**DIGITAL STEREO REVERB**
**Model RV-70**

# MIDI Implementation

**Date : Dec. 5. 1996**
**Version : 1.02**

## 1. RECOGNIZED RECEIVE DATA

### CHANNEL VOICE MESSAGE

#### Program Change

| Status | Second |
|---|---|
| CnH | ppH |

n = MIDI Channel 0H - FH (ch.1 - ch.16)
pp = Program Number 00H - 7FH (prog.1 - prog.128)

The program number of internal memory, that corresponds to the received program number, can be called.

### SYSTEM EXCLUSIVE MESSAGE

| Status | data | Status |
|---|---|---|
| F0H | iiH, ddH, ....,eeH | F7H |

| Status | |
|---|---|
| F0H | System Exclusive |

iiH = Manufacturer ID (Roland = 41H)
dd, ...., eeH = data : 00H - 7FH (0 - 127)
F7H EOX (End of Exclusive)

For more details, please refer to "3.EXCLUSIVE COMMUNICATIONS" and "Roland Exclusive Messages".

## 2. TANSMITTED DATA

### SYSTEM EXCLUSIVE MESSAGE

| Status | data | Status |
|---|---|---|
| F0H | iiH, ddH, ...., eeH | F7H |

| Status | |
|---|---|
| F0H | System Exclusive |

iiH = Manufacturer ID (Roland = 41H)
dd, ...., eeH = data : 00H - 7FH (0 - 127)
F7H EOX (End of Exclusive)

For more details, please refer to "3.EXCLUSIVE COMMUNICATIONS" and "Roland Exclusive Messages".

## 3. EXCLUSIVE COMMUNICATION

Via Exclusive Messages, RV-70 can send or receive parameter setting data in conjunction with external MIDI devices.
Exclusive communications of RV-70 are always conducted under the following One way communication format (shown as the Roland Exclusive Format, type IV).
For more details, please refer to "Roland Exclusive Messages" in this Manual.
For the Model ID, RV-70 accepts 69H.
Deveice ID is 00H - 0FH.

#### Request Data1RQ1 (11H)

| Byte | Description |
|---|---|
| F0H | Exclusive status |
| 41H | Manufacturer ID (Roland) |
| Dev | Device ID (Dev : 00H - 0FH) |
| 69H | Model ID (RV-70) |
| 11H | Command ID (RQ1) |
| aaH | Address MSB |
| bbH | Address |
| ccH | Address LSB |
| ssH | Size MSB |
| ttH | Size |
| uuH | Size LSB |
| sum | Checksum |
| F7H | EOX (End of System Exclusive) |

* RV-70 dose not transmit this message.

#### Data Set1DT1 (12H)

| Byte | Description |
|---|---|
| F0H | Exclusive status |
| 41H | Manufacturer ID (Roland) |
| Dev | Device ID (Dev : 00H - 0FH) |
| 69H | Model ID (RV-70) |
| 12H | Command ID (DT1) |
| aaH | Address MSB |
| bbH | Address |
| ccH | Address LSB |
| ddH | Data |
| : | : |
| eeH | Data |
| sum | Checksum |
| F7H | EOX (End of System Exclusive) |

## 4. ADDRESS MAPPING OF PARAMETERS

The address and size are displayd under 7-bit hexadecimal notation.

| Address | MSB | | LSB |
|---|---|---|---|
| Binary | 0aaa aaaa | 0bbb bbbb | 0ccc cccc |
| 7-bit Hexadecmal | AA | BB | CC |

| Address | MSB | | LSB |
|---|---|---|---|
| Binary | 0sss ssss | 0ttt tttt | 0uuu uuuu |
| 7-bit Hexadecmal | SS | TT | UU |

#### Parameter base address

The actual address of each parameter is the start address of the block plus the offset address.

There are two type of the RV-70 exclsive message.One is an individual parameter communication, the other is a bulk dump communication.

In bulk dump communication, RV-70 needs EOB(End Of Bulk Mark) end of communication.
In individual parameter communication, One system exclusive message "F0 .... F7" can only have one parameter.
You cannot use any address having "#" for the top address in a system exclusive message.

