent out when there is a need to acquire data from a device at the other end of the interface. It contains data for the address and size that specify designation and length, respectively, of data required.

On receiving an RQ1 message, the remote device checks its memory for the data address and size that satisfy the request.

If it finds them and is ready for communication, the device will transmit a "Data set # 1 (DT1)" message, which contains the requested data. Otherwise, the device will send out nothing.

Byte	Description
F0H	Exclusive status
41H	Manufactures ID (Roland)
DEV	Device ID
MDL	Model ID
11H	Command ID
aaH	Address MSB
⋮	⋮
⋮	⋮
⋮	LSB
ssH	Size MSB
⋮	⋮
⋮	⋮
⋮	LSB
sum	Check sum
F7H	End of exclusive

- *The size of the requested data does not indicate the number of bytes that will make up a DT1 message, but represents the address fields where the requested data resides.
- *Some models and data are subject to limitations in data format used for a single transaction. Requested data, for example, may have a limit in length or must be divided into predetermined address fields before it is exchanged across the interface.
- *The same number of bytes comprises address and size data, which, however, vary with the Model-ID.
- *The error checking process uses a checksum that provides a bit pattern where lower seven bits are zero when values for an address, size, and that checksum are summed.

Data set # 1 : DT1 (12H)

This message corresponds to the actual data transfer process. Because every byte in the data is assigned a unique address, a DT1 message can convey the starting address (cs) of one or more data as well as a series of data formatted in an address-dependent order.

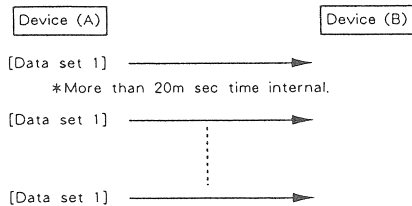
Although the MIDI standards inhibit non-real time messages from interrupting an exclusive one, some devices support a "soft-through" mechanism for such interrupts. To maintain compatibility with such devices, Roland has limited the DT1 to 256 bytes so that an excessively long message is sent out in separate segments.

Byte	Description
FOH	Exclusive
41H	Manufactures ID (Roland)
DEV	Device ID
MDL	Model ID
12H	Command ID
aaH	Address MSB
⋮	⋮
	LSB
ddH	Data
⋮	⋮
sum	Check sum
F7H	End of exclusive

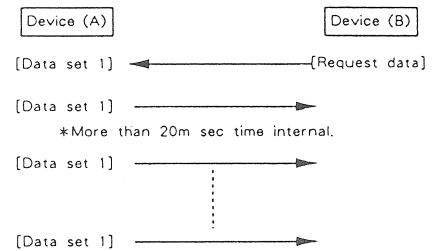
- *A DT1 message is capable of providing only the valid data among those specified by an RQ1 message.
- *Some models and data are subject to limitations in data format used for a single transaction. Requested data, for example, may have a limit in length or must be divided into predetermined address fields before it is exchanged across the interface.
- *The number of bytes comprising address data varies from one Model-ID to another.
- *The error checking process uses a checksum that provides a bit pattern where lower seven bits are zero when values for an address, size, and that checksum are summed.

Example of Message Transactions

- Device A sending data to Device B
Transfer of a DT1 message is all that takes place.



- Device B requesting data from Device A
Device B sends an RQ1 message to Device A. Checking the message, Device A sends a DT1 message back to Device B.



4. Handshake- Transfer Procedure

Handshaking is an interactive process where two devices exchange error checking signals before a message transaction takes place, thereby increasing data reliability. Unlike one-way transfer that inserts a pause between message transactions, handshake transfer allows much speedier transactions because data transfer starts once the receiving device returns a ready signal.

When it comes to handling large amounts of data--sampler waveforms and synthesizer tones over the entire range, for example--across a MIDI interface, handshaking transfer is more efficient than one-way transfer.

Types of Messages

Message	Command ID
Want to send data	WSD (40H)
Request data	ROD (41H)
Data set	DAT (42H)
Acknowledge	ACK (43H)
End of data	EOD (45H)
Communication error	ERR (4EH)
Rejection	RJC (4FH)

Want to send data : WSD (40H)

This message is sent out when data must be sent to a device at the other end of the interface. It contains data for the address and size that specify designation and length, respectively, of the data to be sent.

