

1. TRANSMITTED DATA (Synthesizer Section)

Note Event

Note off

Status	Second	Third
9nH	kkH	00H
kk = Note number n = MIDI channel		
18H-6CH (24-108) 0H-FH (1-16)		

Note on

Status	Second	Third
9nH	kkH	vvH
kk = Note number vv = Velocity n = MIDI channel		
18H-6CH (24-108) 01H-7FH (1-127) 0H-FH (1-16)		

Control Change

Modulation depth

Status	Second	Third
BnH	01H	vvH
vv = Modulation depth n = MIDI channel		
00H-7FH (0-127) 0H-FH (1-16)		

In Performance mode, transmitted when MIDI Modulation function is on.
In Multi timbral mode, transmitted on both upper and lower MIDI TX channels of the keyboard.
D-20 does not transmit this message repeatedly if both channels are the same.

Hold 1

Status	Second	Third
BnH	40H	vvH
vv = 00H (0) : Off vv = 7FH (127) : On n = MIDI channel		
0H-FH (1-16)		

In Performance mode, transmitted when MIDI Hold function is 0.
In Multi timbral mode, transmitted on the MIDI TX channel of upper and lower sides of the keyboard.
D-20 does not transmit this message repeatedly if both channels are the same.

Reset all controllers

Status	Second	Third
BnH	79H	00H
n = MIDI channel		
0H-FH (1-16)		

Transmitted upon changing modes (Performance ↔ Multi timbral) or MIDI channels (on the previous channel).

Program Change

Patch Timbre change

Status	Second	Third
CnH	ppH	
pp = Program number n = MIDI channel		
00H-7FH (0-127) 0H-FH (1-16)		

In Performance mode, transmitted when MIDI Program change function is on.
In Multi timbral mode and when the LCD is showing the status of either of upper or lower keyboard, transmitted on the MIDI TX channel assigned to the keyboard.

Pitch Bender Change

Pitch bender

Status	Second	Third
EnH	vvH	vvH
vv = Pitch bender change value n = MIDI channel		
0H-FH (1-16)		

In Performance mode, transmitted when MIDI Bender function is on.
In Multi timbral mode, transmitted on the MIDI TX channel of both upper and lower sides of keyboard.
Transmitted only once if both TX channels are the same.

pp	A/B	BANK	NUMBER
00H (00)	A	1	1
:	:	:	:
8FH (63)	A	8	8
40H (64)	B	1	1
:	:	:	:
7FH (127)	B	8	8

Mode Message

All notes off

Status	Second	Third
BnH	7BH	00H
n = MIDI channel		
0H-FH (1-16)		

When MIDI All notes off function is on, will be transmitted upon release of all the keys after pressing a key(s).

OMNI off

Status	Second	Third
BnH	7CH	00H
n = MIDI channel		
0H-FH (1-16)		

Transmitted on power-up or when MIDI TX channel is changed to the new channel (always accompanied by "POLY").
In Multi timbral mode, transmitted on the MIDI TX channel of both upper side and lower side of keyboard.
Transmitted only once if both channels are the same.

Poly

Status	Second	Third
BnH	7FH	00H
n = MIDI channel		
0H-FH (1-16)		

Transmitted on power-up or when MIDI TX channel is changed to the new channel. (Always accompanied by "OMNI OFF".)
In Multi timbral mode, transmitted on the MIDI TX channel of both upper side and lower side of keyboard.
Transmitted only once if both channels are the same.

Exclusive

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

A set of Patch Timbre parameters is transmitted when MIDI Patch dump function is on.
The contents in Device-ID is either of the following two: unit number and MIDI channel number. The type of the information in the Device-ID can be determined from the display mode:

When display is showing,
(in Multi timbral mode)
Part --- unit number less 1
Keyboard status --- MIDI channel less 1
(in Performance mode)
unit number less 1
Also used for Bulk dump/load operation.
Refer to Section 7 for details.

Active Sensing

Status
FEH : Active sensing

Transmitted for checking MIDI connection between D-20 and external equipment. Cannot be transmitted during disk operation in data transfer mode.

2. TRANSMITTED DATA (Rhythm Section)

■ Note Event

Note off

Status	Second	Third
9nH	kkH	00H

kk=Note number 18H-6CH (24-108)
n=MIDI channel 0H-FH (1-16)

Note on

Status	Second	Third
9nH	kkH	vvH

kk=Note number 18H-6CH (24-108)
vv=Velocity 01H-7FH (1-127)
n=MIDI channel 0H-FH (1-16)

Transmitted on the MIDI channel being assigned to rhythm part when a rhythm pattern is played in internal clock mode.

■ Exclusive

Status
F0H: System exclusive
F7H: EXX (End of exclusive)

Used for Bulk dump/load operation.
Refer to Section 7 for details.

■ Timing Clock

Status
F8H

Transmitted only when Clock mode is Internal.

■ Start

Status
FAH

Transmitted only when in Internal clock mode.
Panel operation: Press Start button while holding Stop button.

■ Continue

Status
FBH

Transmitted only when in Internal clock mode.
Panel operation: Press Start button.

■ Stop

Status
FCH

Transmitted only when in Internal clock mode.
Panel operation: Press Stop button.

3. TRANSMITTED DATA (Sequencer Section)

The sequencer has 9 tracks: 8 for 8 synth parts and one for seq. of rhythm.

3.1 TRANSMITTED VOICE MESSAGES IN PLAYBACK

Muting a track will enable D 20 to transmit data stored in that track --- on the MIDI channel set by MIDI function in Multi timbral mode.

■ Note Event

Note off

Status	Second	Third
9nH	kkH	00H
kk=Note number		00H-7FH (0-127)
n=MIDI channel		0H-FH (1-16)

Note on

Status	Second	Third
9nH	kkH	vvH
kk=Note number		00H-7FH (0-127)
vv=Velocity		01H-7FH (1-127)
n=MIDI channel		0H-FH (1-16)

■ Control Change

Modulation depth

Status	Second	Third
BnH	01H	vvH
vv=Modulation depth		00H-7FH (0-127)
n=MIDI channel		0H-FH (1-16)

Data entry

Status	Second	Third
BnH	06H	vvH
vv=Value of RPC		00H-7FH (0-127)
n=MIDI channel		0H-FH (1-16)

Main volume

Status	Second	Third
BnH	07H	vvH
vv=Volume value		00H-7FH (0-127)
n=MIDI channel		0H-FH (1-16)

Panpot

Status	Second	Third
BnH	0AH	vvH
vv=Panpot value		00H-7FH (0-127)
n=MIDI channel		0H-FH (1-16)

Expression

Status	Second	Third
BnH	0BH	vvH
vv=Expression		00H-7FH (0-127)
n=MIDI channel		0H-FH (1-16)

Hold-1

Status	Second	Third
BnH	40H	vvH
vv=00H-3FH (0-63): Off		
vv=40H-7FH (64-127): On		
n=MIDI channel		0H-FH (1-16)

RPC LSB

Status	Second	Third
BnH	64H	vvH
vv=LSB of the parameter number controlled by RPC		00H-7FH (0-127)
n=MIDI channel		0H-FH (1-16)

RPC MSB

Status	Second	Third
BnH	65H	vvH

vv=MSB of the parameter number controlled by RPC
00H~7FH (0~127)
n=MIDI channel 0H~FH (1~16)

Program Change

Patch Timbre change

Status	Second
CnH	ppH

pp=Program number 00H~7FH (0~127)
n=MIDI channel 0H~FH (1~16)

Pitch Bender Change

Pitch bender

Status	Second	Third
EnH	vvH	vvH

vv=Pitch bender change value
n=MIDI channel 0H~FH (1~16)

3.2 GENERATED MESSAGES

Mode Message

All notes off

Status	Second	Third
BnH	7BH	00H

n=MIDI channel 0H~FH (1~16)

Transmitted when all notes in a muted track have been turned off with MIDI All Notes Off function set at On. Transmitted channel: Set by MIDI function in Multi timbral mode.