## Address Block Map

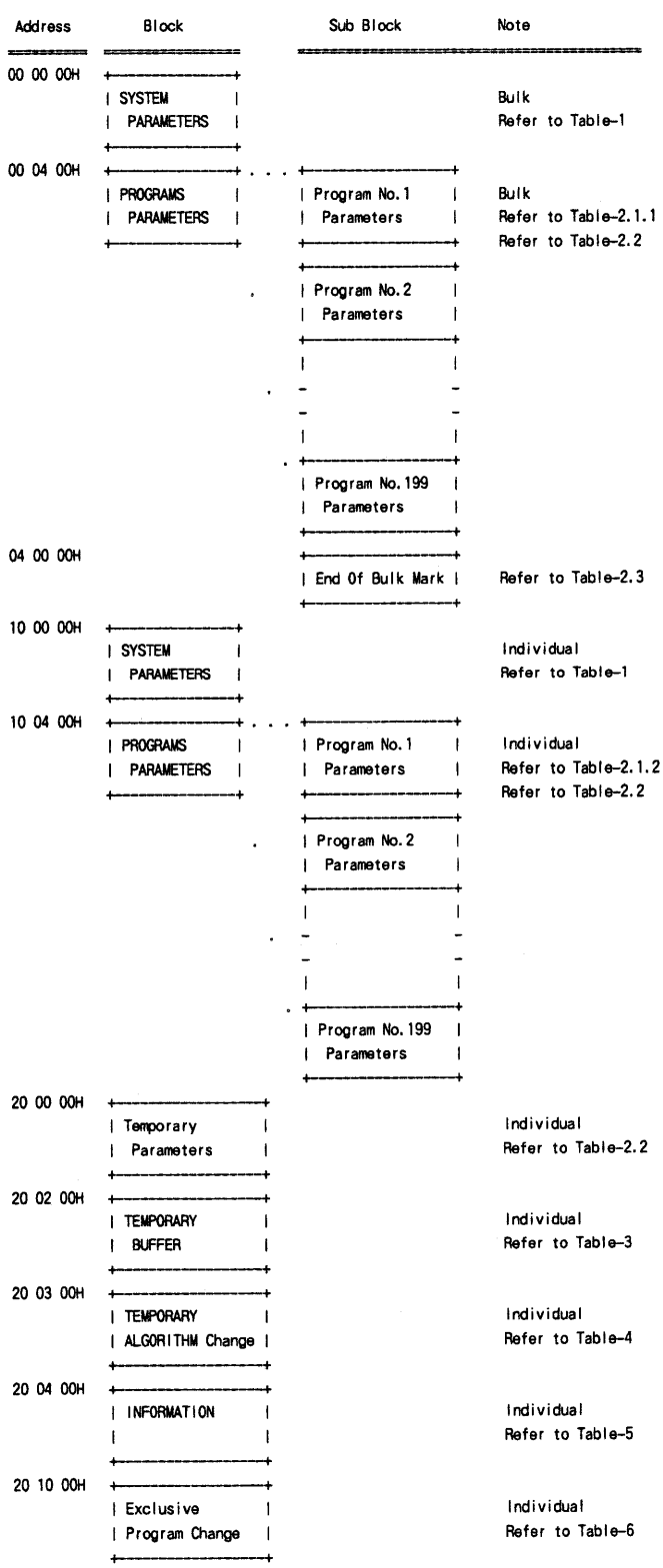



**Table-1 SYSTEM PARAMETERS**

| Offset | Data | Size(H) | Description | |
|---|---|---|---|---|
| 00 00 00H | 0000_000mB | | MIDI MODE m 0:OMNI OFF 1:OMNI ON | |
| 00 00 01H | 0000_000cB | | Rx. MCR-8 Control c 0:OFF 1:ON | |
| 00 01 00H | 0000_ppppB | 00 00 02 | Program Change Map No.1 | LSB (1 - 199) |
| 00 01 01H# | 0000_ppppB | | Program Change Map No.1 | MSB |
| 00 01 02H | 0000_ppppB | 00 00 02 | Program Change Map No.2 | LSB (1 - 199) |
| 00 01 03H# | 0000_ppppB | | Program Change Map No.2 | MSB |
| 00 01 04H | 0000_ppppB | 00 00 02 | Program Change Map No.3 | LSB (1 - 199) |
| 00 01 05H# | 0000_ppppB | | Program Change Map No.3 | MSB |
| 00 01 06H | 0000_ppppB | 00 00 02 | Program Change Map No.4 | LSB (1 - 199) |
| 00 01 07H# | 0000_ppppB | | Program Change Map No.4 | MSB |
| : | : | | : | |
| 00 02 7AH | 0000_ppppB | 00 00 02 | Program Change Map No.126 | LSB (1 - 199) |
| 00 02 7BH# | 0000_ppppB | | Program Change Map No.126 | MSB |
| 00 02 7CH | 0000_ppppB | 00 00 02 | Program Change Map No.127 | LSB (1 - 199) |
| 00 02 7DH# | 0000_ppppB | | Program Change Map No.127 | MSB |
| 00 02 7EH | 0000_ppppB | 00 00 02 | Program Change Map No.128 | LSB (1 - 199) |
| 00 02 7FH# | 0000_ppppB | | Program Change Map No.128 | MSB |

**Table-2.1.1 PROGRAM PARAMETERS (Bulk Area)**

| Address | Data | Description | |
|---|---|---|---|
| 00 04 00H | 0000_aaaaB | Program No.1 Parameters | Refer to Table-2.2 |
| 00 06 00H | 0000_aaaaB | Program No.2 Parameters | : |
| : | : | : | : |
| 03 0C 00H | 0000_aaaaB | Program No.197 Parameters | : |
| 03 0E 00H | 0000_aaaaB | Program No.198 Parameters | : |
| 03 10 00H | 0000_aaaaB | Program No.199 Parameters | Refer to Table-2.2 |

**Table-2.1.2 PROGRAM PARAMETERS (Individual Area)**

| Address | Data | Description | |
|---|---|---|---|
| 10 04 00H | 0000_aaaaB | Program No.1 Parameters | Refer to Table-2.2 |
| 10 06 00H | 0000_aaaaB | Program No.2 Parameters | : |
| : | : | : | : |
| 13 0C 00H | 0000_aaaaB | Program No.197 Parameters | : |
| 13 0E 00H | 0000_aaaaB | Program No.198 Parameters | : |
| 13 10 00H | 0000_aaaaB | Program No.199 Parameters | Refer to Table-2.2 |

**Table-2.2 Program Parameters**

| Offset | Data | Size(H) | Description | |
|---|---|---|---|---|
| 00 00 00H | 0000_ttttB | 00 00 01 | Algorithm Number t:00H-0AH(0 - 10) | |
| 00 00 01H# | 0000_0000B | | Reserved | |
| 00 00 02H | 0000_nnnnB | 00 00 06 | 1st. Parameter Number | LSB |
| 00 00 03H# | 0000_nnnnB | | 1st. Parameter Number | MSB |
| 00 00 04H# | 0000_vvvvB | | 1st. Parameter Value | LSB |
| 00 00 05H# | 0000_vvvvB | | 1st. Parameter Value | : |
| 00 00 06H# | 0000_vvvvB | | 1st. Parameter Value | : |
| 00 00 07H# | 0000_vvvvB | | 1st. Parameter Value | MSB |
| 00 00 08H | 0000_nnnnB | 00 00 06 | 2nd. Parameter Number | LSB |
| 00 00 09H# | 0000_nnnnB | | 2nd. Parameter Number | MSB |
| 00 00 0AH# | 0000_vvvvB | | 2nd. Parameter Value | LSB |
| 00 00 0BH# | 0000_vvvvB | | 2nd. Parameter Value | : |
| 00 00 0CH# | 0000_vvvvB | | 2nd. Parameter Value | : |
| 00 00 0DH# | 0000_vvvvB | | 2nd. Parameter Value | MSB |
| : | : | | : | |
| 00 00 7AH | 0000_nnnnB | 00 00 06 | 21th Parameter Number | LSB |
| 00 00 7BH# | 0000_nnnnB | | 21th Parameter Number | MSB |
| 00 00 7CH# | 0000_vvvvB | | 21th Parameter Value | LSB |
| 00 00 7DH# | 0000_vvvvB | | 21th Parameter Value | : |
| 00 00 7EH# | 0000_vvvvB | | 21th Parameter Value | : |
| 00 00 7FH# | 0000_vvvvB | | 21th Parameter Value | MSB |
| 00 01 00H | 0000_nnnnB | 00 00 06 | 22th Parameter Number | LSB |
| 00 01 01H# | 0000_nnnnB | | 22th Parameter Number | MSB |
| 00 01 02H# | 0000_vvvvB | | 22th Parameter Value | LSB |
| 00 01 03H# | 0000_vvvvB | | 22th Parameter Value | : |
| 00 01 04H# | 0000_vvvvB | | 22th Parameter Value | : |
| 00 01 05H# | 0000_vvvvB | | 22th Parameter Value | MSB |
| : | : | | : | |
| 00 01 48H | 0000_nnnnB | 00 00 06 | 34th Parameter Number | LSB |
| 00 01 49H# | 0000_nnnnB | | 34th Parameter Number | MSB |

| | | | | |
|---|---|---|---|---|
| 00 01 4AH# | 0000_vvvvB | | 34th Parameter Value | LSB |
| 00 01 4BH# | 0000_vvvvB | | 34th Parameter Value | : |
| 00 01 4CH# | 0000_vvvvB | | 34th Parameter Value | : |
| 00 01 4DH# | 0000_vvvvB | | 34th Parameter Value | MSB |
| 00 01 4EH | 0000_nnnnB | 00 00 06 | 35th Parameter Number | LSB |
| 00 01 4FH# | 0000_nnnnB | | 35th Parameter Number | MSB |
| 00 01 50H# | 0000_vvvvB | | 35th Parameter Value | LSB |
| 00 01 51H# | 0000_vvvvB | | 35th Parameter Value | : |
| 00 01 52H# | 0000_vvvvB | | 35th Parameter Value | : |
| 00 01 53H# | 0000_vvvvB | | 35th Parameter Value | MSB |