On receiving a WSD message, the remote device checks its memory for the specified data address and size which will satisfy the request. If it finds them and is ready for communication, the device will return an "Acknowledge (ACK)" message. Otherwise, it will return a "Rejection (RJC)" message.

Byte	Description
FOH	Exclusive status
41H	Manufactures ID (Roland)
DEV	Device ID
MDL	Model ID
40H	Command ID
aaH	Address MSB
⋮	⋮
	LSB
ssH	Size MSB
⋮	⋮
	LSB
sum	Check sum
F7H	End of exclusive

- *The size of the data to be sent does not indicate the number of bytes that make up a "Data set (DAT)" message, but represents the address fields where the data should reside.
- *Some models and data are subject to limitations in data format used for a single transaction. Requested data, for example, may have a limit in length or must be divided into predetermined address fields before it is exchanged across the interface.
- *The same number of bytes comprises address and size data, which, however, vary with the Model-ID.
- *The error checking process uses a checksum that provides a bit pattern where lower seven bits are zero when values for an address, size, and that checksum are summed.

Request data : RQD (41H)

This message is sent out when there is a need to acquire data from a device at the other end of the interface. It contains data for the address and size that specify designation and length, respectively, of data required.

On receiving an RQD message, the remote device checks its memory for the data address and size which satisfy the request. If it finds them and is ready for communication, the device will transmit a "Data set (DAT)" message, which contains the requested data. Otherwise, it will return a "Rejection (RJC)" message.

Byte	Description
F0H	Exclusive status
41H	Manufactures ID (Roland)
DEV	Device ID
MDL	Model ID
41H	Command ID
aaH	Address MSB
⋮	⋮
	LSB
ssH	Size MSB
⋮	⋮
	LSB
sum	Check sum
F7H	End of exclusive

- *The size of the requested data does not indicate the number of bytes that make up a "Data set (DAT)" message, but represents the address fields where the requested data resides.
- *Some models and data are subject to limitations in data format used for a single transaction. Requested data, for example, may have a limit in length or must be divided into predetermined address fields before it is exchanged across the interface.
- *The same number of bytes comprises address and size data, which, however, vary with the Model-ID.
- *The error checking process uses a checksum that provides a bit pattern where lower seven bits are zero when values for an address, size, and that checksum are summed.

Data set : DAT (42H)

This message corresponds to the actual data transfer process. Because every byte in the data is assigned a unique address, the message can convey the starting address (es) of one or more data as well as a series of data formatted in an address-dependent order.

Although the MIDI standards inhibit non-real time messages from interrupting an exclusive one, some devices support a "soft-through" mechanism for such interrupts. To maintain compatibility with such devices, Roland has limited the DAT to 256bytes so that an excessively long message is sent out in separate segments.

Byte	Description
F0H	Exclusive status
41H	Manufactures ID (Roland)
DEV	Device ID
MDL	Model ID
42H	Command ID
aaH	Address MSB
⋮	⋮
	LSB
ddH	Data
⋮	⋮
sum	Check sum
F7H	End of exclusive

- *A DAT message is capable of providing only the valid data among those specified by an RQD or WSD message.
- *Some models and data are subject to limitations in data format used for a single transaction. Requested data, for example, may have a limit in length or must be divided into predetermined address fields before it is exchanged across the interface.
- *The number of bytes comprising address data varies from one model ID to another.
- *The error checking process uses a checksum that provides a bit pattern where lower seven bits are zero when values for an address, size, and that checksum are summed.

Acknowledge : ACK (43H)

This message is sent out when no error was detected on reception of a WSD, DAT, "End of data (EOD)", or some other message and a requested setup or action is complete. Unless it receives an ACK message, the device at the other end will not proceed to the next operation.

Byte	Description
F0H	Exclusive status
41H	Manufactures ID (Roland)
DEV	Device ID
MDL	Model ID
43H	Command ID
F7H	End of exclusive

End of data : EOD (45H)

This message is sent out to inform a remote device of the end of a message. Communication, however, will not come to an end unless the remote device returns an ACK message even though an EOD message was transmitted.

Byte	Description
F0H	Exclusive status
41H	Manufactures ID (Roland)
DEV	Device ID
MDL	Model ID
45H	Command ID
F7H	End of exclusive

Communications error : ERR (4EH)

This message warns the remote device of a communications fault encountered during message transmission due, for example, to a checksum error. An ERR message may be replaced with a "Rejection (RJC)" one, which terminates the current message transaction in midstream.

