1.TRANSMITTED DATA
  1-1 System Realtime Message
  1-2 System Exclusive
  1-2-1 Universal System Exclusive Message (Non Realtime)
  1-2-2 KORG System Exclusive

2.RECOGNIZED RECEIVE DATA
  2-1 Recognized Receive Messages
  2-2 System Exclusive
  2-2-1 Universal System Exclusive Message (Non Realtime)
  2-2-2 Universal System Exclusive Messages (Realtime)
  2-2-3 KORG System Exclusive

3.KORG SYSTEM EXCLUSIVE FORMAT
  3-1 Structure of TRINITY series System Exclusive Messages
  3-2 Each Exclusive message's format

4.TABLES
  [TABLE1] Program Parameters   (for Dump, Parameter Change)
  [TABLE2] Combination Parameters   (for Dump, Parameter Change)
  [TABLE3] Global Parameters   (for Dump)
  [TABLE4] Parameter No. at Combination mode (for Parameter Change)
  [TABLE5] Parameter No. at Program mode   (for Parameter Change)
  [TABLE6] Drumkit Parameters   (for Dump, Drum Parameter Change)
  [TABLE7] Multi Parameters   (for Dump)

1.TRANSMITTED DATA

1-1 SYSTEM REALTIME MESSAGE

Status[H]	Description (Everytime transmitted)
FE	Active Sensing

1-2 SYSTEM EXCLUSIVE

1-2-1 UNIVERSAL SYSTEM EXCLUSIVE MESSAGE (NON REALTIME)

* DEVICE INQUlRY REPLY (Transmits when received a INQUIRY MESSAGE REQUEST)
[F0,7E,0g,06,02,42,3B,00,20,00,nn,00,vv,00,F7]

3rd byte g : Global Channel
6th byte 42 : KORG ID
7th byte 3B : TRINITY series ID
9th byte 20 : TR-Rack
(01: Trinity, 09:Tri plus)
(12: Tri pro, 1B:Tri proX)
11th byte nn : System No. (01..)
13th byte vv : System Version (01..)

1-2-2 KORG SYSTEM EXCLUSIVE See "3. MIDI SYSTEM EXCLUSIVE FORMAT"

* There are 14 transmit Messages, and their format is as below.
[F0,42,3g,3B,[Func],[Data]....,F7]

3rd byte g : Global Channel
5th byte [Func] : Function Code (See below Table)

Transmits Message List "Func" : Function Code

Func	Description	R	D	E
40	CURRENT PROGRAM PARAMETER DUMP	o		
4C	PROGRAM PARAMETER DUMP	o	o	
49	CURRENT COMBINATION PARAMETER DUMP	o		
4D	COMBlNATION PARAMETER DUMP	o	o	
48	MULTI DATA DUMP	o	o	
51	GLOBAL DATA DUMP	o	o	
52	DRUMKIT DATA DUMP	o	o	
50	ALL DATA(GLOBAL,DRUM,COMBl,PROG,MLT) DUMP	o	o	
42	MODE DATA	o		
26	RECEIVED MESSAGE FORMAT ERROR	o		o
23	DATA LOAD COMPLETED (ACK)			o
24	DATA LOAD ERROR (NAK)			o
21	WRITE COMPLETED			o
22	WRlTE ERROR			o

Transmitted when
R : Request Message is received
D : Data dump by SW (Don't respond to Exclusive ENA,DIS)
E : EX.Message received

Some Request Message is not received in some mode. See 2-2-3.

* When transmits series of EX Messages to TRINITY, please wait for message[DATA LOAD COMPLETED] or [WRITE COMPLETED] before sending a next message.

2.RECOGNIZED RECEIVE DATA

2-1 RECOGNIZED RECEIVE MESSAGES [H]:Hex, [D]:Decimal

Status [Hex]	Second [H] [D]	Third [H] [D]	Description (Use ...)	ENA
CHANNEL MESSAGES				
8n	kk (kk)	xx (xx)	Note Off	A
9n	kk (kk)	00 (00)	Note Off	A
9n	kk (kk)	vv (vv)	Note On vv=1..127	A
An	kk (kk)	vv (vv)	Poly Key Pressure (for Alternate Mod)	T
Bn	00 (00)	mm (mm)	Bank Select(MSB) (for Prog/Combi Change) *1	P
Bn	01 (01)	vv (vv)	Modulation1 Depth (for OSC LFO mod)	C
Bn	02 (02)	vv (vv)	Modulation2 Depth (for Filter LFO mod)	C
Bn	04 (04)	vv (vv)	Foot Pedal (for Alternate Mod)	C
Bn	06 (06)	vv (vv)	Data Entry (MSB) (for RPC Edit)	C
Bn	07 (07)	vv (vv)	Volume	C
Bn	0A (10)	vv (vv)	Panpot	C
Bn	0B (11)	vv (vv)	Expression	C
Bn	0C (12)	vv (vv)	Effect Control 1 (as FX Dyn Mod Src = MIDI Cnt1)	C
Bn	0D (13)	vv (vv)	Effect Control 2 (as = MIDI Cnt2)	C
Bn	10 (16)	vv (vv)	Multi Purpose Cntl1 (as Ribbon Controller(X))	C
Bn	11 (17)	vv (vv)	Multi Purpose Cntl2 (as (Z))	C
Bn	12 (18)	vv (vv)	Multi Purpose Cntl3 (as Value Slider)	C
Bn	13 (19)	vv (vv)	Multi Purpose Cntl4 (for AM & FX mod)	C
Bn	20 (32)	bb (bb)	Bank Select(LSB) (for Prog / Combi Change) *1	P
Bn	26 (38)	vv (vv)	Data Entry (LSB) (for RPC Edit)	C
Bn	40 (64)	~3F/40~ (~63/64~)	Hold1 Off/On	C
Bn	48 (72)	vv (vv)	Release Time (as Perf Edit Release Time) *2	C
Bn	49 (73)	vv (vv)	Attack Time (as Attack Time) *2	C
Bn	4A (74)	vv (vv)	Brightness (as Cutoff Freq) *2	C
Bn	50 (80)	vv (vv)	Multi Purpose Cntl5 (as Panel SW 1)	C
Bn	51 (81)	vv (vv)	Multi Purpose Cntl6 (as 2)	C
Bn	52 (82)	vv (vv)	Multi Purpose Cntl7 (as Pedal SW)	C
Bn	53 (83)	vv (vv)	Multi Purpose Cntl8 (for AM & FX mod)	C
Bn	5B (91)	vv (vv)	Effect1 Level (as Send 2 Level)	C
Bg	5C (92)	00/01~ (00/01~)	Effect2 Level (for All Insert FX Off/On)	C
Bn	5D (93)	vv (vv)	Effect3 Level (as Send 1 Level)	C
Bg	5E (94)	00/01~ (00/01~)	Effect4 Level (for Master FX (Mod) Off/On)	C
Bg	5F (95)	00/01~ (00/01~)	Effect5 Level (for (R/D) Off/On)	C
Bn	60 (96)	00 (00)	Data Increment (for RPC Edit)	C
Bn	61 (97)	00 (00)	Data Decrement (for)	C
Bn	64(100)	0r (0r)	RPN Param No. (LSB) (for RPN Select) *3	C
Bn	65(101)	00 (00)	RPN Param No. (MSB) (for) *3	C
Bn	78(120)	00 (00)	All Sound Off	C
Bn	79(121)	00 (00)	Reset All Controllers	C
Bn	7B(123)	00 (00)	All Notes Off	A
Bn	7C(124)	00 (00)	Omni Mode Off (as All Notes Off)	A
Bn	7D(125)	00 (00)	Omni Mode On (as)	A
Bn	7E(126)	0~10 (0~16)	Mono Mode On (as)	A
Bn	7F(127)	00 (00)	Poly mode On (as)	A
Cn	pp (pp)	-- --	Program Change (for Prog/Combi Change) *1,4	P
Dn	vv (vv)	-- --	Channel Pressure (as After Touch)	T
En	bb (bb)	bb (bb)	Bender Change	C
SYSTEM REALTIME MESSAGES				
F8	--	--	Timing Clock (Alternate Mod, Eff Dyna Mod)	A
FE	--	--	Active Sensing (MIDI Connect check)	A