**Table-2.2.1 Algorithm Number**

| Algorithm Name | Number | |
|---|---|---|
| ROOM1 | 0 | /* Reverb ROOM1 */ |
| ROOM2 | 1 | /* Reverb ROOM2 */ |
| ROOM3 | 2 | /* Reverb ROOM3 */ |
| HALL1 | 3 | /* Reverb HALL1 */ |
| HALL2 | 4 | /* Reverb HALL2 */ |
| GARAGE | 5 | /* Reverb GARAGE */ |
| Non Linear | 6 | /* Non Linear */ |
| ROOM SERIES | 7 | /* REV+DELAY ROOM SERIES */ |
| HALL SERIES | 8 | /* REV+DELAY HALL SERIES */ |
| ROOM PARALLEL | 9 | /* REV+DELAY ROOM PARALLEL */ |
| HALL PARALLEL | 10 | /* REV+DELAY HALL PARALLEL */ |

**Table-2.2.2 Parameter Number List**

| Name | Number | Information |
|---|---|---|
| RSize | 0 | Room Size |
| PrDly | 1 | Pre Delay |
| HiCFq | 2 | High Cut Filter Frequency |
| RevTm | 3 | Reverb Time |
| HiDFq | 4 | HF Damp <Frequency> |
| HiDmp | 5 | HF Damp <Gain> |
| LoDFq | 6 | LF Damp <Frequency> |
| LoDmp | 7 | LF Damp <Gain> |
| Dnsty | 8 | Early Density |
| ERLvl | 9 | Early Reflection Level |
| RlDns | 10 | Release Density |
| OutLv | 11 | Output Level |
| LowFq | 12 | Low EQ Frequency |
| LowGn | 13 | Low EQ Gain |
| Low_Q | 14 | Low EQ Q(PEAK/SHELV) |
| MidFq | 15 | Mid EQ Frequency |
| MidGn | 16 | Mid EQ Gain |
| Mid_Q | 17 | Mid EQ Q |
| HigFq | 18 | High EQ Frequency |
| HigGn | 19 | High EQ Gain |
| Hig_Q | 20 | High EQ Q(PEAK/SHELV) |
| NLTyp | 21 | NLR MODE |
| EnvT1 | 22 | NLR Envelope Time 1 |
| EnvT2 | 23 | NLR Envelope Time 2 |
| EnvT3 | 24 | NLR Envelope Time 3 |
| EnvT4 | 25 | NLR Envelope Time 4 |
| EnvL1 | 26 | NLR Envelope Level 1 |
| EnvL2 | 27 | NLR Envelope Level 2 |
| EnvL3 | 28 | NLR Envelope Level 3 |
| NLRTm/DyTim | 29 | NLR & Delay Time Scale |
| NLFil | 30 | Non-Linear Filter |
| DyTmL | 31 | Delay Time Left |
| DyLvL | 32 | Delay Level Left |
| DyTmR | 33 | Delay Time Right |
| DyLvR | 34 | Delay Level Right |
| DyTmC | 35 | Delay Time Center |
| DyLvC | 36 | Delay Level Center |
| DyFLv | 37 | NLR & Delay Feedback Level |
| NLRF1 | 38 | Non-Linear Filter 1 |
| NLRQ1 | 39 | Non-Linear Q 1 |
| NLRF2 | 40 | Non-Linear Filter 2 |
| NLRQ2 | 41 | Non-Linear Q 2 |
| NLRF3 | 42 | Non-Linear Filter 3 |
| NLRQ3 | 43 | Non-Linear Q 3 |
| NLRF4 | 44 | Non-Linear Filter 4 |
| NLRQ4 | 45 | Non-Linear Q 4 |
| NLRF5 | 46 | Non-Linear Filter 5 |
| NLRQ5 | 47 | Non-Linear Q 5 |
| RvlvI | 48 | Reverb Level |

**Table-2.2.3 Parameter Number**

**1. ROOM1 (algo_number 0)**

| Location | Parameter | Number | Description |
|---|---|---|---|
| 1 | RSize | 0 | 56(5.6m) - 326(32.6m) |
| 2 | PrDly | 1 | 0(0msec) - 400(400msec) |
| 3 | HiCFq | 2 | 170(170Hz) - 20000(20.0kHz) |
| 4 | RevTm | 3 | 6(0.06sec) - 3200(32.0sec) |
| 5 | HiDFq | 4 | 4000(4.0kHz) - 20000(20.0kHz) |
| 6 | HiDmp | 5 | -36(-36dB) - 0(0dB) |
| 7 | LoDFq | 6 | 50(50Hz) - 4000(4.00kHz) |
| 8 | LoDmp | 7 | -36(-36dB) - 0(0dB) |
| 9 | Dnsty | 8 | 0 - 99 |
| 10 | ERLvl | 9 | 0 - 99 |
| 11 | RlDns | 10 | 0 - 99 |
| 12 | OutLv | 11 | 0 - 100 |
| 13 | LowFq | 12 | 200(200Hz) - 2000(2.00kHz) |
| 14 | LowGn | 13 | -12(-12dB) - +12(+12dB) |
| 15 | Low_Q | 14 | 2(SHELV),3(0.3) - 100(10.0) |
| 16 | MidFq | 15 | 200(200Hz) - 8000(8.00kHz) |
| 17 | MidGn | 16 | -12(-12dB) - +12(+12dB) |
| 18 | Mid_Q | 17 | 3(0.3) - 100(10.0) |
| 19 | HigFq | 18 | 1500(1.50kHz) - 20000(20.0kHz) |
| 20 | HigGn | 19 | -12(-12dB) - +12(+12dB) |
| 21 | Hig_Q | 20 | 2(SHELV),3(0.3) - 100(10.0) |

**2. ROOM 2 (algo_number 1)**
**HALL 1 (algo_number 3)**

| Location | Parameter | Number | Description |
|---|---|---|---|
| 1 | RSize | 0 | 1 - 10 |
| 2 | PrDly | 1 | 0(0msec) - 400(400msec) |
| 3 | HiCFq | 2 | 170(170Hz) - 20000(20.0kHz) |
| 4 | RevTm | 3 | 6(0.06sec) - 3200(32.0sec) |
| 5 | HiDFq | 4 | 4000(4.0kHz) - 20000(20.0kHz) |
| 6 | HiDmp | 5 | -36(-36dB) - 0(0dB) |
| 7 | LoDFq | 6 | 50(50Hz) - 4000(4.00kHz) |
| 8 | LoDmp | 7 | -36(-36dB) - 0(0dB) |
| 9 | Dnsty | 8 | 0 - 99 |
| 10 | ERLvl | 9 | 0 - 99 |
| 11 | RlDns | 10 | 0 |
| 12 | OutLv | 11 | 0 - 100 |
| 13 | LowFq | 12 | 200(200Hz) - 2000(2.00kHz) |
| 14 | LowGn | 13 | -12(-12dB) - +12(+12dB) |
| 15 | Low_Q | 14 | 2(SHELV),3(0.3) - 100(10.0) |
| 16 | MidFq | 15 | 200(200Hz) - 8000(8.00kHz) |
| 17 | MidGn | 16 | -12(-12dB) - +12(+12dB) |
| 18 | Mid_Q | 17 | 3(0.3) - 100(10.0) |
| 19 | HigFq | 18 | 1500(1.50kHz) - 20000(20.0kHz) |
| 20 | HigGn | 19 | -12(-12dB) - +12(+12dB) |
| 21 | Hig_Q | 20 | 2(SHELV),3(0.3) - 100(10.0) |