When it receives an ERR message, the sending device may either attempt to send out the last message a second time or terminate communication by sending out an RJC message.

Byte	Description
F0H	Exclusive status
41H	Manufactures ID (Roland)
DEV	Device ID
MDL	Model ID
4EH	Command ID
F7H	End of exclusive

Rejection : RJC (4FH)

This message is sent out when there is a need to terminate communication by overriding the current message. An RJC message will be triggered when :

a WSD or RQD message has specified an illegal data address or size, or the device is not ready for communication.

an illegal number of addresses or data has been detected.

data transfer has been terminated by an operator.

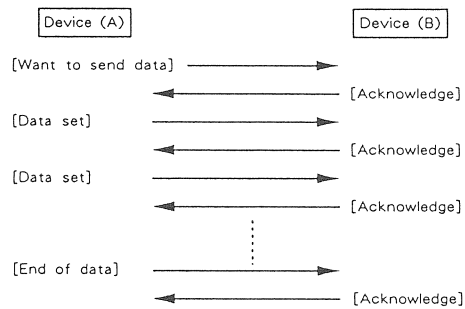
a communications error has occurred.

An ERR message may be sent out by a device on either side of the interface. Communication must be terminated immediately when either side triggers an ERR message.

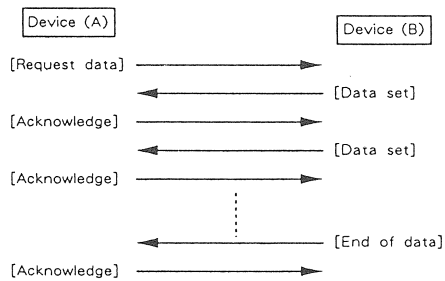
Byte	Description
F0H	Exclusive status
41H	Manufactures ID (Roland)
DEV	Device ID
MDL	Model ID
4FH	Command ID
F7H	End of exclusive

Example of Message Transactions

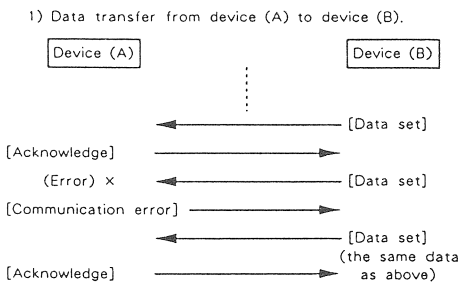
● Data transfer from device (A) to device (B).



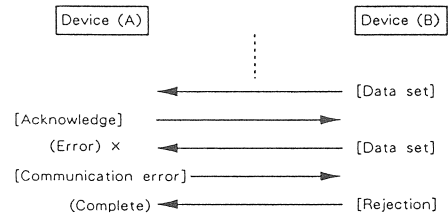
● Device (A) requests and receives data from device (B).



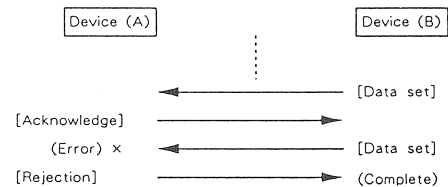
● Error occurs while device (A) is receiving data from device (B).



2) Device (B) rejects the data re-transmitted, and completes data transfer.



3) Device (A) immediately completes data transfer.



1. TRANSMITTED DATA

■ Note event

Note off

Status	Second	Third
9nH	kkH	00H

kk = Note number 17H - 5EH (23 - 94)
n = MIDI Channel 0H - FH (1 - 16)

Note on

Status	Second	Third
9nH	kkH	vvH

vv = Velocity 01H - 7FH (1 - 127)

The range of note numbers can be changed by transposition.
The table below lists the degrees of the transposition.
The default value is 0.
To transpose the keyboard, hold down the TRANSPOSE/MIDI switch then press the [b] switch to key down or [#] to key up, once for on semitone.
Pressing the [b] switch more than 6 times ([#], 5 times) does not introduce further effect.
To return the keyboard back to the original notes, press the [.] .