Timing Clock

Status
F8H

Transmitted only when in Internal clock mode.

Start

Status
FAH

Transmitted only when in Internal clock mode.
Panel operation: Press Start button while holding Stop button.

Continue

Status
FBH

Transmitted only when in Internal clock mode.
Panel operation: Press Start button.

Stop

Status
FCH

Transmitted only when in Internal clock mode.
Panel operation: Press Stop button.

4. RECOGNIZED RECEIVE DATA (Synthesizer Section)

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

kk=Note number 00H~7FH (0~127)
vv=Velocity 01H~7FH (1~127)
n=MIDI channel 0H~FH (1~16)

Note numbers outside of the range 12~108 are transposed to the nearest octave inside the range.

Control Change

Modulation depth

Status	Second	Third
BnH	01H	vvH

vv=Modulation depth 00H~7FH (0~127)
n=MIDI channel 0H~FH (1~16)

In Performance mode, recognized when MIDI Modulation function is on.
In Multi timbral mode, always recognized.

Data entry

Status	Second	Third
BnH	06H	vvH

vv=Value of RPC 00H~18H (0~24)
n=MIDI channel 0H~FH (1~16)

Recognized a value corresponding to the parameter specified by RPC.
See RPC MSB section.

Main volume

Status	Second	Third
BnH	07H	vvH

vv=Volume value 00H~7FH (0~127)
n=MIDI channel 0H~FH (1~16)

In Performance mode, recognized when MIDI Volume function is on.
In Multi timbral mode, always recognized.
Can control the volume of the Parts played through the same MIDI channel.
The maximum volume is determined by the Volume knob and Expression message.

Panpot

Status	Second	Third
BnH	0AH	vvH

vv=Panpot value 00H~7FH (0~127)
n=MIDI channel 0H~FH (1~16)

Ignored when in Performance mode.
Moving direction of sound is as follows.

0=LEFT, 63=CENTER, 127=RIGHT

Expression

Status	Second	Third
BnH	0BH	vvH

vv=Expression 00H~7FH (0~127)
n=MIDI channel 0H~FH (1~16)

Can control the volume of the parts played through the same MIDI channel.
The maximum volume is determined by the Volume knob and Main volume message.

Hold 1

Status	Second	Third
BnH	40H	vvH

vv=00H-3FH (0-63): Off
 vv=40H-7FH (64-127): On
 n=MIDI channel 0H-FH (1-16)

In Performance mode, recognized when MIDI Hold function is on.
 In Multi timbral mode, always recognized.

RPC LSB

Status	Second	Third
BnH	64H	vvH

vv=LSB of the parameter number controlled by RPC
 n=MIDI channel 0H-FH (1-16)

See RPC MSB section.

RPC MSB

Status	Second	Third
BnH	65H	vvH

vv=MSB of the parameter number controlled by RPC
 n=MIDI channel 0H-FH (1-16)

Using MIDI RPC, parameters can be changed by Control change message. RPC MSB and LSB specify the parameter to be controlled, while Data entry sets the parameter value.

RPC MSB LSB	Data entry	Description
00H 00H	vvH	Bender Range (vv=0-24)

Reset all controllers

Status	Second	Third
BnH	79H	00H

n=MIDI channel 0H-FH (1-16)

When Reset all controllers is recognized, controllers are set to the following value.

Controller	Setting
Modulation Depth	OFF (0)
Main Volume	MAX (127)
Expression	MAX (127)
Hold1	OFF (0)
Pitch Bender Change	CENTER

Program Change

Patch/Timbre change

Status	Second
CnH	ppH

pp=Program number 00H-7FH (0-127)
 n=MIDI channel 0H-FH (1-16)

In Performance mode, recognized when MIDI Prog. Change function is on and the Patch is changed.

In Multi timbral mode, always recognized and the Timbre is changed.

Cannot switch between Internal and Card through MIDI Program change message.

pp	A/B	BANK	NUMBER
00H (00)	A	1	1
:	:	:	:
3FH (63)	A	8	8
40H (64)	B	1	1
:	:	:	:
7FH (127)	B	8	8

Pitch Bender Change

Pitch bender

Status	Second	Third
EnH	vvH	vvH

vv,vv=Pitch bender change value
 n=MIDI channel 0H-FH (1-16)

In Performance mode, recognized when MIDI Bender function is on.

In Multi timbral mode, always recognized.

Mode Message

Local control

Status	Second	Third
BnH	7AH	vvH

vv=00H (0): Off
 vv=7FH (127): On
 n=MIDI Channel 0H-FH (1-16)

Recognized in performance mode only.

All notes off

Status	Second	Third
BnH	7BH	00H

n=MIDI channel 0H-FH (1-16)

When All notes off is recognized, all the notes which have been turned on by Note on message are turned off.

OMNI off

Status	Second	Third
BnH	7CH	00H

n=MIDI channel 0H-FH (1-16)

Recognized as All notes off only.
 The D-20 stays in MODE 3.

OMNI on

Status	Second	Third
BnH	7DH	00H

n=MIDI channel 0H-FH (1-16)

Recognized as All notes off only.
 The D-20 stays in MODE 3.

MONO

Status	Second	Third
BnH	7EH	mmH

mm=MONO channel range ignored
 n=MIDI channel 0H-FH (1-16)

Recognized as All notes off only.
 The D-20 stays in MODE 3.

POLY

Status	Second	Third
BnH	7FH	00H

n=MIDI channel 0H-FH (1-16)

Recognized as All notes off only.
 The D-20 stays in mode 3.

Exclusive

Status
F0H: System exclusive
F7H: BOX (End of exclusive)

A set of Patch, Timbre parameters will be received when MIDI Exclusive function is on.

When in Multi timbral mode and if Device-ID contains "MIDI Channel number less 1", the timbre parameters enter into the parts of the same MIDI channel; if Device-ID contains "Unit number less 1", into the parts specified by address in the exclusive message.

In performance mode "Unit number less 1" is effective.

Also used for Bulk dump/load operation.
 Refer to Section 7 for details.