**3. ROOM 3 (algo_number 2)**
**HALL 2 (algo_number 4)**
**GARAGE (algo_number 5)**

| Location | Parameter | Number | Description |
|---|---|---|---|
| 1 | RSize | 0 | 1 - 8 |
| 2 | PrDly | 1 | 0(0msec) - 400(400msec) |
| 3 | HiCFq | 2 | 170(170Hz) - 20000(20.0kHz) |
| 4 | RevTm | 3 | 6(0.06sec) - 3200(32.0sec) |
| 5 | HiDFq | 4 | 4000(4.0kHz) - 20000(20.0kHz) |
| 6 | HiDmp | 5 | -36(-36dB) - 0(0dB) |
| 7 | LoDFq | 6 | 50(50Hz) - 4000(4.00kHz) |
| 8 | LoDmp | 7 | -36(-36dB) - 0(0dB) |
| 9 | Dnsty | 8 | 0 - 99 |
| 10 | ERLvl | 9 | 0 - 99 |
| 11 | RlDns | 10 | 0 - 99 |
| 12 | OutLv | 11 | 0 - 100 |
| 13 | LowFq | 12 | 200(200Hz) - 2000(2.00kHz) |
| 14 | LowGn | 13 | -12(-12dB) - +12(+12dB) |
| 15 | Low_Q | 14 | 2(SHELV),3(0.3) - 100(10.0) |
| 16 | MidFq | 15 | 200(200Hz) - 8000(8.00kHz) |
| 17 | MidGn | 16 | -12(-12dB) - +12(+12dB) |
| 18 | Mid_Q | 17 | 3(0.3) - 100(10.0) |
| 19 | HigFq | 18 | 1500(1.50kHz) - 20000(20.0kHz) |
| 20 | HigGn | 19 | -12(-12dB) - +12(+12dB) |
| 21 | Hig_Q | 20 | 2(SHELV),3(0.3) - 100(10.0) |

### 4. Non Linear (algo_number 6)

| Location | Parameter | Number | Description |
|---|---|---|---|
| 1 | PrDly | 1 | 0(0msec) - 400(400msec) |
| 2 | HiCFq | 2 | 170(170Hz) - 20000(20.0kHz) |
| 3 | Dnsty | 8 | 0 - 99 |
| 4 | OutLv | 11 | 0 - 100 |
| 5 | NLTyp | 21 | 0 - 2 0: >>> 1:<<>> 2:<<< |
| 6 | EnvT1 | 22 | 0(0msec) - 1000(1000msec) |
| 7 | EnvT2 | 23 | 0(0msec) - 1000(1000msec) |
| 8 | EnvT3 | 24 | 0(0msec) - 1000(1000msec) |
| 9 | EnvT4 | 25 | 0(0msec) - 1000(1000msec) |
| 10 | EnvL1 | 26 | 0 - 100 |
| 11 | EnvL2 | 27 | 0 - 100 |
| 12 | EnvL3 | 28 | 0 - 100 |
| 13 | TmRto | 29 | 10 - 100[%] |
| 14 | NRBal | 30 | 0 - 100 |
| 15 | LowFq | 2 | 200(200Hz) - 2000(2.00kHz) |
| 16 | LowGn | 13 | -12(-12dB) - +12(+12dB) |
| 17 | Low_Q | 14 | 2(SHELV),3(0.3) - 100(10.0) |
| 18 | MidFq | 15 | 200(200Hz) - 8000(8.00kHz) |
| 19 | MidGn | 16 | -12(-12dB) - +12(+12dB) |
| 20 | Mid_Q | 17 | 3(0.3) - 100(10.0) |
| 21 | HigFq | 18 | 1500(1.50kHz) - 20000(20.0kHz) |
| 22 | HigGn | 19 | -12(-12dB) - +12(+12dB) |
| 23 | Hig_Q | 20 | 2(SHELV),3(0.3) - 100(10.0) |
| 24 | DyFLv | 37 | 0 - 99 |
| 25 | NLRF1 | 38 | 24 - 120 |
| 26 | NLRQ1 | 39 | 1 - 10 |
| 27 | NLRF2 | 40 | 24 - 120 |
| 28 | NLRQ2 | 41 | 1 - 10 |
| 29 | NLRF3 | 42 | 24 - 120 |
| 30 | NLRQ3 | 43 | 1 - 10 |
| 31 | NLRF4 | 44 | 24 - 120 |
| 32 | NLRQ4 | 45 | 1 - 10 |
| 33 | NLRF5 | 46 | 24 - 120 |
| 34 | NLRQ5 | 47 | 1 - 10 |

### 5. REV+DELAY SIREAL ROOM (algo_number 7)
### REV+DELAY SIREAL HALL (algo_number 8)
### REV+DELAY Parallel ROOM (algo_number 9)
### REV+DELAY Parallel HALL (algo_number 10)

| Location | Parameter | Number | Description |
|---|---|---|---|
| 1 | RSize | 0 | 1 - 10 |
| 2 | PrDly | 1 | 0(0msec) - 200(200msec) |
| 3 | HiCFq | 2 | 170(170Hz) - 20000(20.0kHz) |
| 4 | RevTm | 3 | 6(0.06sec) - 3200(32.0sec) |
| 5 | HiDFq | 4 | 4000(4.0kHz) - 20000(20.0kHz) |
| 6 | HiDmp | 5 | -36(-36dB) - 0(0dB) |
| 7 | LoDFq | 6 | 50(50Hz) - 4000(4.00kHz) |
| 8 | LoDmp | 7 | -36(-36dB) - 0(0dB) |
| 9 | Dnsty | 8 | 0 - 99 |
| 10 | ERLvl | 9 | 0 - 99 |
| 11 | OutLv | 11 | 0 - 100 |
| 12 | TmRto | 29 | 10 - 100[%] |
| 13 | DyTmL | 31 | 0(0msec) - 500(500msec) |
| 14 | DyLvL | 32 | 0 - 99 |
| 15 | DyTmR | 33 | 0(0msec) - 500(500msec) |
| 16 | DyLvR | 34 | 0 - 99 |
| 17 | DyTmC | 35 | 0(0msec) - 500(500msec) |
| 18 | DyLvC | 36 | 0 - 99 |
| 19 | DyFLv | 37 | 0 - 99 |
| 20 | LowFq | 12 | 200(200Hz) - 2000(2.00kHz) |
| 21 | LowGn | 13 | -12(-12dB) - +12(+12dB) |
| 22 | Low_Q | 14 | 2(SHELV),3(0.3) - 100(10.0) |
| 23 | MidFq | 15 | 200(200Hz) - 8000(8.00kHz) |
| 24 | MidGn | 16 | -12(-12dB) - +12(+12dB) |
| 25 | Mid_Q | 17 | 3(0.3) - 100(10.0) |
| 26 | HigFq | 18 | 1500(1.50kHz) - 20000(20.0kHz) |
| 27 | HigGn | 19 | -12(-12dB) - +12(+12dB) |
| 28 | Hig_Q | 20 | 2(SHELV),3(0.3) - 100(10.0) |
| 29 | RvlvI | 48 | 0 - 100 |