n : MIDI Channel No. (0..15) ..... Usually Global Channel.
When in Combi/Multi mode, each timbre's/track's channel.
g : Always Global Channel No. (0..15)

x : Random

ENA = A : Always Enabled
C : Enabled when Control Filter is ENA
P : Program Filter is ENA
T : Aftertouch Filter is ENA

*1 : MIDI In [Hex] Program/Combination
mm,bb,pp = 00,00,00..7F : BankA 00..127
00,01,00..7F : B 00..127
00,02,00..7F : C 00..127
00,03,00..7F : D 00..127

*2 : vv < 40 : Fast or Dark
= 40 : Default

```
       > 40 : Slow or Bright

*3 : r = 0 : Pitch Bend Sens ( Only in MULTI Mode ).
       = 1 : Detune          (                   ). When received Ch = Global Ch,
       = 2 : Transpose       (                   ).            work as Master Tune ( Other mode ).

*4 : At the end of process ( While Exclusive Filter is set to ENA ),
     Transmits Exclusive Message[DATA LOAD COMPLETED]or[DATA LOAD ERROR].

2-2 SYSTEM EXCLUSIVE

2-2-1 UNIVERSAL SYSTEM EXCLUSIVE MESSAGE ( NON REALTIME )

      * DEVICE INQUlRY ( When received this message, transmits INQUlRY MESSAGE REPLY )
        [ F0,7E,nn,06,01,F7 ]                          3rd byte  nn : Channel = 0..F : Global Channel
                                                                    = 7F   : Any Channel

2-2-2 UNIVERSAL SYSTEM EXCLUSIVE MESSAGES ( REALTIME )

      * MASTER VOLUME
        [ F0,7F,0g,04,01,vv,mm,F7 ]                    3rd byte   g : Global Channel
                                                       6th byte  vv : Value(LSB)
                                                       7th byte  mm :      (MSB)

      * MASTER BALANCE
        [ F0,7F,0g,04,02,vv,mm,F7 ]                    3rd byte   g : Global Channel
                                                       6th byte  vv : Value(LSB)
                                                       7th byte  mm :      (MSB)
                                                                 mm,vv = 00,00:L, 40,00:C, 7F,7F:R

2-2-3 KORG SYSTEM EXCLUSIVE        See "3.MIDI SYSTEM EXCLUSIVE FORMAT"
       There are 22 received messages and their format is as below.
        [ F0,42,3g,3B,[Func],[Data]....,F7 ]       3rd byte      g : Global Channel
                                                   5th byte [Func] : Function Code ( See below Table )

                  Received Message List              "Func" : Function Code
      +-----+-----------------------------------------------+---+---+---+---+----+
      | Func|                Description                    | G | C | P | A | No.|
      +-----+-----------------------------------------------+---+---+---+---+----+
      |  12 | MODE DATA DUMP REQUEST                        | o | o | o | o | 42 |
      |  10 | CURRENT PROGRAM PARAMETER DUMP REQUEST        | o | o | o | o | 40 |
      |  1C | PROGRAM PARAMETER DUMP REQUEST                | A | o | o | o | 4C |
      |  19 | CURRENT COMBlNATION PARAMETER DUMP REQUEST    | o | o | o | o | 49 |
      |  1D | COMBINATION PARAMETER DUMP REQUEST            | A | o | o | o | 4D |
      |  18 | MULTI DATA DUMP REQUEST                       | A | o | o | o | 48 |
      |  0E | GLOBAL DATA DUMP REQUEST                      | A | o | o | o | 51 |
      |  0D | DRUMKIT DATA DUMP REQUEST                     | A | o | o | o | 52 |
      |  0F | ALL DATA(GLOBL,DRUM,COMBl,PROG,MULTI)DUMP REQ | A | o | o | o | 50 |
      |     |                                               |   |   |   |   |    |
      |  11 | PROGRAM WRITE REQUEST                         |   |   | o |   | 21 |
      |  1A | COMBINATION WRITE REQUEST                     |   | o |   |   | 21 |
      |  4E | MODE CHANGE                                   | o | o | o | o | 23 |
      |  41 | PARAMETER CHANGE                              |   | o | o |   | 23 |
      |  53 | DRUM KIT PARAMETER CHANGE                     | o |   |   |   | 23 |
      |     |                                               |   |   |   |   |    |
      |  40 | CURRENT PROGRAM PARAMETER DUMP                |   |   | o |   | 23 |
      |  4C | PROGRAM PARAMETER DUMP                        | A | o | o | o | 23 |
      |  49 | CURRENT COMBINATION PARAMETER DUMP            |   | o |   |   | 23 |
      |  4D | COMBINATION PARAMETER DUMP                    | A | o | o | o | 23 |
      |  48 | MULTI DATA DUMP                               | A | o | o | o | 23 |
      |  51 | GLOBAL DATA DUMP                              | A | o | o | o | 23 |
      |  52 | DRUMKIT DATA DUMP                             | A | o | o | o | 23 |
      |  50 | ALL DATA(GLOBAL,DRUMS,COMBI,PROG,MULTI) DUMP  | A | o | o | o | 23 |
      +-----+-----------------------------------------------+---+---+---+---+----+
          Received when in
             G : GLOBAL mode. ( A ... Does not respond to Exclusive ENA,DIS in DATA DUMP page )
             C : COMBI PLAY, COMBI EDIT mode.
             P : PROG PLAY, PROG EDIT mode.
             A : Any other mode.

          No. : MIDI Out Function No.
               ( transmitted when the message has been received )


3.KORG SYSTEM EXCLUSIVE FORMAT

3-1 Structure of TRINITY series SYSTEM EXCLUSIVE MESSAGES
        +--                                                    --+
        |   1st Byte = F0H : Exclusive Status            --+     |
        |   2nd Byte = 42H : KORG   ID                    | EX. Header  |
        |   3rd Byte = 3gH : Format ID     ( g:Global Ch ) |     |
        |   4th Byte = 3BH : TRINITY series ID           --+     |
        |   5th Byte = ffH : Function Code ( See Func Code List )  |
        |   6th Byte = ddH : Data         ( Some massages doesn't have data ) |
```

```
      |                                                          |
      |   LastByte = F7H : End of Exclusive.                     |
      +--                                                      --+
```