Active Sensing

Status
FEH: Active sensing

Having received this message, the D-20 expects to accept status in data in sequence, at least within 300ms intervals. If the unit fails to receive a message more than after the previous one, it judges there is a problem somewhere and stops monitoring the current sound and stopping 300ms interval monitoring of the next status.

5. RECOGNIZED RECEIVE DATA (Rhythm Section)

■ Note Event

Note off

Status	Second	Third
8nH	kkH	vvH
9nH	kkH	00H

kk=Note number 18H-6CH (24-108)
 vv=Velocity ignored
 n=MIDI channel 0H-FH (1-16)

Note on

Status	Second	Third
9nH	kkH	vvH

kk=Note number 18H-6CH (24-108)
 vv=Velocity 01H-7FH (1-127)
 n=MIDI channel 0H-FH (1-16)

Note numbers outside of the range 24-108 are ignored.

■ Control Change

Data entry

Status	Second	Third
BnH	06H	vvH

vv=Value of RPC 00H-18H (0-24)
 n=MIDI channel 0H-FH (1-16)

Recognized as a value corresponding to the parameter specified by RPC.

Main volume

Status	Second	Third
BnH	07H	vvH

vv=Volume value 00H-7FH (0-127)
 n=MIDI channel 0H-FH (1-16)

Can control the volume of the Rhythm section.
 The maximum volume is determined by the Volume knob setting and Expression message.

Expression

Status	Second	Third
BnH	0BH	vvH

vv=Expression 00H-7FH (0-127)
 n=MIDI channel 0H-FH (1-16)

Can control the volume of the Rhythm section.
 The maximum volume is determined by the volume knob setting and Main volume message.

RPC LSB

Status	Second	Third
BnH	64H	vvH

vv=LSB of parameter number controlled by RPC
 n=MIDI channel 0H-FH (1-16)

See RPC MSB section.

RPC MSB

Status	Second	Third
BnH	65H	vvH

vv=MSB of parameter number controlled by RPC
 n=MIDI channel 0H-FH (1-16)

Using MIDI RPC, parameters can be changed by Control change messages. RPC MSB and LSB specify the parameter to be controlled, and Data entry shows the parameter value.

RPC MSB LSB	Data entry	Description
00H 00H	vvH	Bender Range (vv=0-24)

Reset all controllers

Status	Second	Third
BnH	79H	00H

When Reset All Controllers is recognized, each of the following controllers is set as follows.

Controller	setting
Main volume	MAX (127)
Expression	MAX (127)
Pitch bender change	CENTER

■ Pitch Bender Change

Pitch bender

Status	Second	Third
EnH	vvH	vvH

vv vv=Pitch bender change value
 n=MIDI channel 0H-FH (1-16)

■ Exclusive

Status
F0H : System exclusive
F7H : EOX (End of exclusive)

Used for Bulk dump/load operation.
 Refer to Section 7 for details.

■ Timing Clock

Status
F8H

Recognized only when Clock mode is MIDI.

■ Start

Status
FAH

Recognized only when Clock mode is MIDI.

■ Continue

Status
FBH

Recognized only when Clock mode is MIDI.

■ Stop

Status
FCH

Recognized only when Clock mode is MIDI.

6. RECOGNIZED RECEIVE DATA (Sequencer Section)

6.1 RECORDED MESSAGES

During external recording, each of the following messages is recorded onto the track assigned to the MIDI channel in a part. The MIDI channel is the channel set by MIDI function in Multi timbral mode.

■ 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

kk=Note number 00H-7FH (0-127)
vv=Velocity 01H-7FH (1-127)
n=MIDI channel 0H-FH (1-16)

■ Control Change

Modulation depth

Status	Second	Third
BnH	01H	vvH

vv=Modulation depth 00H-7FH (0-127)
n=MIDI channel 0H-FH (1-16)

Data entry

Status	Second	Third
BnH	06H	vvH

vv=Value of RPC 00H-7FH (0-127)
n=MIDI channel 0H-FH (1-16)

Main volume

Status	Second	Third
BnH	07H	vvH

vv=Volume value 00H-7FH (0-127)
n=MIDI channel 0H-FH (1-16)

Panpot

Status	Second	Third
BnH	0AH	vvH

vv=Panpot value 00H-7FH (0-127)
n=MIDI channel 0H-FH (1-16)

Expression

Status	Second	Third
BnH	0BH	vvH

vv=Expression 00H-7FH (0-127)
n=MIDI channel 0H-FH (1-16)

Hold-1

Status	Second	Third
BnH	40H	vvH

vv=00H-3FH (0-63): Off
vv=40H-7FH (64-127): On
n=MIDI channel 0H-FH (1-16)

RPC LSB

Status	Second	Third
BnH	64H	vvH

vv=LSB of the parameter number controlled by RPC
00H-7FH (0-127)
n=MIDI channel 0H-FH (1-16)

RPC MSB

Status	Second	Third
BnH	65H	vvH

vv=MSB of the parameter number controlled by RPC
00H-7FH (0-127)
n=MIDI channel 0H-FH (1-16)

■ Program Change

Patch/Timbre change

Status	Second
CnH	ppH

pp=Program number 00H-7FH (0-127)
n=MIDI channel 0H-FH (1-16)

■ Pitch bender change

Pitch bender

Status	Second	Third
EnH	vvH	vvH

vv=Pitch bender change value
n=MIDI channel 0H-FH (1-16)

6.2 RECOGNIZED DATA IN RECORDING

During external recording, following messages are recognized but not memorized as performance information. Receiving channel: MIDI channel set by MIDI function in Multi timbral mode.

■ Mode Message

All notes off

Status	Second	Third
BnH	7BH	00H

n=MIDI channel 0H-FH (1-16)

This message causes the D-20 to generate and retain Note off events for the notes turned on by MIDI.

OMNI off

Status	Second	Third
BnH	7CH	00H

n=MIDI channel 0H-FH (1-16)

OMNI on

Status	Second	Third
BnH	7DH	00H

n=MIDI channel 0H-FH (1-16)

MONO

Status	Second	Third
BnH	7EH	mmH

mm=MONO channel range ignored
n=MIDI channel 0H-FH (1-16)

POLY

Status	Second	Third
BnH	7FH	00H

n=MIDI channel 0H-FH (1-16)

OMNI off, OMNI on, POLY and MONO are recognized as All notes off only.

6.3 Recognized Synchronizing Messages

■ Timing Clock

Status
F&H

Recognized only when Clock mode is MIDI.

■ Start

Status
FAH

Recognized only when Clock mode is MIDI.

■ Continue

Status
FBH

Recognized only when Clock mode is MIDI.

■ Stop

Status
FCH

Recognized only when Clock mode is MIDI.

7. EXCLUSIVE COMMUNICATION

A set of parameters of a patch or timbre can be transmitted to / from D-20 using one way MIDI exclusive message. Bulk dumping / loading of internal memory can be performed using either of one way or handshaking communication.

Model ID# in the exclusive message: 16H

In addition to usual MIDI channel, each D-20 can be provided with a unique ID# called unit # through which any part is made accessible independently of its MIDI channel.