### Table-2.3 End Of Bulk Mark

| Address | Data | Description |
|---|---|---|
| 04 00 00H | 0000_0000B | End Of Bulk Mark |

### Table-3 TEMPORARY BUFFER (Write Only)

| Address | Data | Description | | |
|---|---|---|---|---|
| 20 02 00H | 0000_nnnnB | Parameter Number | n:00H-30H(0 - 48) | LSB |
| 20 02 01H# | 0000_nnnnB | Parameter Number | | MSB |
| 20 02 02H# | 0000_vvvvB | Parameter Value | | LSB |
| 20 02 03H# | 0000_vvvvB | Parameter Value | | : |
| 20 02 04H# | 0000_vvvvB | Parameter Value | | : |
| 20 02 05H# | 0000_vvvvB | Parameter Value | | MSB |

v:0000H-FFFFH(-32768 - 32767)use nibblized data

### Table-4 TEMPORARY Algorithm Change (Write Only)

| Address | Data | Description | |
|---|---|---|---|
| 20 03 00H | 0000_ttttB | Algorithm Number | t:00H-0AH(0 - 10) |

### Table-5 INFORMATION (READ ONLY)

| Address | Data | Size(H) | Description |
|---|---|---|---|
| 20 04 00H | 0aaa_aaaaB | 00 00 08 | Software Version Number(ASCII)20H-7FH(32-127) |
| 20 04 01H | 0aaa_aaaaB | | Software Version Number(ASCII)20H-7FH(32-127) |
| | : | | : |
| 20 04 07H | 0aaa_aaaaB | | Software Version Number(ASCII)20H-7FH(32-127) |

### Table-6 Exclusive Program Change (Write Only)

| Address | Data | Description | | |
|---|---|---|---|---|
| 20 10 00H | 0000_nnnnB | Program number | n:00H-C6H(1 - 199) | LSB |
| 20 10 01H# | 0000_nnnnB | | | MSB |

## Example of exclusive message and checksum calculation

### Example 1

Setting the gain of low band EQ for the effect sound being output to -12dB (set to temporary buffer)
To set the gain, transmit the parameter number and parameter value at the same time.

The low band EQ gain parameter number is as shown below : refer to Table 2.2.2. Parameter Number list.

LowGn 13 Low Band EQ Gain

Convert the decimal number 13 into hexadecimal number :

0Dh
^^
| LSB
MSB

Express two's complement of -12 in 16-bit value (refer to conversion table) :

FFF4h
^ ^
| LSB
MSB

Set items (1) through (6) listed below to Roland exclusive format.
Referring to Table 3, set 8 bits of the number and the value in that order, LSB first.

```
F0  41  00  69  12  20  02  00  0D  00  04  0F 0F  0F  ???  F7
                    ----------  ------  --------------  ---
(1) (2) (3) (4) (5)     (6)         (7)         (8)         (9) (10)
```

(1) Exclusive Status
(2) ID (Roland)
(3) Device ID (= Rx.MIDI Channel)
(4) MODEL ID (RV-70)
(5) Common ID DT1
(6) address
(7) data (nibbled)
(8) data (nibbled)
(9) checksum
(10) End of Exclusive

Calculate checksum (9).

Address (6) + Data (7) + Data (8) =

20H + 02H + 00H + 0DH + 00H + 04H + 0FH + 0FH + 0FH = 60H (sum)
32 + 2 + 0 + 13 + 0 + 4 + 15 + 15 + 15 = 96

96 (sum) / 128 = 0 (quotient) ... 96 (remainder)
checksum = 128 - 96 (remainder) = 32 = 20H

### Example 2
Using exclusive message, change the program number to 134.

Hexadecimal number equivalent of decimal number 134 :
86h
`--`
| LSB
MSB

Set items (1) through (6) listed below to Roland exclusive format.
Referring to Table 3, set 8 bits of the program number, LSB first.

```
F0  41  00  69  12  20  10  00  06  08  ???  F7
                    ----------  ------  ---
(1) (2) (3) (4) (5)      (6)         (7)   (8)  (9)
```

Calculate checksum (8).

Address (6) + Data (7) =

20H + 10H + 00H + 06H + 08H = 2CH(sum)
32 + 16 + 0 + 6 + 8 = 44

44 (sum) / 128 = 0 (quotient) ... 44 (remainder)
checksum = 128 - 44 (remainder) = 84 = 54H

Transmitted message : F0 41 69 00 12 20 10 00 06 08 54 F7

### Example 3
Change parameter "EqHFq" of the main program No. 15 to 18800Hz. Below takes algorithm No. 6 "Non Linear" as an example.
* Transferring this data changes the value stored in the RV-70 memory but does not affect the tone color of the sound being output. This change becomes valid only when the program is changed to 15 by a program change operation or by a key operation.

Determine the address
As can be seen from the parameter address map, the base address of the program 15 is 10 20 00. The location of EqHFq for Non Linear : Refer to Table 2.2. Add the offset address of the parameter at location 21 to the base address.

```
10  20  00  +  00  00  7A  =  10  20  7A
----------     ----------
```

Base address + Offset address

Set the parameter number of EqHFq to 20.

Hexadecimal number equivalent of decimal number 20 :
14 h
`--`
| LSB
MSB

Obtain the value.

Convert decimal number 18800 into hexadecimal number :
4970h
`- -`
| LSB
MSB

Referring to Table 3, set 8 bits of the number and the value in that order, LSB first.

```
F0  41  00  69  12  20  10  7A  04  01  00  07  09  04  ???  F7
                    ----------  ------  --------------  ---
(1) (2) (3) (4) (5)      (6)         (7)         (8)         (9) (10)
```

Calculate the checksum (9).

Address (6) + Data (7) + Data (8) =

20H + 10H + 7AH + 04H + 01H + 00H + 07H + 09H + 04H = C3H (sum)
32 + 16 + 122 + 4 + 1 + 0 + 7 + 9 + 4 = 195

195 (sum) / 128 = 1 (quotient) ... 67 (remainder)
checksum = 128 - 67 (remainder) = 61 = 3DH

Transmitted data : F0 41 69 00 12 20 10 7F 04 01 00 07 09 04 3D F7

## Reference

### Decimal number vs hexadecimal number

### Two's complement in 16-bit value

| 10-bit | 16-bit | 10-bit | 16-bit | 10-bit | 16-bit | |
|---|---|---|---|---|---|---|
| 0 | 0000h | -13 | FFF3h | -25 | FFE7h | |
| -1 | FFFFh | -14 | FFF2h | -26 | FFE6h | |
| -2 | FFFEh | -15 | FFF1h | -27 | FFE5h | |
| -3 | FFFDh | -16 | FFE0h | -28 | FFE4h | |
| -4 | FFFCh | -17 | FFEFh | -29 | FFE3h | |
| -5 | FFF8h | -18 | FFEEh | -30 | FFE2h | |
| -6 | FFFAh | -19 | FFEDh | -31 | FFE1h | |
| -7 | FFF9h | -20 | FFECh | -32 | FFE0h | |
| -8 | FFF8h | -21 | FFEBh | -33 | FFDFh | |
| -9 | FFF7h | -22 | FFEAh | -34 | FFDEh | |
| -10 | FFF6h | -23 | FFE9h | -35 | FFDDh | |
| -11 | FFF5h | -24 | FFE8h | -36 | FFDCh | < Hi,LowDmp Gain minimum |
| -12 | FFF4h | < EQ Gain minimum | | | | |

## Communication between RV-70 and MCR-8

Control change from MCR-8 is used to alter internal parameter settings. And it is not defined by MIDI specifications.