When transmits series of EX Messages to SG series, please wait for messages [DATA LOAD COMPLETED] or [WRITE COMPLETED] before sending a next message.

3-2 Each Exclusive message's format

R: Receive, T: Transmit
xx : Random (The value would be 00 for safe)

(1) MODE DATA DUMP REQUEST R
[F0,42,3g,3B,12,F7]
Receives this message, and transmits Func=42 message.

(2) CURRENT PROGRAM PARAMETER DUMP REQUEST R
[F0,42,3g,3B,10,xx,F7]
Receives this message, and transmits Func=40 or Func=24 message.

(3) PROGRAM PARAMETER (In Memory)DUMP REQUEST R
[F0,42,3g,3B,1C,kb,pp,xx,F7]
k : Kind = 0 : All Programs
1 : 1 Bank Programs (Use b)
2 : 1 Program (Use b & pp)
b : Bank = 0..3 : A..D
pp: Prog = 00..7F : 00..127
Receives this message, and transmits Func=4C message.

(4) CURRENT COMBINATION PARAMETER DUMP REQUEST R
[F0,42,3g,3B,19,xx,F7]
Receives this message, and transmits Func=49 or Func=24 message.

(5) COMBINATION PARAMETER (In Memory) DUMP REQUEST R
[F0,42,3g,3B,1D,kb,cc,xx,F7]
k : Kind = 0 : All Combinations
1 : 1 Bank Combinations (Use b)
2 : 1 Combination (Use b & cc)
b : Bank = 0..3 : A..D
cc: Comb = 00..7F : 00..127
Receives this message, and transmits Func=4D message.

(6) MULTI DATA (In Memory) DUMP REQUEST R
[F0,42,3g,3B,18,xx,F7]
Receives this message, and transmits Func=48 or Func=24 message.

(7) GLOBAL DATA DUMP REQUEST R
[F0,42,3g,3B,0E,xx,F7]
Receives this message, and transmits Func=51 message.

(8) DRUMKIT DATA DUMP REQUEST R
[F0,42,3g,3B,0D,kd,xx,F7]
k : Kind = 0 : All Drumkits
1 : 1 Drumkit (use d)
d : Drum = 0..17 : 00..23
Recelves this message, and transmits Func=52 message.

(9) ALL DATA(GLOB,DRUMS,COMBI,PROG,MULTI) DUMP REQUEST R
[F0,42,3g,3B.0F,xx,F7]
Receives this message, and transmits Func=50 or Func=24 message.

(10) PROGRAM WRITE REQUEST R
[F0,42,3g,3B,11,0b,pp,F7]
b : Dest Prog Bank = 0..3 : A..D
pp: Dest Prog No. = 00..7F : 00..127
Receives this message, writes the program to dest No. and transmits Func=21 message.

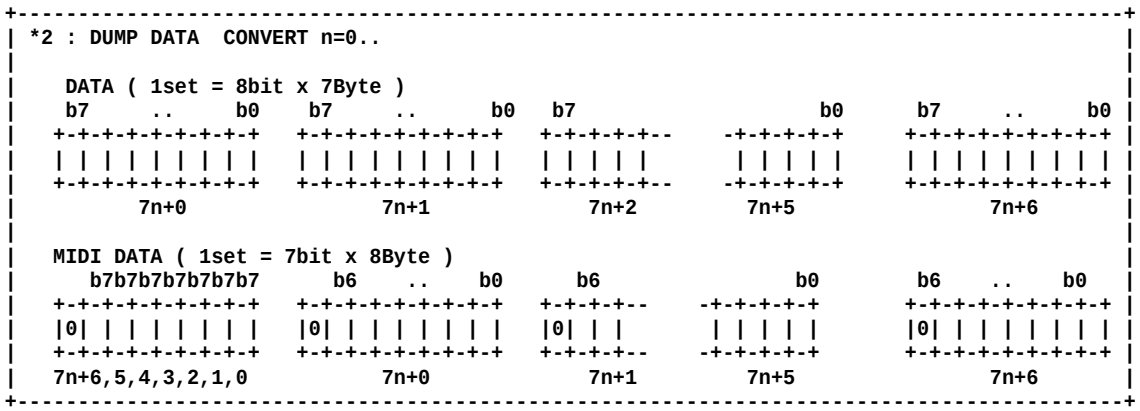
(11) COMBINATION WRITE REQUEST R
[F0,42,3g,3B,1A,0b,cc,F7]
b : Dest Comb Bank = 0..3 : A..D
cc: Dest Comb No. = 00..7F : 00..127
Receives this message, writes the Combination to dest No. and transmits Funk = 21 message.