Transposed value (semitones)	Transmitted note range
-6	23 - 83
-5	24 - 84
-4	25 - 85
-3	26 - 86
-2	27 - 87
-1	28 - 88
0	29 - 89
+1	30 - 90
+2	31 - 91
+3	32 - 92
+4	33 - 93
+5	34 - 94

■ Control change

Hol-1

tatus	Second	Third
BnH	40H	vvH

vv = 7FH : On
vv = 00H : Off

Expression

Status	Second	Third
BnH	0BH	vvH

vv = Expression 00H - 07H (0 - 127)

■ Program change

Status	Second
CnH	ppH

pp = Program Change (0 - 127)

Key	Related value
A 4	GROUP A
B 4	GROUP B
F# 3	BANK 1
G# 3	BANK 2
A# 3	BANK 3
C# 4	BANK 4
D# 4	BANK 5
F# 4	BANK 6
G# 4	BANK 7
A# 4	BANK 8
F 3	NUMBER 1
G 3	NUMBER 2
A 3	NUMBER 3
B 3	NUMBER 4
C 4	NUMBER 5
D 4	NUMBER 6
E 4	NUMBER 7
F 4	NUMBER 8

GROUP A	NUMBER	1	2	3	4	5	6	7	8
	BANK	1	2	3	4	5	6	7	8
1	0	1	2	3	4	5	6	7	
2	8	9	10	11	12	13	14	15	
3	16	17	18	19	20	21	22	23	
4	24	25	26	27	28	29	30	31	
5	32	33	34	35	36	37	38	39	
6	40	41	42	43	44	45	46	47	
7	48	49	50	51	52	53	54	55	
8	56	57	58	59	60	61	62	63	

GROUP B	NUMBER	1	2	3	4	5	6	7	8
	BANK	1	2	3	4	5	6	7	8
1	64	65	66	67	68	69	70	71	
2	72	73	74	75	76	77	78	79	
3	80	81	82	83	84	85	86	87	
4	88	89	90	91	92	93	94	95	
5	96	97	98	99	100	101	102	103	
6	104	105	106	107	108	109	110	111	
7	112	113	114	115	116	117	118	119	
8	120	121	122	123	124	125	126	127	

If the Harpsichord has been applied while the TRANSPOSE/MIDI switch is held down:
Pressing a tone selector switch calls the tone just the same as in the normal tone changing. At the same time the Program Change assigned to the tone is sent.

TO NE	PROGRAM CHANGE NUMBER
8'- I	0
8'- II	1
8'+8'	2
8'+4'	3
LUTE	4
STRINGS	5
ORGAN- I	6
ORGAN- II	7
8'- I + STRING	8
8'- II + STRINGS	9
8'+8' + STRINGS	10
8'+4' + STRINGS	11
LUTE + STRINGS	12
8'- I + ORGAN- I	16
8'- II + ORGAN- I	17
8'+8' + ORGAN- I	18
8'+4' + ORGAN- I	19
LUTE + ORGAN- I	20
8'- I + ORGAN- II	28
8'- II + ORGAN- II	29
8'+8' + ORGAN- II	30
8'+4' + ORGAN- II	31
LUTE + ORGAN- II	32

When the Harpsichord is in MULTI TIMBRE MODE, different program change number to above-mentioned is sent when tone is changed. (see MULTI TIMBRE MODE)

■ Mode message

Status	econd	Third
BnH	mmH	00H

mm = 7BH : ALL NOTES OFF +1
mm = 7CH : OMNI OFF +2
mm = 7FH : POLY ON +2

- *1 When all keys on the keyboard are released, the ALL NOTES OFF is sent.
- *2 When power is first applied or after Basic Channel is changed, OMNI OFF and POLY ON are sent in the current Basic Channel.

■ Exclusive

Status
FOH : System Exclusive
F7H : EOX (End of Exclusive)

These functions can be sent as Exclusive Message.

- Reverb Mode Change (ROOM, HALL ON/OFF)
- Reverb Decay Time Change
- Harpsichord Tone Velocity Sensitivity
- Sustaining Tone Velocity Sensitivity
- Temperament Change

(1) Reverb mode change (ROOM, HALL ON/OFF)

When ROOM or HALL switch is pressed while holding the TRANSPOSE/MIDI, respective reverb ON or OFF message is sent. This switching does not affect the internal functions.