MCR-8 Receive switch of RV-70 must be turned on when you use a MCR-8 to operate the RV-70.

The setting of a MCR-8 is MODE 4.

### 1. Parameter arrangement of MCR-8.

The effective parameter may change from Algorithm number even when receive same control change signal.

e.g. When change C1_2 Volume of MCR-8 and send it to RV-70,
if Algorithm setting is 7 (NLR), EnvT1 will be edited.
if Algorithm setting is 1-6 (REV) or 8-11 (REV + DELAY), Densty will be edited.

**** With Algorithm 1-6 (REVERB), there is no delay-time and feedback that is in Algorithm 8-11 (REVERB + DELAY).***

● ALGORITHM 1-6 (REV) 8-11 (REV+DELAY)

| | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | : MASTER |
|---|---|---|---|---|---|---|---|---|---|
| C1: | RSize | Dnsty | HiDFq | LoDFq | RlDns | DyTmL | DyTmR | DyTmC | : HiCFq |
| S1: | ALG_1 | ALG_2 | ALG_3 | ALG_4 | ALG_5 | ALG_6 | ALG_7 | ALG_8 | |
| S2: | ALG_9 | ALG10 | ALG11 | | | | | | |
| C2: | RevTm | PrDly | HiDmp | LoDmp | ERLvl | DyLvL | DyLvR | DyLvC | : OutLv |

| | 9 | 10 | 11 | 12 | 13 | 14 | 15 | 16 | : MASTER |
|---|---|---|---|---|---|---|---|---|---|
| C1: | LowFq | Low_Q | MidFq | Mid_Q | HigFq | Hig_Q | DyFLv | DyTim | : HiCFq |
| S1: | SHELV | | | | SHELV | | | | |
| S2: | PEAK | | | | PEAK | | | | |
| C2: | LowGn | none | MidGn | none | EQHGn | none | none | RevLv | : OutLv |

● ALGORITHM 7 (NLR)

| | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | : MASTER |
|---|---|---|---|---|---|---|---|---|---|
| C1: | Dnsty | EnvT1 | EnvT2 | EnvT3 | EnvT4 | NLBal | NLTyp | | : HiCFq |
| S1: | ALG_1 | ALG_2 | ALG_3 | ALG_4 | ALG_5 | ALG_6 | ALG_7 | ALG_8 | |
| S2: | ALG_9 | ALG10 | ALG11 | | | | | | |
| C2: | PrDly | EnvL1 | EnvL2 | EnvL3 | none | none | none | none | : OutLv |

| | 9 | 10 | 11 | 12 | 13 | 14 | 15 | 16 | : MASTER |
|---|---|---|---|---|---|---|---|---|---|
| C1: | LowFq | Low_Q | MidFq | Mid_Q | HigFq | Hig_Q | DyFLv | NLTim | : HiCFq |
| S1: | SHELV | | | | SHELV | | | | |
| S2: | PEAK | | | | PEAK | | | | |
| C2: | LowGn | none | MidGn | none | HigGn | none | none | none | : OutLv |

FILTER (Push F1)

| | 1/9 | 2/10 | 3/11 | 4/12 | 5/13 | 6/14 | 7/15 | 8/16 | : MASTER |
|---|---|---|---|---|---|---|---|---|---|
| C1: | NLRF1 | NLRF2 | NLRF3 | NLRF4 | NLRF5 | none | none | none | : none |
| S1: | | | | | | | | | |
| S2: | | | | | | | | | |
| C2: | NLR01 | NLR02 | NLR03 | NLR04 | HigGn | none | none | none | : none |

## 2. The relation between "MIDI OUTPUT DATA" controlled from MCR-8 and RV-70 parameter.

```
=MCR-8=    = MIDI OUTPUT DATA =    = RV-70 SW & Parameter =
SELECT     Status
|            | Second
| SW/Slider  |  | Third
|  |         |  |  |
v  v         v  v  v  ( Value )    Description
```

### [ALGORITHM CHANGE]

```
                    Release / Depressed
A  S1_1 :  Bn 00 vv (00 / 7FH) : ALGORITHM Change  1 ROOM1
A  S1_2 :  Bn 01 vv (00 / 7FH) : ALGORITHM Change  2 ROOM2
A  S1_3 :  Bn 02 vv (00 / 7FH) : ALGORITHM Change  3 ROOM3
A  S1_4 :  Bn 03 vv (00 / 7FH) : ALGORITHM Change  4 HALL1
A  S1_5 :  Bn 04 vv (00 / 7FH) : ALGORITHM Change  5 HALL1
A  S1_6 :  Bn 05 vv (00 / 7FH) : ALGORITHM Change  6 GARAGE
A  S1_7 :  Bn 06 vv (00 / 7FH) : ALGORITHM Change  7 NLR
A  S1_8 :  Bn 07 vv (00 / 7FH) : ALGORITHM Change  8 REV+DLY ROOM SERIAL
A  S2_1 :  Bn 28 vv (00 / 7FH) : ALGORITHM Change  9 REV+DLY HALL SERIAL
A  S2_2 :  Bn 29 vv (00 / 7FH) : ALGORITHM Change 10 REV+DLY ROOM PARALLEL
A  S2_3 :  Bn 2A vv (00 / 7FH) : ALGORITHM Change 11 REV+DLY HALL PARALLEL
```

### [RV-70 PANEL CONTROL]

```
   F1   :  Bn 0A vv (00 / 7FH) : NLR BPF EDIT_MODE (押している間のみ)
   ■    :  Bn 15 vv (00 / 7FH) : WRITE MODE EXIT
   ●    :  Bn 17 vv (00 / 7FH) : WRITE KEY
  DEC   :  Bn 18 vv (00 / 7FH) : DOWN  KEY
  INC   :  Bn 19 vv (00 / 7FH) : UP    KEY

 VALUE  :  Bn 60 vv (00 - 7FH) : PROGRAM NUMBER INC/DEC
                                  01H-3FH INC
                                  40H-7FH DEC
   S3   :  Bn 1E vv (00 / 7FH) : PROGRAM SET
```