(12) MODE CHANGE
[F0,42,3g,3B,4E,0m,xx,F7]
m : Mode = 0:Combination, 1:Combi Edit, 2:Program,
3:Prog Edit, 4:Multi, 5:Global
Receives this message, change a mode and transmits Func=23 message.

(13) PARAMETER CHANGE R
[F0,42,3g,3B,41,0m,pp,00,qq,00,vv,ww,F7]
m : Mode (Only use for mode check)
= 0:Combination, 1:Combi Edit, 2:Program,
3:Prog Edit, 4:Multi, 5:Global
pp: Parameter ID See TABLE1,2,3,4,5

```
            qq: Parameter SUB ID                                    See TABLE1,2,3,4,5
            vv: Value (MSB bit 7..13)                                          *1
            ww: Value (LSB bit 0..6)                                           *1
   Receives this message, check the mode, select a parameter, change a value
    and transmits Func= 23 message.

(14) DRUMKIT PARAMETER CHANGE                          R
        [ F0,42,3g,3B,53,kk,ss,pp,qq,vv,ww,F7 ]
            kk: Drumkit = 00..17 : Drumkit00..23
            ss: Key No. = 15..6C : A0..C8
            pp: Parameter No.(MSB)                                  See TABLE6
            qq: Parameter No (LSB)                                  See TABLE6
            vv: Value (MSB bit7..13)                                           *1
            ww: Value (LSB bit0..6)                                            *1
       Receives this message, select a Drumkit,Key,Parameter, change a value
       and transmits Func= 23 message.

(15) CURRENT PROGRAM PARAMETER DUMP                    R,T
        [ F0,42,3g,3B,40,00,dd, ... ,F7 ]
            dd: [Param No.00]....[Param No.432]                     See TABLE1
                433Bytes = 7x61+6 -> 8x61+(1+6) = 495Bytes                     *2
       Receives this message & data, and transmits Func=23 or Func=24 message.
       Receives Func=10 message, and transmits this message & data.

(16) PROGRAM PARAMETER (In Memory) DUMP                R,T
      [ F0,42,3g,3B,4C,01,kb,pp,xx,dd,....,F7 ]
            k : Kind = 0 : All Programs
                       1 : 1 Bank Programs       (Use b)
                       2 : 1 Program            (Use b & pp)
            b : Bank =  0..3  :  A..D
           pp : Prog = 00..7F : 00..127
            dd : Data                                               See TABLE1
                    *ALL    [A00(433Bytes)], .. ,[D127(433Bytes)]
                            433x512Bytes = 7x31670+6 -> 8x31670+(1+6) = 253367Bytes *2
                 *1BANK  [A00(433Bytes)], .. ,[A127(433Bytes)]
                            433x128Bytes = 7x7917+5 -> 8x7917+(1+5) = 63342Bytes   *2
                    *1PROG  433Bytes = 7x61+6 -> 8x61+(1+6) = 495Bytes             *2
       Receives this message & data, and transmits Func=23 or Funk=24 message.
       Receives Funk=1C message, and transmits this message & data.
       Transmits this message & data when DATA DUMP is executed.

(17) CURRENT COMBINATION PARAMETER DUMP                R,T
        [ F0,42,3g,3B,49,xx,dd, ... ,F7 ]
            dd: [Param No.00]....[Param No.387]                     See TABLE2
                388Bytes = 7x55+3 -> 8x55+(1+3) = 444Bytes                     *2
       Receives this message & data, and transmits Func=23 or Funk=24 message.
       Receives Funk=19 message, and transmits this message & data.

(18) COMBINATION PARAMETER ( In Memory ) DUMP          R,T
        [ F0,42,3g,3B,4D,01,kb,cc,xx,dd,.....,F7 ]
            k : Kind = 0 : All Combinations
                       1 : 1 Bank Combinations ( Use b )
                       2 : 1 Combination       ( Use b & cc )
            b : Bank =  0..3  :  A..D
            cc: Comb = 00..7F : 00..127
           dd: Data                                                 See TABLE2
                    *ALL    [A00(388Bytes)], .. ,[D127(388Bytes)]
                            388x512Bytes = 7x28379+3 -> 8x28379+(1+3) = 227036Bytes *2
                    *1BANK  [A00(388Bytes)], .. ,[A127(388Bytes)]
                            388x128Bytes = 7x7094+6 -> 8x7094+(1+6) = 56759Bytes   *2
                    *1COMBI 388Bytes = 7x55+3 -> 8x55+(1+3) = 444Bytes             *2
       Receives this message & data, and transmits Func=23 or Func=24 message.
       Receives Func=1D message, and transmits this message & data.
       Transmits this message & data when DATA DUMP is executed.

(19) MULTI DATA ( In Memory ) DUMP                     R,T
      Use TRINITY's Sequencer's song0 area.
        [ F0,42,3g,3B,48,xx,00,00,00,00,dd, ... ,F7 ]
            dd: [Param No.00]....[Param No.4001]                    See TABLE7
                4002Bytes = 7x571+5 -> 8x571+(1+5) = 4574Bytes                 *2
       Receives this message & data, and transmits Func=23 or Func=24 message.
       Receives Func=18 message, and transmits this message & data.
       Transmits this message & data when DATA DUMP is executed.

(20) GLOBAL DATA DUMP                                  R,T
        [ F0,42,3g,3B,51,xx,dd, ... ,F7]
            dd: [Global Data (1172Bytes)]                           See TABLE3
                1172Bytes = 7x167+3 -> 8x167+(1+3) = 1340Bytes                 *2
       Receives this message & data, and transmits Func=23 or Func=24  message.
       Receives Func=0E message, and transmits this message & data.
       Transmits this message & data when DATA DUMP is executed.

(21) DRUMKIT DATA DUMP                                 R,T
        [ F0,42,3g,3B,52,01,kd,xx,dd, ... ,F7 ]
```

```
          k(bit6): Kind = 0: All Drumkits
                          1:1 Drumkit           ( Use d )
               d : Drumkit No.= 0..17 : Drumkit 00..23
               dd: Data                                                    See TABLE6
                     *ALL DRUM [DRUM0(1426Bytes)], .. ,[DRUM23(1426Bytes) ]
                               1426x24Bytes = 7x4889+1 -> 8x4889+(1+1) = 39114Bytes      *2
                     *1DRUMKIT 1426Bytes = 7x203+5 -> 8x203+(1+5) = 1630Bytes           *2
       Receives this message & data, and transmits Func=23 or Func=24 message.
       Receives Func=0D message, and transmits this message & data.
       Transmits this message & data when DATA DUMP is executed.

 (22) ALL DATA(GLOBAL,DRUMS,COMBI,PROG,MULTI) DUMP          R,T
         [ F0,42,3g,3B,50,01,xx,dd, ... ,F7 ]
               dd: Data
                       [Global Data(1172Bytes)],                             See TABLE3
                       [Drums Data(1426x24Bytes)],                           See TABLE6
                       [All Combi Param Data(388x512Bytes)],                 See TABLE2
                       [All Prog Param Data(433x512Bytes)],                  See TABLE1
                       [ ( Reserved )(84Bytes)],
                       [Multi Data(3918Bytes)]                               See TABLE7
                       1172+34224+198656+221696+84+3918Bytes =7x65678+4
                       -> 8x65678+(1+4) = 525429Bytes                              *2
       Receives this message & data, and transmits Func=23 or Func=24 message.
       Receives Func=0F message, and transmits this message & data.
       Transmits this message & data when DATA DUMP is executed.

 (23) MODE DATA                                              T
         [ F0,42,3g,3B,42,0m.00,s2,0d,xx,F7 ]
               m : Mode = 0:Combi, 1:CombEdit, 2:Prog, 3:ProgEdit, 8 Global
               s :(bit6)= 0: System Clock is Internal
                        = 1:                 Word Clock
              d :(bit0)= 0: Prog Mem is not protected,   =1 : protected
                 (bit1)= 0: Combi                        =1 :
                 (bit2)= 0: Multi                        =1 :
       Receives Func=12 message, and transmits this message & data.

 (24) RECEIVED MESSAGE FORMAT ERROR                          T
         [ F0,42,3g,3B,26,cc,F7 ]
               cc: Error code = 0 : Received Data Length is wrong
                                1 : Received Function code is not registered
                               40 : Another type error
       Transmits this message when there is an error in the MIDI IN message (ex.data length).

 (25) DATA LOAD COMPLETED ( ACK )                            T
         [ F0,42,3g,3B,23,F7 ]
       Transmits this message when DATA LOAD, PROCESSING have been completed.

 (26) DATA LOAD ERROR ( NAK )                                T
         [ F0,42,3g,3B,24,cc,F7 ]
               cc: Error code = 0 : Dest Memory is protected
                                1 : Dest Bank/Prog/Param is not exist
                                2 : The mode is wrong
                               40 : Another type error
       Transmits this message when DATA LOAD, PROCESSING have not been completed (ex. protected).

 (27) WRITE COMPLETED                                        T
         [ F0,42,3g,3B,21,F7 ]
       Transmits this message when DATA WRITE MIDI has been completed.

 (28) WRITE ERROR                                            T
         [ F0,42,3g,3B,22,cc,F7 ]
               cc: Error code = 0 : Dest Memory is protected
                                1 : Dest Bank/Prog is not exist
                                2 : The mode is wrong
                               40 : Another type error
       Transmits this message when DATA WRITE MIDI has not been completed.



*1 : VALUE DATA FORMAT  (Use at PARAMETER CHANGE, DRUM KIT PARAMETER CHANGE)

           Bit15..13 of Value Data is the Sign Flag, and each bit has the same value
             +---+---+---+---+---+---+---+---+   +---+---+---+---+---+---+---+---+
   Value Data|   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |
             +---+---+---+---+---+---+---+---+   +---+---+---+---+---+---+---+---+
               |   |   |   |   |   |   |   |       |   |   |   |   |   |   |   |
               +---+---+   |   |   |   |   |       |   |   |   |   |   |   |   |
                   +-+   +-+ +-+ +-+ +-+ +-+ +-----+   |   |   |   |   |   |   |
                     |   |   |   |   |   |   |         |   |   |   |   |   |   |
               +---+---+---+---+---+---+---+---+ +---+---+---+---+---+---+---+---+
   MIDI Data   |  0|   |   |   |   |   |   |   | |  0|   |   |   |   |   |   |   |
               +---+---+---+---+---+---+---+---+ +---+---+---+---+---+---+---+---+
                           MSB                             LSB
```