MIDI channel: 1-16 Unit #: 17-32

Whether to use MIDI channel or unit # is dependent on application -- refer to description on each message.

NOTE: MIDI standard states that channel starts with "0". So the actual Device # is a number that is "1" subtracted from the above-mentioned channel number or unit #.

■ One-Way Communication

Request data RQ1 11H

When the RQ1 received contains start address listed in the Parameter base address table; and address size is 1 or more, D-20 sends the data stored in that address location and the subsequent locations, if any.

Byte	Description
F0H	Exclusive status
41H	Manufactures ID (Roland)
DEV	Device ID
16H	Model ID
11H	Command ID
aaH	Address MSB *7-1
aa1	Address
aaH	Address LSB
ss1	Size MSB
ssH	Size
ssH	Size LSB
sum	Check sum
F7H	End of exclusive

Data set 1 DT1 12H

When D-20 is receiver:

- D-20 recognizes this message when it has a unit # (17-32) which is indicated on MIDI function display. If the address specified in the message corresponds to the current mode (Performance or Multi timbral) parameter base address, D-20 stores the data into that and subsequent address locations.
Device-ID# = MIDI channel # less 1 or Unit # less 1
- When D-20 receives this message while executing one way bulk loading in data transfer mode with or without having unit #; And if the address specified in the message corresponds to one of the following parameter base addresses, D-20 stores coming data into that and subsequent address locations.
Timbre memory
Patch memory
Tone memory
Rhythm setup
Rhythm pattern
Rhythm track
System area
Device ID#
When unit # is specified by MIDI function: Unit # less 1. If not specified: 10H

When D-20 is transmitter:

- With unit # (17-32) set
Transmits data directed by RQ1.
Device-ID# = Unit # less 1
- 1) With unit # (17-32) set and Patch dump on (Performance mode) Modifying timbre from the D-20 panel causes it to send program change message and parameter data of a patch.
2) With unit # (17-32) set and Timbre dump on (Multi timbral mode) Modifying timbre from the D-20 panel causes it to send program change message and parameter data of a timbre.
Device-ID#:
Performance mode -- Unit # less 1
Multi timbral mode ----
LCD is showing part status: Unit # less 1
LCD is showing keyboard: Transmitting channel number less 1
- D-20 sends this message when one way dump is executed in Data transfer mode.
Transferable addresses:
Timbre memory
Patch memory
Tone memory
Rhythm setup
Rhythm pattern
Rhythm track
System area
Device-ID#:
With Unit # set -- Unit # less 1
Without Unit # ---- 10H

Refer to Section 8 Parameter Address Map for transferable parameters.

Byte	Description
F0H	Exclusive status
41H	Manufactures ID (Roland)
DEV	Device ID
16H	Model ID
12H	Command ID
aa1	Address MSB *7-1
aaH	Address
aaH	Address LSB
ddH	Data *7-2
:	:
sum	Check sum
F7H	End of exclusive

■ Handshake Communication

Bulk dump / load to an from D-20 through handshaking communication in Data transfer mode starts with the following message.

Device-ID#:
With Unit # set Unit # less 1
Without Unit # ---- 10H

Addresses containable in the bulk dump / load messages:

Timbre memory
Patch memory
Tone memory
Rhythm setup
Rhythm pattern
Rhythm track
System area

Want to send data WSD 40H

D-20 sends acknowledge upon receiving this message and waits for coming data.

Byte	Description
F0H	Exclusive status
41H	Manufactures ID (Roland)
DEV	Device ID
16H	Model ID
40H	Command ID
aa1	Address MSB *7-1
aaH	Address
aa1	Address LSB
ssH	Size MSB
ssH	Size
ssH	Size LSB
sum	Check sum
F7H	End of exclusive

Request data RQD 41H

When the RQD received contains start address listed in the Parameter base address table; and the address size is 1 or more, D-20 sends the data stored in that and subsequent address locations, if any.

Byte	Description
F0H	Exclusive status
41H	Manufactures ID (Roland)
DEV	Device ID
16H	Model ID
41H	Command ID
aaH	Address MSB *7-1
aaH	Address
aaH	Address LSB
ssH	Size MSB
ssH	Size
ssH	Size LSB
sum	Check sum
F7H	End of exclusive

Data set DAT 42H

When the DAT received contains address listed in the Parameter base address table, D-20 stores the data into that address location.

Byte	Description
F0H	Exclusive status
41H	Manufactures ID (Roland)
DEV	Device ID
16H	Model ID
42H	Command ID
aaH	Address MSB *7-1
aaH	Address
aaH	Address LSB
ddH	Data *7-2
:	:
sum	Check sum
F7H	End of exclusive

Acknowledge ACK 43H

Upon receiving this message in reply to DAT, D-20 sends the next data; when receives in reply to DOD, ceases current handshaking communication. D-20 sends this message upon receipt of WSD or DAT.

Byte	Description
F0H	Exclusive status
41H	Manufactures ID (Roland)
DEV	Device ID
16H	Model ID
43H	Command ID
F7H	End of exclusive

End of data EOD 45H

Upon receipt of this message, D-20 sends acknowledge and terminates the current handshaking communication.

Byte	Description
F0H	Exclusive status
41H	Manufactures ID (Roland)
DEV	Device ID
16H	Model ID
45H	Command ID
F7H	End of exclusive

Communication error ERR 4EH

Should failure in data reception occur (e.g. disagreement of checksum), D-20 sends this message.

If D-20 receives this message, it sends the last message again.

Byte	Description
F0H	Exclusive status
41H	Manufactures ID (Roland)
DEV	Device ID
16H	Model ID
4EH	Command ID
F7H	End of exclusive

Rejection RJC 4FH

D-20 ends communication upon receipt of this message.

Byte	Description
F0H	Exclusive status
41H	Manufactures ID (Roland)
DEV	Device ID
16H	Model ID
4FH	Command ID
F7H	End of exclusive

- *7-1 Address and size must specify the address where data exist.
*7-2 If the receiving data are system partial parameters, D-20 recognizes these data only after it has received all the partial reserve parameters. (See *8-8 System area.)

8. PARAMETER ADDRESS MAP

Addresses are shown in 7-bit hexadecimal.

Address	MSB	LSB
Binary	0aaa aaaa	0bbb bbbb
7-bit hex.	AA	BB CC

The actual address of a parameter in a block is the sum of the start address of each block and one or more offset address.

Parameters marked by *8-1 have two offset addresses: one in the table in *8-1 and the other one in the Common parameter table or in the Partial parameter table.