### [OUTPUT CONTROL]

```
  MASTER
B  C1   :  Bn 50 vv (00 - 7FH) : HiCut
B  C2   :  Bn 51 vv (00 - 7FH) : OutLv
```

### [PARAMETRIC EQ SHELLVING/PEAKING]

```
B  S1_1 :  Bn 20 vv (00 / 7FH) : Low_Q SHELLVING
B  S1_5 :  Bn 24 vv (00 / 7FH) : Hig_Q SHELLVING
B  S2_1 :  Bn 58 vv (00 / 7FH) : Low_Q PEAKING
B  S2_5 :  Bn 5C vv (00 / 7FH) : Hig_Q PEAKING
```

### [EFFECT PARAMETER CONTROL]

```
                                   ---------- MODE ----------
                                   [REVERB]
                                   [REVERB+DELAY]  [NLR]       [NLR FILTER (F1 ON)]
A  C1_1 :  Bn 48 vv (00 - 7FH) : RSize      Dnsty [NLR]    NLRF1 [NLR (F1 On)]
A  C1_2 :  Bn 49 vv (00 - 7FH) : Dnsty      EnvT1 [NLR]    NLRF2 [NLR (F1 On)]
A  C1_3 :  Bn 4A vv (00 - 7FH) : HiDFq      EnvT2 [NLR]    NLRF3 [NLR (F1 On)]
A  C1_4 :  Bn 4B vv (00 - 7FH) : LoDFq      EnvT3 [NLR]    NLRF4 [NLR (F1 On)]
A  C1_5 :  Bn 4C vv (00 - 7FH) : RlDns      EnvT4 [NLR]    NLRF5 [NLR (F1 On)]
A  C1_6 :  Bn 4D vv (00 - 7FH) : DyTmL      NLBal [NLR]
A  C1_7 :  Bn 4E vv (00 - 7FH) : DyTmR      NLTyp [NLR]
A  C1_8 :  Bn 4F vv (00 - 7FH) : DyTmC      none  [NLR]
A  C2_1 :  Bn 40 vv (00 - 7FH) : RevTm      PrDly [NLR]    NLR01 [NLR (F1 On)]
A  C2_2 :  Bn 41 vv (00 - 7FH) : PrDly      EnvL1 [NLR]    NLR02 [NLR (F1 On)]
A  C2_3 :  Bn 42 vv (00 - 7FH) : HiDmp      EnvL2 [NLR]    NLR03 [NLR (F1 On)]
A  C2_4 :  Bn 43 vv (00 - 7FH) : LoDmp      EnvL3 [NLR]    NLR04 [NLR (F1 On)]
A  C2_5 :  Bn 44 vv (00 - 7FH) : ERLvl      none  [NLR]    NLR05 [NLR (F1 On)]
A  C2_6 :  Bn 45 vv (00 - 7FH) : DyLvL      none  [NLR]
A  C2_7 :  Bn 46 vv (00 - 7FH) : DyLvR      none  [NLR]
A  C2_8 :  Bn 47 vv (00 - 7FH) : DyLvR      none  [NLR]
B  C1_1 :  Bn 38 vv (00 - 7FH) : LowFq      LowFq
B  C1_2 :  Bn 39 vv (00 - 7FH) : Low_Q      Low_Q
B  C1_3 :  Bn 3A vv (00 - 7FH) : MidFq      MidFq
B  C1_4 :  Bn 3B vv (00 - 7FH) : Mid_Q      Mid_Q
B  C1_5 :  Bn 3C vv (00 - 7FH) : HigFq      HigFq
B  C1_6 :  Bn 3D vv (00 - 7FH) : Hig_Q      Hig_Q
B  C1_7 :  Bn 3E vv (00 - 7FH) : DyFLv      DyFLv [NLR]
B  C1_8 :  Bn 3F vv (00 - 7FH) : TmRto      TmRto [NLR]
B  C2_1 :  Bn 30 vv (00 - 7FH) : LowGn      LowGn
B  C2_2 :  Bn 31 vv (00 - 7FH) : none       none
B  C2_3 :  Bn 32 vv (00 - 7FH) : MidGn      MidGn
B  C2_4 :  Bn 33 vv (00 - 7FH) : none       none
B  C2_5 :  Bn 34 vv (00 - 7FH) : HigGn      HigGn
B  C2_6 :  Bn 35 vv (00 - 7FH) : none       none
B  C2_7 :  Bn 36 vv (00 - 7FH) : none       none
B  C2_8 :  Bn 37 vv (00 - 7FH) : RevLv      none  [NLR]
```