4.TABLES

[TABLE 1] PROGRAM PARAMETERS

1997.09.29

No. : No. in the PROGRAM DUMP DATA.
PARA No. : Parameter ID & SUB ID [Hex] for PARAMETER CHANGE.
Left side of ','is Parameter ID, and right side is SUB ID.
$: While Assign mode is Drum, these parameters are ignored.
: These parameters are ignored in Combination,Multi.

No. (bit)	PARAMETER	DATA(Hex) : VALUE	DESCRIPTION	PARA No.
00	PROGRAM NAME (Head)	20..7F : ''.. '<-' [ASCII CODE]		----
15	PROGRAM NAME (Tail)			
CATEGORY				
b0..3	CATEGORY	0..F : 1..16	(Ex. for Instruments) *1	00,00
16				
b4..7	(Reserved)			
OSCILLATOR				
b0,1	OSCILLATOR MODE	0:SINGLE,1:DOUBLE,2:DRUM		00,02
bit2	LEGATO SW $	0:OFF, 1:ON	Available when MONO	00,04
bit3	KEY ASSIGN	0:POLY, 1:MONO		00,03
17				
bit4	HOLD	0:OFF, 1:ON		00,07
b5,6	KEY PRIORITY	0:LOW, 1:HIGH, 2:LAST	Available when MONO	00,05
bit7	POLY ASSIGN MODE	0:NORMAL, 1:PIANO	Available when POLY *2	00,06
18	BOTTOM VEL OF OSC2 $	01..7F : 01..127	Available when DOUBLE *3	01,16
SCALE				
b0..3	SCALE KEY #	0..B : C..B		00,09
19				
b4..7	SCALE TYPE #	0..C : *4		00,08
20	RANDOM INTENSITY #	00..07 : 00..07	Normal = 0 *5	00,0A
21	(Reserved)			
OSCILLATOR EG (Linear Line)				
22	START LEVEL	9D..63 : -99..99		06,00
23	ATTACK TIME	00..63 : 00..99		06,01
24	ATTACK LEVEL	9D..63 : -99..99		06,02
25	DECAY TIME	00..63 : 00..99		06,03
26	RELEASE TIME	00..63 : 00..99		06,04
27	RELEASE LEVEL	9D..63 : -99..99		06,05