Parameter base address

Temporary area (Accessible on each basic channel)

Start address	Description	
00 00 00	Timbre Temporary Area	(synth part) *8-3
01 00 00	Setup Temporary Area	(rhythm part) *8-2
02 00 00	Tone Temporary Area	(synth part) *8-1

Whole part (Accessible on UNIT#)

Start address	Description	
03 00 00	Timbre Temporary Area	(part 1) *8-3
03 00 10	Timbre Temporary Area	(part 2)
:	:	:
03 00 60	Timbre Temporary Area	(part 7)
03 00 70	Timbre Temporary Area	(part 8)
03 01 00	Timbre Temporary Area	(rhythm part)
03 01 10	Rhythm Setup Temporary Area	*8-2
03 04 00	Patch Temporary Area	*8-4
04 00 00	Tone Temporary Area	(part 1, upper) *8-1
04 01 76	Tone Temporary Area	(part 2, lower)
:	:	:
04 0B 44	Tone Temporary Area	(part 7)
04 0D 3A	Tone Temporary Area	(part 8)
05 00 00	Timbre Memory #1	*8-5
05 00 08	Timbre Memory #2	
:	:	:
05 07 70	Timbre Memory #127	
05 07 78	Timbre Memory #128	
07 00 00	Patch Memory #1	*8-4
07 00 26	Patch Memory #2	
:	:	:
07 25 34	Patch Memory #127	
07 25 5A	Patch Memory #128	
08 00 00	Tone Memory #1	*8-1
08 02 00	Tone Memory #2	
:	:	:
08 7C 00	Tone Memory #63	
08 7E 00	Tone Memory #64	
09 00 00	Rhythm Setup #1	*8-2
09 00 04	Rhythm Setup #2	
:	:	:
09 02 4C	Rhythm Setup #84	
09 02 50	Rhythm Setup #85	
0A 00 00	Rhythm Pattern P-51	*8-6
0A 04 4C	Rhythm Pattern P-52	
:	:	:
0B 09 68	Rhythm Pattern P-87	
0B 0E 34	Rhythm Pattern P-88	
0C 00 00	Rhythm Track	*8-7
10 00 00	System Area	*8-8
20 00 00	Display	*8-9
40 00 00	Write Request	*8-10

Notes:

*8-1 Tone Temporary area, Tone Memory

Start address	Description	
00 00 00	Common parameter	*8-1-1
00 00 0E	Partial parameter (for Partial# 1)	*8-1-2
00 00 48	Partial parameter (for Partial# 2)	
00 01 02	Partial parameter (for Partial# 3)	
00 01 3C	Partial parameter (for Partial# 4)	

Total size = 00 01 76H

*8-1-1 Common parameter

Offset address	Description
00H 0aaa aaaa	TONE NAME 1 32 127 (ASCII)
09H 0aaa aaaa	TONE NAME 10
0AH 0000 aaaa	Structure of Partial# 1&2 0-12 (1-13)
0BH 0000 aaaa	Structure of Partial# 3&4 0-12 (1-13)
0CH 0000 aaaa	PARTIAL MUTE 0-15 (0000 1111)
0DH 0000 000a	ENV MODE 0-1 (Normal, No sustain)

Total size = 00 00 0EH

*8-1-2 Partial parameter

Offset address	Description
00 00H 0aaa aaaa	WG PITCH COARSE 0-96 (C1-C9)
00 01H 0aaa aaaa	WG PITCH FINE 0-100 (-50--50)
00 02H 000a aaaa	WG PITCH KEYFOLLOW 0-16 (1, 1/2, 1/4, 0, 1/8, 1/4, 3/8, 1/2, 5/8, 3/4, 7/8, 1, 5/4, 3/2, 2, s1, s2)
00 03H 0000 000a	WG PITCH BENDER SW 0-1 (OFF, ON)
00 04H 0000 00aa	WG WAVEFORM/PCM BANK 0-3 (SQL/1, SAW/1, SQU/2, SAW/2)
00 05H 0aaa aaaa	WG PCM WAVE # 0-127 (1-128)
00 06H 0aaa aaaa	WG PULSE WIDTH 0-100
00 07H 0000 aaaa	WG PW VELO SENS 0-14 (1-17)
00 08H 0000 aaaa	P-ENV DEPTH 0-10
00 09H 0000 00aa	P-ENV VELO SENS 0-3
00 0AH 0000 0aaa	P-ENV TIME KEYF 0-4
00 0BH 0aaa aaaa	P-ENV TIME 1 0-100
00 0CH 0aaa aaaa	P-ENV TIME 2 0-100
00 0DH 0aaa aaaa	P-ENV TIME 3 0-100
00 0EH 0aaa aaaa	P-ENV TIME 4 0-100
00 0FH 0aaa aaaa	P-ENV LEVEL 0 0-100 (-50--50)
00 10H 0aaa aaaa	P-ENV LEVEL 1 0-100 (-50--50)
00 11H 0aaa aaaa	P-ENV LEVEL 2 0-100 (-50--50)
00 12H 0aaa aaaa	dummy (for MT-32)
00 13H 0aaa aaaa	END LEVEL 0-100 (-50--50)
00 14H 0aaa aaaa	P-LFO RATE 0-100
00 15H 0aaa aaaa	P-LFO DEPTH 0-100
00 16H 0aaa aaaa	P-LFO MOD SENS 0-100
00 17H 0aaa aaaa	TVF CUTOFF FREQ 0-100
00 18H 000a aaaa	TVF RESONANCE 0-30
00 19H 0000 aaaa	TVF KEYFOLLOW 0-14 (-1, -1/2, -1/4, 0, 1/8, 1/4, 3/8, 1/2, 5/8, 3/4, 7/8, 1, 5/4, 3/2, 2)
00 1AH 0aaa aaaa	TVF BIAS POINT 0-127 (<1A <7C >1A >7C)
00 1BH 0000 aaaa	TVF BIAS LEVEL 0-14 (-7--7)
00 1CH 0aaa aaaa	TVF ENV DEPTH 0-100
00 1DH 0aaa aaaa	TVF ENV VELO SENS 0-100
00 1EH 0000 0aaa	TVF ENV DEPTH KEYF 0-4
00 1FH 0000 0aaa	TVF ENV TIME KEYF 0-4
00 20H 0aaa aaaa	TVF ENV TIME 1 0-100
00 21H 0aaa aaaa	TVF ENV TIME 2 0-100
00 22H 0aaa aaaa	TVF ENV TIME 3 0-100
00 23H 0aaa aaaa	dummy (for MT-32)
00 24H 0aaa aaaa	TVF ENV TIME 4 0-100
00 25H 0aaa aaaa	TVF ENV LEVEL 1 0-100
00 26H 0aaa aaaa	TVF ENV LEVEL 2 0-100
00 27H 0aaa aaaa	dummy (for MT-32)
00 28H 0aaa aaaa	TVF ENV SUSTAIN LEVEL 0-100
00 29H 0aaa aaaa	TVA LEVEL 0-100
00 2AH 0aaa aaaa	TVA VELO SENS 0-100 (-50--50)

00 2BH 0aaa aaaa	TVA BIAS POINT 1 0-127 (<1A <7C >1A >7C)
00 2CH 0000 aaaa	TVA BIAS LEVEL 1 0-12 (-12 0)
00 2DH 0aaa aaaa	TVA BIAS POINT 2 0-127 (<1A <7C >1A >7C)
00 2EH 0000 aaaa	TVA BIAS LEVEL 2 0-12
00 2FH 0000 0aaa	TVA ENV TIME KEYF 0-4
00 30H 0000 0aaa	TVA ENV TIME V-FOLLOW 0-4
00 31H 0aaa aaaa	TVA ENV TIME 1 0-100
00 32H 0aaa aaaa	TVA ENV TIME 2 0-100
00 33H 0aaa aaaa	TVA ENV TIME 3 0-100
00 34H 0aaa aaaa	dummy (for MT-32)
00 35H 0aaa aaaa	TVA ENV TIME 4 0-100
00 36H 0aaa aaaa	TVA ENV LEVEL 1 0-100
00 37H 0aaa aaaa	TVA ENV LEVEL 2 0-100
00 38H 0aaa aaaa	dummy (for MT-32)
00 39H 0aaa aaaa	TVA ENV SUSTAIN LEVEL 0-100

Total size = 00 00 3AH

Example of RQ1 and DT1 application... 1

Unit number is set at 17 in this example.