If the Harpsichord has been applied while the TRANSPOSE/MIDI switch being held down:
Pressing reverb selector switch calls ROOM or HALL ON/OFF message transmitting, as well as internal reverb ON/OFF.

If the Harpsichord has been applied while the ROOM switch with also TRANSPOSE/MIDI being held down:
This mode setting is memorized (volatile) : Will be recalled later upon selecting this voice (tone) again and sent as the Reverb ON/OFF message.

The Exclusive Messages are following.

FOH	Status of System Exclusive
41h	Roland ID
00H	Device ID
1AH	Model ID
12H	Command ID (data set)
00H	Address (msb)
01H	Address (lsb) = Reverb select
vvH	Data vv = 00H - 7FH
ssH	Sum ss
F7H	End of Exclusive

vv = 00H : Reverb OFF
vv = 30H : ROOM ON
vv = 70H : HALL ON

(2) Reverb decay time change

When the Harpsichord has been applied while TRANSPOSE/MIDI being held down:
Pressing the tone selector switch while the ROOM or HALL switch is held down changes the internal reverb decay time (8 degrees). At the same time decay time change message is sent.

If the Harpsichord has been applied while the ROOM switch with also the TRANSPOSE/MIDI being held down:
This decay setting is memorized (volatile) : Will be recalled later upon selecting this voice (tone) again and sent as the Reverb Decay time Change message.

The Exclusive Messages are following.

```
FOH Status of System Exclusive
41h Roland ID
00H Device ID
1AH Model ID
12H Command ID (data set)
00H Address (msb)
02H Address (lsb) = Decay time select
vvH Data vv = 00H - 7FH
ssH Sum ss
F7H End of Exclusive
```

```
vv = 00H : short
vv = 10H : ↑
vv = 20H : |
vv = 30H : ↓
vv = 40H : |
vv = 50H : ↑
vv = 60H : ↓
vv = 70H : long
```

(3) Harpsichord-tone velocity sensitivity

Pressing the 8'+4' switch while the TRANSPOSE/MIDI held down calls the Harpsichord-tone velocity sensitivity OFF, and LUTE for ON. (The default is OFF)
At the same time the Velocity Sensitivity Change message is sent.

The Exclusive Messages are following.

```
FOH Status of System Exclusive
41h Rolan ID
00H Device ID
1AH Model ID
12H Command ID (data set)
00H Address (msb)
03H Address (lsb) = Reverb select
vvH Data vv = 00H - 7FH
ssH Sum ss
F7H End of Exclusive
```

```
vv = 00H : Sensitivity OFF
vv = 7FH : Sensitivity ON
```

(4) Sustaining-tone velocity sensitivity

Pressing ORGAN-1 switch while the TRANSPOSE-MIDI held down, changes the sustaining-tone velocity sensitivity OFF, and ORGAN-II for ON. (The default is OFF)
At the same time the Velocity Sensitivity Change message is sent.

The Exclusive Messages are following.

```
FOH Status of System Exclusive
41h Roland ID
00H Device ID
1AH Model ID
12H Command ID (data set)
00H Address (msb)
04H Address (lsb) = Reverb select
vvH Data vv = 00H - 7FH
ssH Sum ss
F7H End of Exclusive
```

```
vv = 00H : Sensitivity OFF
vv = 7FH : Sensitivity ON
```

(5) Temperament Change

Pressing the tone selector switch while the TEMPERAMENT switch held down calls the temperament changing.
And also, pressing the keyboard while the TEMPERAMENT held down changes the key signature of temperament.
At the same time the Temperament Change message is sent.

The Exclusive Messages are following.

```
FOH Status of System Exclusive
41h Roland ID
00H Device ID
1AH Model ID
12H Command ID (data set)
00H Address (msb)
05H Address (lsb) = Reverb select
tkH Data tk = 00H - 5BH
ssH Sum ss
F7H End of Exclusive
```

```
t = 0H - 5H : temperament select
k = 0H - bH : key signature select
```