	OSCILLATOR EG TIME MOD (For EG Whole Time)				
28	INT BY VELOCITY	9D..63 : -99..99			06,06
29	A.M SOURCE	00..16 : *6	Alternate Modulation		06,07
30	INT BY A.M	9D..63 : -99..99			06,08
	OSCILLATOR-1		Right side of '/'is SUB ID for OSC 2		
31	bit7 LOW MS OFFSET START$	0:NORMAL, 1:OFFSET			01,04/0E
	b0..6 LOW MULTISAMPL(MSB)$	000..19E : 000..414	Lower Vel's Multisample *7		01,03/0D
32	LOW MULTISAMPL(LSB)$				
33	bit7 HI M.S OFFSET START	0:NORMAL, 1:OFFSET	Drum is setupes by each Keys		01,01/0B
	b0..6 HI M.SMP,D.KIT(MSB)	000..19E : 000..414	Hi Vel's Multi/DrumKit *7		01,00/0A
34	HI M.SMP,D.KIT(LSB)				
35	LOWER LEVEL $	00..7F : 00..127			01,05/0F
36	HIGHER LEVEL	00..7F : 00..127			01,02/0C
37	BOTTOM VEL OF HI MS	01..7F : 01..127	(For Vel Split) *7		01,14/15
38	b0..4 TRANSPOSE	F4..0C : -12..12 [S.T]			01,08/12
	b6,7 OCTAVE	00..03 : 32..4 [']			01,07/11
39	TUNE (MSB)	FB50..04B0 : -1200..1200			
40	TUNE (LSB)	[Cent]	Only change a Pitch		01,09/13
41	DELAY START	00..60,FF : *8	FF : Start by NOTE OFF!		01,06/10

	OSC-1 PITCH MOD				
42	BY PITCH SLOPE	F6..14 : -1.0..2.0	Linear, Center Key is C4 *9		02,00
43	INT BY OCS EG	8D..73 : -12.00..12.00	*10		02,08
44	INT BY OSC-1 LFO	8D..73 : -12.00..12.00	*10		02,0C
45	INT BY RIBBON(X)	F4..0C : -12..12[S.T]	Ribbon(X) : CC#16		02,01
	OSC-1 PITCH MOD BY JOY STICK (X)				
46	INT BY J.S(+X) #	C4..0C : -60..12	J.S(+X) : Pitch Bend(H) *11		02,02
47	INT BY J.S(-X) #	C4..0C : -60..12	J.S(-X) : Pitch Bend(L) *11		02,04
48	b0..3 STEP OF J.S(+X) #	0..F : *12	J.S(+X) : Pitch Bend(H)		02,03
	b4..7 STEP OF J.S(-X) #	0..F : *12	J.S(-X) : Pitch Bend(L)		02,05
	OSC-1 PITCH MOD BY ALTERNATE MOD				
49	A.M SOURCE	00..16 : *6	Alternate Modulation		02,06
50	INT BY A.M	8D..73 : -12.00..12.00	*10		02,07
	INTENSITY MODULATION OF OSC EG TO OSC-1 PITCH				
51	MOD INT BY VELOCITY	9D..63 : -99..99			02,09
52	A.M SOURCE	00..16 : *6	Alternate Modulation		02,0A
53	INT BY A.M	8D..73 : -12.00..12.00	*10		02,0B
	OSC-1 LFO				
	b0..4 WAVEFORM	0..12 : *13			03,00
54	b5,6 START MODE	0:ON, 1:OFF, 2:BOTH	*14		03,03
	bit7 KEY SYNC	0:OFF, 1:ON			03,04
55	OFF SET	9D..63 : -99..99	Doesn't effect while DELAY		03,02

56	FREQUENCY	00..63 : 00..99		03,01
57	DELAY	00..63 : 00..99		03,05
58	FADE	9D..63 : -99..99	*15	03,06
OSC-1 LFO FREQUENCY MOD				
59	INT BY KBD TRK	9D..63 : -99..99	Linear, Center Key is C4	03,07
60	INT BY J.S(+Y)	00..63 : 00..99	J.S(+Y) : CC#01	03,08
61	A.M SOURCE	00..16 : *6	Alternate Modulation	03,09
62	INT BY A.M	9D..63 : -99..99		03,0A
INTENSITY MODULATION OF OSC-1 LFO TO OSC-1 PITCH				
63	MOD INT BY J.S(+Y)	00..63 : 00..99	J.S(+Y) : CC#01	02,0D
64	MOD INT BY A.T	00..63 : 00..99		02,0E
65	A.M SOURCE	00..16 : *6	Alternate Modulation	02,0F
66	INT BY A.M	8D..73 : -12.00..12.00	*10	02,10
FILTER-1				
b0,1	FILTER-1A TYPE	0..3 : *16		07,01
b2,3	FILTER-1B TYPE	0..3 : *16		07,06
b4,5	FILTER-1 ROUTING	0..3 : *17		07,00
FILTER-1 EG (Up:Linear, Down:Exponential)				
68	START LEVEL	9D..63 : -99..99		0B,00
69	ATTACK TIME	00..63 : 00..99		0B,01
70	ATTACK LEVEL	9D..63 : -99..99		0B,02
71	DECAY TIME	00..63 : 00..99		0B,03
72	BREAK POINT LEVEL	9D..63 : -99..99		0B,04
73	SLOPE TIME	00..63 : 00..99		0B,05
74	SUSTAIN LEVEL	9D..63 : -99..99		0B,06
75	RELEASE TIME	00..63 : 00..99		0B,07
76	RELEASE LEVEL	9D..63 : -99..99		0B,08
FILTER-1 EG TIME(4POINTS) MOD BY KEYBOARD TRACK (Linear, Center Key is C4)				
77	ATTACK TIME	9D..63 : -99..99		0B,09
78	DECAY TIME	9D..63 : -99..99		0B,0A
79	SLOPE TIME	9D..63 : -99..99		0B,0B
80	RELEASE TIME	9D..63 : -99..99		0B,0C

FILTER-1 EG TIME(4POINTS) MOD BY VELOCITY				
81	ATTACK TIME	9D..63 : -99..99		0B,0D
82	DECAY TIME	9D..63 : -99..99		0B,0E
83	SLOPE TIME	9D..63 : -99..99		0B,0F
84	RELEASE TIME	9D..63 : -99..99		0B,10
FILTER-1 EG TIME MOD (For EG Whole Time)				
85	A.M SOURCE	00..16 : *6	Alternate Modulation	0B,11
86	INT BY A.M	9D..63 : -99..99		0B,12
FILTER-1 EG LEVEL(3POINTS) MOD BY VELOCITY				