Sending the following data string lets D-20 send Part 2/Lower tone data from the temporary area.

FO 41 10 16 11 04 01 76 00 01 76 0E F7

*8-2 Rhythm Setup

Offset address	Description
00 00H 0aaa aaaa	TONE 0-127 (r01-r64, r01-r63, OFF)
00 01H 0aaa aaaa	OUTPUT LEVEL 0-100
00 02H 0000 aaaa	PANPOT 0-14 (L-R)
00 03H 0000 000a	REVERB SWITCH 0-1 (OFF, ON)

Total size = 00 00 04H

*8-3 Timbre temporary area

D-20 accepts the data for the area below only in Multi timbral mode.

Offset address	Description
00 00H 0000 00aa	TONE GROUP 0-3 (a, b, i, r)
00 01H 00aa aaaa	TONE NUMBER 0-63 (1-64)
00 02H 00aa aaaa	KEY SHIFT 0-48 (-24--24)
00 03H 0aaa aaaa	FINE TUNE 0-100 (-50--50)
00 04H 000a aaaa	BENDER RANGE 0-24
00 05H 0000 00aa	ASSIGN MODE 0-3 (POLY1, POLY2, POLY3, POLY4)
00 06H 0000 000a	REVERB SWITCH 0-1 (OFF, ON)
00 07H 0000 0000	dummy (ignored if received)
00 08H 0aaa aaaa	OUTPUT LEVEL 0-100
00 09H 0000 aaaa	PANPOT 0-14 (L-R)
00 0AH 0000 0000	dummy (ignored if received)
00 0BH 0000 0000	dummy

Total size = 00 00 10H

*8-4 Patch Temporary area Patch Memory

D-20 accepts the data for Patch temporary area only in Performance mode.

Offset address	Description
00 00H 0000 00aa	KEY MODE 0-2 (whole, dual, split)
00 01H 00aa aaaa	SPLIT POINT 0-61 (C2-C#7)
00 02H 0000 00aa	LOWER TONE GROUP 0-3 (a, b, i, r)

00 03H	00aa aaaa	LOWER TONE NUMBER	0-63 (1-64)
00 04H	0000 00aa	UPPER TONE GROUP	0-3 (a, b, i, r)
00 05H	00aa aaaa	UPPER TONE NUMBER	0-63 (1-64)
00 06H	00aa aaaa	LOWER KEY SHIFT	0-48 (-24 ~ +24)
00 07H	00aa aaaa	UPPER KEY SHIFT	0-48 (-24 ~ +24)
00 08H	0aaa aaaa	LOWER FINE TUNE	0-100 (-50 ~ +50)
00 09H	0aaa aaaa	UPPER FINE TUNE	0-100 (-50 ~ +50)
00 0AH	000a aaaa	LOWER BENDER RANGE	0-24
00 0BH	000a aaaa	UPPER BENDER RANGE	0-24
00 0CH	0000 00aa	LOWER ASSIGN MODE	0-3 (POLY1, POLY2, POLY3, POLY4)
00 0DH	0000 00aa	UPPER ASSIGN MODE	0-3 (POLY1, POLY2, POLY3, POLY4)
00 0EH	0000 000a	LOWER REVERB SWITCH	0-1 (OFF, ON)
00 0FH	0000 000a	UPPER REVERB SWITCH	0-1 (OFF, ON)
00 10H	0000 aaaa	REVERB MODE	0-8 (Room1/2, Hall1/2, Plate, Delay1/2/3, OFF)
00 11H	0000 0aaa	REVERB TIME	0-7 (1-8)
00 12H	0000 0aaa	REVERB LEVEL	0-7
00 13H	0aaa aaaa	U/L BALANCE	0-100 (L max < - - > U max)
00 14H	0aaa aaaa	PATCH LEVEL	0-100
00 15H	0aaa aaaa	PATCH NAME CHAR.1	32-127 (ASCII CODE)
:	:	:	:
00 24H	0aaa aaaa	PATCH NAME CHAR.16	
00 25H	0000 0000	dummy (ignored if received)	

Total size = 00 00 26H

Example of RQ1 and DT1 application 2

Unit # is set at 17 in this example.

When D 20 receive the following messages in Performance mode, it sends Patch data from the temporary area.

F0 41 10 16 11 03 04 00 00 00 26 53 F7

*8-5 Timbre memory

Offset address	Description
00 00H	0000 00aa TONE GROUP 0-3 (a, b, i, r)
00 01H	00aa aaaa TONE NUMBER 0-63 (1-64)
00 02H	00aa aaaa KEY SHIFT 0-48 (-24 ~ +24)
00 03H	0aaa aaaa FINE TUNE 0-100 (-50 ~ +50)
00 04H	000a aaaa BENDER RANGE 0-24
00 05H	0000 00aa ASSIGN MODE 0-3 (POLY1, POLY2, POLY3, POLY4)
00 06H	0000 000a REVERB SWITCH 0-1 (OFF, ON)
00 07H	0000 0000 dummy (ignored if received)

Total size = 00 00 08H

*8-6 Rhythm pattern

The data listed below are divided by two 8 bit data and sent/received as two 4-bit data. (bbbbaaaa → 0000aaaa, 0000bbbb)
Events are listed in an ascending order.

Offset address	Description
00 00H	0000 0aaa TIME 0-7 (1/4, 2/4, 3/4, 4/4, 5/4, 6/4, 7/4, 8/4)
00 01H	0000 0100 TOTAL # OF NOTES 0-96
00 02H	0000 0100
00 03H	0000 0100
00 04H	0000 0100 dummy (ignored if received)

00 05H	0000 0000	dummy
00 06H	EVENT # 1	*8-6-1
00 0CH	EVENT # 2	
:	:	:
04 3AH	EVENT #95	
04 40H	EVENT #96	
04 46H	0000 1111	END MARK
04 47H	0000 1111	
04 48H	0000 0000	dummy (ignored if received)
04 49H	0000 0000	dummy
04 4AH	0000 0000	dummy (ignored if received)
04 4BH	0000 0000	dummy

Total size = 00 04 4CH

*8-6-1 Event

Offset address	Description
00 00H	0000 aaaa STEP 0-191
00 01H	0000 bbbb
00 02H	0000 aaaa NOTE NUMBER 24-108
00 03H	0000 0bbb
00 04H	0000 aaaa VELOCITY 1-127
00 05H	0000 0bbb

*8-7 Rhythm track

Offset address	Description
00 00H	0aaa aaaa TRACK LENGTH LSB 0-500
00 01H	0000 00aa TRACK LENGTH MSB
00 02H	0aaa aaaa Pattern 1 0-63, 64-71 (P-11 ~ P-88, Blank 1-8)
:	:
03 75H	0aaa aaaa Pattern 500

Total size = 00 03 76H

*8-8 System area

When All is selected for bulk dump load in data transfer mode, data in this area are transmitted or received together with associated sound data and rhythm data.