Temperament Change values are assigned as follows.
When the EQUAL tempered tune is selected, the key signature change is ignored.

```

: C : C# : D : D# : E : F : F# : G : G# : A : A# : B :
-----
EQUAL : 00:00:00:00:00:00:00:00:00:00:00:00:00:
-----
JUST (major) : 10:11:12:13:14:15:16:17:18:19:1A:1B:
-----
JUST (minor) : 120:21:22:23:24:25:26:27:28:29:2A:2B:
-----
MEAN TONE : 30:31:32:33:34:35:36:37:38:39:3A:3B:
-----
WERCKMEISTER : 40:41:42:43:44:45:46:47:48:49:4A:4B:
-----
KIRNBERGER : 50:51:52:53:54:55:56:57:58:59:5A:5B:
```

■ Active sensing

```
Status
-----
FEH
```

2. RECOGNIZED RECEIVE DATA

■ Note event

```
Note off
Status Second Third
-----
8nH kkH vvH
9nH kkH 00H

kk = Note number 00H - 7FH ( 0 - 127 )
vv = Velocity ignored
n = MIDI Channel 0H - FH ( 1 - 16 )
```

```
Note on
Status Second Third
-----
9nH kkH vvH

vv = Velocity 01H - 7FH ( 1 - 127 )
```

Note numbers outside of the range 11 - 94 are transposed to the nearest octave inside this range, for internal voicing.
The transpose function does not affect the recognized NOTE numbers.

■ Control change

```
Hold-1
Status Second Third
-----
BnH 40H vvH

vv = 00H - 3FH : Off
vv = 40H - 7FH : On
```

If the power has been applied with the LUTE switch being held down, Hold-1 message does not affect sustaining tones.
Received message affect only MIDI note event.

Expression

```
Status Second Third
-----
BnH 0BH vvH

vv = Expression 00H - 07H ( 0 - 127 )
```

Received message affect only MIDI note event.
Expression message does not affect Harpsichord tones.

Volume

```
Status Second Third
-----
BnH 07H vvH

vv = Volume 00H - 07H ( 0 - 127 )
```

Volume message is regarded as sam as expression, and the last message has priority.

If the power has been applied while the ORGAN-1 held down :
Volume message is ignored.

■ Program change

```
Status Second
-----
CnH ppH

pp = Program Change ( 0 - 32 )
```

Ignored if the power has been applied while the HARPSICHORD 8'-1 switch being held down.

Received Program Change messages are assigned as follows.
The program numbers 13 - 15, 21 - 27, 33 - 127 are ignored.

Prog #	tone
0	8'- I
1	8'- II
2	8'+8'
3	8'+4'
4	LUTE
5	STRINGS
6	ORGAN- I
7	ORGAN- II
8	8'- I + STRINGS
9	8'- II + STRINGS
10	8'+8' + STRINGS
11	8'+4' + STRINGS
12	LUTE + STRINGS
16	8'- I + ORGAN- I
17	8'- II + ORGAN- I
18	8'+8' + ORGAN- I
19	8'+4' + ORGAN- I
20	LUTE + ORGAN- I
28	8'- I + ORGAN- II
29	8'- II + ORGAN- II
30	8'+8' + ORGAN- II
31	8'+4' + ORGAN- II
32	LUTE + ORGAN- II

When the Harpsichord is in MULTI TIMBRE MODE, different program change number to this table is recognized.
(see MULTI TIMBRE MOD)

■ Moe message

All notes off

```

Status      Second      Third
-----
BnH         7BH         00H
    
```

When the ALL NOTES OFF is recognized, all the notes which had been turned ON by received MIDI Note On messages are turned OFF. However, the notes being held on by MIDI Damper On message are not turned off until the subsequent Damper Off message.

OMNI OFF

```

Status      Second      Third
-----
BnH         7CH         00H
    
```

OMNI ON

```

Status      Second      Third
-----
BnH         7DH         00H
    
```

MONO

```

Status      Second      Third
-----
BnH         7EH         00H
    
```

POLY

```

Status      Second      Third
-----
BnH         7FH         00H
    
```

These Mode Messages (OMNI OFF, OMNI ON, MONO, POLY) are also recognized as ALL NOTES OFF as well as follows:

```

      POLY ON (127) : MONO ON (126) : MONO ON (126)
      -----
      : POLY ON (127) : mmmm = 1 : mmmm < 1
-----
OMNI OFF (124) : OMNI = OFF : OMNI = OFF : OMNI = ON
      POLY      : POLY      : POLY      : POLY
-----
OMNI ON (125) : OMNI = ON : OMNI = ON : OMNI = ON
      POLY      : POLY      : POLY      : POLY
    
```

■ Exclusive

```

Status
-----
FOH : System Exclusive
F7H : EOx ( End of Exclusive )
    
```

These functions are assigned for recognized Exclusive Message.