87	START LEVEL	9D..63 : -99..99		0B,13
88	ATTACK LEVEL	9D..63 : -99..99		0B,14
89	BREAK POINT LEVEL	9D..63 : -99..99		0B,15
	INTENSITY MODULATION OF FILTER-1 EG TO FILTER-1A & FILTER-1B CUTOFF FREQ BY A.M			
90	A.M SOURCE	00..16 : *6	Alternate Modulation	08,14
91	INT BY A.M	9D..63 : -99..99		08,15
	FILTER-1 LFO			
b0..4	WAVEFORM	0..12 : *13		0C,00
b5,6	START MODE	0:ON, 1:OFF, 2:BOTH	*14	0C,03
bit7	KEY SYNC	0:OFF, 1:ON		0C,04
92	OFFSET	9D..63 : -99..99	Doesn't effect while DELAY	0C,02
93	FREQUENCY	00..63 : 00..99		0C,01
94	DELAY	00..63 : 00..99		0C,05
95	FADE	9D..63 : -99..99	*15	0C,06
	FILTER-1 LFO FREQUENCY MOD			
96	A.M SOURCE	00..16 : *6	Alternate Modulation	0C,07
97	INT BY A.M	9D..63 : -99..99		0C,08
	INTENSITY MODULATION OF FILTER-1 LFO TO FILTER-1A & FILTER-1B CUTOFF FREQ			
98	MOD INT BY J.S(-Y)	00..63 : 00..99	J.S(+Y) : CC#02	08,16
99	MOD INT BY A.T	00..63 : 00..99		08,17
100	A.M SOURCE	00..16 : *6	Alternate Modulation	08,1A
101	INT BY A.M	9D..63 : -99..99		08,1B
	FILTER-1A		Right side of '/'is SUB ID for Filter-1B	
102	CUTOFF FREQ VALUE	00..63 : 00..99		07,02/07
103	INPUT GAIN	00..63 : 00..99		07,03/08
104	RESONANCE LEVEL	00..1F : 00..31		07,04/09
105	RESO LEVL MOD BY VEL	9D..63 : -99..99		07,05/0A
	FILTER-1A CUTOFF FREQ MOD		Right side of '/'is SUB ID for Filter-1B	
106	INT BY FILTER-1 EG	9D..63 : -99..99		08,12/13
107	EG INT MOD BY VEL	9D..63 : -99..99		08,10/11
108	INT BY FILTER-1 LFO	9D..63 : -99..99		08,18/19
109	INT BY J.S(X)	9D..63 : -99..99	J.S(X) : Pitch Bent	08,04/0C
110	INT BY A.T	00..63 : 00..99		08,05/0D
	FILTER-1A CUTOFF MOD BY KBD TRACK (Figured) *18		Right side of '/'is SUB ID for Filter-1B	
111	LOW KEY	00..7F : C-1..G9		08,00/08
112	HIGH KEY	00..7F : C-1..G9		08,01/09
113	LOWER RAMP	9D..63 : -99..99		08,02/0A
114	HIGHER RAMP	9D..63 : -99..99		08,03/0B
	FILTER-1A CUTOFF FREQ MOD		Right side of '/'is SUB ID for Filter-1B	
115	A.M SOURCE	00..16 : *6	Alternate Modulation	08,06/0E
116	INT BY A.M	9D..63 : -99..99		08,07/0F
	FILTER-1B PARAMETERS			

118	SAME AS FILTER-1A(103..117)		Above 15 param No.'s
			right side of '/'is
132			SUB ID for Filter1-B

AMPLIFIER-1				
133	OUTPUT LEVEL	00..7F : 00..127		0F,00
AMPLIFIER-1 AMPLITUDE MOD BY KEYBOARD TRACK (Figured)				*18
134	LOW KEY	00..7F : C-1..G9		0F,01
135	HIGH KEY	00..7F : C-1..G9		0F,02
136	LOWER RAMP	9D..63 : -99..99		0F,03
137	HIGHER RAMP	9D..63 : -99..99		0F,04
AMPLIFIER-1 AMPLITUDE MOD				
138	INT BY VELOCITY	9D..63 : -99..99		0F,05
139	INT BY A.M	9D..63 : -99..99		0F,06
140	A.M SOURCE	00..16 : *6	Alternate Modulation	0F,07
141	INT BY A.M	9D..63 : -99..99		0F,08
AMPLIFIER-1 EG (Up:Linear, Down:Exponential)				
142	START LEVEL	00..63 : 00..99		10,00
143	ATTACK TIME	00..63 : 00..99		10,01
144	ATTACK LEVEL	00..63 : 00..99		10,02
145	DECAY TIME	00..63 : 00..99		10,03
146	BREAK POINT LEVEL	00..63 : 00..99		10,04
147	SLOPE TIME	00..63 : 00..99		10,05
148	SUSTAIN LEVEL	00..63 : 00..99		10,06
149	RELEASE TIME	00..63 : 00..99		10,07
AMPLIFIER-1 EG TIME(4POINTS) MOD BY KEYBOARD TRACK (Linear, Center Key is C4)				
150	ATTACK TIME	9D..63 : -99..99		10,08
151	DECAY TIME	9D..63 : -99..99		10,09
152	SLOPE TIME	9D..63 : -99..99		10,0A
153	RELEASE TIME	9D..63 : -99..99		10,0B
AMPLIFIER-1 EG TIME(4POINTS) MOD BY VELOCITY				
154	ATTACK TIME	9D..63 : -99..99		10,0C
155	DECAY TIME	9D..63 : -99..99		10,0D
156	SLOPE TIME	9D..63 : -99..99		10,0E
157	RELEASE TIME	9D..63 : -99..99		10,0F
AMPLIFIER-1 EG TIME MOD BY A.M SOURCE (For EG Whole Time)				
158	A.M SOURCE	00..16 : *6	Alternate Modulation	10,10
159	INT BY A.M	9D..63 : -99..99		10,11
AMPLIFIER-1 EG LEVEL (3POINTS) MOD BY VELOCITY				
160	START LEVEL	9D..63 : -99..99		10,12
161	ATTACK LEVEL	9D..63 : -99..99		10,13
162	BREAK POINT LEVEL	9D..63 : -99..99		10,14
OSC-1 BLOCK PANPOT & PANPOT MOD				