Partial reserve must be sent as a package of 9 parts, which in total, should contain no more than 32 partials.

Offset address	Description
00 00H	0aaa aaaa MASTER TUNE 0-127 (432.1Hz ~ 457.6Hz)
00 01H	0000 aaaa REVERB MODE 0-8 (Room1/2, Hall1/2, Plate, Delay1/2/3, OFF)
00 02H	0000 0aaa REVERB TIME 0-7 (1-8)
00 03H	0000 0aaa REVERB LEVEL 0-7
00 04H	00aa aaaa PARTIAL RESERVE (Part 1) 0-32
00 05H	00aa aaaa PARTIAL RESERVE (Part 2) 0-32
00 06H	00aa aaaa PARTIAL RESERVE (Part 3) 0-32
00 07H	00aa aaaa PARTIAL RESERVE (Part 4) 0-32
00 08H	00aa aaaa PARTIAL RESERVE (Part 5) 0-32
00 09H	00aa aaaa PARTIAL RESERVE (Part 6) 0-32
00 0AH	00aa aaaa PARTIAL RESERVE (Part 7) 0-32
00 0BH	00aa aaaa PARTIAL RESERVE (Part 8) 0-32
00 0CH	00aa aaaa PARTIAL RESERVE (Part 9) 0-32
00 0DH	0000 0000 dummy (for D-110)
:	:
00 20H	0000 0000 dummy (for D-110)
00 21H	0aaa aaaa OUTPUT LEVEL (Part 1) 0-100
00 22H	0aaa aaaa OUTPUT LEVEL (Part 2) 0-100
00 23H	0aaa aaaa OUTPUT LEVEL (Part 3) 0-100
00 24H	0aaa aaaa OUTPUT LEVEL (Part 4) 0-100
00 25H	0aaa aaaa OUTPUT LEVEL (Part 5) 0-100
00 26H	0aaa aaaa OUTPUT LEVEL (Part 6) 0-100
00 27H	0aaa aaaa OUTPUT LEVEL (Part 7) 0-100
00 28H	0aaa aaaa OUTPUT LEVEL (Part 8) 0-100
00 29H	0aaa aaaa OUTPUT LEVEL (Part 9) 0-100
00 2AH	0000 aaaa PANPOT (Part 1) 0-14
00 2BH	0000 aaaa PANPOT (Part 2) 0-14
00 2CH	0000 aaaa PANPOT (Part 3) 0-14
00 2DH	0000 aaaa PANPOT (Part 4) 0-14
00 2EH	0000 aaaa PANPOT (Part 5) 0-14
00 2FH	0000 aaaa PANPOT (Part 6) 0-14
00 30H	0000 aaaa PANPOT (Part 7) 0-14
00 31H	0000 aaaa PANPOT (Part 8) 0-14

Total size = 00 00 32H

Example of RQ1 and DT1 application 3

Unit # is set at 17 in this example.

The byte string shown below will set Partial reserve of each part as follows:

Part 1 8 Part 3 thru 8 0
Part 2 10 Rhythm part 8

F0 41 10 16 12 10 00 04 00 08 0A 00 00 00 00 00 08 66 F7

*8-9 DISPLAY

D-20 deciphers incoming data and sends them to the LCD as a string of ASCII code characters.

The display data in this area cannot be brought outside D-20 through MIDI message, such as RQ1 and DT1.

Offset address		Description	
00H	0aaa aaaa	DISPLAYED LETTER	82-127 (ASCII)
:	:	:	:
1FH	0aaa aaaa	DISPLAYED LETTER	
Total size = 00 00 20H			

*8-10 Write Request

This message simulates write switch: D-20 stores the data of each part in the temporary area into individual memory locations specified by two byte data. Timbre write is effective only in Multi timbral mode: Patch write only in Performance mode.

The data in this area cannot be brought outside D-20 through MIDI message, such as RQ1 and DT1.

D-20 returns the result to the transmitter.

Offset address		Description	
00 00H	00aa aaaa	Tone Write (part 1 upper)	0-63 (01-64)
00 01H	0000 000a		0, 1 (Internal, Card)
00 02H	00aa aaaa	Tone Write (part 2, lower)	
00 03H	0000 000a		
:	:	:	:
00 0EH	00aa aaaa	Tone Write (part 8)	
00 0FH	0000 000a		
01 00H	0aaa aaaa	Timbre Write (part 1)	0-127 (A11-B88)
01 01H	0000 000a		0, 1 (Internal, Card)
01 02H	0aaa aaaa	Timbre Write (part 2)	
01 03H	0000 000a		
:	:	:	:
01 0EH	0aaa aaaa	Timbre Write (part 8)	
01 0FH	0000 000a		
03 00H	0aaa aaaa	Patch Write	0-127 (A11-B88)
03 01H	0000 000a		0, 1 (Internal, Card)
10 00H	0000 00aa	Result	0-3
0=Function Completed 1=Card Not Ready 2=Write Protected 3=Incorrect Mod			

Example of RQ1 and DT1 application 4

Unit # is set at 17 in this example.

Sending the following byte string will enable D-20 to write data in Part 3 in temporary data into I-B24.

F0 41 10 16 12 40 04 4B 00 71 F7

Address Map

Address	Block	Sub Block	Reference
00-00-00	Timbre Temp (Basic Ch)		8-3
01-00-00	Rhythm Setup Tempo (Basic Ch)	Note# 24 Note# 25 : Note# 107 Note# 108	8-2
02-00-00	Tone Temp (Basic Ch)	Common Partial 1 Partial 2 Partial 3 Partial 4	8-1-1 8-1-2
03-00-00	Timbre Temp (Unit#)	Part 1 Part 2 : Part 8 Part R	8-3
04-00-00	Tone Temp (Unit#)	Part 1 Part 2 : Part 7 Part 8	8-1
05-00-00	Timbre Memory	I-A11 (# 1) I-A12 (# 2) : I-B87 (# 127) I-B88 (# 128)	8-5
07-00-00	Patch Memory	I-A11 (# 1) I-A12 (# 2) : I-B87 (# 127) I-B88 (# 128)	8-4
08-00-00	Tone Memory	i-01 i-02 : i-63 i-64	8-1
09-00-00	Rhythm Setup	i-01 i-02 : i-63 i-64	8-2
0A-00-00	Rhythm Pattern	p-51 p-52 : p-87 p-88	8-6
0C-00-00	Rhythm Track		8-7
10-00-00	System Area		8-8
20-00-00	Display		8-9
40-30-00	Write Request		8-10