Multi timbre mode on/off
 Reverb Mode Change (ROOM, HALL ON/OFF)
 Reverb Decay Time Change
 Harpsichord Tone Velocity sensitivity
 Sustaining Tone Velocity Sensitivity
 Temperament Change

(1) Multi timbre mode on/off

```

FOH      Status of System Exclusive
41h      Roland ID
00H      Device ID
1AH      Model ID
12H      Command ID (data set)
00H      Address (msb)
00H      Address (lsb) = Reverb select
vvH      Data vv = 00H - 7FH
ssH      Sum ss
F7H      End of Exclusive
    
```

vv = 00H : Multi timbre mode on *
 vv = 01H - 7FH : Multi timbre mode off

* see to MULTI TIMBRE MODE

(2) Reverb Mode Change

Reverb mode change by Exclusive message is not memorized (volatile) for each tone.

```

FOH      Status of System Exclusive
41h      Roland ID
00H      Device ID
1AH      Model ID
12H      Command ID (data set)
00H      Address (msb)
01H      Address (lsb) = Reverb select
vvH      Data vv = 00H - 7FH
ssH      Sum ss
F7H      End of Exclusive
    
```

vv = 00H : reverb OFF
 vv = 01H - 3FH : ROOM ON
 vv = 40H - 7FH : HALL ON

(3) Reverb decay time change

Decay time change by Exclusive message is not memorized (volatile) for each tone.

```

FOH      Status of System Exclusive
41h      Roland ID
00H      Device ID
1AH      Model ID
12H      Command ID (data set)
00H      Address (msb)
02H      Address (lsb) = Decay time select
vvH      Data vv = 00H - 7FH
ssH      Sum ss
F7H      End of Exclusive
    
```

```

vv = 00H-0FH : short
vv = 10H-1FH : |
vv = 20H-2FH : |
vv = 30H-3FH : |
vv = 40H-4FH : |
vv = 50H-5FH : |
vv = 60H-6FH : |
vv = 70H-7FH : long
    
```

(4) Harpsichord-tone velocity sensitivity

```

FOH      Status of System Exclusive
41h      Roland ID
00H      Device ID
1AH      Model ID
12H      Command ID (data set)
00H      Address (msb)
03H      Address (lsb) = Reverb select
vvH      Data vv = 00H - 7FH
ssH      Sum ss
F7H      End of Exclusive
    
```

vv = 00H : sensitivity OFF
 vv = 01H - 7FH : sensitivity ON

(5) Sustaining-tone velocity sensitivity

```

FOH      Status of System Exclusive
41h      Roland ID
00H      Device ID
1AH      Model ID
12H      Command ID (data set)
00H      Address (msb)
04H      Address (lsb) = Reverb select
vvH      Data vv = 00H - 7FH
ssH      Sum ss
F7H      End of Exclusive
    
```

vv = 00H : sensitivity OFF
 vv = 01H - 7FH : sensitivity ON

(6) Temperament Change

```

FOH      Status of System Exclusive
41h      Roland ID
00H      Device ID
1AH      Model ID
12H      Command ID (data set)
00H      Address (msb)
05H      Address (lsb) = Reverb select
tkH      Data tk = 00H - 5BH
ssH      Sum ss
F7H      End of Exclusive
    
```

t = 0H - 5H : temperament select
 k = 0H - bH : key signature select

Received Temperament Change messages are assigned as follows. When EQUAL tempered tune is selected, the key signature change is ignored.

```

: C : C# : D : D# : E : F : F# : G : G# : A : A# : B :
-----
EQUAL : 00:01:02:03:04:05:06:07:08:09:0A:0B:
-----
JUST (major) : 110:11:12:13:14:15:16:17:18:19:1A:1B:
-----
JUST (minor) : 20:21:22:23:24:25:26:27:28:29:2A:2B:
-----
MEAN TONE : 30:31:32:33:34:35:36:37:38:39:3A:3B:
-----
WERCKMEISTER : 40:41:42:43:44:45:46:47:48:49:4A:4B:
-----
KIRNBERGER : 50:51:52:53:54:55:56:57:58:59:5A:5B:
    
```