163	L:R PAN	$#	FF,0..7F : OFF,L00..R127	*19	0F,0B
164	A.M SOURCE		00..16 : *6	Alternate Modulation	0F,0C
165	INT BY A.M		9D..63 : -99..99		0F,0D
OSC-1 BLOCK SEND					
166	SEND 1 LEVEL	$#	00..7F : 00..127		0F,09
167	SEND 2 LEVEL	$#	00..7F : 00..127		0F,0A
OSC-2 BLOCK PARAMETERS		$			
168 – 304	SAME AS OSC-1 BLOCK(31..167)			OSC2's ParamID is calculated by above each Param ID[02, 03,07,08,0B,0C,0F,10] +2.	
INSERT EFFECT PARAMETERS		$ #			
305 – 392	FX1..4 (22Bytes x 4)				13,00 – 17,??
MASTER EFFECT PARAMETERS		#			
393 – 432					18,00 – 1A,??

*1 : Each Category's names are setupped in GLOBAL mode

*2 : PIANO MODE : Piano Assign (= self exclusive assign).

*3 : For OSC2 BLOCK ON/OFF by Velocity (OSC1 is always on by all range of velocity).

*4 :
0 : Equal Temperament
1 : Pure Major
2 : Pure Minor
3 : Arabic
4 : Pythagoras
5 : Werckmeister
6 : Kirnberger
7 : Slendro
8 : Pelog
9 : 1 Octave user Scale (RAM)
10 : Stretch
11 : All range user scale (RAM)

*5 : Range of Random pitch [Semi tone]
0 : 00
1 : -1/64..+1/64
2 : -1/32..+1/32
3 : -1/16..+1/16
4 : -1/8..+1/8
5 : -1/4..+1/4
6 : -1/2..+1/2
7 : -1 ..+1

*6 : See the AMS table. below is a list of all AMS.

		(as MIDI In)			(as MIDI In)
0	OFF		14	Ribbon Controller (Z)	C.C #17
1	OSC EG		15	Assignable Pedal	C.C #04
2	Filter EG in the same OSC		16	Value Slider	C.C #18
3	Amp EG in the same OSC		17	MIDI Control Change #19	C.C #19
4	OSC LFO in the same OSC		18	Assignable Panel SW1	C.C #80
5	Filter LFO in the same OSC		19	Assignable Panel SW2	C.C #81
6	Velocity	(Vel of Note On!)	20	Assignable Pedal SW	C.C #82
7	Note No.	(No. of Note On!)	21	MIDI Control Change #83	C.C #83
8	Poly After	Poly After	22	Tempo	(Count of Clock)
9	After Touch	After Touch	23	Filter 1 EG (Only from OSC2)	
10	Joy Stick (X)	Pitch Bend	24	Amp 1 EG (Only from OSC2)	
11	Joy Stick (+Y)	C.C #01	25	OSC 1 LFO (Only from OSC2)	
12	Joy Stick (-Y)	C.C #02	26	Filter 1 LFO (Only from OSC2)	
13	Ribbon Controller (X)	C.C #16			

*7 : Multisample is selected by velocity.

*8 :

Data	Time[mSec]	Step
00..19	00.. 50	(2mSec)
1A..28	60.. 200	(10mSec)
29..38	250..1000	(50mSec)
39..60	1100..5000	(100mSec)
FF	KEY OFF (Sound will start at NOTE OFF!)	

*9 : F6 : -1.0 (-12 S.T / Oct)

00 : 0.0 (Flat)

14 : +2.0 (24 S.T / Oct)

*10: 8D..C3 : -12.00 .. -1.20 (0.20 Step)
C4..CD : -1.00 .. -0.55 (0.05 Step)

```
    CE..32 :  -0.50 .. +0.50 ( 0.01 Step )
    33..3C :  +0.55 .. +1.00 ( 0.05 Step )
    3D..73 :  +1.20 ..+12.00 ( 0.20 Step )

*11 : INTENSITY = C4 : -60 (-5Oct)

                  00 :  00 (Off)

                  0C :  12 (+1Oct)

*12 : STEP = 0 : Continuous
             1 : 1/8 [ Semi Tone ]
             2 : 1/4
             3 : 1/2
             4 :  1
              :
             F : 12

*13 : 0 : Triangle   00 deg.(   )             10 : Sine  00 deg.(   )
      1 : Triangle   90 deg.(   )             11 : Sine 180 deg.(   )
      2 : Triangle  180 deg.(   )             12 : Guitar    (   )
      3 : Triangle  270 deg.(   )             13 : Random1 ( Time is fixed, Level is random )
      4 : Up saw     00 deg.(   )             14 : Rondom2 ( Time is random, Level is fixed )
      5 : Up saw    180 deg.(   )             15 : Random3 ( Time and Level are random )
      6 : Down saw   00 deg.(   )             16 : Random4 ( Time is fixed, Level is random with Ramp )
      7 : Down saw  180 deg.(   )             17 : Random5 ( Time is random, Level is fixed with Ramp )
      8 : Rectangle  00 deg.(   )             18 : Random6 ( Time and Level are random with Ramp )
      9 : Rectangle 180 deg.(   )

*14 : ON  : LFO is started at NOTE ON! ( Normal ).
      OFF : LFO is started at NOTE OFF!.
      BOTH: LFO is started at NOTE ON! and stopped at NOTE OFF!(Reversable).

*15 : Fade < 0 : Fade out at Note on!                          ( ON mode )
                 Fade out at Note off!                         ( OFF mode )
                 Fade out at Note on!, and fade in at Note off! ( BOTH mode )
           > 0 : Fade in at Note on! : Normal                  ( ON mode )
                 Fade in at Note off!                          ( OFF mode )
                 Fade in at Note on!, and fade out at Note off! ( BOTH mode )

*16 : 0 : Low Pass
      1 : High Pass
      2 : Band Pass
      3 : Band Reject

*17 : 0 : Parallel
      1 : Serial
      2 : Single
      3 : Through

*18 : Between LOW KEY & HIGH KEY is connected by linear line. Lower(Higher) area of LOW(HIGH) KEY has
     a linear line, and its ramp will decided by RAMP.

*19 : When panpot is controlled by Alternate Mod, it will act based on its initial setting.
```