## 3. The Control Change number that RV-70 recognizes.

Control Change Table

```
= MIDI =              = RV-70 Parameter =          = Value =
Status
| Second
|  | Third
|  |  |
v  v  v  ( Value )
Bn 20 vv (7FH) :      Low_Q SHELLVING     /*  Shellving              */
Bn 24 vv (7FH) :      Hig_Q SHELLVING     /*  Shellving              */
Bn 30 vv (00 - 7FH) : LowGn               /*  (-12) - 0 - +12 [dB]   */
Bn 32 vv (00 - 7FH) : MidGn               /*  (-12) - 0 - +12 [dB]   */
Bn 34 vv (00 - 7FH) : EQHGn               /*  (-12) - 0 - +12 [dB]   */
Bn 37 vv (00 - 7FH) : RevLv               /*        0 - 100          */
Bn 38 vv (00 - 7FH) : LowFq               /*       60 - 2000  [Hz]   */
Bn 39 vv (00 - 7FH) : Low_Q               /*      0.3 - 10.0         */
Bn 3A vv (00 - 7FH) : MidFq               /*      200 - 8000  [Hz]   */
Bn 3B vv (00 - 7FH) : Mid_Q               /*      0.3 - 10.0         */
Bn 3C vv (00 - 7FH) : HigFq               /*     1500 - 20000 [Hz]   */
Bn 3D vv (00 - 7FH) : Hig_Q               /*      0.3 - 10.0         */
Bn 3E vv (00 - 7FH) : DyFLv               /*        0 - 99           */
Bn 3E vv (00 - 7FH) : DyFLv[NLR]          /*        0 - 99           */
Bn 3F vv (00 - 7FH) : TmRto               /*       10 - 100   [%]    */
Bn 3F vv (00 - 7FH) : TmRto[NLR]          /*       10 - 100   [%]    */
Bn 40 vv (00 - 7FH) : RevTm               /*     0.06 - 32.0  [sec]  */
Bn 40 vv (00 - 7FH) : PrDly[NLR]          /*        0 - 400   [msec] */
Bn 40 vv (00 - 7FH) : NLR01[NLR (F1 On)]  /*   TYPE 1 - TYPE 10      */
Bn 41 vv (00 - 7FH) : PrDly               /*        0 - 400   [msec] */
                    : ALGORITHM 8,9       /*        0 - 200   [msec] */
                    : ALGORITHM 10,11     /*        0 - 200   [msec] */
Bn 41 vv (00 - 7FH) : EnvL1[NLR]          /*        0 - 100          */
Bn 41 vv (00 - 7FH) : NLR02[NLR (F1 On)]  /*   TYPE 1 - TYPE 10      */
Bn 42 vv (00 - 7FH) : HiDmp               /*        0 - (-36) [dB]   */
Bn 42 vv (00 - 7FH) : EnvL2[NLR]          /*        0 - 100          */
Bn 42 vv (00 - 7FH) : NLR03[NLR (F1 On)]  /*   TYPE 1 - TYPE 10      */
Bn 43 vv (00 - 7FH) : LoDmp               /*        0 - (-36) [dB]   */
Bn 43 vv (00 - 7FH) : EnvL3[NLR]          /*        0 - 100          */
Bn 43 vv (00 - 7FH) : NLR04[NLR (F1 On)]  /*   TYPE 1 - TYPE 10      */
Bn 44 vv (00 - 7FH) : ERLvl               /*        0 - 99           */
Bn 44 vv (00 - 7FH) : NLR05[NLR (F1 On)]  /*   TYPE 1 - TYPE 10      */
Bn 45 vv (00 - 7FH) : DyLvL               /*        0 - 99           */
Bn 46 vv (00 - 7FH) : DyLvC               /*        0 - 99           */
Bn 47 vv (00 - 7FH) : DyLvR               /*        0 - 99           */
Bn 48 vv (00 - 7FH) : RSize
                    : ALGORITHM 1         /* Size 5.6 - 32.6  [m]    */
                    : ALGORITHM 2,3       /* Size   1 - 10           */
                    : ALGORITHM 8,9       /* Size   1 - 10           */
                    : ALGORITHM 10,11     /* Size   1 - 10           */
                    : ALGORITHM 4,5       /* Size   1 - 8            */
Bn 48 vv (00 - 7FH) : Dnsty[NLR]          /*        0 - 99           */
Bn 48 vv (00 - 7FH) : NLRF1[NLR (F1 On)]  /*      C_0 - C_8          */
                                          /* C_0 :  16.351598[Hz]    */
                                          /* C_8 : 4186.009045[Hz]   */
Bn 49 vv (00 - 7FH) : Dnsty               /*        0 - 99           */
Bn 49 vv (00 - 7FH) : EnvT1[NLR]          /*        0 - 1000  [msec] */
Bn 49 vv (00 - 7FH) : NLRF2[NLR (F1 On)]  /*  Same as NLRF1          */
Bn 4A vv (00 - 7FH) : HiDFq               /*     4000 - 20000 [Hz]   */
Bn 4A vv (00 - 7FH) : EnvT2[NLR]          /*        0 - 1000  [msec] */
Bn 4A vv (00 - 7FH) : NLRF3[NLR (F1 On)]  /*  Same as NLRF1          */
Bn 4B vv (00 - 7FH) : LoDFq               /*       50 - 4000  [Hz]   */
Bn 4B vv (00 - 7FH) : EnvT3[NLR]          /*        0 - 1000  [msec] */
Bn 4B vv (00 - 7FH) : NLRF4[NLR (F1 On)]  /*  Same as NLRF1          */
Bn 4C vv (00 - 7FH) : RlDns               /*        0 - 99           */
Bn 4C vv (00 - 7FH) : EnvT4[NLR]          /*        0 - 1000  [msec] */
Bn 4C vv (00 - 7FH) : NLRF5[NLR (F1 On)]  /*  Same as NLRF1          */
Bn 4D vv (00 - 7FH) : DyTmL               /*        0 - 500   [msec] */
Bn 4D vv (00 - 7FH) : NLBal[NLR]          /*        0 - 99           */
Bn 4E vv (00 - 7FH) : DyTmR               /*        0 - 500   [msec] */
Bn 4E vv (00 - 7FH) : NLTyp[NLR]          /* 00H - 28H =  <<  Right to Left */
                                          /* 29H - 51H = <<>> Center        */
                                          /* 52H - 7FH =  >>  Left to Right */
Bn 4F vv (00 - 7FH) : DyTmC               /*        0 - 500   [msec] */

Bn 50 vv (00 - 7FH) : HiCut               /*      170 - 20000 [Hz]   */
Bn 51 vv (00 - 7FH) : OutLv               /*        0 - 100          */

Bn 58 vv (7FH) : Low_Q PEAKING            /*  Peaking value = 1.0    */
Bn 5C vv (7FH) : Hig_Q PEAKING            /*  Peaking value = 1.0    */
```

# 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 | Manufacturer ID (Roland) |
| DEV | Device ID |
| MDL | Model ID |
| CMD | Command ID |
| [BODY] | Main data |
| F7H | End of exclusive |

### •MIDI status: F0H, F7H

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

### •Manufacturer ID: 41H

The Manufacturer ID identifies the manufacturer of a MIDI instrument that sends an Exclusive message. Value 41H represents Roland's Manufacturer ID.

### •Device ID: DEV

The Device ID contains a unique value that identifies individual devices in the implementation of several 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 several basic channels.

### •Model ID: MDL

The Model ID contains a value that 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:

01H
02H
03H
00H, 01H
00H, 02H
00H, 00H, 01H

### •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:

01H
02H
03H
00H, 01H
00H, 02H
00H, 00H, 01H

### •Main data: BODY

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

## 2. Address-mapped Data Transfer

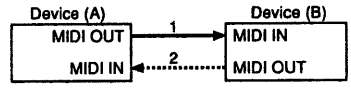
Address mapping is a technique for transferring messages conforming to the data format given in Section 1. It assigns a series of memory-resident records—waveform and tone data, switch status, and parameters, for example, to specific locations in a machine-dependent address space, thereby allowing access 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 to the transfer of a small amount of data. It sends out an Exclusive message completely independent of the receiving device's status.

**Connection Diagram**

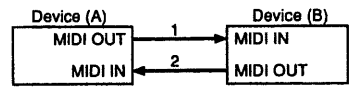



Connection at point 2 is essential for "Request data" procedures. (See Section 3.)

### •Handshake-transfer procedure (This device does not use this procedure)

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 at points 1 and 2 is essential.

### Notes on the above procedures

* ***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 until it has all been sent and is used when the messages are so short that answerbacks need not be checked. For longer messages, however, the receiving device must acquire each message in time with the transfer sequence, which inserts 20 milliseconds intervals.

**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 won't send out anything.

| Byte | Description |
|---|---|
| F0H | Exclusive Status |
| 41H | Manufacturer 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 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 the last 7 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 of one or more bits of data as well as a series of data formatted in an address-dependent order.

The MIDI standards inhibit non real-time messages from interrupting an Exclusive one. This fact is inconvenient for devices that support a "soft-thru" function. 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'.

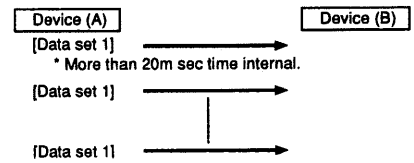
| Byte | Description |
|---|---|
| F0H | Exclusive Status |
| 41H | Manufacturer ID (Roland) |
| DEV | Device ID |
| MDL | Model ID |
| 12H | Command ID |
| aaH | Address MSB |
| ⋮ | ⋮ |
| ⋮ | ⋮ |
| | LSB |
| ddH | Data MSB |
| ⋮ | ⋮ |
| ⋮ | ⋮ |
| | LSB |
| sum | Check sum |
| F7H | End of exclusive |

* ***A DT1 message is capable of providing only the valid data among those specified by an RQ1 message.***
* ***Some models 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 the last 7 bits are zero when values for an address, data, 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.