■ Active sensing

```

Status
-----
FEH
    
```

3. BASIC CHANNEL SETTING

When the power is first applied, the Basic Channel is normally set to 1, ODE 3 (OMNI OFF, POLY ON). However, the Basic Channel may be changed when the following key on the keyboard is pressed while the TRANPOSE/MIDI switch is held down, with both receiving and transmitting modes set to MODE 3 (OMNI OFF, POLY ON). Pressing the highest key (F6) on the keyboard while holding TRANPOSE switch sets the Basic Channels (both transmit, receive) to 1, MODE 1 (OMNI ON, POLY ON).

key	basic channel	omni
Power-on	1	OFF
F 1	1	OFF
F# 1	2	OFF
G 1	3	OFF
G# 1	4	OFF
A 1	5	OFF
A# 1	6	OFF
B 1	7	OFF
C 2	8	OFF
C# 2	9	OFF
D 2	10	OFF
D# 2	11	OFF
E 2	12	OFF
F 2	13	OFF
F# 2	14	OFF
G 2	15	OFF
G# 2	16	OFF
F 6	1	ON

When the Harpsichord applied to MULTI TIMBRE MODE, channel number is fixed.
 (see MULTI TIMBRE MODE)

4. MULTI TIMBRE MODE

If the power has been applied while the 8'-II switch is held down, or the System Exclusive Message (Multi Timbre ON) has been received the Harpsichord turns to MULTI TIMBRE MODE.

Also, if the power is applied again while no switches or any except 8'-II are held down, or the System Exclusive Message (Multi Timbre OFF) has been received, the Harpsichord returns from this mode.

■ Basic channel and Program change

If the Harpsichord has been applied for MULTI TIMBRE MODE, channel 11 is assigned to Harpsichord tones, and channel 14 to sustaining tones.

These channels are fixed, (cannot be changed).

The fixed program number is assigned to each tone.

Pressing the tone selector switch automatically sets the respective Basic Channel (11 or 14), and sends the Program Change message through the channel.

The assigned channel number and program number is as follows.

tone	channel	Prog #
8'-I	11	0
8'-II	11	1
8'+8'	11	2
8'+4'	11	3
LUTE	11	4
STRINGS	14	48
ORGAN-I	14	64
ORGAN-II	14	65

Ignored received message except above-mentioned channel and program number.

■ Note event

The note event is sent through the channel assigned to the tone selected at the present time.

Ignored received message except channel 11 or 14.

■ Control change

Hold-1

Hold-1 is sent through both channel (11 and 14), if any Basic Channel is set.

Received hold-1 individually affect each tone.

Expression

Expression always sent in channel 14.

Ignored received message through channel 11.

Hold-1 and expression can be recognized individually as manual and MIDI message.

■ Mode message

Cannot be recognized Mode Messages, always in Mode 3 (OMNI OFF POLY).

MIDI Implementation Chart

Function...		Transmitted	Recognized	Remarks
Basic Channel	Default Changed	1 1-16	1 1-16	
Mode	Default Messages Altered	3 POLY, OMNI OFF *****	3 POLY, OMNI ON/OFF MONO (M≠1) → 1, (M=1) → 3	
Note Number	True Voice	23-94 *****	0-127 11-94	
Velocity	Note ON Note OFF	○ × (9n v=0)	○ ×	V=1-127
After Touch	Key's Ch's	× ×	× ×	
Pitch Bender		×	×	
Control Change		7 ×	○	Volume Expression Hold 1
		11 ○	○	
		64 ○	○	
Prog Change	True #	○ (0-127) *****	○ (0-32) can be ignored by 0-32 power-up setting	
System Exclusive		○	○	
System Common	Song Pos Song Sel Tune	× × ×	× × ×	
System Real Time	Clock Commands	× ×	× ×	
Aux Message	Local ON/OFF All Notes OFF Active Sense Reset	× ○ ○ ×	× ○ (123-127) ○ ×	
Notes		When power on, ch-1 OMNI OFF and POLY are sent. When Basic channel is changed, Mode is set to 3.		

Mode 1 : OMNI ON, POLY
 Mode 3 : OMNI OFF, POLY

Mode 2 : OMNI ON, MONO
 Mode 4 : OMNI OFF, MONO

○ : Yes
 × : No