MIDI Implementation Chart

Function...		Transmitted	Recognized	Remarks
Basic Channel	Default	×	1-16	Memorized
	Changed	×	1-16	
Mode	Default	×	Mode 3	
	Messages Altered	×	×	

Note Number	True Voice	×	0-127	
		*****	12-108	
Velocity	Note ON	×	○ v=1-127	
	Note OFF	×	×	
After Touch	Key's	×	×	
	Ch's	×	×	
Pitch Bender		×	○ 0-24 semi	9 bit resolution
Control Change	1	×	○	Modulation
	6	×	**	Data entry
	7	×	○	Volume
	10	×	○	Panpot
	11	×	○	Expression
	64	×	○	Hold 1
	100, 101	×	** (0)	RPC LSB, MSB
	121	×	○	Reset all controllers
Prog Change	True #	×	○ 0-127	
		*****	0-127	
System Exclusive		*	*	Tone Parameter
System Common	Song Pos	×	×	
	Song Sel	×	×	
	Tune	×	×	
System Real Time	Clock	×	×	
	Commands	×	×	
Aux Message	Local ON/OFF	×	×	
	All Notes OFF	×	○ (123-127)	
	Active Sense	×	○	
	Reset	×	×	
Notes		* Can be set to ○ or × manually. ** RPC=Registered parameter control number. RPC #0: Pitch bend sensitivity Parameter values are given by Data Entry.		

LINEAR SYNTHESIZER (Multi Timbral mode, Keyboard section)
MODEL D-20

Date : Mar. 3, 1988

MIDI Implementation Chart

Version : 1.00

Function...		Transmitted	Recognized	Remarks
Basic Channel	Default Changed	1-16 1-16	× ×	Memorized (upper/lower)
Mode	Default Messages Altered	Mode 3 POLY, OMNI OFF *****	× ×	
Note Number	True Voice	24-108 *****	× ×	
Velocity	Note ON Note OFF	○ v=1-127 × 9n v=0	× ×	
After Touch	Key's Ch's	× ×	× ×	
Pitch Bender		**	×	
Control Change	1	**	×	Modulation
	64	**	×	Hold 1
	121	**	×	Reset all controllers
Prog Change	True #	○ 0-127 *****	×	
System Exclusive		×	×	
System Common	Song Pos	×	×	
	Song Sel	×	×	
	Tune	×	×	
System Real Time	Clock	×	×	
	Commands	×	×	
Aux Message	Local ON/OFF	×	×	
	All Notes OFF	* (123)	×	
	Active Sense	○	×	
	Reset	×	×	
Notes		* Can be set to ○ or × manually. ** Transmitted to both upper/lower MIDI TX channels.		

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

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

○ : Yes
× : No

Function...		Transmitted	Recognized	Remarks
Basic Channel	Default Changed	1-16 1-16	1-16 1-16	Memorized
Mode	Default Messages Altered	Mode 3 POLY, OMNI OFF *****	Mode 3 X	
Note Number	True Voice	24-108 *****	0-127 12-108	
Velocity	Note ON Note OFF	O v=1-127 X 9n v=0	O v=1-127 X	
After Touch	Key's Ch's	X X	X X	
Pitch Bender		*	* 0-24 semi	9 bit resolution
Control Change	1	*	*	Modulation
	6	X	***	Data entry
	7	X	*	Volume
	11	X	O	Expression
	64	*	*	Hold 1
	100, 101	X	*** (0)	RPC LSB, MSB
	121	O	O	Reset all controllers
Prog Change	True #	* 0-127 *****	O 0-127 0-127	
System Exclusive		**	**	Tone Parameter
System Common	Song Pos Song Sel Tune	X X X	X X X	
System Real Time	Clock Commands	X X	X X	
Aux Message	Local ON/OFF All Notes OFF Active Sense Reset	X ** O X	O O (123-127) O X	
Notes	* Can be set to O or X manually, and memorized. ** Can be set to O or X manually *** RPC=Registered parameter control number. RPC #0: Pitch bend sensitivity Parameter values are given by Data Entry.			

MIDI Implementation Chart

Function...		Transmitted	Recognized	Remarks
Basic Channel	Default Changed	1-16 1-16	1-16 1-16	Memorized
Mode	Default Messages Altered	Mode 3 POLY, OMNI OFF *****	Mode 3 ×	
Note Number	True Voice	24-108 *****	24-108 24-108	
Velocity	Note ON Note OFF	○ v=1-127 × 9n v=0	○ v=1-127 ×	
After Touch	Key's Ch's	×	×	
Pitch Bender		×	* 0-24 semi	9 bit resolution
Control Change	6	×	**	Data entry Volume Expression
	7	×	*	
	11	×	○	
	100, 101	×	** (0)	RPC LSB, MSB
	121	×	○	Reset all controllers
Prog Change	True #	×	×	
System Exclusive		○	***	Setup & Song data
System Common	Song Pos	×	×	
	Song Sel	×	×	
	Tune	×	×	
System Real Time	Clock Commands	○ (Clock mode=INT) ○ (Clock mode=INT)	○ (Clock mode=MIDI) ○ (Clock mode=MIDI)	
Aux Message	Local ON/OFF	×	×	
	All Notes OFF	×	○	
	Active Sense	×	○	
	Reset	×	×	
Notes		* Performance mode—Can be set to ○ or × manually and memorized. Multi Timbral mode—Always received. ** RPC=Registered parameter control number. RPC #0: Pitch bend sensitivity *** Can be set to ○ or × manually.		

Function...		Transmitted	Recognized	Remarks
Basic Channel	Default Changed	* 1-16 X	* 1-16 X	Memorized
Mode	Default Messages Altered	X X *****	Mode 3 X	
Note Number	True Voice	0-127 *****	0-127 0-127	
Velocity	Note ON Note OFF	*** X 9n v=0 (***)	O v=1-127 X	
After Touch	Key's Ch's	X X	X X	
Pitch Bender		***	O	
Control Change	1	***	O	Modulation Data entry Volume Panpot Expression
	6	***	O	
	7	***	O	
	10	***	O	
	11	***	O	
	64	***	O	Hold 1 RPC LSB, MSB
	100, 101	***	O	
Prog Change	True #	*** *****	O 0-127 0-127	
System Exclusive		X	X	
System Common	Song Pos Song Sel Tune	X X X	X X X	
System Real Time	Clock Commands	O (Clock mode=INT) O (Clock mode=INT)	O (Clock mode=MIDI) O (Clock mode=MIDI)	
Aux Message	Local ON/OFF All Notes OFF Active Sense Reset	X **** X X	X O (123-127) X X	
Notes	* Channel number of a part. ** Can be set to O or X manually. *** Transmitted when the track is muted. **** Can be set to O or X manually. Only the data in a muted track is made transferable.			